

# Power Management for Edge Data Centers With Rack Power Distribution Units (rPDUs)

[The importance of power distribution at the edge](#)

[Common features of rPDUs](#)

[Types of rPDUs](#)

[Selecting the right rPDU](#)

[Ordering options for rPDUs](#)

[Conclusion and resources](#)



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## Power Distribution for Edge Data Centers

Network power management at the edge is rapidly evolving to support the dynamic and changing nature of edge IT deployments. To leverage cost savings, operators need to be aware of the efficiency of their energy usage and their environmental impact while predicting capacity expansion. They need reliability they can depend on to ensure their critical IT equipment has maximum uptime. They need flexibility for the equipment they use today, and scalability for future growth. Additionally, the nature of the network edge often means that your power chain will not be the same size, shape, and structure across sites both domestic and globally.

Rack power distribution units (rPDUs) are the “last mile” in the IT power chain. They not only expand the number of devices a rack can support, but they can also provide insight into power usage and enable remote, outlet-level control of equipment power. Edge data centers rely on rPDUs to secure the power chain, monitor the energy usage, and provide alarms and alerts if there is an anomaly within the equipment.

See also: [What Is a Rack PDU?](#)



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## Common Features of rPDUs

The primary function of a rPDU is to ensure critical power is delivered to IT equipment. Today's intelligent and adaptive rPDUs have gone beyond power distribution, offering features to enhance business agility, efficiency, and availability. When selecting a rPDU, these key features should be considered:

### Alternating Outlet

To simplify circuit/phase balancing and cable management, rPDU manufacturers offer color-coded alternating outlets that significantly streamline the deployment process.

### Locking Outlets

Outlet locking mechanisms secure the physical connection between the IT equipment and the rPDU to ensure power cords are not accidentally pulled out of the outlet, causing an inadvertent load drop.

### Small Footprint

The rPDU should be compact so it can be installed in tight spaces.

### Remote Connectivity

Some rPDUs are remotely accessible via the network interface or serial connection for monitoring power consumption and configuring alert notifications to help prevent downtime.

### Fault-Tolerant Daisy Chaining

Intelligent rPDUs with the fault-tolerant daisy chaining functionality not only simplify rPDU connectivity but ensure data is reported even when a break in the network chain occurs.

### IP Aggregation

IP addresses and switch ports are increasingly expensive, so data center managers can reduce the cost of deploying intelligent rPDUs by utilizing units with IP aggregation capabilities.

### Environmental Monitoring

Intelligent rPDUs can incorporate environmental sensors to proactively monitor environmental conditions within the rack to ensure optimal operating conditions.

### Combination Outlets

Outlets are available that offer the flexibility to connect C14 and C20 plugs in the same outlet.

### Future-Ready Design

Upgradeable basic and intelligent rPDUs can leverage new technologies and accommodate changing business needs without having to replace entire power strips or interrupt power to critical servers.

[See all the features of rPDUs](#)

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## Types of rPDUs From Vertiv



**Basic:** Reliable power distribution without monitoring or switching.

- Units provide reliable power distribution to critical IT equipment within a rack or cabinet.
- Every unit is 100% tested for reliability and functionality to ensure units function as designed.
- North American units are UL listed in accordance with common data center and insurance provider requirements.
- Vertical and horizontal rackmount form factors with a variety of electrical and receptacle configurations are available.



**Monitored:** Reliable power distribution with local and remote power monitoring.

- Units provide a comprehensive view of power usage, both at the rack and via remote access, while continuing to provide reliable power distribution to critical IT equipment.
- Unit-level and outlet-level remote monitoring configuration options are available.
- Units offer quick access to evaluate energy usage trends and have alarming capabilities to alert users of breaches in user-defined power thresholds.
- Units are recommended for high-density data center operators that want to monitor or improve power usage effectiveness (PUE).



**Metered:** Reliable power distribution with local power monitoring.

- Units allow data center managers to view power consumption metrics instantly from a local display.
- Units are best suited for highly secure data center environments that must keep power infrastructure air-gapped from the local network.
- A Local LED display to view real-time current data included.
- Users are able to avoid accidental overloads when deploying or moving critical server equipment with instant access to current metrics on the local digital display.



**Switched:** Reliable power distribution with local and remote power monitoring and ability to switch outlets on and off.

- Units provide a comprehensive view of critical IT equipment power usage, both at the rack and via remote access with the added ability to remotely turn on, turn off, or reboot power at each outlet.
- Comprehensive view of critical IT equipment power usage is available at the rack and via remote access.
- Outlets can be remotely turned on, turned off, or rebooted, and are available with unit-level and outlet-level monitoring configuration options.
- Units are ideal for data center operators needing to limit power usage at the outlet to avoid accidental overloads and those needing a quick, easy way to power cycle equipment in a large facility.

