Panduit G6 PDU Installation
Manual Rev. 01

# Contents

# Before You Begin

## Overview

This document provides installation instructions and configuration instructions to qualified personnel for installing a Panduit Metered, Switched, and Metered & Switched Power Distribution Unit (PDU) into a datacenter rack. Please read all instructions before operating the equipment and save this manual for future reference.

## Important Safety Information

See the complete regulatory compliance notices in *Safety and Compliance Information for Server, Storage, Power, Networking, and Rack Products* on the Panduit website (http://www.panduit.com/). In addition, follow the safety precautions that are specific to this device.

This PDU is intended only for Information Technology Equipment (ITE) loads with linear/Power Factor Corrected (PFC) input current. If non-linear loads are connected, the nameplate current rating of the PDU must be reduced by a factor of 0.8.

⚠ **WARNING:** A risk of personal injury from electric shock and hazardous energy levels exists. The installation of options and routine maintenance and service of this product must be performed by individuals who are knowledgeable about the procedures, precautions, and hazards associated with AC power products.

**IMPORTANT SAFETY INSTRUCTIONS-----SAVE THESE INSTRUCTIONS**

Follow these safety precautions when connecting multiple hardware components to power sources.

⚠ **WARNING:** To reduce the risk of fire, electric shock and damage to the equipment:

**HIGH LEAKAGE CURRENT.** To reduce the risk of electric shock due to high leakage currents, ensure that there is a reliable grounded (earthed) connection before connecting power distribution products to AC power. If a large number of products will be connected to a single PDU, it may be

necessary to conduct an evaluation of the installation to verify the total amount of leakage current. The total combined leakage current should not exceed 5 percent of the input current for the PDU and associated load.

Connect only to a circuit providing branch circuit overcurrent protection of appropriate current rating.

Connect the input power cord to a grounded (earthed) electrical outlet that is located near the equipment and is easily accessible.

Be sure all circuit breakers are in the off position before connecting input power.

Be sure that the devices connected to the Panduit PDU are adjusted for, or otherwise capable of, operation from the same line voltage supplying the PDU. Failure to verify the voltage can lead to severe equipment damage.

Do not overload the PDU. The total input current rating of all equipment connected to each output cannot exceed the total output rating marked on the PDU.

Use only the hardware provided to install the PDU.

To reduce the risk of fire or electric shock, install this PDU in a temperature and humidity controlled, indoor environment, free of conductive contaminants. Do not operate near water or excessive humidity (90% maximum noncondensing).

Ambient temperature must not exceed 0°C to 60°C (32°F to 140°F).

The internal components can become extremely hot during operation. Allow sufficient time for the PDU to cool before handling.

Do not use a two-wire power cord in any product configuration.

TO ISOLATE THIS EQUIPMENT, DISCONNECT THE POWER CORD.

⚠ **DANGER:** This PDU contains **LETHAL VOLTAGES**. **NO** repairs should be performed on these units except for the replacement of the management card. There are **NO USER SERVICEABLE PARTS** inside the PDU. The installation of options, routine maintenance, and service of this product must be performed by individuals who are knowledgeable about the procedures, precautions, and hazards associated with AC power products.

**IT IS ESSENTIAL THAT THIS EQUIPMENT IS CONNECTED TO AN ELECTRICAL SUPPLY.**

For permanently connected PDUs, the installation must be performed by a licensed electrician, must be connected to an AC power source that is current limited by a properly rated circuit breaker or fuse meeting national and local electrical codes, and must be

connected to a protective earth ground.

## Required Tools

The following tools maybe required for installation:

- Phillips screwdriver
- Torx screwdriver
- USB Drive (firmware upgrade)

# Section 1 – Introduction

## Classification Overview

The Panduit G6 Monitored, Switched, Monitored per Outlet, and Monitored & Switched per Outlet PDUs (Power Distribution Units) are intelligent PDUs designed to distribute power to IT equipment installed into a rack. These PDUs are single-phase (1Ph) or three-phase (3Ph) models with electrical metering and switching capabilities.

Each PDU provides power distribution to IT loads through C13, C19, Combination or NEMA 5-20R outlets. The quantity and location of outlets vary by model. The PDUs allow you to connect and manage these outlets from a single power connection. The PDUs can be managed from a Web interface, a Command Line Interface (CLI) or Redfish API and viewed from the local display.

Panduit PDUs are designed for use with all Panduit cabinets and are compatible with most third-party data center racks. The PDU models vary in form factor with several mounting configurations available.

**Panduit Monitored PDU:** Provides aggregate power monitoring to quickly identify potential power issues and reclaim available or under-utilized power capacity.

