Vertiv™ EnergyCore Li5 800 VDC

Integrated lithium battery and DC/DC converter to support 800 VDC architecture

Vertiv™ EnergyCore Li5 800 VDC provides battery backup for an 800 VDC bus in one solution: a Vertiv EnergyCore Li5 lithium battery cabinet with a bidirectional DC/DC converter mounted directly on top, charging from and discharging to the bus.

Benefits

- **Save floor space:** Up to 260 kW of 800 VDC backup in a 600 x 750 mm footprint, with the converter mounted on top
- **Ride through power loss:** No interruption to the compute load; 5-minute runtime at maximum discharge power, even at battery end of life
- **Low conversion losses:** Up to 98% efficiency between the battery and the 800 VDC bus
- **Deploy faster:** Battery modules and battery management system (BMS) ship installed, reducing contractor scope
- **Scale to 1.6 MW:** Up to six systems in parallel, with active current sharing

Description

In normal operation, the DC/DC converter charges the batteries from the 800 VDC bus. On an AC-loss signal or bus undervoltage, all converter power modules switch from charging to discharging at the same time, delivering a constant 800 VDC output with no interruption to the compute load. The Vertiv EnergyCore Li5 battery cabinet stores 31.1 kWh, and the DC/DC converter delivers 200 kW continuous with 260 kW overload capability. Up to six systems can run in parallel for up to 1.6 MW, with active current sharing.

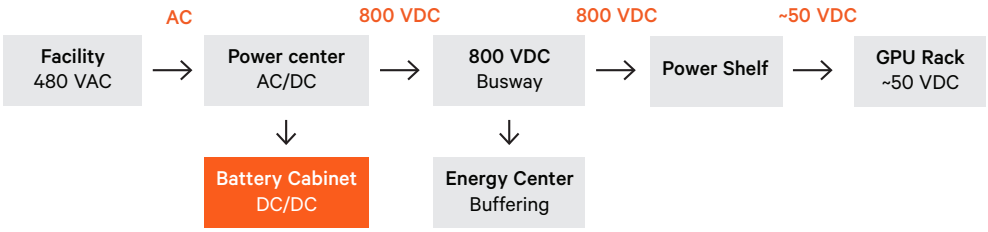


Vertiv™ EnergyCore Li5 800 VDC DC/DC converter

Application

- Hyperscale and colocation AI data centers
- Battery rooms and energy centers backing an 800 VDC bus
- 800 VDC pod and row power architectures
- 800 VDC rack and pod solutions requiring lithium backup

Where it fits in the 800 VDC power train



Technical specifications — Vertiv™ EnergyCore DC/DC Converter

Configurations (5 min EOL runtime) — 18 modules

Nominal energy	31.1 kWh
Nominal voltage	518 VDC
Maximum discharge power	263 kW
End of discharge voltage	451 VDC (recommended)
Float charge voltage	557 VDC
Weight	590 kg (1,301 lb.)

Battery and electrical

Cell type	Lithium iron phosphate (LFP) cylindrical cells (CATL); 1 mm mica barrier between battery modules
Battery module	9S3P, 60 Ah nominal capacity
Charging	20 A recommended charge current; charge inhibit circuit included
Fusing	500 A / 700 VDC, 100 kA
Maintenance disconnect	1 x 600 A DC disconnect
DC connections	Lugs to terminals; 1 x 2-hole lug per polarity (rear top); optional conduit box

Control and communication

BMS and power	Internally powered, factory-installed BMS; internal control power; 24 VDC service power
Front panel	Global HMI (human-machine interface) touchscreen, one per system
Network interfaces	100 Mb Ethernet (Modbus TCP or SNMP); RS-485 (Modbus RTU)
Service interfaces and signaling	RS-232 serial, USB 2.0; isolated discretes
Delivery	Ships with battery modules and BMS installed; internal battery interface board reduces contractor scope
800 VDC interface	Via the Vertiv™ EnergyCore DC/DC Converter, mounted on top of the cabinet

Physical and environmental

Dimensions (W x H x D)	600 x 2000 x 750 mm (23.6 x 78.7 x 29.5 in); 2,280 mm (89.8 in) H with DC/DC converter installed
Cooling	Convective
Operating temperature	20°C to 30°C recommended; cell temperature 10°C minimum operating, 60°C maximum
Storage temperature	-20°C to 30°C long period; -20°C to 45°C less than 2 weeks; -30°C to 60°C less than 1 week
Relative Humidity	5% to 95%, non-condensing
Altitude	Up to 3,000 m

Compliance

Certifications	CSA mark (UL 1973 3rd edition), CE mark (IEC 62619:2022), ISO 13849:2015 Cat. 2 PLa, ISTA 3B, UN DOT 38.3, FCC 47 CFR 15B
Testing	UL 9540A 4th edition

Preliminary Specifications (subject to change without notice.)

Technical specifications — Vertiv™ EnergyCore DC/DC Converter

Electrical

DC input	Li5 battery cabinet (18 battery modules)
DC output	800 VDC
Rated power	200 kW continuous (260 kW overload, 10 min)
Efficiency	Up to 98%
Topology	Bidirectional, non-isolated
Operating modes	Standby, charge and discharge, managed automatically from a single hardware platform
Transfer	AC-loss signal or bus undervoltage transfers all power modules from charge to discharge simultaneously

Design and control

Module format	Hot-pluggable 3U DC/DC power module plus 2U battery overcurrent protection unit (BOPU) shelf
Mounting	Top of the Vertiv™ EnergyCore Li5 Battery Cabinet; field-installable
Parallel operation	Up to 6 Li5 battery cabinet and DC/DC converter systems per group, with active current sharing over CAN FD
Communication	CAN FD parallel bus; CAN point-to-point to Li5 battery cabinet
Protection	Emergency power off (EPO), fuse, BOPU; overvoltage, undervoltage, overcurrent, overheat, short-circuit, battery-reverse and current-share imbalance

Physical and environmental

Shelf dimensions (W x H x D)	600 x 280 x 750 mm (23.6 x 11.0 x 29.5 in)
Module dimensions (W x H x D)	520 x 133 x 530 mm (20.5 x 5.2 x 20.9 in)
Weight	<100 kg (<220 lb.), estimated
Cooling	Air-cooled
Operating temperature	-5°C to +40°C at full load
Relative humidity	10% to 90%, non-condensing
Altitude (no derating)	3000 m at 200 kW

Compliance

Standards	UL 1741, UL 508

Preliminary Specifications (subject to change without notice.)

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