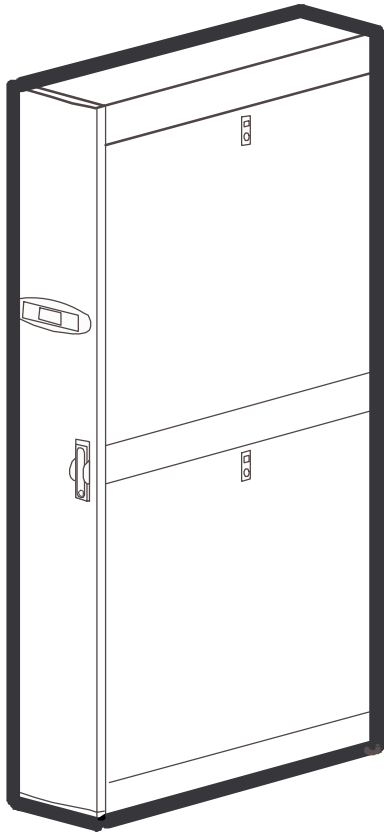


# Modular Power Distribution Unit (PDU)

## Installation

PDPM277H, PDPM144F

Latest updates are available on the Schneider Electric website  
03/2024



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The information provided in this document contains general descriptions, technical characteristics and/or recommendations related to products/solutions.

This document is not intended as a substitute for a detailed study or operational and site-specific development or schematic plan. It is not to be used for determining suitability or reliability of the products/solutions for specific user applications. It is the duty of any such user to perform or have any professional expert of its choice (integrator, specifier or the like) perform the appropriate and comprehensive risk analysis, evaluation and testing of the products/solutions with respect to the relevant specific application or use thereof.

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# Table of Contents

Important Safety Instructions — SAVE THESE	
INSTRUCTIONS .....	5
Safety Precautions .....	6
Additional Safety Information .....	8
Specifications .....	9
PDU Weights and Dimensions .....	10
PDU Shipping Weights and Dimensions .....	11
Environment.....	11
Compliance.....	11
Installation Procedure .....	12
Position and Level the PDU .....	13
Prepare the PDU for Input Cables.....	15
Connect the Input Cables .....	18
Connect the Communication Cables .....	20
Install Shielding Troughs (Option).....	21
Final Installation .....	22
Decommission or Move the PDU to a New Location.....	23



# Important Safety Instructions — SAVE THESE INSTRUCTIONS

Read these instructions carefully and look at the equipment to become familiar with it before trying to install, operate, service or maintain it. The following safety 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 message 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 with this symbol to avoid possible injury or death.

## DANGER

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

**Failure to follow these instructions will result in death or serious injury.**

## WARNING

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

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

## CAUTION

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

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

## NOTICE

**NOTICE** is used to address practices not related to physical injury. The safety alert symbol shall not be used with this type of safety message.

**Failure to follow these instructions can result in equipment damage.**

## Please Note

Electrical equipment should only be installed, operated, serviced, and maintained by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction, installation, and operation of electrical equipment and has received safety training to recognize and avoid the hazards involved.

## Safety Precautions

This manual contains important instructions that must be followed during installation, operation, and maintenance of the power distribution unit (PDU). For safety reasons, only trained users are allowed to operate the display interface and replace the power distribution modules (PDMs).

### DANGER

#### HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Electrical equipment must be installed, operated, serviced, and maintained only by qualified personnel.
- The PDU must be installed in accordance with the National Electrical Code or the Canadian Electrical Code and all applicable local codes.
- Service access areas are locked with a Red Key. The Red Keys must remain under the control of qualified service personnel.
- Wear appropriate personal protection equipment (PPE) when performing maintenance on this PDU.

**Failure to follow these instructions will result in death or serious injury.**

### DANGER

#### HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Turn off all power supplying the equipment and perform appropriate lockout/tagout procedures before installing or removing the PDM.

**Failure to follow these instructions will result in death or serious injury.**

### WARNING

#### UNEXPECTED BEHAVIOR OF APPLICATION

Only trained users should operate the display or replace the PDMs.

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

### CAUTION

#### HAZARD OF EQUIPMENT DAMAGE

- For PDMs with RCDs (residual current devices) installed, the occurrence of a ground fault will automatically open the adjacent circuit-breaker.
- PDMs with RCDs are equipped with a test button. Periodic testing of the RCD may be required. Check local codes for your region.

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

## Regulatory Agency Approval

This equipment has been tested and found to comply with the limits for a class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the installation guide, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

*This class A digital apparatus complies with Canadian ICES-003.*

*Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.*

This is a class A product. In a domestic environment this product may cause interference in which case the user may be required to take adequate measures.

## Additional Safety Information

### Before You Begin

Verify that the system is free from all short circuits and grounds, except those grounds installed according to local regulations (according to the National Electrical Code in the U.S.A., for instance). If high-potential voltage testing is necessary, follow recommendations in equipment documentation to prevent accidental equipment damage.

Before energizing equipment:

- Remove tools, meters, and debris from equipment.
- Close the equipment enclosure door.
- Perform all start-up tests recommended by the manufacturer.

### Operation and Adjustments

The following precautions are from the NEMA Standards Publication ICS 7.1-195 (English version prevails):

- Regardless of the care exercised in the design and manufacture of equipment or in the selection and ratings of components, there are hazards that can be encountered if such equipment is improperly operated.
- It is possible to misadjust the equipment and thus produce unsatisfactory or unsafe operation. Always use the manufacturer instructions as a guide for functional adjustments. Personnel who have access to these adjustments should be familiar with the equipment manufacturer's instructions and other equipment used with this product.
- Only those operational adjustments actually required by the operator should be accessible to the operator. Access to other controls should be restricted to prevent unauthorized changes in operating characteristics.

#### **⚠ WARNING**

##### **UNGUARDED MACHINERY HAZARD**

- Do not use this product with equipment which does not have point-of-operation protection.
- Do not reach into equipment during operation.