**Panduit Switched PDU:** Provides aggregate power monitoring and outlet level switching capabilities for individual outlets or a group of outlets. This PDU enables power sequencing, rebooting equipment or restrict unauthorized use of individual outlets.

**Panduit Monitored per Outlet PDU**: Provides outlet-level power monitoring to quickly identify potential power issues and reclaim available or under-utilized power capacity at the outlet level.

**Panduit Monitored & Switched per Outlet PDU:** Provides outlet-level power monitoring and outlet-level switching capabilities for individual outlets or a group of outlets. Power monitoring at the individual outlet level provides actionable management data on the power consumption of each connected IT device, enabling the redeployment or decommissioning of individual servers to reclaim available or under-utilized power capacity.

## Features

The Panduit Monitored, Switched, Monitored per Outlet, and Monitored & Switched PDUs provide the following features:

- **Lower profile on vertical PDUs** – enhances serviceability area in the back of the rack.

- **Multiple mounting options on vertical PDUs** – threaded inserts on 3 mounting faces enable vertical PDUs to be mounted with outlets facing in toward center of rack, back or front of rack.

- **Higher operating temperature** – all G6 series PDUs rated for 60˚C operating temperature.

- **Universal input connector** – has the capability to handle input voltages ranging from 208V-415V (1PH or 3PH).  Simply select the facility side cord set to match the power needs of the installation.  If your power needs ever change in the future, just swap in a new facility side cord set for the ultimate in future proofing and rack power scalability.

- **4-in-1 combination outlets** - the ultimate in connection flexibility allowing a single outlet to be used as a C13/C15 or a C13/C15/C19/C21, making sure connection types are available when needed most. Combination outlets also accept the Panduit dual locking power cords to eliminate accidental disconnects.

- **Color-coded outlets to circuit breakers** – used to easily differentiate load segments and aid in balancing of the phases.

- **Integrated (cable tie accepting) cord retention on most C13 & C19 outlets** – eliminates accidental disconnects.

- **Supports Dual locking cords on all C13, C19 and combination outlets** – locks on both ends of the power cord and virtually eliminates accidental disconnects.

- **Hot Swappable Network Management Module** – allows power distribution during module replacement eliminating downtime.

- **Dual 1Gb Ethernet** – eliminates the need to manually set the network switch to

run at a slower rate and increases the amount of PDUs that can be daisy chained together.

- **Daisy Chain** – able to network up to 32 of the same PDUs on one IP address.

- **Enhanced Sensor Support** – supports up to six physical sensors (with optional hub) and eight measurements per PDU with a total of 32 measurements in a maximum daisy chain configuration.

- **Highly Visible OLED display** – improves visibility while providing local access to view configuration settings. Automatically enters power save mode to conserve energy and protect the display from burn in.

## Form Factors

Details of the form factors that are covered within this document.

| Form Factor | Details |
|---|---|
| 0U (Vertical) | Vertical PDUs come in Half, Mid, & Full-height versions and install vertically in the 0U space in the back of the rack. There are also Half and Full-height dual sided models that install vertically in the 0U space in the back of the rack. The dual sided model mounts on its side with outlets facing the back of the rack. |

## Load Segment and Phase Distinction

Panduit G6 PDUs have colored outlets to help distinguish between the different load segments and phases. All Panduit three phase PDUs have different colored outlets (white, light gray, and dark gray) to distinguish the different phases. All Panduit PDUs with breakers have different colored outlets to distinguish the different load segments (with one exception as noted below). For single phase PDUs with no breakers the outlets are all black.



**Single Phase PDU Example**
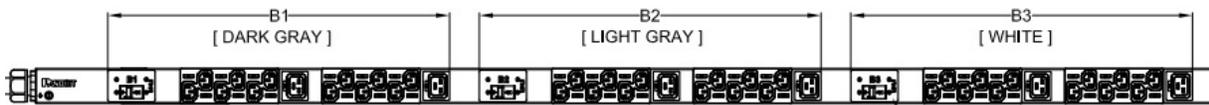
**Three Phase PDU Example**
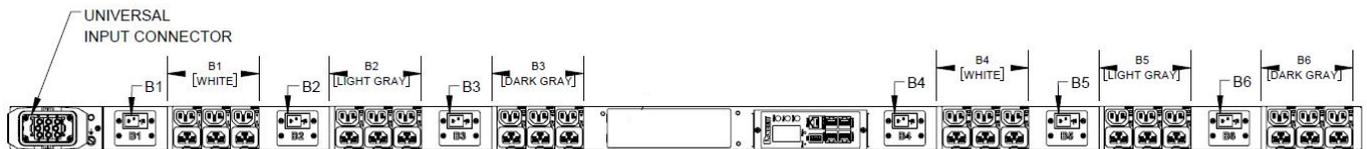


**Universal Input PDU Example**

# Power Cord Retention

**Integrated Cord Retention**

Most IEC C13 and C19 outlet on the PDU comes equipped with an integrated cord retention feature. This will allow you to secure the cord to the outlet without a cord retention bracket.

