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Compaq Power Distribution Unit Information Guide

The new Compaq Power Distribution Unit's innovative "zero-U" rack design provides managed power distribution for rack cabinets without sacrificing valuable rack space needed for business critical servers and storage requirements. External power cords connecting AC receptacles plug directly into the Compaq Power Distribution Unit, organizing otherwise haphazardly connected cords.

Several voltage models are available, including the distinctive new high voltage, high ampere PDU that provides up to 30-amperes of alternating current. Compaq Power Distribution Units provide a space efficient and economical way to manage power cords while offering additional security features such as surge protection and circuit breakers.

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Product Overview

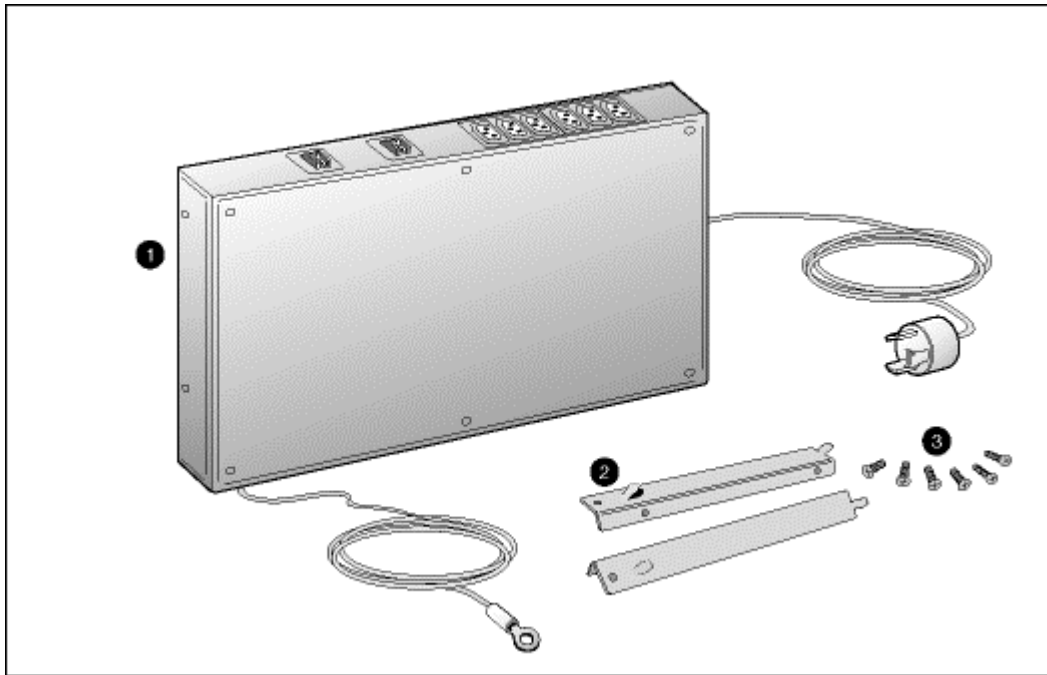


Figure 1. Compaq Power Distribution Unit (Low voltage model shown)

- ① Compaq Power Distribution Unit
- ② Brackets for rack-mount installation
- ③ Six mounting screws

The Compaq Power Distribution Unit manages power distribution within Compaq rack cabinets by providing 12 AC receptacles at one single input power cord for rack-mountable devices. Total electrical current (measured in amperes and referred to as an electrical load) generated from all connected devices can often consume more power than typically provided from a standard prong 15A commercial wall outlet. Such high capacity power requirements necessitate the need for a Power Distribution Unit to distribute AC power to multiple devices and to ensure that each connected device receives individual power required to function. With PDU assistance, power is actually dispersed as needed to connected servers, storage units, and other peripherals. The Compaq Power Distribution Unit is available in low and high voltage models.

High Voltage (30A) Power Distribution Unit (Model NA295365-003)