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



# Specifications

## Input Conductors

This product is rated 400 A. It must be supplied with a circuit breaker with a maximum rating of 400 A.

**NOTE:** Torque input conductors to 31.1 Nm (275 lb-in) using an 8 mm (5/16 in) Allen (hexagonal) wrench.

### AC Input Specifications

Nominal voltage (V)	415/240 V, 3PH + N + G 120/208 V, 3PH + N + G 3PH/N/PE ~ 400/230 V
Frequency (Hz)	47-63
Upstream circuit breaker (A)	400
Maximum continuous current (A)	400
Maximum main input conductor size (kcmil)	500

### AC Output Specifications

Nominal voltage (V)	415/240 V, 3PH + N + G or 3 x 240 V 1PH+N+G 120/208 V, 3PH + N + G or 3 x 120 V 1PH+N+G 3PH/N/PE ~ 400 V or 3 x 1/N/PE ~ 230 V
Maximum continuous current (A)	400
Connections	3PH + N + PE or 3 x (1PH + N + PE), based on attached PDMs
Full load rating	288 kW at 415 V 3PH 277 kW at 400 V 3PH 144 kW at 208 V 3PH
Output power cable connections	Various, based on attached PDMs
Output power cable lengths	Various, based on attached PDMs
Maximum PDMs	24
Maximum power distribution poles	72

## Maximum Input Conductor Size

For North America, if supplied by a 400 A circuit breaker, it is recommended that conductors are sized in accordance with the following table.

### Maximum Input Conductor (400 A, 75 °C/167 °F Conductors) Size for North America

Wiring system	Copper	Aluminum
3 CCC <sup>1</sup> , 30 °C ambient	PH <sup>2</sup> and N <sup>3</sup> = 500 kcmil G <sup>4</sup> = 3 AWG <sup>5</sup>	PH and N = (2) 4/0 AWG G = (2) <sup>6</sup> 3 AWG
4 CCC, 30 °C ambient	PH and N = (2) 4/0 AWG G = (2) 3 AWG	PH and N = (2) 350 kcmil G = (2) 1 AWG

For countries outside of North America, if supplied by a 400 A circuit breaker, it is recommended that conductors are sized in accordance with the following table.

### Maximum Input Conductor Size for Countries outside North America

Installation method	Copper, PVC <sup>7</sup> insulation, 30 °C ambient (mm <sup>2</sup> )	Copper, XLPE <sup>8</sup> or EPR <sup>9</sup> insulation, 30 °C ambient (mm <sup>2</sup> )	Aluminum, PVC insulation, 30 °C ambient (mm <sup>2</sup> )	Aluminum, XLPE or ERP insulation, 30 °C ambient (mm <sup>2</sup> )
B1	PH and N = (2) 95 PE <sup>10</sup> = (2) 50	PH and N = 240 PE = 120	PH and N = (2) 150 PE = (2) 95	PH and N = (2) 95 PE = (2) 50
B2	PH and N = (2) 120 PE = (2) 70	PH and N = (2) 95 PE = (2) 50	PH and N = 240 PE = 120	PH and N = (2) 120 PE = (2) 70
C	PH and N = 240 PE = 120	PH and N = 185 PE = 95	PH and N = (2) 150 PE = (2) 95	PH and N = (2) 95 PE = (2) 50
E	PH and N = 240 PE = 120	PH and N = 185 PE = 95	PH and N = (2) 120 PE = (2) 70	PH and N = 240 PE = 120
F (Trefoil)	PH and N = 185 PE = 95	PH and N = 150 PE = 95	PH and N = (2) 95 PE = (2) 50	PH and N = 240 PE = 120
F (Flat)	PH and N = 185 PE = 95	PH and N = 120 PE = 70	PH and N = (2) 95 PE = (2) 50	PH and N = 185 PE = 95

## PDU Weights and Dimensions

Commercial reference	Weight kg (lbs)	Height mm (in)	Width mm (in)	Depth mm (in)
PDPM277H	160 (352)	2002 (78.8)	300 (11.8)	1072 (42.4)
PDPM144F	160 (352)	2002 (78.8)	300 (11.8)	1077 (42.4)

1. CCC = Current-carrying conductors
2. PH = Phase conductor
3. N = Neutral conductor
4. G = Ground conductor
5. AWG = American Wire Gauge
6. (2) = Two conductors per terminal
7. PVC = Polyvinyl3-chloride
8. XLPE = Cross-linked polyethylene
9. Ethylene propylene rubber
10. PE = Protective Earth conductor

## PDU Shipping Weights and Dimensions

Commercial reference	Weight kg (lbs)	Height mm (in)	Width mm (in)	Depth mm (in)
PDPM277H	183 (402)	2248 (88.5)	853 (3.6)	1207 (47.5)
PDPM144F	182 (401)	2248 (88.5)	851 (3.5)	1206 (47.5)

## Environment

	Operating	Storage
Temperature	0 °C to 30 °C (32 °F to 86 °F) without load derating. 0 °C to 40 °C (32 °F to 104 °F) with power derated.	0 °C to 45 °C (32 °F to 113 °F)
Relative humidity	0-95% non-condensing	0-95% non-condensing
Elevation	Designed for operation in 0-1000 m (0-3300 feet) elevation.	
Operation environment	Protected from water and conductive contaminants	

**NOTE:** If this product is installed in an environment with greater than 30 °C (86 °F) ambient temperature, either derate the product’s current rating, or increase the size of the conductors supplying, in accordance with the derating factors of NFPA 70 and IEC 60364-5-53.