1. Plug in the power cord.
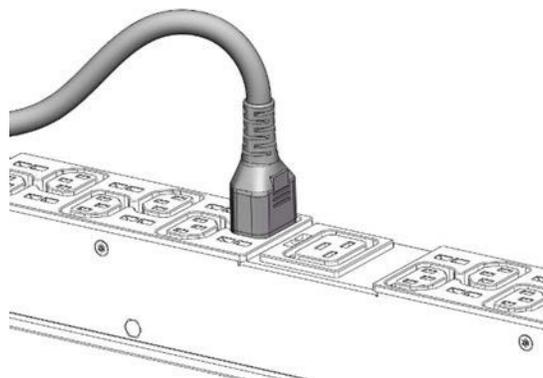
2. Using the tie wraps provided, slide the end of the tie wrap into the notch on the PDU next to the desired outlet and wrap around the cord.
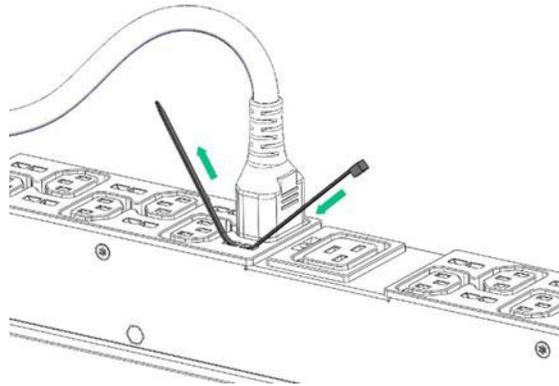
3. Secure the tie wrap.
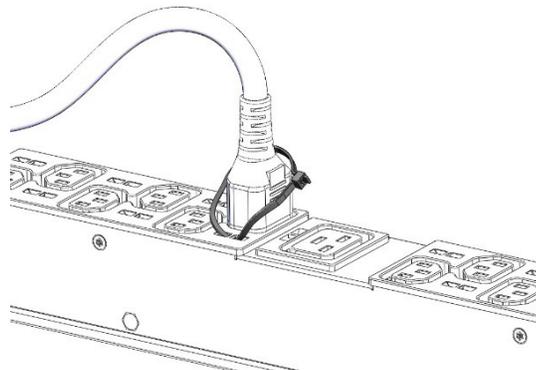
**4-in-1 combination outlets**
Provides the ultimate in flexibility by allowing a customer to use an outlet as either a C13/C15 outlet (Image C) or a C13/C15/C19/C21 outlet (Image D) without any modifications. Merely plug in the corresponding power cord to the applicable outlet.

(C)

(D)
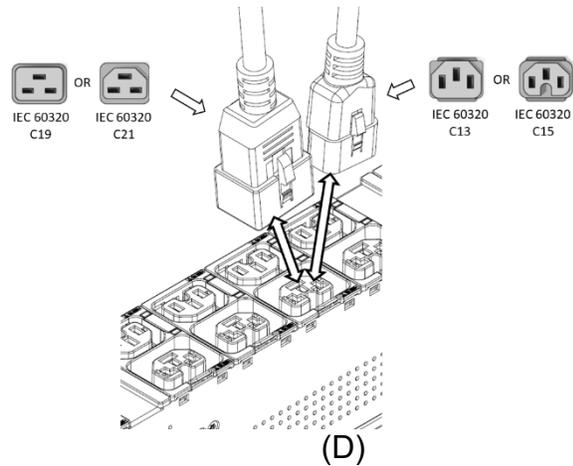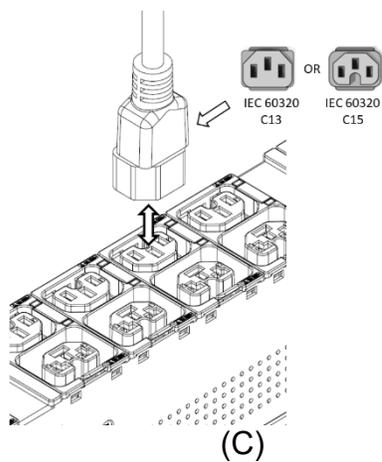
## Locking Power Cord