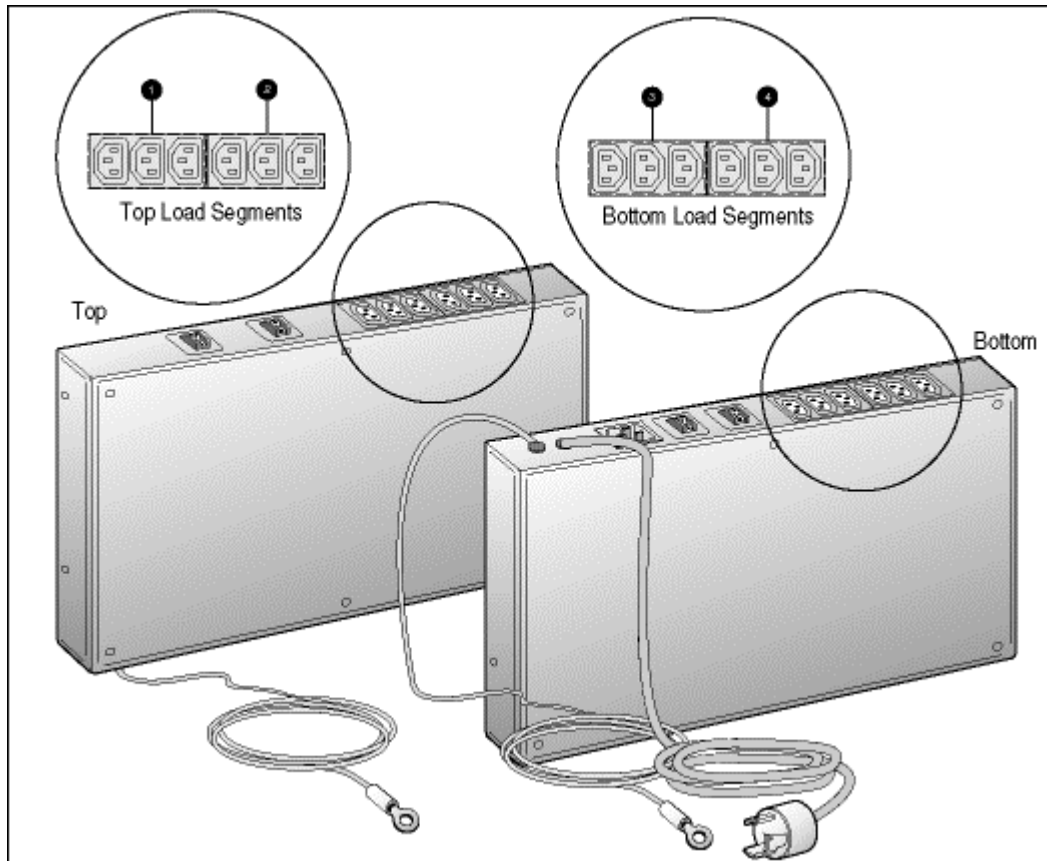


Figure 2. The New 30A Compaq High Voltage Power Distribution Unit

This high voltage Power Distribution Unit provides up to a 30-ampere capacity of alternating current load at 208 volts. This new Compaq PDU is the source to accommodate more powerful loads, and will support twice the load segments of the 16A model and is equipped with four circuit breakers providing additional protection. This High Voltage Power Distribution Unit is designed to operate at 275-320V for rack-mountable servers, and protects up to 50,000A per unit, supporting electrical power distribution requirements of the Compaq rack environment. The High Voltage PDU utilizes IEC320 (C-10) output connectors, whereas the input is provided by a 16A IEC320 (C19) inlet connector to link the AC source to the rack cabinet.

Note: The new 30A High Voltage, High Ampere Power Distribution Unit will be available October 25, 1999 in North America.

Load Balancing

The Compaq 30A High Voltage Power Distribution Unit is divided into four sections. Each section is protected with a 10A circuit breaker. The total load for this PDU cannot exceed 30A or an internal fuse will open. Each section of the PDU has three outlets. The total current available for each section is 10A. The loads should be balanced among the four sections such that the total per section does not exceed 10A or a total of 30A for the PDU. Refer to Figure 2 for load segmentation for the 30A Power Distribution Unit.

High Voltage (16A) Power Distribution Unit (Model NA 295363-002)