## Compliance

Certification	Certified by VDE to IEC 61439-1:2020-05 IEC 61439-2:2020-07 DIN EN IEC 61439-1 (VDE 0660-600-1):2021-10 DIN EN IEC 61439-2 (VDE 0660-600-2):2021-10 EN IEC 61439-1:2021 EN IEC 61439-2:2021 Listed (US) and cUL(Canada) by Underwriters Laboratories Inc. to UL 60950
Conditional short-circuit current rating (ICC)	10 kA
Rated impulse withstand voltage (UCC)	4 kV
Rated diversity factor	0.6
Overvoltage category	OVCIII
Protective class	1
Pollution degree	2

**NOTE:** If this product is installed in an environment with greater than 30 °C (86 °F) ambient temperature, either derate the product’s current rating, or increase the size of the conductors supplying, in accordance with the derating factors of NFPA 70 and IEC 60364-5-53.

# Installation Procedure

## DANGER

### HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

The PDU must be secured against movement. Once the PDU is in its final position, install the stabilizing brackets on the PDU and mount them to the floor.

**Failure to follow these instructions will result in death or serious injury.**

## WARNING

### TILTING HAZARD

The PDU is top heavy - move with care and use ramps over uneven floors.

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

1. Position and Level the PDU, page 13.
2. Prepare the PDU for Input Cables, page 15.
3. Connect the Input Cables, page 18.
4. Install the PDMs. Follow the installation manual provided with the PDM.
5. Connect the Communication Cables, page 20.
6. Install Shielding Troughs (Option), page 21.
7. Final Installation, page 22.

For moving or decommissioning the PDU after installation has been completed, see Decommission or Move the PDU to a New Location, page 23.

# Position and Level the PDU

## **⚡⚠ DANGER**

### **HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

The PDU must be secured against movement. Once the PDU is in its final position, install the stabilizing brackets on the PDU and mount them to the floor.

**Failure to follow these instructions will result in death or serious injury.**

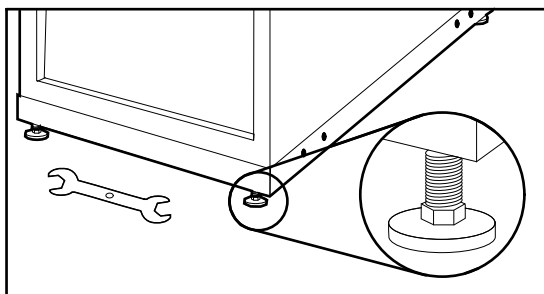
## **⚠ WARNING**

### **TIP HAZARD**

The PDU must be installed on a level floor. The leveling feet will stabilize the PDU, but will not compensate for a badly sloped floor.

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

1. After moving the PDU to its final location, use a 13/14 mm wrench to adjust the four leveling feet and ensure that the PDU is level.

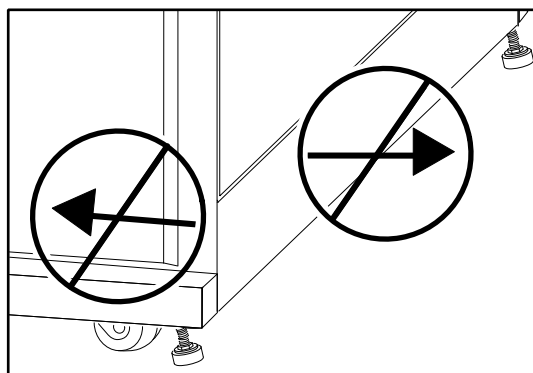


## **⚠ WARNING**

### **TIP HAZARD**

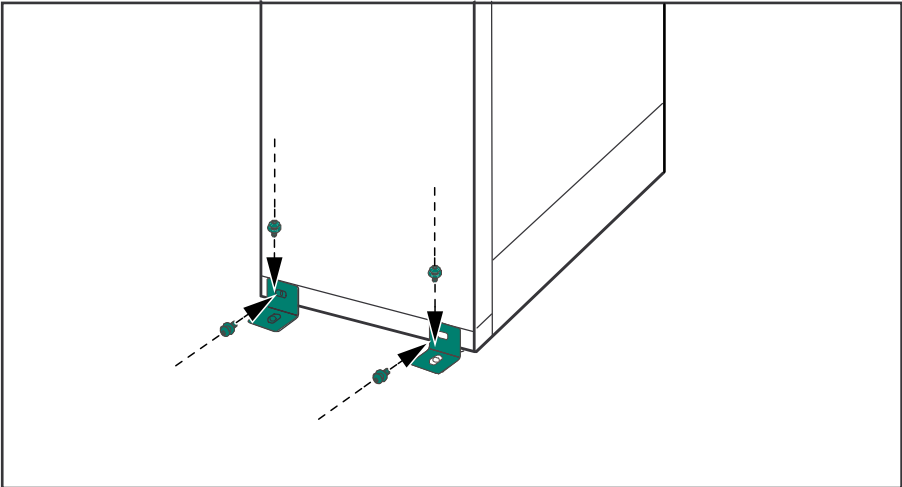
Do not move the PDU after the leveling feet have been lowered.

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



- 2. If not already done, install the stabilizing brackets on the PDU and mount them to the floor.

**Rear View of the PDU**



## Prepare the PDU for Input Cables

### ⚠ CAUTION

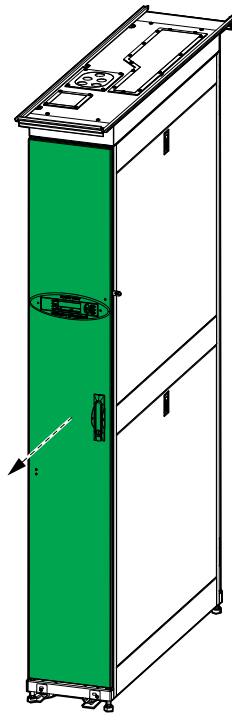
#### RISK OF EQUIPMENT DAMAGE

- Remove the gland plates from the PDU before cutting holes for power cable access. Metal shavings can cause serious equipment damage. A metal punch can be used to make the holes in the gland plates.