Optional locking power cords can be used on each IEC C13 (Image A) and C19 (Image B) outlet on the PDUs. Several lengths are available to support any configuration. The image below shows the locking power cord engaged with the outlets.
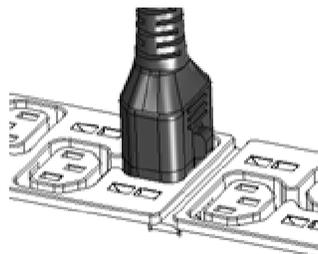
(A)
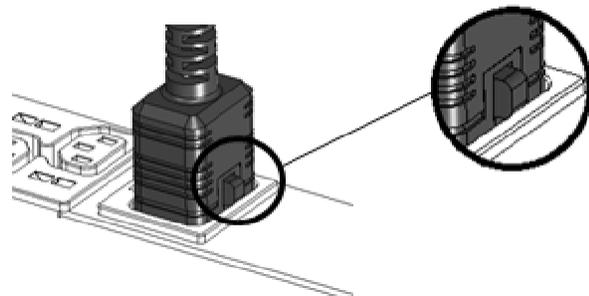
(B)

# Section 2 – Installing the PDU

## Vertical PDUs

Panduit Vertical PDUs include the following form factors: half-height, mid-height, full-height and full-height wide models. This section covers the recommended installation methods.

## Install Mounting Hardware

Each vertical PDU has two different mounting hole locations on the sides and back

of the PDU for the button installation to assist with mounting in a non-Panduit racks. When installing the mounting buttons, use either mounting holes as a set.

### *Mounting button installation – outlets facing the center of the rack*

1. Align and install the mounting buttons with the screw holes on the face, opposite of the outlets.
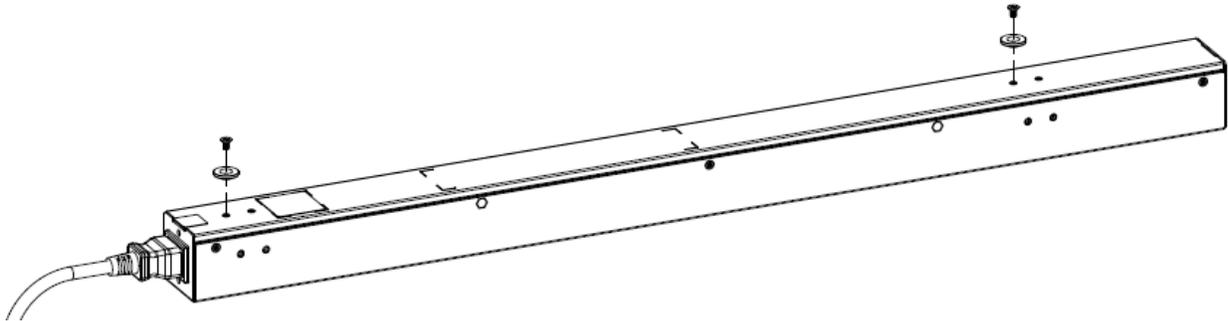


2. Install the PDU by inserting the mounting buttons into the keyhole slots on the PDU mounting bracket in the rack.

### *Mounting button installation – outlets facing the back or front of the rack*

1. Align and install the mounting buttons with the screw holes on the sides of the PDU.
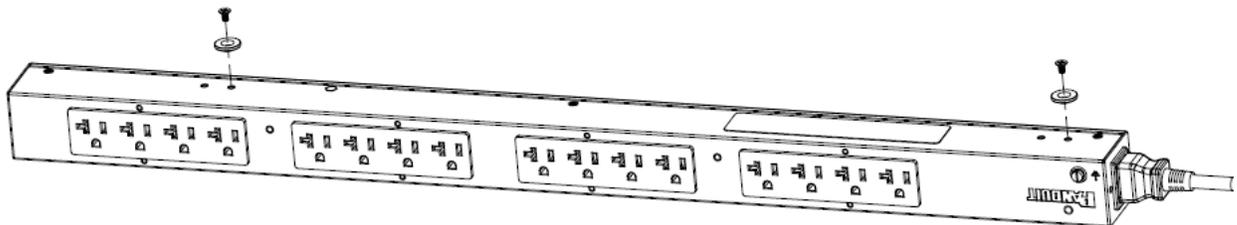