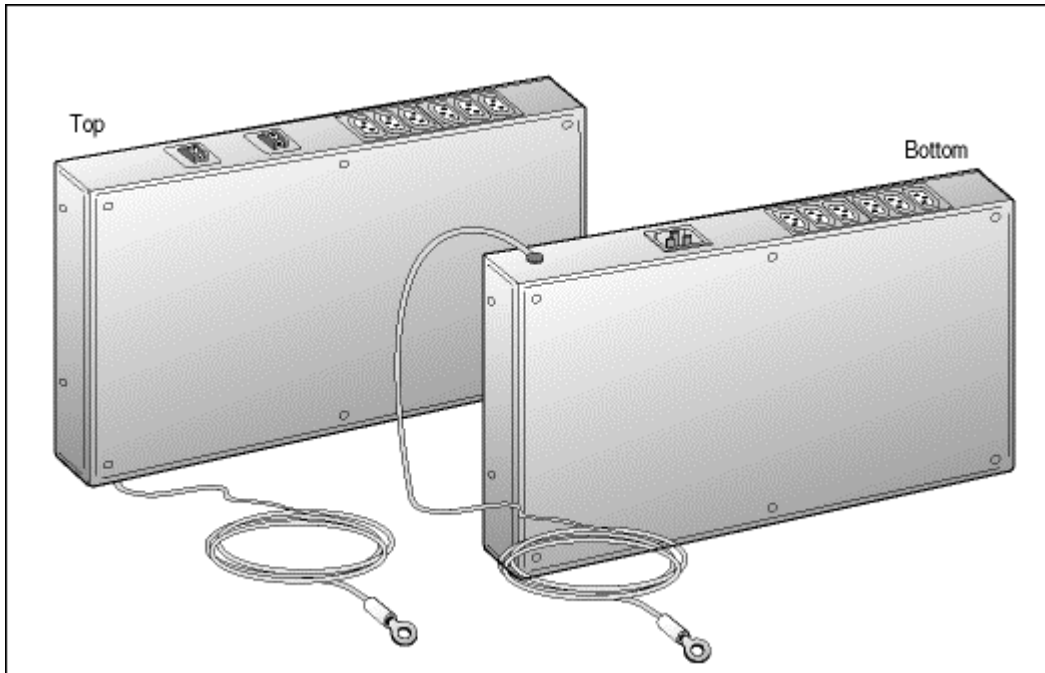


Figure 3. Compaq High Voltage (16A) Power Distribution Unit

This High Voltage Power Distribution Unit provides up to a 16A capacity, and is designed to clamp at 208-240V for rack-mountable servers, and protects to 50,000A per unit, supporting electrical power distribution requirements of the Compaq rack environment. This High Voltage PDU utilizes IEC320 (C-10) output connectors, whereas the input is provided by a 16A IEC320 (C19) inlet connector to link the AC source to the rack cabinet.

Note: For more detailed information regarding Compaq Power Distribution Unit specifications, please consult the Compaq website: www.compaq.com/products/servers/options/ups/pdu.

Low Voltage Power Distribution Unit (Model 295363-001)

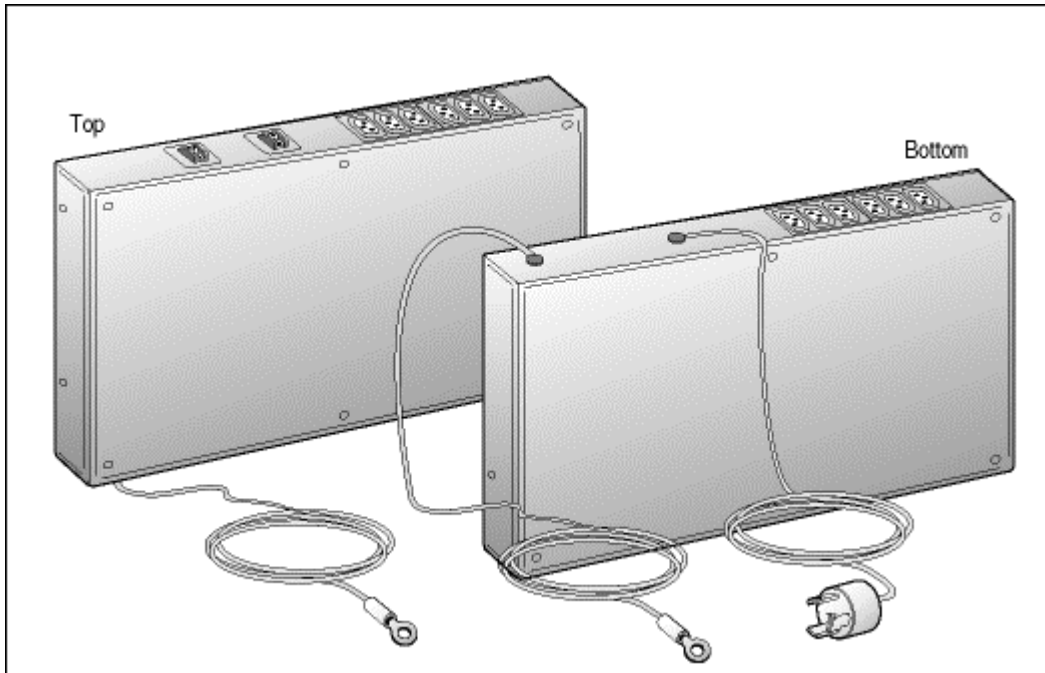


Figure 4. Compaq Low Voltage Power Distribution Unit

Low Voltage Power Distribution Units provide all-path surge and spike protection, and feature 50,000A of surge current clamping at 180 volts. This PDU model provides up to 24A of alternating current capacity to support demanding power distribution requirements of the Compaq rack environment. The Low Voltage PDU utilizes NEMA 5-15R output receptacles that are similar to standard wall outlet connections. The input is provided by a single 30A NEMA L6-30 input line connecting the AC source to the rack cabinet.

