

CyberPower®

CHOOSING A POWER DISTRIBUTION UNIT

A Power Management Primer



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If your organization is growing, so are your technology requirements. At some point, you'll need more electrical outlets than you have. Power strips simply do not deliver enough power, flexibility, or control for a growing company. You need an effective way to manage your changing power needs.



As the number of servers, switches and other networking equipment increases, so does the need for more power. But managing the demand for more computing power can be a challenge. To distribute reliable power to multiple devices, a power distribution unit (PDU) is required. A PDU does not generate or condition power, but delivers AC power from an uninterruptible power supply (UPS), a generator, or utility power source to servers, networking hardware, telecom equipment, and other devices.

PDUs are most often used in data centers, network closets, VoIP phone systems, and industrial environments. PDUs manage and distribute the power via multiple outlets to the servers and networking equipment.

PDUs are designed for installation in equipment racks, keeping power within reach of rack-mounted devices such as servers, switches, routers, or cooling fans. PDUs can be mounted vertically or horizontally on equipment racks, walls or shelves.

TYPES OF PDUS

Basic

A Basic PDU distributes unfiltered AC power from a UPS system, generator, or utility source to multiple connected devices. To ensure power availability, Basic PDUs do not include features such as surge suppression or line filtering, which could interrupt the flow of power to connected equipment.

BASIC	RACK SIZE	# OUTLETS	INPUT CURRENT
Available in:	0U & 1U	8 TO 38	15A, 20A & 30A

Metered

A Metered PDU has the same features of a Basic PDU, plus a digital current meter for local monitoring to help optimize load levels. Load monitoring can help prevent downtime due to overloads or other power events.

METERED	RACK SIZE	# OUTLETS	INPUT CURRENT
Available in:	0U & 1U	10 TO 38	15A, 20A & 30A



Monitored

A Monitored PDU has all of the features of a Metered PDU plus a network connection to allow for remote monitoring of voltage, frequency, and load levels in real-time. It can send alerts when load levels exceed thresholds, preventing downtime before it happens. Monitored PDUs also include Power Panel® management software, which allows for easy control and monitoring of the UPS.

MONITORED	RACK SIZE	# OUTLETS	INPUT CURRENT
Available in:	0U, 1U & 2U	8 TO 42	15A, 20A & 30A



Switched

A Switched PDU does what a Monitored PDU does but also allows for remote control of each outlet (device) individually or collectively. Individual outlets can be switched on or off over the network manually or via pre-set program. Unresponsive equipment can be rebooted remotely to minimize downtime and eliminate costly service calls.

SWITCHED	RACK SIZE	# OUTLETS	INPUT CURRENT
Available in:	0U, 1U & 2U	8 TO 24	15A, 20A & 30A



Switched Metered by Outlet

A Switched MBO PDU has the same features as a Switched PDU, but also allows for remote monitoring of each outlet (device) individually or collectively. This level of detail is necessary for making precise decisions about load balancing and can be used to compare the efficiency of each piece of connected equipment.

SWITCHED MBO	RACK SIZE	# OUTLETS	INPUT CURRENT
Available in:	0U, 1U & 2U	8 TO 24	15A, 20A & 30A



Metered Auto Transfer Switch (ATS)

Metered Auto Transfer Switch PDU provides backup power from redundant power sources to equipment with a single power supply. If power from the primary source fails, the PDU will automatically switch to the secondary power source to ensure continuous operation.

METERED ATS	RACK SIZE	# OUTLETS	INPUT CURRENT
Available in:	1U & 2U	10 TO 19	15A, 20A & 30A



Switched Auto Transfer Switch (ATS)

A Switched Auto Transfer Switch PDU has all the features of a switched PDU, plus the ability to distribute redundant power from separate input sources to single-corded connected equipment. If power for the primary source fails, the PDU will switch to the secondary power source to ensure continuous operation.

SWITCHED ATS	RACK SIZE	# OUTLETS	INPUT CURRENT
Available in:	1U & 2U	10 TO 19	15A, 20A & 30A



Maintenance Bypass

Designed for data centers where uptime is critical, a Maintenance Bypass PDU helps prevent downtime when performing maintenance. It allows the seamless transfer of an electrical load from UPS power to utility power for continuous operation of connected equipment when performing maintenance such as replacing batteries or installing a new UPS.