2. Install the PDU by inserting the mounting buttons into the keyhole slots on the PDU mounting bracket in the rack.

### **Vertical (0U) PDU– Single Installation**

A single vertical unit can be installed with the outlets facing the center (A), outlets facing the back of the rack (B), or outlets facing the front of the rack (C). The pictures below illustrate these installation methods.
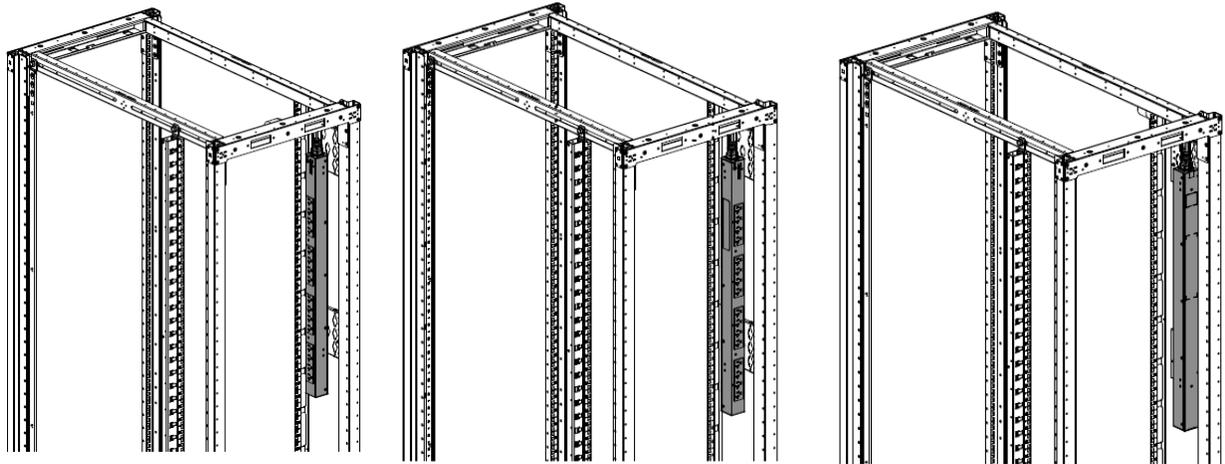
(A)                    (B)                    (C)

**NOTE:** The above installation methods are true for all vertical models except for the dual sided models. Those units can only mount on its side with outlets facing the back of the rack. Reference the dual sided PDU installation section for installation instructions.

### Vertical (0U) PDU– Two or More Installation
For two full-height (in a 42U/45U/48U rack), two mid-height (in a 42U/45U/48U rack), or four half-height (in a 42U/45U/48U rack) vertical units to be mounted on one side of the rack, all units must be installed with the outlets facing in towards the center of the rack.

(A)       (B)       (C)
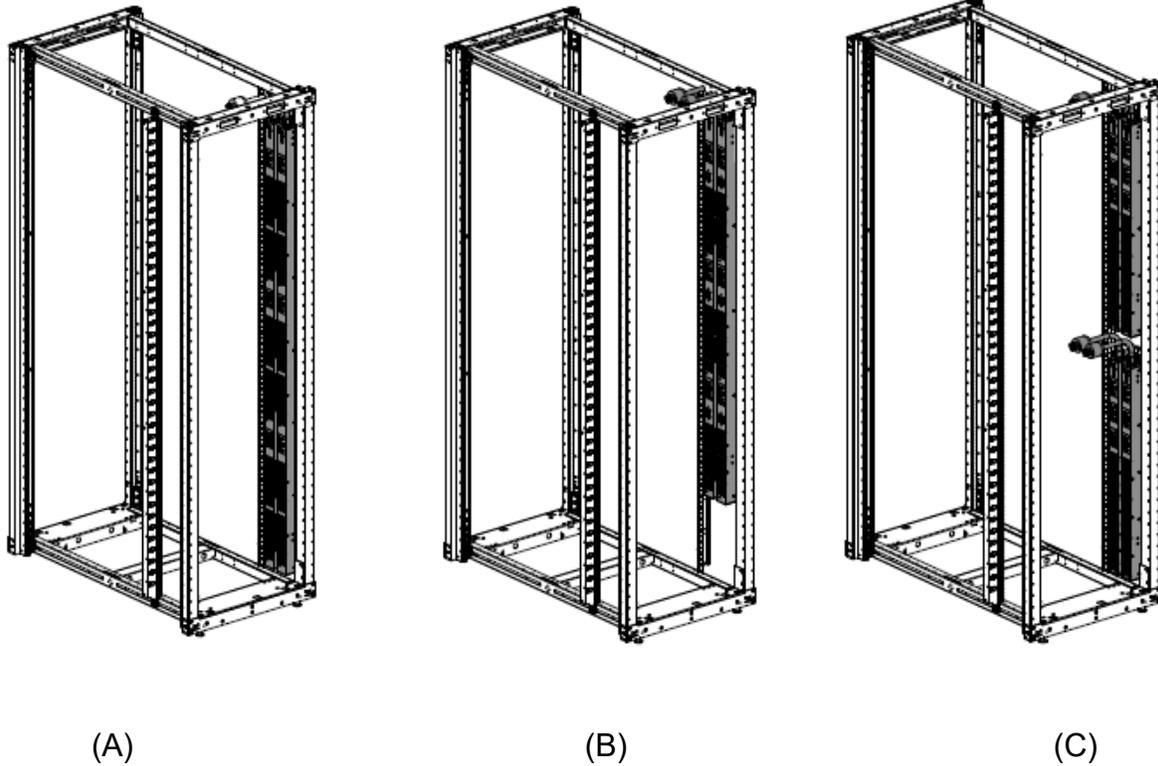
**NOTE:** (A) Two full-height PDUs with outlets facing in towards the center of the rack; (B) Two mid-height PDUs with outlets facing in towards center of the rack; (C) Four half-height PDUs with outlets facing in towards center of the rack.