Space-saving Design

The Compaq Power Distribution Unit is “zero-U”, requiring no front-panel rack-mounting space, and easily installs into the wall of Compaq 42U, 36U, and 22U rack cabinets. The Compaq PDU is designed for mounting between the frame members of a rack to preserve interior and front panel rack space for business-critical servers and other equipment. The Compaq PDU is hooked into the frame members and secured with two screws. With the preservation of rack space, the Compaq PDU facilitates the consolidation of power cords by managing the cords within the rack and can even be added to a fully loaded rack.

Note: One U is equal to 1.75 inches and is the common unit for measuring rack cabinet space.

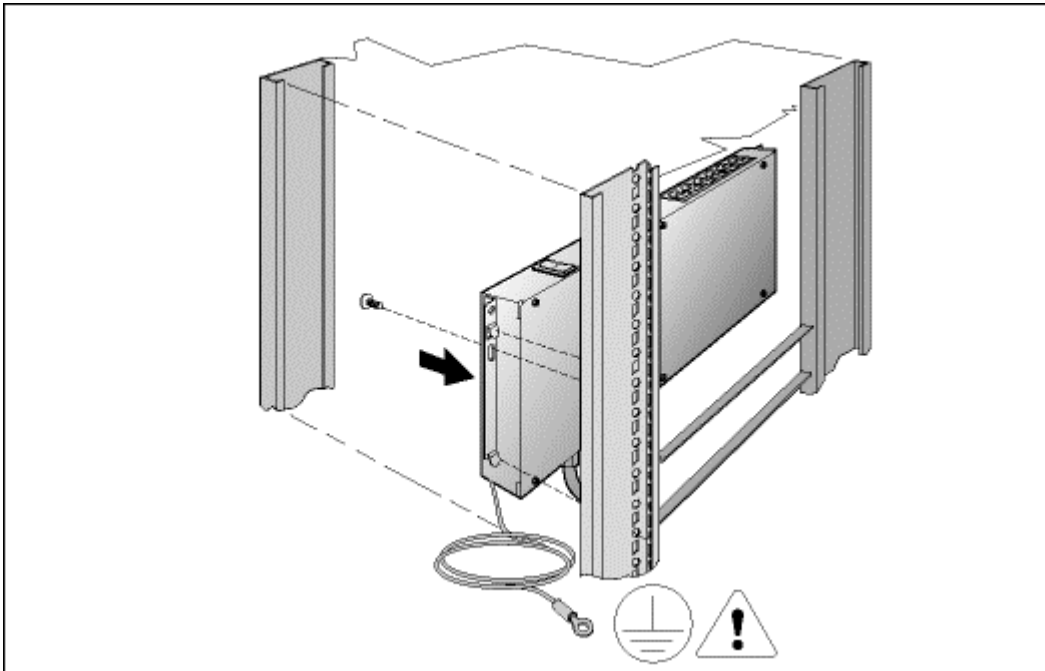


Figure 5. Compaq Power Distribution Unit's Sidewall Rack Installation

Note: For more detailed installation instruction, refer to the Installation Card that accompanied your Compaq Power Distribution Unit.

Single point of connection

The Compaq Power Distribution Unit connects up to 12 devices to a single outside connection, eliminating multiple power cords connected to AC receptacles outside the equipment rack. This single point of connection simplifies cable management and routing to minimize the risk of inadvertent plug removal.

The customer can connect up to 12 power cords to the IEC-320 Power Distribution Unit receptacles. It also reduces the risk of pulling the wrong plug when performing maintenance.