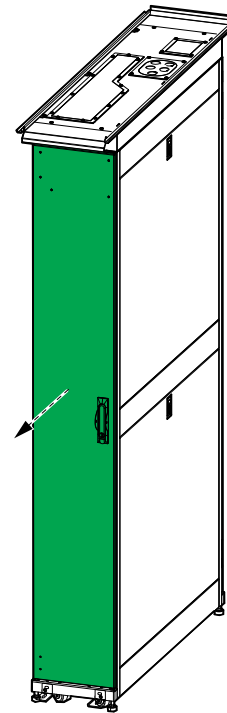
**Failure to follow these instructions can result in injury or equipment damage.**

1. Remove the front and rear doors of the PDU.

Front View

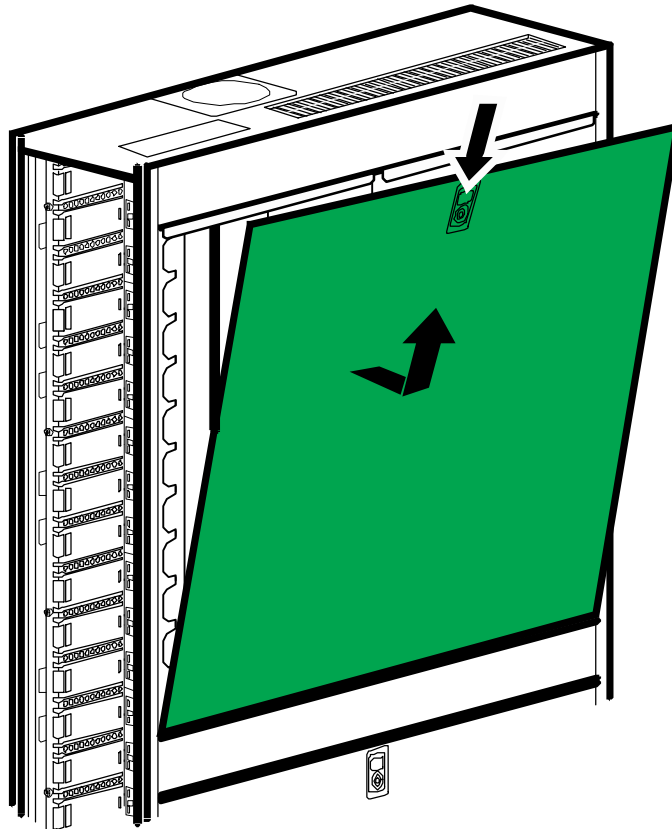


Rear View



2. Unlock the side panel with the provided key. Press down the lock and pull the panel out and up.

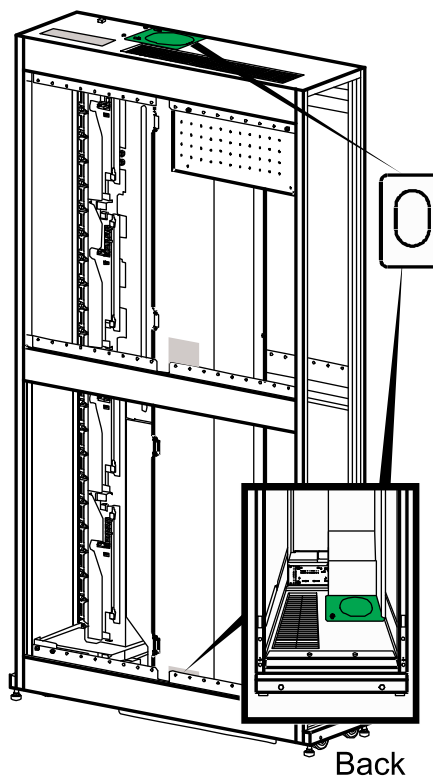
### Front and Side View



3. Remove the top gland plate for top cable entry, or the bottom gland plate for bottom cable entry.

### Side View

Front



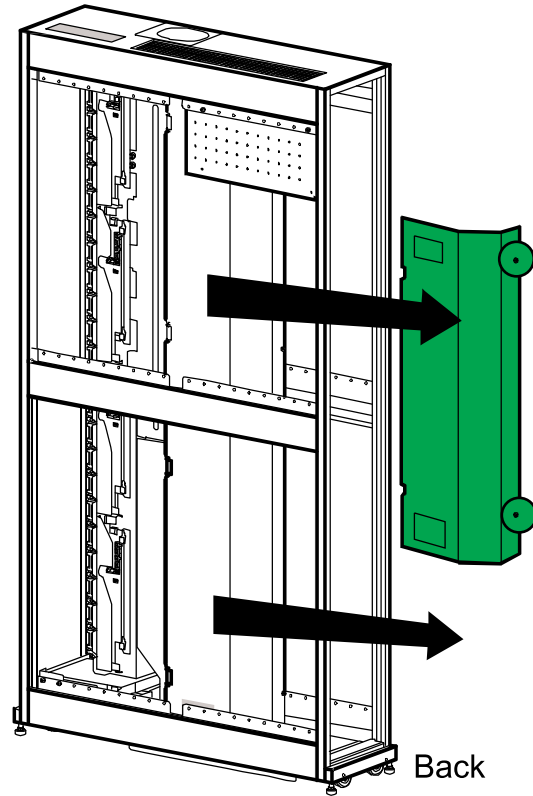


4. Cut holes for conduits in the gland plate following the markings. Reinstall the gland plate.
5. Loosen the captive screws to remove the covers for the compression terminals.