[Learn more about considerations for highly available intelligent rPDUs](#)

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## Key Considerations for Selecting the Right rPDU

### 1 Define total power requirements

Determine the total kilowatts (kW) for the server rack where the rPDU will be installed. Make sure you have desired power capacity available. Some sites have capacity that is limited by power availability.

### 2 Determine device requirements

Identify the amperage, voltage, and receptacle type for the equipment you will be connecting to the rPDU.

### 3 Select the level of intelligence your application requires

When selecting an intelligent rPDU, these key features should be considered:

- IP aggregation
- Environmental monitoring
- Remote connectivity
- Out-of-band communication
- Data center infrastructure management (DCIM) access

### 4 Select your configuration and outlet needs

Horizontal rPDUs have 8-24 outlets. Vertical rPDUs have up to 48 outlets and do not consume any rack space.

Quickly find the rPDU that fits your business requirements with the [Vertiv rPDU finder](#)

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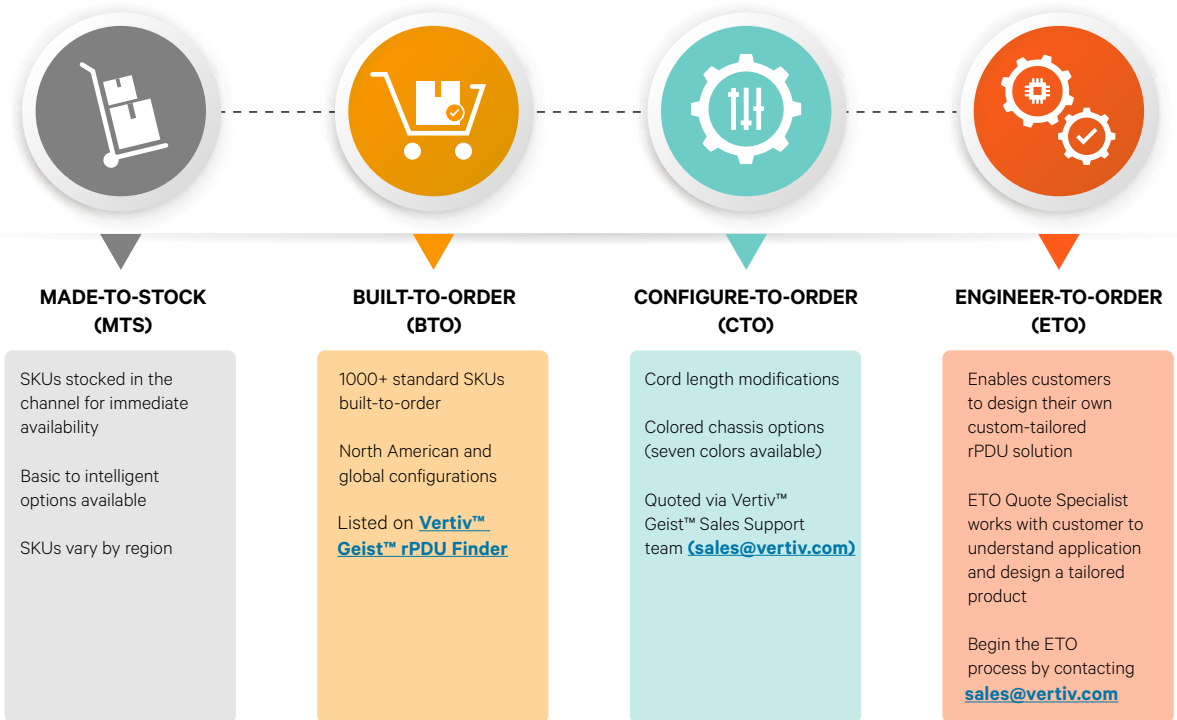
Selecting the right rPDU

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## Ordering Options for Your rPDU

Being flexible at the edge is key as is getting the right rPDUs for your business. Pick from a broad range of rPDUs in stock but also leverage tools to configure-to-order solutions that allow you to define chassis color, outlet and plug type, intelligence, and cord length for your rPDUs.



[Learn about custom rPDUs](#)



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## Conclusion and Resources

As your data center and edge locations become more business-critical so too does the availability, efficiency, and cost effectiveness of your power management. Rack power distribution units (rPDUs) are the last link in the power chain. They are designed to distribute power to all types of IT equipment at the edge and help ensure availability of critical IT loads. As edge sites expand and grow, the rPDU features and functionality become increasingly more important to achieving efficient power distribution and to responding to changes in data center capacities and densities.

[Learn more](#)

### Additional Resources

[Reimagining Rack PDUs Through Modular Design](#)

[Rack Power Distribution Designed Your Way](#)

### See How Vertiv Customers Are Using rPDU Solutions

[Columbus Crew's New Stadium Counts on Vertiv™ Infrastructure to Maximize Fan Entertainment  
Isaac Regional Council](#)