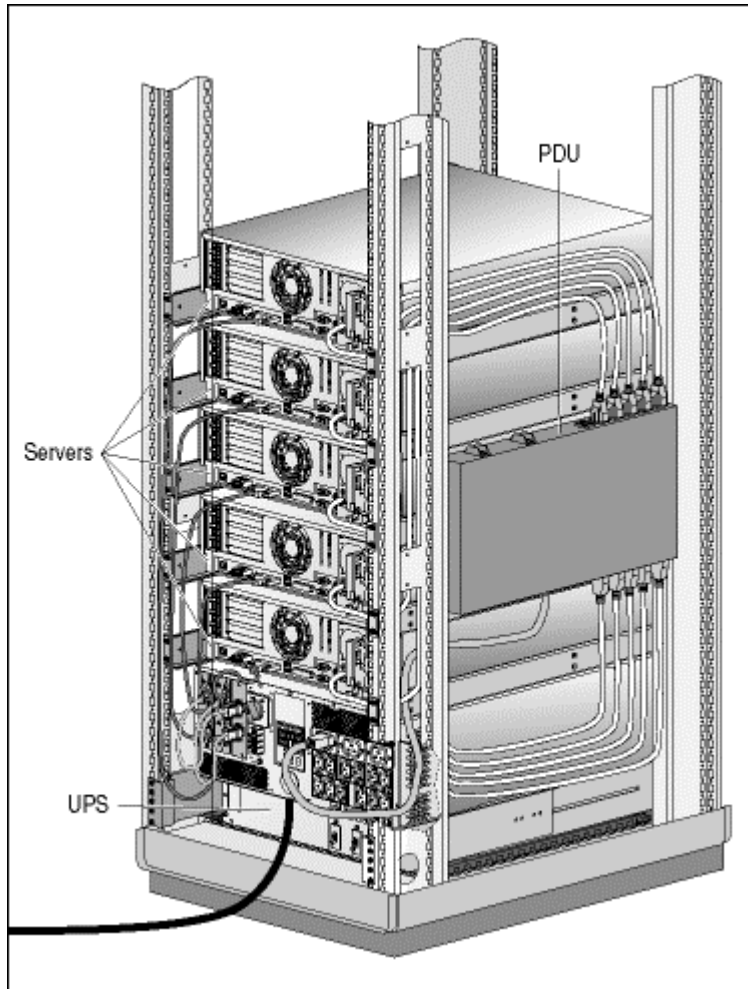


Figure 6. Sample Compaq PDU single point of connection convenience

Note: The 30A High Voltage Power Distribution Unit is not designed to connect to an Uninterruptible Power System.

Overcurrent and Surge Protection

Compaq Power Distribution Units include overcurrent and surge protection for both low and high voltage equipment requirements and are equipped with a Circuit Breaker function to protect any connected system devices from damage in the event of an incoming electrical surge or external equipment malfunction.

Low Voltage Power Distribution Units feature two 15A circuit breakers, the 16A High Voltage Model features two 10A circuit breakers with each circuit breaker protecting six receptacles. The 30A High Voltage PDU is equipped with four 10A output circuit breakers and four 20A input slow blow fuses, with each protecting three output receptacles.

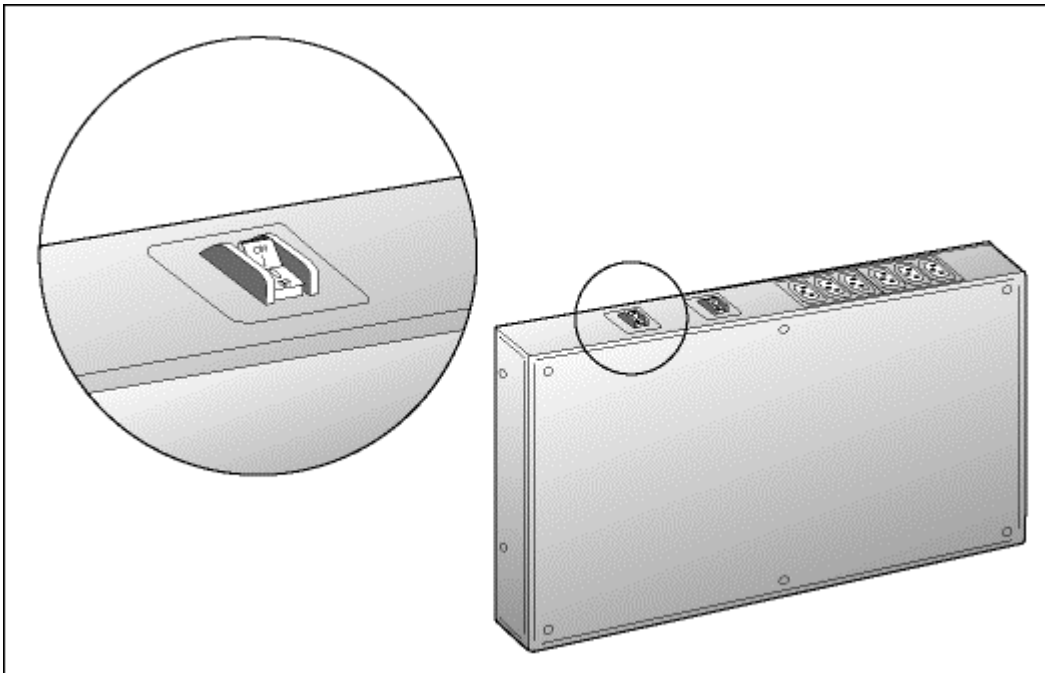


Figure 7. Compaq Power Distribution Unit's Circuit Breaker

Compaq Power Distribution Units are equipped with a surge suppression feature that clamps power when the maximum allowed voltage is reached. For maximum current ratings for Compaq PDUs, please refer to Table 1.