**NOTE:** Only remove the bottom cover when power cables are routed in through the bottom of the PDU.

**Side View**

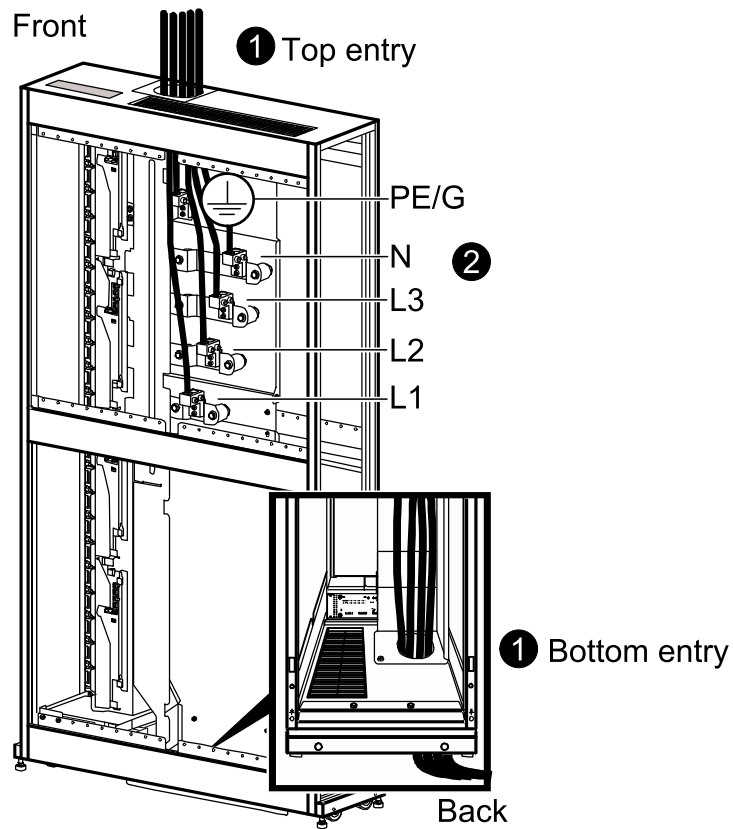
Front



# Connect the Input Cables

1. Route the cables through the top or the bottom of the PDU.

## Side View

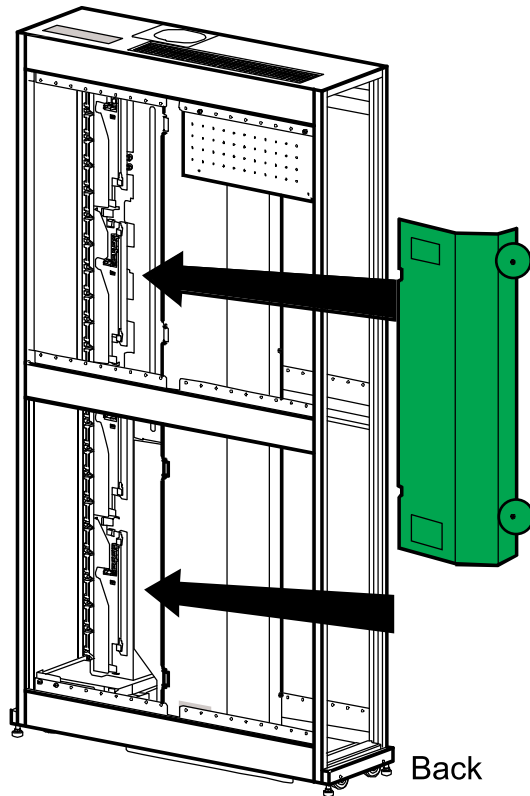


2. Connect the conductors for Protective Earth/ground (PE/G), neutral (N), and phases (L1, L2, and L3) to the appropriate compression terminals.

3. Reinstall the cover(s) for the compression terminals.

Side View

Front

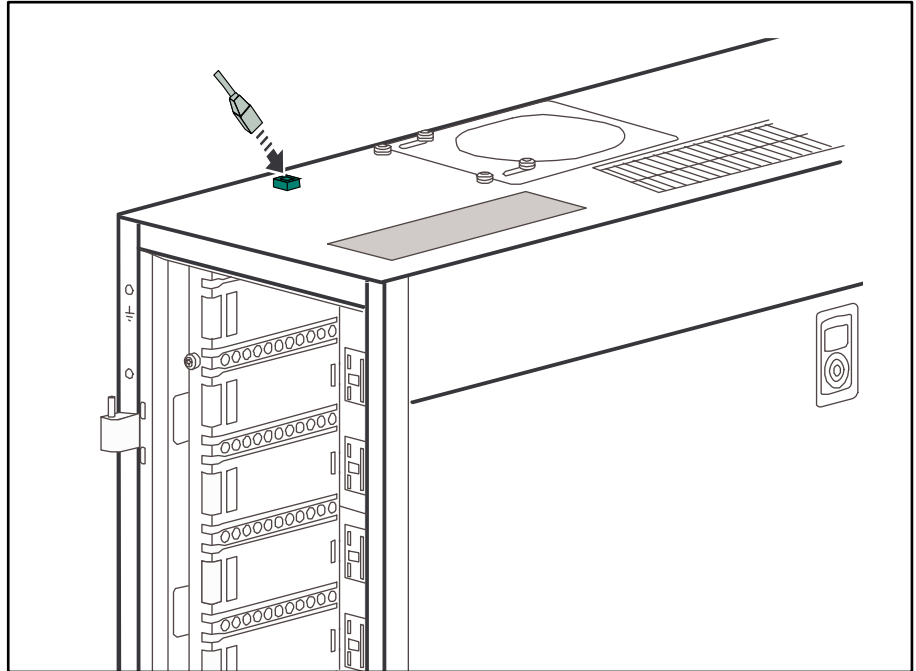


4. Install the PDMs. Follow the installation manual provided with the PDM.

# Connect the Communication Cables

1. Connect one end of the communication cable to the port on the top of the PDU and the other end to the local area network port.

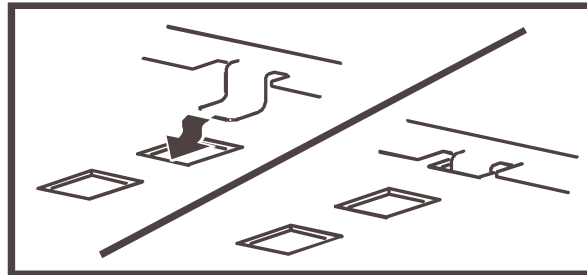
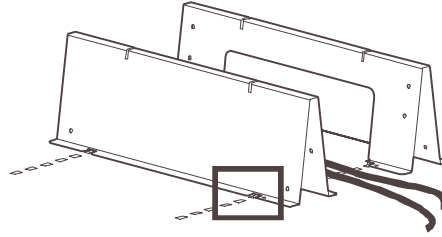
## Front and Side View



## Install Shielding Troughs (Option)

1. Snap an optional shielding trough into slots on the roof of the PDU. The tabs at the base of the trough must fit securely into the slots.

