What size power distribution box is best for a data center

Overview

How To Choose the Right Power Distribution Unit for Your Data Learn how to choose the right power distribution unit (PDU) for your data center IT enclosure.

Key Takeaways

Data center PDUs typically range from 16A to 60A per phase, with form factors including 1U, 2U, and Zero U, depending on rack density and power requirements.PDU Capacity and Amperage

The size of a power distribution box in a data center is primarily determined by the total power draw of the rack. Most modern racks use single-phase PDUs for low-density setups and three-phase PDUs for high-density racks, as three-phase power delivers more power efficiently and balances the load better . Typical amperage ratings for PDUs include:

• 16A–32A: Common for standard server racks with moderate power density

• 32A–60A: Used for high-density racks or equipment with higher power requirements

• Custom higher amperage: For specialized high-performance computing or storage racks PDUs must match the incoming voltage and amperage from the facility feed to ensure safe and reliable operation .
Form Factor and Mounting

PDUs come in different rack-mounted form factors:

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• 1U or 2U Horizontal PDUs: Mounted inside the rack, occupy rack space, suitable for small or medium-density racks

• Zero U PDUs: Mounted vertically along the rack frame, do not consume rack space, improve airflow, and are preferred for high-density racks The choice of form factor affects airflow, cable management, and accessibility.
Redundancy and Growth Considerations

Data centers often deploy dual PDUs (A and B feeds) to provide redundancy. Each PDU handles a separate power feed, ensuring that if one source fails, the rack remains powered . It is also standard practice to keep racks below 70–80% of PDU capacity to allow for future expansion and prevent overloads .

Outlet Types

PDUs are equipped with outlets compatible with server and network equipment, such as C13, C19, or NEMA types. Choosing a PDU with more outlets than currently needed allows for future growth without replacing the unit .

Summary

When selecting a PDU for a data center:

• Determine the total rack power draw

• Choose single-phase or three-phase based on density

• Select amperage rating (16A–60A typical)

• Pick a form factor (1U, 2U, Zero U) that fits airflow and space requirements

• Consider redundancy with dual PDUs

• Ensure outlet compatibility and room for growth This approach ensures reliable, scalable, and efficient power distribution for data center racks .

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