

# Vertiv™ HPL Lithium-ion Battery Energy Storage System



## Overview

Lithium-ion battery, as one of the most influential technical breakthroughs in the last decade, has transformed our lifestyle and reshapes the world by powering from our cell phones and notepads to our new e-cars and renewable power plants. It will be the next generation batteries to power our UPS and datacenters.

Vertiv's innovative mindset and early experience with lithium-ion batteries has helped many organizations achieve their infrastructure goals.

### Ideally Suited For:

- New data centers
- Cloud, colo, hosting facilities
- Enterprise data centers
- UPS energy storage
- Replacements to lead-acid batteries

### Compliant

- UL 1642
- IEC 62619 (safety)
- IEC 61000 (EMC)

Qualified for immediate use with most current and legacy three phase Liebert® UPS systems.



## Lithium-ion Battery Cabinet

The Vertiv™ HPL is the first lithium-ion battery cabinet designed by datacenter experts for data center users. The latest version of the Vertiv™ HPL system has successfully completed a UL 9540A fire test. According to NFPA 855's ESS installation standards, when successfully completing a UL9540A test, three feet (92cm) spacing requirements between racks can be waived by the Authorities Having Jurisdiction (AHJ).



Vertiv™ HPL lithium-ion cabinet battery

The Vertiv HPL is engineered to provide safe, reliable, and cost effective high-power energy that improves critical infrastructure performance over traditional value-regulated lead-acid systems.

Not only do users enjoy the longer life, more cycles and fewer replacements of a lithium system, they also benefit from its compact, smaller size and lower weight

These advantages directly impact an impressive total cost of ownership experience.

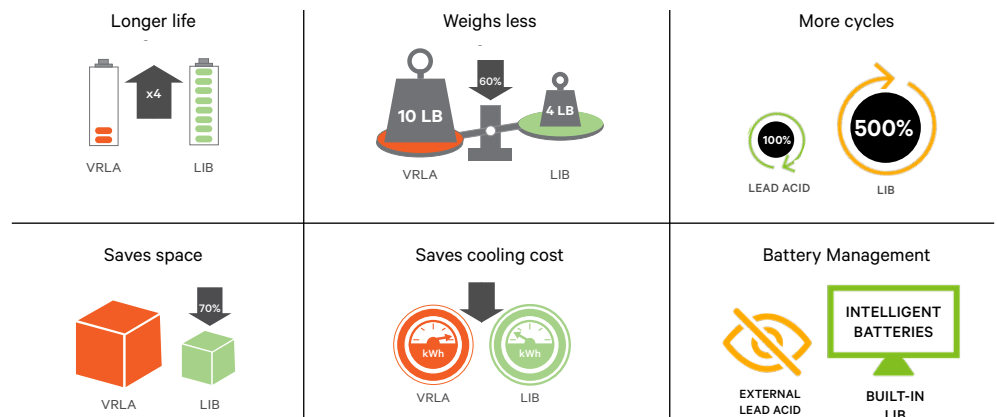
### Reduce Battery Replacement Cycles

VRLA → 3-5 years  
LIB → 10-15 years

VRLA = valve regulated lead-acid  
LIB = data center lithium-ion

**Fewer Facility Disruptions  
Lower Total Cost of Ownership**

## Benefits of Lithium-ion Batteries



# Vertiv™ HPL 9540A Lithium-Ion Battery Cabinet

Designed to Power Critical Data Centers

## A New Standard in Energy

The Vertiv™ HPL offers powerful 38kWh (207kWh/cabinet) density that provides effective, safe energy storage. It delivers an optimized energy storage solution that modern data centers demand.

### Control and Protection

The Vertiv™ battery management system monitors battery performance and performs SoH calculations to provide safe, reliable protection.

### Internal Power Supply

The control power is internally sourced from DC voltage. No onsite wiring, saves installation time and costs.