MAINTENANCE BYPASS	RACK SIZE	# OUTLETS	INPUT CURRENT
Available in:	1U	5 TO 6	15A, 20A & 30A

Primary Functions of Power Distribution Units

MODEL	CABLE MANAGEMENT	HORIZONTAL & VERTICAL MOUNTING	LOCAL MONITORING	REMOTE MONITORING	ENVIRO-MONITORING*	REMOTE SWITCHING
Basic	●	●				
Metered	●	●	●			
Monitored	●	●	●	●	●	
Switched	●	●	●	●	●	●
Switched MBO	●	●	●	●	●	●
Metered ATS	●		●			
Switched ATS	●		●	●	●	●
Maintenance Bypass		●				

*Enviro-monitoring capabilities possible with separately purchased CyberPower Environmental Sensor.

STEP-BY-STEP GUIDE

1 DETERMINE INPUT POWER

Depending on your location and building type, you may have either single-phase or three-phase power. If you're not sure, ask a licensed electrician.

Most offices have single-phase 120V or 208V (high voltage) power—but confirm before buying any new equipment. For lower-density applications, such as racks of traditional 1U and 2U servers—a single-phase PDU will work just fine. Three-phase power is common in higher density racks in commercial environments. Also three-phase can be more efficient to deliver and less expensive.

2 DETERMINE HOW MUCH POWER IS NEEDED

Add up the total power consumption of your equipment. The amount of power consumed by each device should be listed in voltamperes (VA) or in watts (W) in the user manual or on the equipment itself. The output from your power source—utility power from a service panel, local power from a generator, or backup power from a UPS—should be higher than the total power required for your equipment.

Many devices use automatic switching power supplies that can be used with voltages from 120 to 240. If your power source is 120V (typical for North America), base your calculations on that figure. If it's 208V (typical for North America) or 200V/230V (typical for Europe and Asia), use the voltage appropriate for your utility input. For input amperage, use the figure listed on the device or in its user manual.

One PDU connected to one UPS can provide power to a smaller network. Larger and more complex installations may need multiple PDUs and a large-capacity UPS system.

3 HOW MANY OUTLETS DO MY DEVICES NEED?

This question is probably the easiest to answer, but take it seriously. The PDU you choose should have at least as many outlets as the number of plugs you need to connect. If a device has more than one plug, or if one device has to be plugged into another, adjust your count. And remember to leave room for more devices.

4 DETERMINE THE RIGHT CONNECTIONS

Identify the kinds of plugs on your equipment. Each PDU can support several devices. The plug shape corresponds to the required voltage and amperage.

Why are there different plugs?