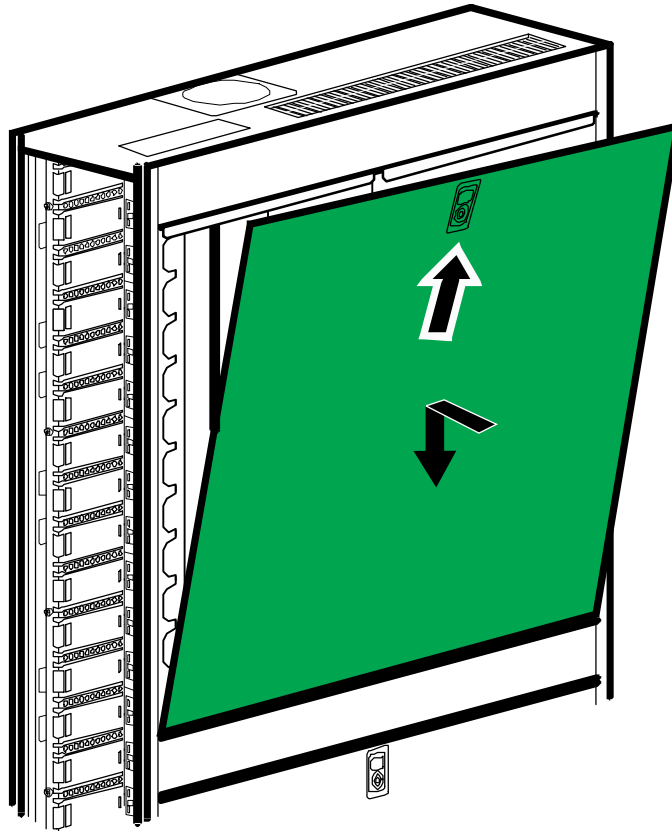
**NOTE:** Align the PDU trough with troughs that are already installed on top of adjacent PDUs.



# Final Installation

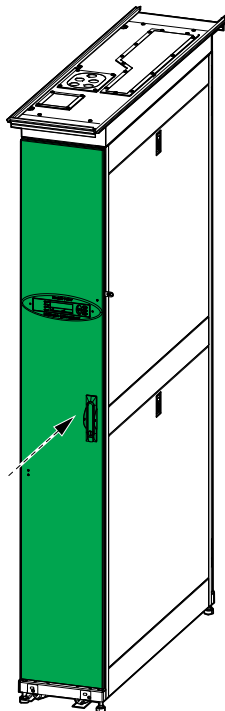
1. Push the side panel in and down. Lock the side panel with the provided key.

## Front and Side View

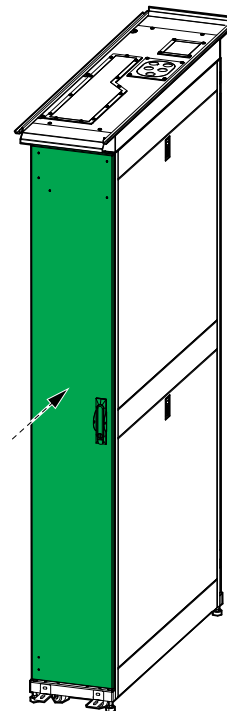


2. Reinstall the front and rear doors.

## Front View



## Rear View



# Decommission or Move the PDU to a New Location

## **⚠️⚠️ DANGER**

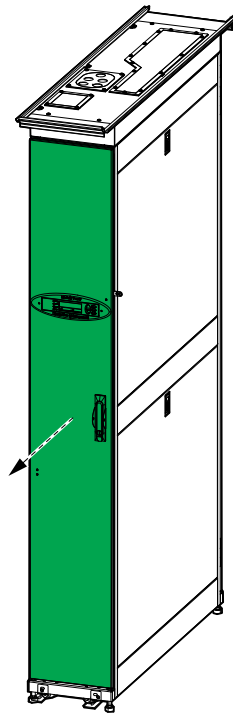
### **HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

Electrical equipment must be installed, operated, serviced, and maintained only by qualified personnel.

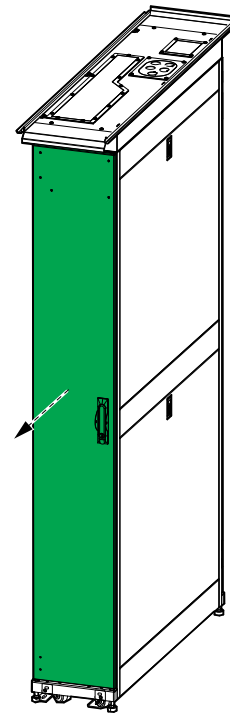
**Failure to follow these instructions will result in death or serious injury.**

1. Shut down the PDU completely – follow the instructions in the PDU operation manual.
2. Remove the front and rear doors of the PDU.