Table 1. Compaq Power Distribution Unit maximum current ratings

Model Number	PDU	Amperes	Voltage Range
NA 295365-003	High Voltage PDU	30	208 volts
NA 295363-002	High Voltage PDU*	20	208 volts
NA 295363-002	High Voltage PDU*	16	220 – 240 volts
295363-001	Low Voltage PDU	24	100 – 120 volts

* The High Voltage PDU can be run at either 20 or at 16A. Depending on the ampere quantity, the voltage range will vary as demonstrated above.

Advanced Power Distribution Unit Application

Tiered PDU Configuration

The Compaq Power Distribution Unit can also be used in conjunction with a second Compaq PDU to provide an additional twelve power connections with continued power surge protection. Even when two Power Distribution Units are installed into a rack environment, the “zero-U” space design is maintained. Each PDU can be mounted on opposite sides of the rack for optimal space preservation. Refer to Figure 8 for tiered Compaq PDU configuration.

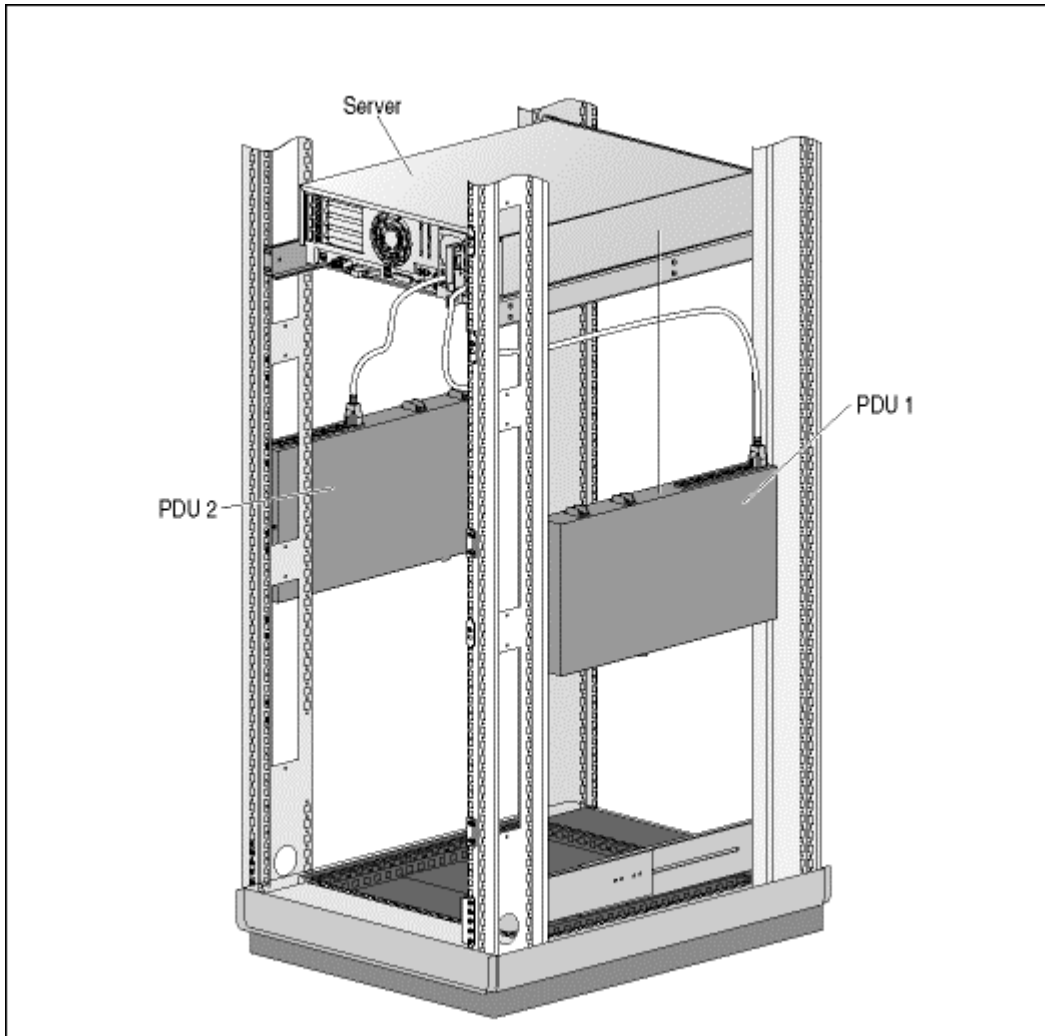


Figure 8. Sample Tiered Compaq PDU configuration

Power Supply Redundancy

Along with the addition of extra outlet availability, a second Power Distribution Unit coupled with a second Uninterruptible Power System will create a redundant power supply to improve reliability. Simply, install a second UPS into the rack environment to ensure enhanced power protection and connect each PDU to their own individual UPS. In this configuration, if one UPS goes down, a second power supply remains to protect mission critical devices in case of power emergency of either electrical source.