### User-friendly Display Panel

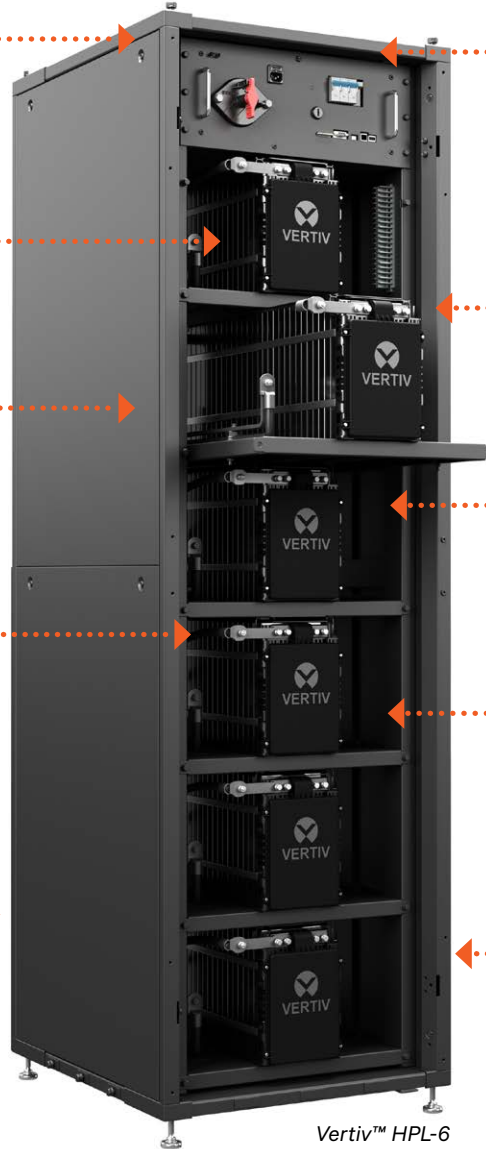
Easy to see, easy to use front control panel delivers key status and information located on the front door.

### Powerful, Proven Batteries

Vertiv HPL uses proven, high power battery modules that are rooted in the battery technology that was engineered for the demanding automotive industry.

### Smallest Footprint

The most compact lithium-ion battery cabinet design will save valuable data center space.



Vertiv™ HPL-6

### Built-in Redundancy

Redundancy built-in within the battery management system design improves reliability by eliminating single points of failure.

### Smart Communications

Provides MODBUS/IP protocol for communicating with building management systems.

### Best-in-Class Serviceability

Front-access design saves space required for service. The sturdy, retractable shelves enable fast module replacement, if needed.

### Pre-assembled

Vertiv HPL is shipped pre-assembled and factory-tested to minimize site installation time and cost, and improves the integrity of the system on site.

### Data Center Rack

The standardized design provides a safe, secure, and sturdy enclosure that matches the look and feel in modern data centers.

## The Right Battery for the High Performer

If the UPS is only as good as the battery, it's important to select the right one for the application. There are a variety of lithium-ion batteries on the market, each with varying behaviors. Vertiv selected the lithium nickel-manganese-cobalt (NMC) chemistry for the Vertiv HPL to deliver a well-balanced, safe, high-performing energy storage system that provides reliable energy whenever called upon.



Vertiv™ High Power Lithium-ion Battery

Operate at  
Higher  
Temperatures

Save on  
Cooling Costs



Guaranteed  
Runtime

10 Year  
Warranty

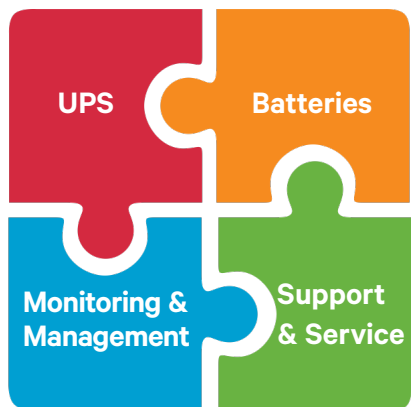
## Confidence on Runtime

Given the behavior of lithium-ion batteries, Vertiv understands runtime is what matters. We provide a predictable runtime through the life of the battery.

Then we back it up with a 10 year warranty.

## Vertiv Brings All the Pieces Together

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.

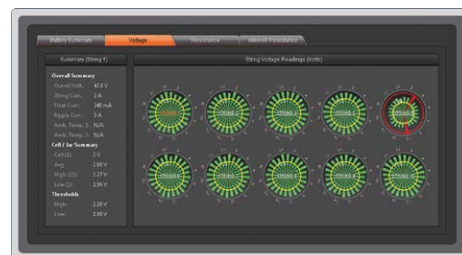


Vertiv™ HPL Lithium-ion Battery Cabinets with 1200kW Liebert® EXL S1 UPS

## Management and Control

The Battery Management System within the Vertiv HPL ensures secured communications with the right level of visibility. Whether for local or remote monitoring, customers can receive a proactive flow of battery information at the cell, module, system and facility level.