**Front View**

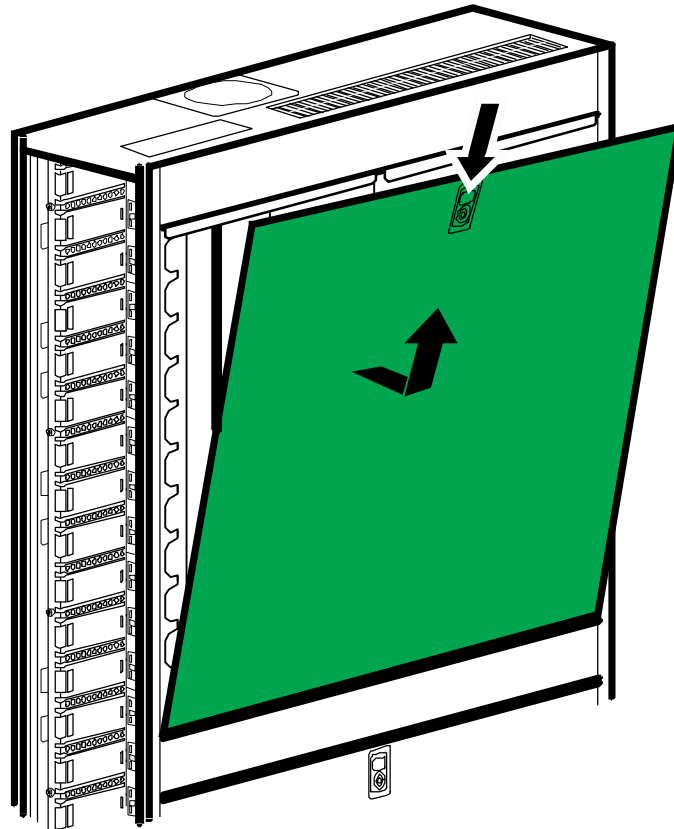


**Rear View**



3. Unlock the side panel with the provided key. Press down the lock and pull the panel out and up.

#### Front and Side View



4. Remove all PDMs – follow the installation manual provided with the PDM.

### **⚡ ⚠ DANGER**

#### **UNGUARDED MACHINERY HAZARD**

- If a Symmetra PX UPS is providing power to the PDU, transfer the UPS into battery operation (to reduce fault current) before removing the PDM. Follow the operation manual provided with the UPS to transfer the UPS into battery operation.

**Failure to follow these instructions will result in death or serious injury.**

### **⚡ ⚠ DANGER**

#### **HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

- Turn off all power supplying the equipment and perform appropriate lockout/tagout procedures before removing the PDM.

**Failure to follow these instructions will result in death or serious injury.**



5. Measure for and verify ABSENCE of voltage on each input terminal before continuing.

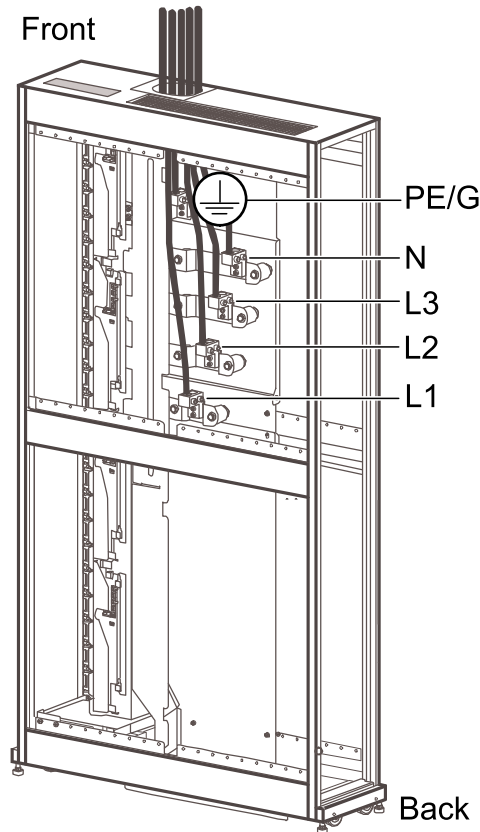
**⚡ ⚠ DANGER**

**HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

Measure for and verify ABSENCE of voltage on each input terminal before continuing.

**Failure to follow these instructions will result in death or serious injury.**

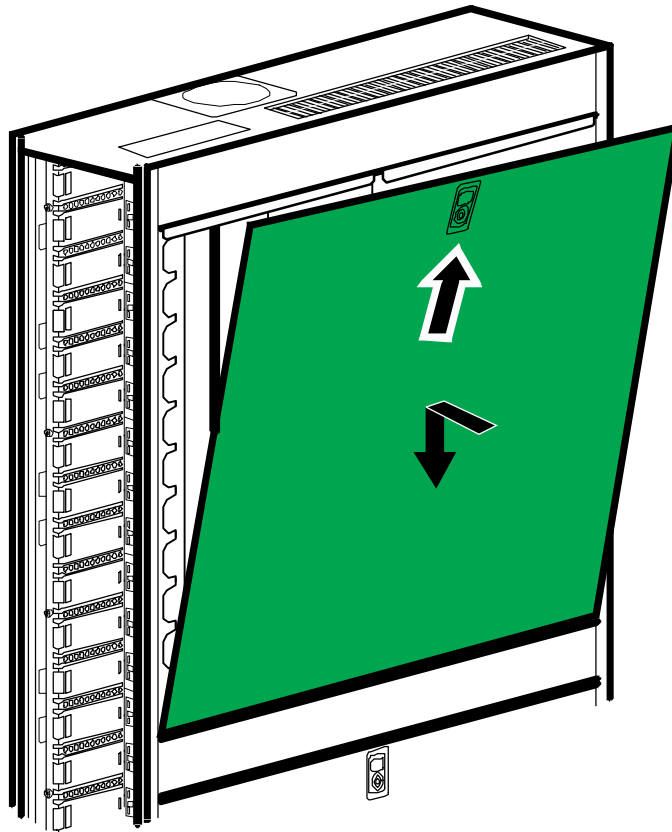
**Side View**



6. Disconnect and remove all power cables from the PDU. See [Connect the Input Cables](#), page 18 for details.

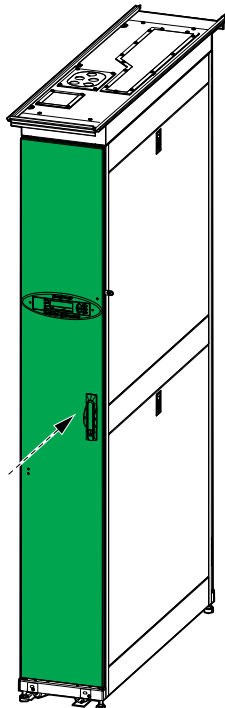
7. Push the side panel in and down. Lock the side panel with the provided key.