IMPORTANT: The 30A High Voltage Power Distribution Unit is not designed to connect to an Uninterruptible Power System.

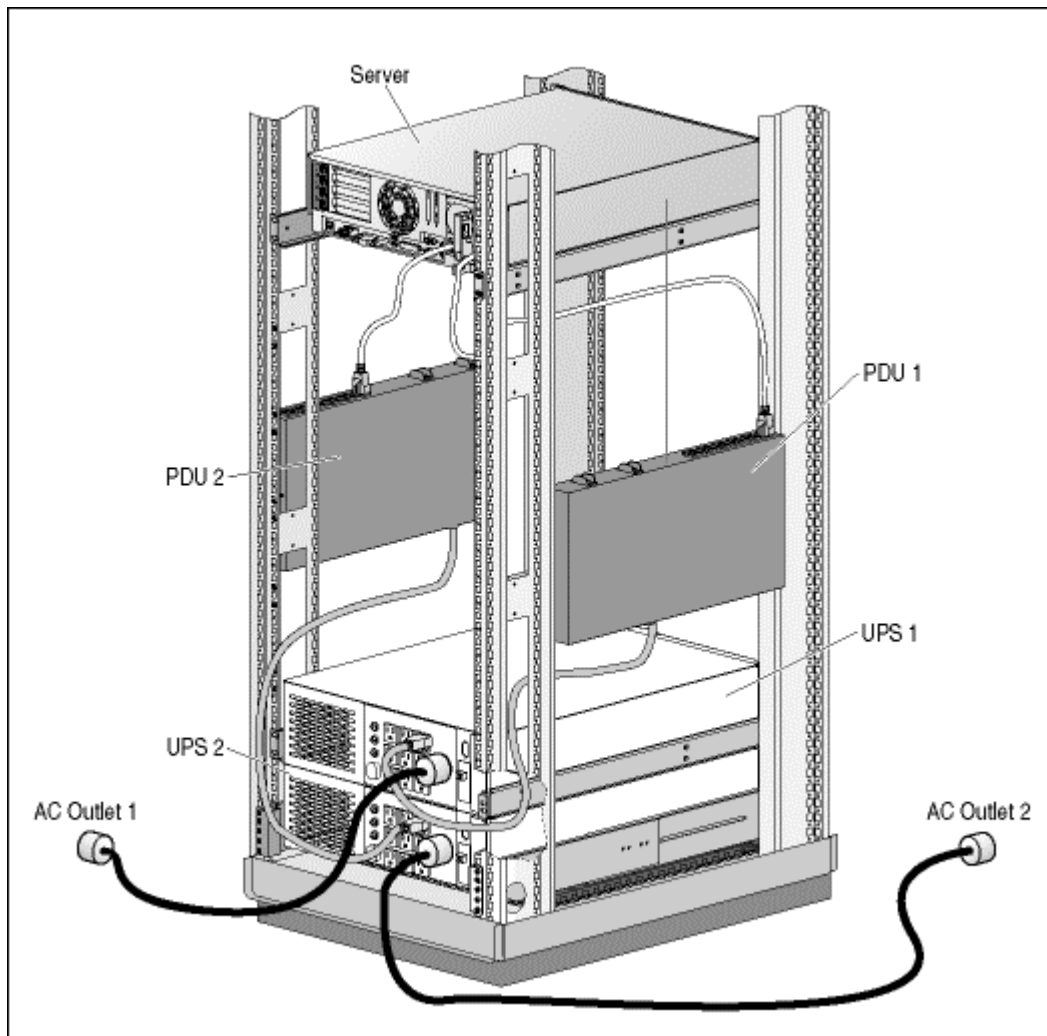


Figure 9. PDU configuration to support UPS redundancy

Compaq R3000 Series Uninterruptible Power Systems

Compaq Power Distribution Units are specifically designed to interface with the Compaq R3000 Series Uninterruptible Power Systems. The Low Voltage PDU fits perfectly into the Compaq R3000 UPS, and the 16A High Voltage PDU is specifically accommodated by the R3000H model UPS. On the R3000 UPS models, Compaq provides a high current outlet that is part of the third load segment of the UPS. By plugging the Compaq Power Distribution Unit into this high current outlet, an additional twelve outlets are added to the UPS, which can be managed as part of load segment three. Figure 10 depicts the Low Voltage PDU operating with the R3000 UPS.