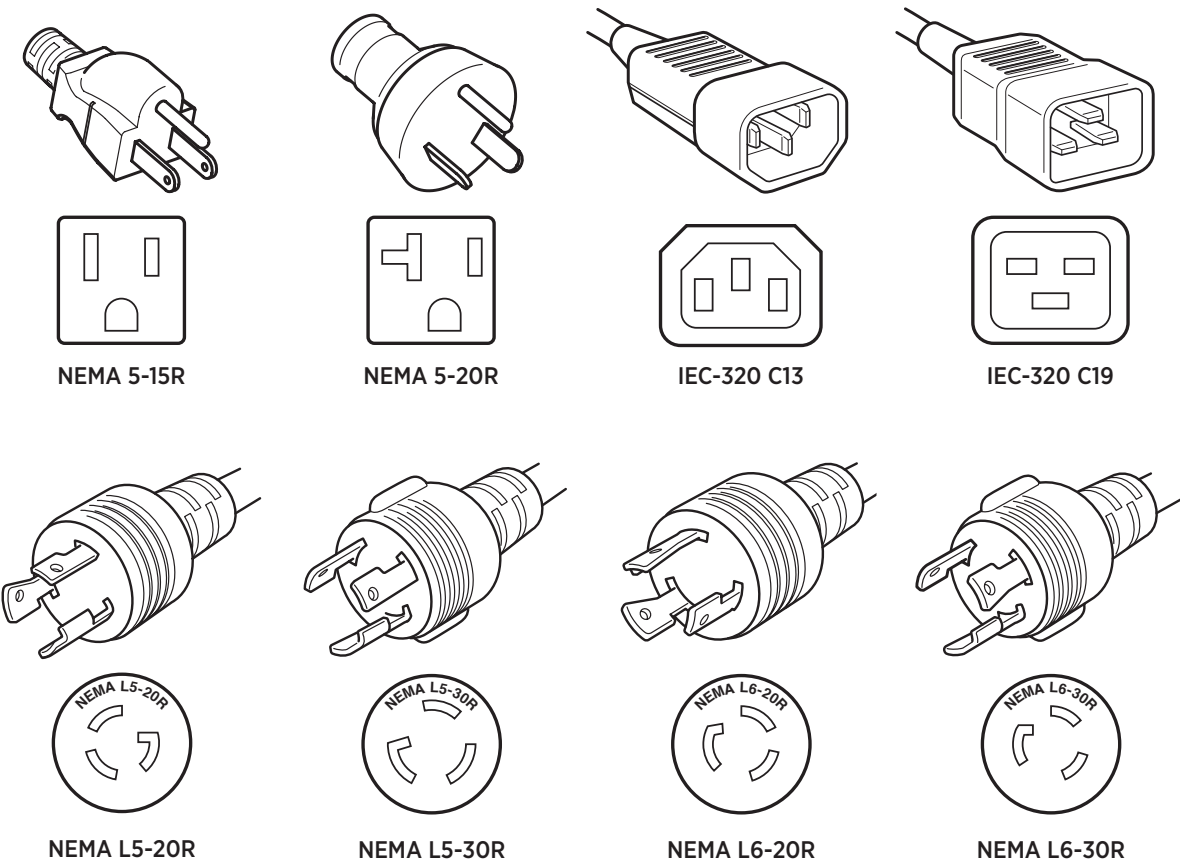
The National Electrical Manufacturer’s Association (NEMA) and International Electrotechnical Commission (IEC) have developed standards for input (plugs) and output (receptacles) to ensure you do not accidentally connect devices to power sources with incompatible voltages and amperages because this could create dangerous conditions.

Ask yourself two questions:

- What type of plug does my equipment have?
- What type of plug and receptacles should the PDU have?

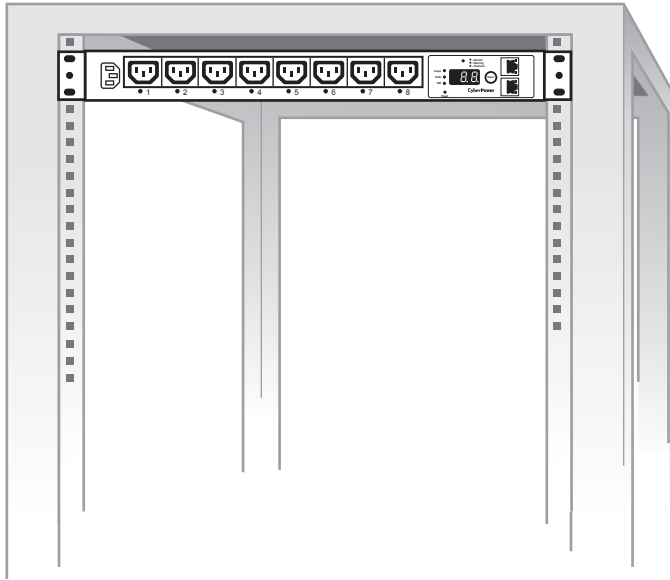
Use the chart below to match the correct plug with the correct receptacle. The blade type, voltage, and amperage of a plug must match the blade type, voltage, and amperage of the receptacle. If they don’t match, it will be physically impossible to connect the plug to the receptacle, since both the IEC and NEMA standards ensure the plug blades are shaped and spaced differently.

CyberPower offers PDU models to fit the following plug and outlet types:

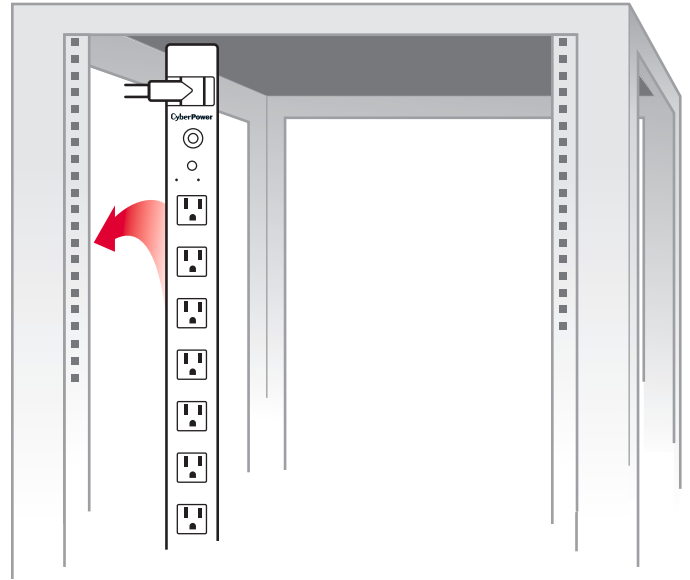


5 DETERMINE WHERE THE PDU WILL BE INSTALLED

PDU models are typically available in 1U or 2U heights for horizontal mounting. They can also be mounted vertically, known as 0U. Depending on the model, they can be mounted in a rack enclosure, on wall or under a shelf.



Horizontal PDUs are designed for mounting in EIA-310 standard 19-inch equipment racks. They can be placed above, below, or between the components they power.



Vertical PDUs fit on the upright rails of a rack enclosure and do not take horizontal mounting space away from other equipment.

6 DETERMINE THE TYPE(S) OF PDUS REQUIRED

See **page 3** for detailed explanation of basic, metered, monitored, switched, switched MBO, metered ATS, switched ATS, maintenance bypass. If you need the ability to monitor the PDU remotely via PowerPanel® software, consider choosing a monitored, switched, switched MBO, or switched ATS PDU.

Other considerations

Plan for expansion and growth, special equipment or connections in your environment, enviro-monitoring, etc. The consequences of selecting the wrong PDU could result in operational shutdowns and delays. Every minute your system is down could cost your company lost sales in the short term and lost customers in the long run.

For more information, visit the CyberPower PDU Product Selector:
CyberPowerSystems.com/tools/pdu-selector/

WHY CHOOSE CYBERPOWER?

From basic to advanced, CyberPower has over a hundred different PDUs to efficiently direct and manage power to IT equipment in all types of rack environments. From simple electrical pass-through, to monitoring and managing power from multiple sources, CyberPower has PDUs for every application.

CyberPower PDUs are designed with as many as 42 outlets, positioned on the front and/or back of the units. Offered in 1U, 2U, or OU form factors; each PDU includes the necessary hardware to be mounted vertically or horizontally for versatile placement inside a rack enclosure, on a wall, or under a shelf.

PowerPanel® Business, our free proprietary software included with CyberPower monitored and switched PDUs. With this software, you can remotely monitor and manage PDUs easily from a single dashboard. For switched PDUs, it allows for remote shutdown of any networked PC connected to the PDU. This ensures a proper shutdown when the switched PDU is scheduled for a power cycle or to power down.

CyberPower Management Console Firmware allows you to control your PDUs with real-time remote power monitoring, built into all CyberPower Switched and Monitored PDUs. Easily perform operational tasks such as switch PDU outlets on and off, reboot connected equipment locally or remotely, schedule power cycling of attached equipment, perform load monitoring and event logging.

Software features:

- Automatic shutdown sequence in response to power or UPS system events.
- Outlet-level monitoring to pinpoint inefficiencies and system-critical failures.
- Power consumption monitoring and control for advanced energy management.
- Real time power event notifications via email and SMS text.
- Free downloadable firmware updates can be performed via USB.

Easy installation right out of the box CyberPower PDUs are ready for mounting either horizontally (1U) or vertically (OU) to distribute power to equipment within a rack enclosure. CyberPower PDUs are also designed to fit under a counter or via wall mount. Mounting hardware is included on all models.

Industry-leading warranties and US-based Technical Support. All CyberPower PDUs are backed by a limited lifetime warranty that covers defects in materials and workmanship in the product under normal use and conditions.

BUSINESS DEPENDS ON RELIABLE POWER

for the integrity
and efficiency of
its operations



Rely on CyberPower for power solutions to ensure peak performance and continuity across every level of your organization.

For questions or help locating a reseller, contact us toll free:

833-444-1055

Monday - Friday

8am - 5pm CST

CyberPower provides many great resources on our website; from product catalogs and promotions, to tools and support.

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