#### Front and Side View

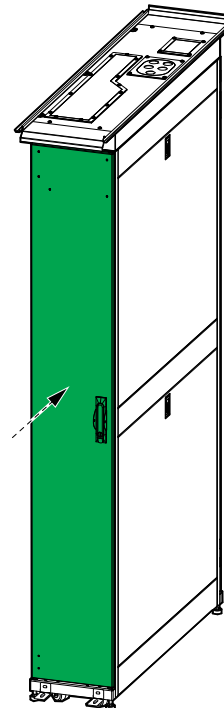


8. For parallel PDUs, remove the interconnection hardware between the PDUs. Save the hardware for reinstallation.
9. Reinstall the front and rear doors.

#### Front View

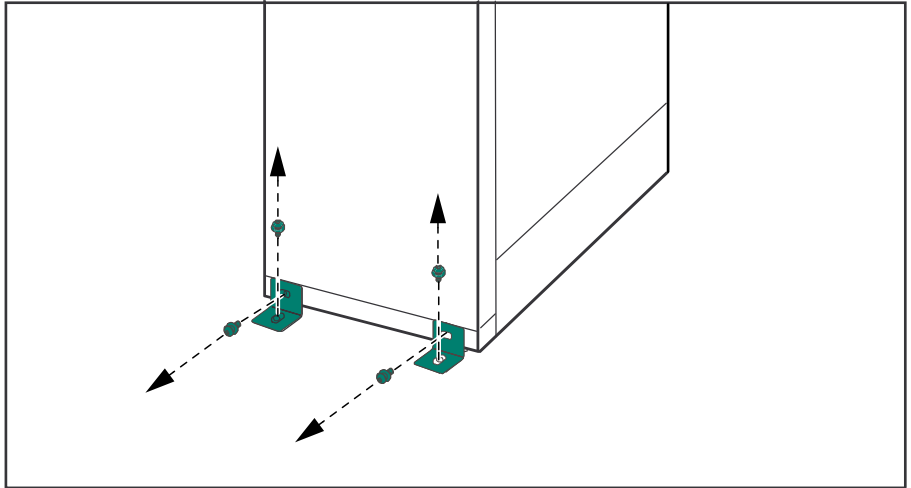


#### Rear View



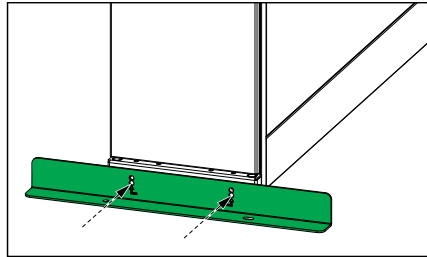
10. Remove the stabilizing brackets from the PDU and the floor.

**Rear View of the PDU**

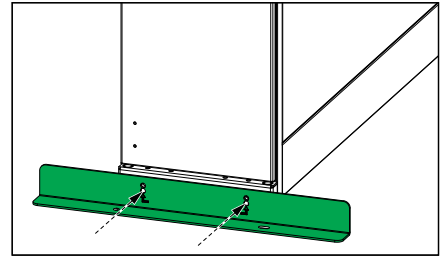


11. Reinstall the front and rear transportation brackets on the PDU with the provided bolts, if available. Slide the transportation brackets up before tightening the bolts.

**Front View of the PDU**



**Rear View of the PDU**



12. Raise the feet of the PDU until the casters have full contact with the floor.
13. You can now move the PDU by rolling it over the floor on the casters.

**⚠ WARNING**

**TIPPING HAZARD**

- The casters of the PDU are exclusively for transport on flat, even, hard, and horizontal surfaces.
- The casters of the PDU are intended for transport over short distances (i.e. inside the same building).
- Move at a slow pace and pay close attention on the floor conditions and the balance of the PDU.

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

14. **For transport over longer distances or in conditions that are not suitable for the casters of the PDU:**

**⚠ WARNING****TOP-HEAVY CABINET**

The PDU is top-heavy. Take appropriate precautions during handling and preparation for transport/shipment.

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

**⚠ WARNING****TIPPING HAZARD**

For transport over longer distances or in conditions that are not suitable for the casters of the PDU, ensure:

- that personnel performing the transport have necessary skill and have received adequate training;
- to use appropriate tools to safely lift and transport the PDU;
- to protect the product against damage by using appropriate protection (like wrapping or packaging).

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

Transportation requirements:

- Mount the PDU in a vertical position in the center of a suitable pallet with minimum dimensions: 840 mm x 1200 mm (33.1 in x 47.2 in). The pallet must be suitable for the weight of the PDU. The PDU weighs 160 kg (352 lbs).
- Use appropriate means of fixation to mount the PDU to the pallet.
- The original shipping pallet in combination with the original transportation brackets can be reused, if in undamaged condition.

**⚠ DANGER****TIPPING HAZARD**

- The PDU must be appropriately fixed to the pallet immediately after being placed on the pallet.
- The fixation hardware must be strong enough to withstand vibrations and shocks during loading, transport, and unloading.

**Failure to follow these instructions will result in death or serious injury.**

**⚠ WARNING****UNEXPECTED EQUIPMENT BEHAVIOR**

Do not lift the PDU with a forklift/pallet truck directly on the frame as it may bend or damage the frame.

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

15. Perform one of the following:
  - Decommission the PDU, OR
  - Move the PDU to a new location to install it.
16. **Only for installing the PDU in a new location:** Follow the installation manual to install the PDU in the new location. See *Installation Procedure*, page 12 for installation overview.







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As standards, specifications, and design change from time to time,  
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990-3052D-001