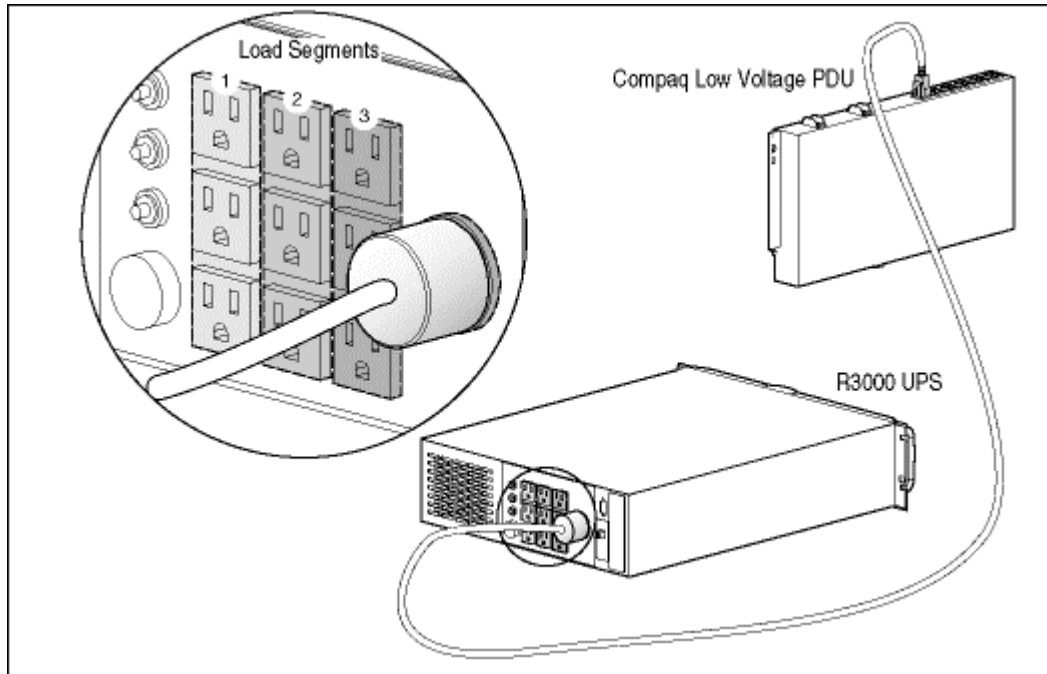


Figure 10. Compaq Low Voltage PDU connected to load segment three of the R3000 UPS

Tips for Better Reliability

- **Secure Line Cords** – It is important to ensure that all lines connected to the Compaq Power Distribution Unit remain stable. To guarantee line stability, it is recommended to secure line cords with either Velcro straps or with cable ties. This will keep the line cords from becoming tangled and also stabilize all connected plugs from movement.
- **Thoughtful Positioning** – Keep in mind that the Compaq Power Distribution Unit will operate optimally when strategically positioned in the rack-cabinet. When possible, position Power Distribution Units adjacent to devices that are on slide rails to facilitate ease in rack component accessibility.

Questions and Answers

Q What is a Power Distribution Unit?

A A Power Distribution Unit, or PDU, is a device that distributes energy to multiple external devices in increments to suit individual power requirements.

Q My system is running a full rack configuration. How can I add a Compaq Power Distribution Unit?

A The Compaq Power Distribution Unit has an exclusive “zero-U” rack design that mounts into the wall of Compaq rack cabinets, requiring no front-panel rack-mounting space.

Q How many system devices can be plugged into a Compaq Power Distribution Unit?

A Up to 12 single AC receptacles can be plugged into a Compaq Power Distribution Unit.

Q I have utilized all 12 AC receptacles on my Compaq Power Distribution Unit, what option do I have to create additional power receptacles?

A Simply add a second Power Distribution Unit for an additional 12 AC receptacles while still maintaining the “zero-U” space considerations.

Q In the event of power emergency, how does the Compaq Power Distribution Unit prevent damage from incoming electrical surges to my externally attached equipment?

A The Compaq Power Distribution Unit comes equipped with a Circuit Breaker feature that prevents damage to attached external equipment in the case of incoming electrical surges.

Q How can the Compaq Power Distribution Unit occupy “zero-U”?

A The Compaq PDU requires no front-panel rack mounting space as it installs easily between the sidewall frame members of the rack cabinet.

Q How do I install a Power Distribution Unit?

A Refer to the installation documentation that accompanied the PDU.

Q Is it possible to have a power back-up supply when utilizing a Compaq Power Distribution Unit?

A Yes. Simply add either another 16A High Voltage PDU or another Low Voltage PDU with a second Uninterruptible Power System to the rack configuration. Plug each PDU into a separate UPS, and then each UPS into individual power supplies.

Q I am unsure of which Uninterruptible Power System to use for my Compaq PDU?

A The 16A High Voltage PDU and the Low Voltage PDU are designed to be used with the Compaq R3000 Series Uninterruptible Power System. The R3000 and R3000H both are equipped with a high current outlet that is part of the third load segment of the UPS.