## Universal Input PDUs

**Attaching Input Cord to Universal Input Connector**
1. Open input cord connector latches on PDU and insert input cord plug.
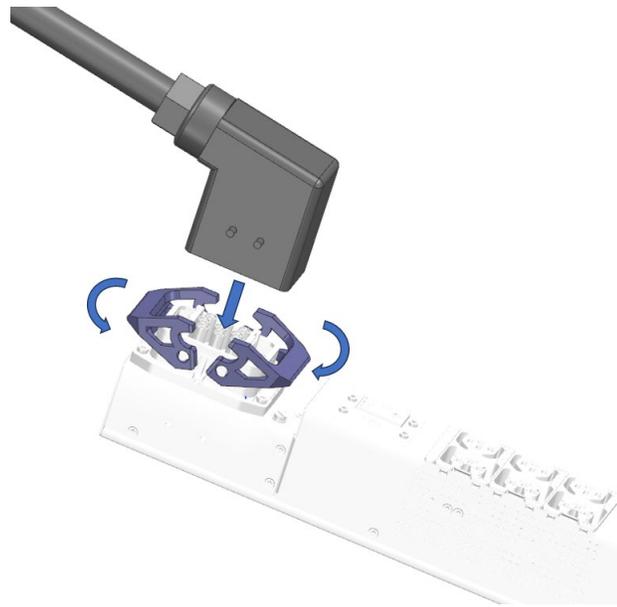
2. Close input cord connector latches on PDU to lock input cord into connector.
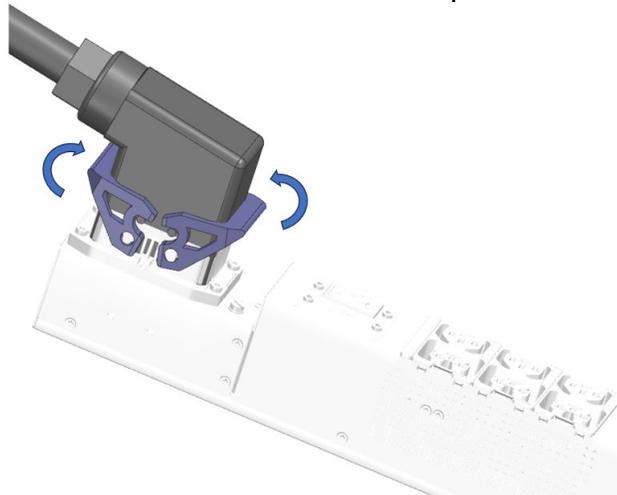


**On the rack, maintaining the spacing between top and bottom PDU brackets, move both PDU brackets up until the top PDU bracket reaches how far it can go up. Install Universal Input PDUs to PDU brackets.**

**NOTE:** When installing Universal Input PDUs with input cord at the top, top three RUs might be obstructed at the back by the input cord plug.
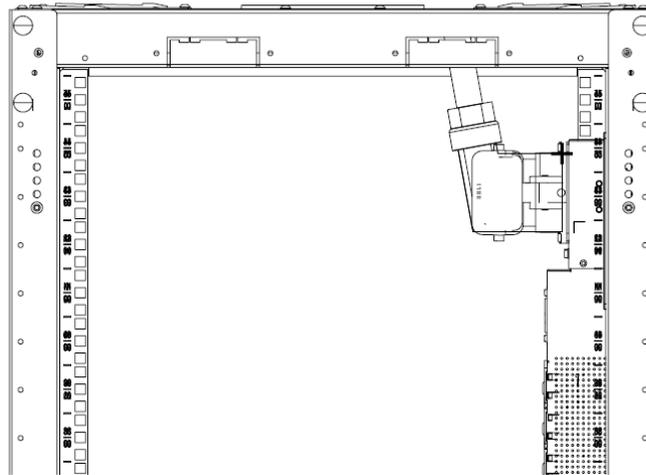
**Configuring Universal Input PDU input type in Web interface.**
The universal input PDU needs to be configured for the type of input cord connected to the PDU.

**NOTE:** If the incorrect input cord is selected the PDU may meter the data incorrectly and will show the incorrect power rating of the PDU.

