VERTIV.

Vertiv™ PowerDirect 9000

1.5 MW 800 VDC Power Center

AI is redefining the power demands of the data center. Vertiv™ PowerDirect 9000 enables the shift to 800 VDC by moving power conversion out of the IT rack and into a centralized, scalable power center. From facility AC to 800 VDC to the compute pod, Vertiv PowerDirect 9000 integrates conversion, distribution, protection, safety, and controls into a high-power density platform purpose-built for AI infrastructure.

Benefits

- **Convert at the row:** 1.5 MW of 800 VDC from a single compact rack, keeping conversion out of the IT row
- **Modular and scalable:** hot-pluggable 60 kW power supply units in 180 kW shelves, scalable to desired capacity
- **Fault ride through and power smoothing:** compatible capacitor-based energy storage module solutions to mitigate high frequency pulse load profiles of AI compute
- **Hold the load:** integrated charging supports up to 1.5 MW of battery backup at 5 minutes end of life with 6 strings Vertiv™ EnergyCore Lithium 5 800 VDC
- **Deploy safely:** arc flash monitoring, ground fault detection, high-resistance midpoint grounding, and touch-proof busbars

Application

- Hyperscale, cloud, colocation AI data centers
- Traditional AC to 800 VDC conversion at the compute pod
- Training and inferencing workloads

Description

The Vertiv™ PowerDirect 9000 Power Center is a high-power density compact power converter taking 480 VAC to 800 VDC up to 1.5 MW of power capacity plus 120 kW of redundancy. Modular, hot-pluggable 60 kW power supply units (PSU) enable scalable capacity, while a touch-proof 800 VDC output busbar feeds two protected output distribution branches to the pod. Centralized controls and monitoring on a 10.1" LCD display integrate with infrastructure management through Modbus and Redfish.



Vertiv™ PowerDirect 9000 1.5 MW, 480 VAC to 800 VDC Power Center

Technical specifications

Input Power

Voltage AC	480 VAC (3PH 3W+PE); 456-528 VAC Linear derating below 456 VAC.
Frequency	47 – 63 Hz
Power capacity	1.62 MW (1.5 MW rated output with 120 kW redundancy)
AC input connection	2500A withdrawable air circuit breaker 65kAIC; Four lugs reserved per phase; lug capacity 750 kcmil or 400 mm²; Front and top cable entry
AC PDU	19-inch 1RU shelf with fuse protection per phase, forced-air cooling and fuse fault indication
AC input protection	100 A Class J fuses, 600 VAC, 200 kA rms symmetrical interrupting rating, to UL 248-8; fuse blow detection

Output Power

Voltage	800 VDC / 0 V, ±3% including droop compensation
Power supply unit (PSU)	60 kW
Power factor	Unity
Power supply shelf (PSS)	180 kW
Rack Power Efficiency	Up to 97.6% peak, up to 97.2% at full load
Hold up time	>20 ms at 100% load
Dynamic Pulse power	115% for 10 s; 120% for 100 ms; repetitive 140% for 50 ms and 160% for 400 µs
Current sharing	Active current sharing across power supply units
Power density	>80 W/in³ (power supply unit). 2083 kW/m² (power center rack)
DC busbar	Vertical touch-proof busbar, 800 VDC, 2500 A, with NTC sampling resistor and voltage sampling point
DC output connection	Four lugs reserved per branch (2 branches); lug capacity 750 kcmil or 400 mm² Rear and top cable entry (rear access required for installation and operation)
DC Distribution	Two (2) x 1200A (80% rated) molded case circuit breakers (MCCB) 25kAIC rated circuit protection devices

Energy storage

Backup battery rack (BBR) Product	Vertiv EnergyCore Lithium 5 800 VDC
Backup Battery Rack Capacity	Six (6) strings 1.5MW 5 minutes End of Life (EoL)
Battery input connection	6 lugs per phase for battery connection

Preliminary Specifications (subject to change without notice.)

Protection and safety

Emergency stop	E-stop EPO button included (front door panel)
Ground fault	Ground fault detection with high resistance mid-point grounding; High resistance midpoint grounding designed to prevent arc flash to ground during a single ground fault
Arc flash detection	An arc flash monitoring unit operates within the safety management unit.
Safety management unit	19-inch 1RU shelf providing 24 VDC auxiliary power distribution, ground fault detection, and high-resistance mid point grounding, with AC and DC auxiliary power redundancy. Insulation monitoring device (IMD) for current leakage
Busbar safety	Touch-proof design referencing IEC 62368; approved to UL 1977 and IEC 61984; flammability rating UL 94 V-0
Temperature detection	DC output temperature monitored at DC busbar connection to power shelf

Control and monitoring

Centralized control module	10.1" LCD HMI and controller integrated in one front door-mounted module for monitoring, control, and alarms
Northbound communication	Gigabit Ethernet to higher-level management systems over Modbus and Redfish
Southbound communication	CANBUS aggregation of all field-replaceable units; 4 x RJ45 Modbus ports to four IT rack top-of-rack units on a predefined mapping
Firmware and diagnostics	Online firmware upgrade per power supply unit; BlackBox failure analysis; field-replaceable unit physical address management

Physical characteristics - Dimensions (H x W x D), Weight

Power Center Rack System	Approximately 600 mm wide x 1200 mm deep (23.6 x 47.2 in); approximately 1600 kg fully populated
Power supply unit (PSU)	82.1 x 163 x 905 mm, <25 kg
Power supply shelf (PSS)	87.5 x 537 x 1007 mm, <30 kg (excluding power supply units); 21-inch 2RU
Centralized control module	185 x 267.5 x 47 mm, <1.5 kg
AC PDU and safety management unit	19-inch 1RU shelves

Environmental and compliance

Operating temperature	-5°C to 45°C at full load
Humidity	10% to 90% relative humidity, non-condensing
Altitude	Up to 3050 m (10,000 ft) with no de-rating at 60 kW per power supply unit
Cooling	Forced air, front to rear airflow
Acoustic Noise	
Safety compliance	Busbar to UL 1977 and IEC 61984, UL 94 V-0, UL 62368/IEC 62368-1; AC fusing to UL 248-8 Class J, ≤95 dB (A) 30°C at 80% load
EMC	FCC Part 15 and EN55032 Class A
Transportation	ISTA 3E
Ingress Protection	IP 20

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