Vertiv™ HPL P1 Lithium-ion Battery Energy Storage System

Key Features

- 100 Ah (108 Ah), 512 V Lithium iron phosphate battery
- Houses 10 Battery modules per rack
- Delivers 51.2 kWh/210 kW power per rack, 13.5 min BOL
- Parallel up to 8 battery cabinets
- Compatible with 2 wire and 3 wire battery system
- Integrated pre-charging and balancing circuit
- Intelligent 3-tier battery management system
- Integrated parallel communication ports
- Cycle life >2500 at room temperature
- 10 years of Design life
- Standard 5 years warranty
- Both top and bottom cable entry available
- Optional internal fire suppression module
- Advanced integration with Liebert UPS systems (APM2, EXS 30-80kVA, APM Plus, EXL S1, Trinergy Cube)
- CE certified
- UN certified at the module level - ensure the safety of lithium batteries during transportation.

Lithium-ion Battery Cabinet

The Vertiv™ HPL P1 is engineered to provide safe, reliable, and cost-effective high-power energy that improves critical infrastructure performance over traditional value-regulated lead-acid systems. The Vertiv HPL P1 offers powerful 51.2 kWh (210 kW/cabinet) density in the smallest footprint that matches the look and feel of modern data centers. It houses ten high-power battery packs with a rated voltage 51.2 V connected in series.

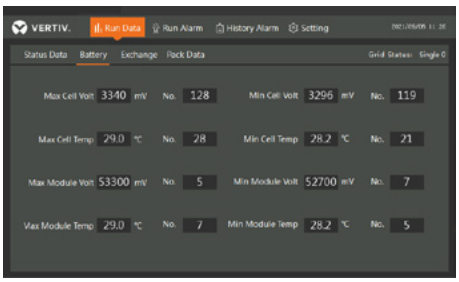
The Vertiv HPL P1 adopts three-tier battery management system namely Battery Module Managament Unit (BMU), Battery Cabinet Management System (BCMS), and EMS to provide safe and reliable protection. The battery management system (BMS) is powered by both AC and DC power supply. The BMS preferentially uses AC power supply from the mains and automatically switches to DC power supply from the battery string when the mains is abnormal and thereby ensuring ultimate safety and uptime for the critical infrastructure.

It comes with easy-to-use 7-inch touch screen control panel that delivers key status and information. The Vertiv HPL P1 communicates with the UPS through RS485 and dry contact to exchange operating data with paired UPS in real time for intelligent protection and monitoring. In addition, the HPL P1 also supports the independent battery cluster operation when UPS communication is abnormal.

Vertiv leverages its DNA in critical systems to deliver a lithium-ion battery system that is integrated seamlessly into the power chain. Our capabilities and processes come together to ensure the UPS, batteries, monitoring, management, service and support offerings are orchestrated for delivering on our customer expectations.

Vertiv™ HPL P1

Vertiv™ HPL P1 Internal view



Vertiv™ HPL P1 Display Images

Technical Specifications

Technical Parameters

Nominal Energy	51.2 kWh
Nominal Capacity	100 AH
Nominal Voltage	512 VDC
Cabinet Dimensions (W x D x H), mm	600 x 1100 x 2000
Cabinet Weight (including battery mdoules)	800 kg
Color	Black ZP7021
Protection degree, IEC (60529)	IP20 (front door open or closed, rear door closed)
Battery Module Configuration	16S4P
Discharge Cut-off Voltage	448 VDC
Maximum Charging Voltage	568 VDC
Maximum Discharging Current	450 A
Maximum Charging Current	100 A/1C (Recommended: 0.5C)
Factory Open Circuit Voltage	512 V-544 V(3.2 V-3.4 V/cell)
Communication	CAN Communication, Dry Contacts
Auxiliary Power Inputs	Dual AC/DC inputs
General safety requirements	EN62040-1/IEC62040-1
EMC requirements	EN62040-2/IEC62040-2 (Class C3)
Method of specifying the performance and test requirements of HPL P1	IEC62619, UL1642
Road transport safety standards	UN38.3
Operating Temperature	0-40°C (Temperature without derating: 25±2°C / Range covered by warranty: 25±5°C)
Storage Temperature	-25 °C to 60 °C (the storage time shall not exceed 3 months, and 20 °C to 25 °C is the best storage temperature for batteries)
Relative Humidity	0 to 95 %RH, non condensing
Altitude	0-4000 m (no derating for 0-1000 m, and derating for 1000 m and above shall refer toIEC 62040-3-2021 standard)

Battery Runtime Chart (in minutes)

	30kVA	40kVA	60kVA	80kVA	100kVA	120kVA	160kVA	200kVA	250kVA	300kVA	500kVA
1 Rack(s)	91.5	68.6	45.8	34.3	27.7	23.1	17	13	0	0	0
2 Rack(s)	183.1	137.3	91.5	68.6	54.9	45.8	34.3	27.7	22.2	18.5	0
3 Rack(s)	274.6	205.9	137.3	103	82.4	68.6	51.5	41.2	32.9	27.7	16.1
4 Rack(s)	366.1	274.6	183.1	137.3	109.8	91.5	68.6	54.9	43.9	36.6	22.2
5 Rack(s)	465.3	346.8	228.9	172.6	137.3	114.5	86.3	68.6	54.9	45.8	27.7
6 Rack(s)	549.2	411.9	274.6	205.9	164.7	137.3	103	82.4	65.9	54.9	32.9

Note:
1. *Battery autonomy times are calculated based on operation at 25°C.*
2. *UPS output power factor is 0.9*
3. *Inverter efficiency is 95%*
4. *The energy of the single cabinet is 51.2 kWh*
5. *The minimum end of discharge voltage is set to 448V*
6. *The discharge depth is 93%*