1. Reference the User Manual for instructions to connect to the Web interface.
2. Navigate to the **System Management** page under setting.
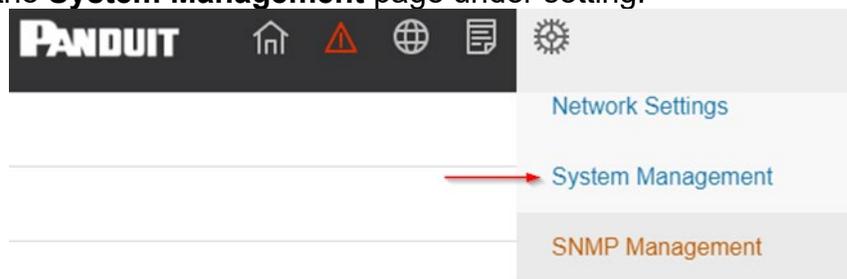


**System Management Navigation**

3. Select **Set Input Cord** under actions.
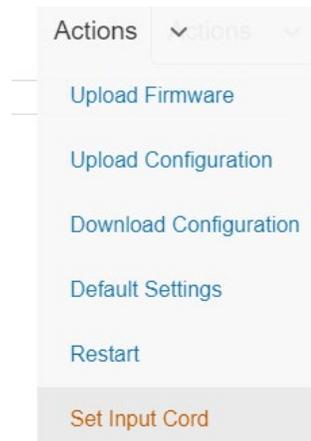
**Set Cord Type**

4. Select the correct cord type.
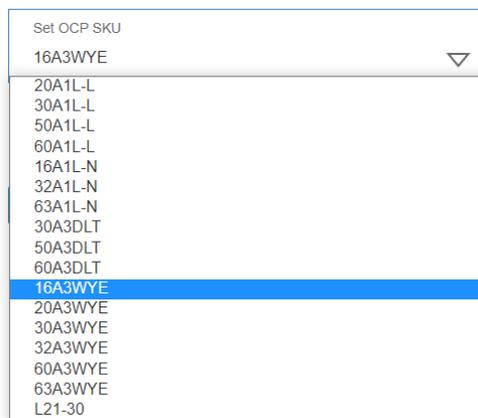

**Cord Type Pull Down**

5. Select **Save** and the PDU will reset.

Use the following table to determine the correct configuration setting.

| Cord Part Number | Facility Side Plug | NA Region | EMEA Region |
|---|---|---|---|
| UPDUCRD1 | IEC 60309 3P+N+E 6h 32A (IP44) | 30A3WYE | 32A3WYE |
| UPDUCRD2 | IEC 60309 2P+E 6h 60A (IP44) | 60A1L-L | |
| UPDUCRD3 | IEC 60309 3P+E 9h 60A (IP44) | 60A3DLT | |
| UPDUCRD4 | CS8365C | 50A3DLT | |
| UPDUCRD5 | IEC 60309 3P+N+E 6h 63A (IP44) | 60A3WYE | 63A3WYE |
| UPDUCRD6 | IEC 60309 3P+N+E 6h 20A (IP44) | 20A3WYE | 16A3WYE |
| UPDUCRD7 | L6-30P | 30A1L-L | |
| UPDUCRD8 | IEC 60309 2P+E 6h 20A (IP44) | 20A1L-L | 16A1L-N |
| UPDUCRD9 | IEC 60309 2P+E 6h 32A (IP44) | 30A1L-L | 32A1L-N |
| UPDUCRD10 | L21-30P | L21-30 | |
| UPDUCRD11 | L15-30P | 30A3DLT | |
| UPDUCRD12 | CS8265C | 50A1L-L | |

