Vertiv™ PowerDirect Rack

50V DC Power System, Scalable from 33kW to 132kW

Benefits

- Save space by leveraging high power density shelves – up to 33 kW (660 A at 50 V DC) per shelf in one open rack unit (1.87")
- Expand rack capacity of a live system by adding more PSUs and shelves without disruption
- Support high-capacity servers with high power shelves and PSUs providing up to 132 kW per rack
- Provide flexibility to your data center by using power shelves and PSUs that can support both AC and HVDC input
- Save energy by using high efficiency (97.5% Peak) power supply units

This high-density 50V DC power system features a compact, modular design that is well-suited for a wide variety of data rack applications.



Description

The modular Vertiv™ PowerDirect Rack, 50V DC power system provides up to 132 kW (2640 amps at 50 volts DC) per rack via high efficiency power supply units rated at 5500 watts (110 amps) each. Each power shelf takes up one open rack unit of height. It's rated at 33 kW and can house six 5.5 kW high efficiency power supply units. The PSUs are hot pluggable and can be added in an operating system without any interruption. Also, new power shelves can be added live when more power is required.

The power system accommodates a power management unit that controls and monitors the power supply units while communicating to the rack management system. The power management unit can support up to 48 power supply units to meet various redundancy schemes.

Application

The Vertiv™ PowerDirect Rack 50V DC power system is specifically designed for compatibility with the Open Compute ORV3 rack. It is fully compliant with the ORV3 high power specification.



50V power supply unit



Power management module

Ordering Information

Part Number	Model Number	Description
1PSS503321N2	PSS5033-21N2	Shelf, 50VDC, 33kW, OCP ORV3, Dual Input
1PMM1S0	PMM1S0	Power Management Module, OCP ORV3
1R505500E4	R50-5500E4	Power Supply Unit, 50VDC, 5500W, OCP ORV3

Technical Specifications

Input

Voltage, Shelf	200 V AC to 240 V AC nominal three-phase (3-wire + PE) with range of 180 V AC to 264 V AC 230/400 V AC to 277/480 V AC nominal three-phase (4-wire + PE) with range of 195/338 V AC and 305/528 V AC 200 V AC to 277 V AC nominal single phase (2-wire + PE) with range of 180 V AC to 305 V AC 240 V DC to 336 V DC nominal with range of 180 V DC to 410 V DC
Voltage, Power Supply Unit	200 V AC / 208 V AC / 220 V AC / 240 V AC / 277 V AC nominal single-phase with range of 180 V AC to 305 V AC, 240 V DC to 336 V DC nominal with range of 180 V DC to 410 V DC
Current, Power Supply Unit	31.8 amps maximum at full power and 180 V AC, 31.6 amps maximum at 180 V DC
Circuit Protection	Fuses located in each line input of power supply units
Efficiency	97.5% peak

Output Capacity

Voltage	50.0 V DC nominal
Current, Shelf	660 amps at 50.0 V DC
Current, Power Supply Unit	110 amps at 50.0 V DC (5500 watts maximum)
Regulation	Steady state output voltage remains within ±1 % for any load current from no load to full load and over the specified input voltage range
Dynamic Response	For a 50% step load change within the range of 10% to 100% of full rated current, the maximum voltage transient will not exceed 1% of the initial steady state voltage
Filtering	Wide band noise does not exceed 500 mV peak to peak

Protection Capacity

Over-Voltage	Each power supply unit will automatically shut down and lock out should its output voltage exceed 52.5 V DC. Unit will automatically attempt to restart once. A second (backup) over-voltage protection circuit will shut down and latch off the unit if the voltage exceeds 54.5 V DC maximum
Over-Current	The power supply can operate continuously at up to 115 amps above which it will shut down dependent on the duration of the overcurrent condition. Consult the user manual for details.
Power Limit	Non-adjustable limit of 5500 watts maximum per power supply unit
Over-Temperature	Each power supply unit will automatically shut down if the internal temperature of the module exceeds a predetermined value. Operation will automatically resume after the over-temperature condition is removed
Internal Fault On Output	Each power supply unit contains an output blocking (ORing) circuit which prevents an internal fault in the unit from affecting the bus voltage

Physical Characteristics

Dimensions (H x W x D), Weight	
Shelf	14.5 kg (32 lb) without AC cords, 46 mm H x 537 mm W x 788.7 mm D (1.81" H x 21.1" W x 31.05“ D)
Power Supply unit	1.82 kg (4.0 lb), 40 mm H x 73.5 mm W x 640 mm D (1.57" H x 2.89" W x 25.2" D)

Environmental

Operating Temperature	-20°C to +75°C (-4°F to +167°F) with power derating above 45°C
Storage Temperature	-40°C to +85°C (-40°F to +185°F)
Humidity	10% to 90% relative humidity, non-condensing
Altitude	-60m (-200 ft) to 3050m (10000 ft) with no derating
EMC	FCC Part 15, Subpart B, Class A and EN55022 for radiated and conducted noise
Safety Compliance	UL 62368-1, IEC 62368-1, EN 62368-1, RoHS

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