# Grounding the PDU

## Connecting the Ground Bonding Cable

Per international regulatory requirements, the primary Safety Earth Bond connection is
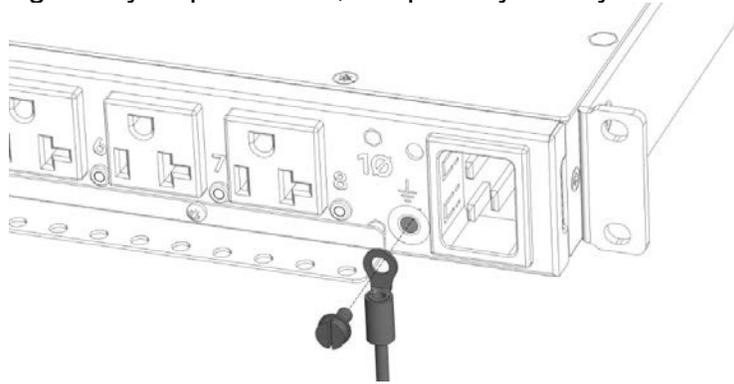
contained in the PDU as an integral part of the branch circuit cabling and plug.  There is an external ground bonding point located on the chassis of the PDU. The ground bonding screw is provided as an attachment point for conductors. Use a ground bonding cable if the rack contains any conductors for functional grounding or bonding of ungrounded metal parts. This bonding point can also be used to bond the PDU to a known earthed reference terminal in the building. The ground bounding point is located on the surface with the outlets on all PDUs except for the dual-sided models. These models have the ground bounding point on the surface with the circuit breakers.
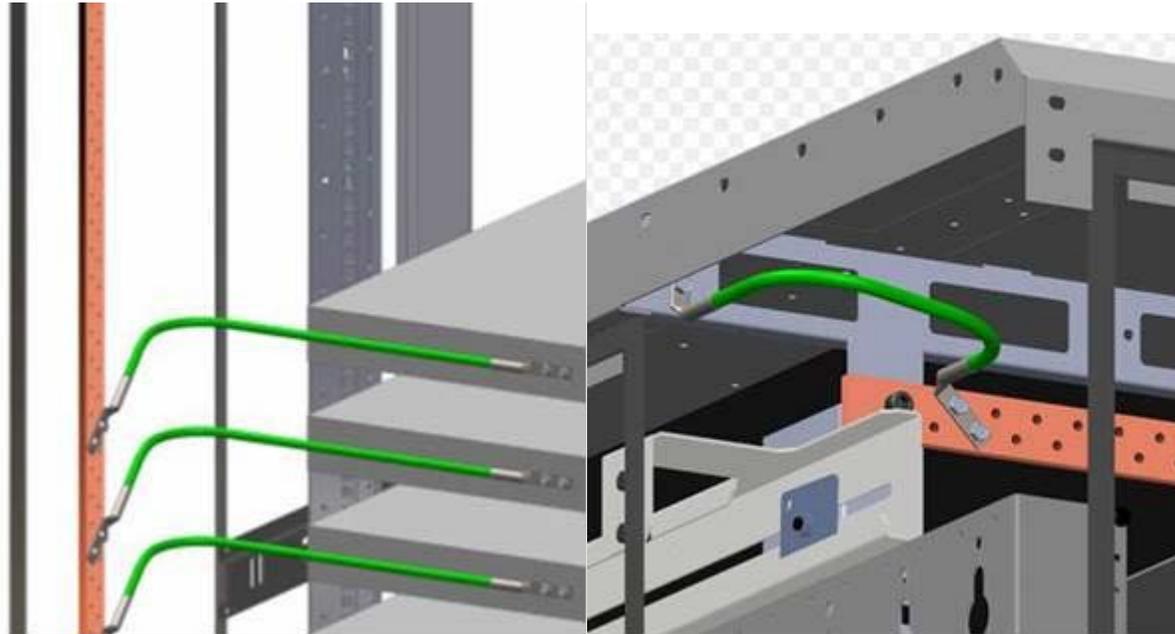
Bond Power Distribution Units (PDUs) to grounding strip or grounding bus bar. See **Panduit Grounding and Bonding Jumper kits** for factory terminated options to provide a bolt-on solution.

# Bonding

This product contains an external earthing screw with a star washer, which should be used for supplementary Earth bonding to the rack metalwork.

| Bonding | |
|---|---|
| **Minimum Requirements for Bonding Conductors** | |
| Up to and including 32A | 12 AWG |
| Up to and including 63A | 8 AWG |
| Up to and including 80A | 6 AWG |
| **Screw Size** | |
| Over 16A, less than or equal to 40A | 5mm |
| Over 40A, less than or equal to 63A | 6mm |
| 64A | 7mm |

# Section 3 – Connecting the PDU

## Connecting the PDU to a Power Source

Always follow local and national codes when installing the PDU. The PDU should be connected to a dedicated circuit protected by a branch circuit breaker matching the PDU input plug type.

**NOTE:** When connecting the PDU to a Power Source, make sure that you have enough length in the PDU power cord to reach the PDU power source.

1. Turn the feed circuit breaker Off.

2. Make sure that all circuit breakers on the PDU are set to On.

3. Connect each PDU to an appropriately rated branch circuit.

   **NOTE:** Refer to the label on the PDU for the input ratings.

4. Turn the feed circuit breaker On. The OLED screen (on units with display) will display a status bar when the PDU operating system is loading. When complete, the Main Menu will display on the OLED screen. Switched and Monitored & Switched PDUs show a light corresponding to each outlet as it is powered up.

# Section 4 – Configuration considerations

## Dual rated PDUs

Dual rated PDUs require an additional CLI configuration step to enable the Web interface to report the correct power capacity.  See CLI Commands in the User Manual for details.