- Albér™ Battery Xplorer Enterprise
- PowerShield Battery Management Systems
- 3rd party systems



Albér™ Battery Xplorer Enterprise

## Protect Your Assets – Wherever They are Located

Critical systems demand proper attention. Vertiv Services can provide highly trained local engineers and remote experts for monitoring your systems live or via shared files. Our service team is prepared to support all or a portion of the data center's infrastructure, before and after the installation.

## Vertiv, Your Energy Storage Expert

We have the experience and solutions you need to ensure effective energy storage for all your critical operations. Our capabilities can provide you with a supply of lithium-ion cabinets for your next battery deployment.

Whether you need solutions that involve batteries, battery maintenance or replacements, you can put your trust in Vertiv.



Support Services for Critical Facilities

## Specifications

Parameter	Vertiv™ HPL-4	Vertiv™ HPL-5	Vertiv™ HPL-6	Vertiv™ HPL-7
Module Qty.	4	5	6	7
Dimensions	600mm x 725mm x 2022mm	600mm x 725mm x 2022mm	600mm x 725mm x 2022mm	600mm x 725mm x 2022mm
Weight	494kg (1090lb)	540kg (1190lb)	585kg (1290lb)	630kg (1390lb)
Cell Type	Lithium-Ion NMC Pouch Cell	Lithium-Ion NMC Pouch Cell	Lithium-Ion NMC Pouch Cell	Lithium-Ion NMC Pouch Cell
Battery Module	22S3P	22S3P	22S3P	22S3P
Nominal Capacity	78Ah	78Ah	78Ah	78Ah
Nominal Energy	25.3kWh	31.7kWh	38.0kWh	44.3kWh
Nominal Rack Voltage	320V	400V	480V	560V
Maximum Rack Voltage	363V	454V	545V	636V
Minimum Rack Voltage	273V	342V	410V	478V
Float Voltage Setting	360-363V	451-454V	542-545V	633-636V
Maximum Discharge Power	138kWb	173kWb	207kWb	242kWb
Maximum Charge Current	30A	30A	30A	30A
Max Battery Cell Temp.	70°C	70°C	70°C	70°C
Min Battery Cell Temp.	20°C	20°C	20°C	20°C
Maintenance Disconnect	1	1	1	1
Charge Inhibit Circuit	Included	Included	Included	Included
DC Connections	Lugs to Terminals	Lugs to Terminals	Lugs to Terminals	Lugs to Terminals
Network Interfaces	100 BaseT Ethernet Modbus/IP and SNMP	100 BaseT Ethernet Modbus/IP and SNMP	100 BaseT Ethernet Modbus/IP and SNMP	100 BaseT Ethernet Modbus/IP and SNMP
Service Interfaces	RS-232	RS-232	RS-232	RS-232
Signaling	Isolated Discretes	Isolated Discretes	Isolated Discretes	Isolated Discretes
Front Panel	Backlit LCD Display	Backlit LCD Display	Backlit LCD Display	Backlit LCD Display
Push Buttons	Enable/Stop	Enable/Stop	Enable/Stop	Enable/Stop
Interlocks	Door Sensor/Service Switch	Door Sensor/Service Switch	Door Sensor/Service Switch	Door Sensor/Service Switch
Operating Temp	22°C to 30°C	22°C to 30°C	22°C to 30°C	22°C to 30°C
Storage Temp	0°C to 40°C	0°C to 40°C	0°C to 40°C	0°C to 40°C
Cooling	Convective	Convective	Convective	Convective
Control Power	Internal	Internal	Internal	Internal
Service Power	24VDC	24VDC	24VDC	24VDC
Compliance	UL1973, UL1642, ISTA 3B, UNDOT38.3, FCC 47 CFR 15B-Class B, IEC 62619, IEC 61000	UL1973, UL1642, ISTA 3B, UNDOT38.3, FCC 47 CFR 15B-Class B, IEC 62619, IEC 61000	UL1973, UL1642, ISTA 3B, UNDOT38.3, FCC 47 CFR 15B-Class B, IEC 62619, IEC 61000	UL1642, ISTA 3B, UNDOT38.3, FCC 47 CFR 15B-Class B, IEC 62619, IEC 61000
Altitude	Up to 2,000m	Up to 2,000m	Up to 2,000m	Up to 2,000m



Vertiv™ HPL Lithium-ion Battery Cabinet

UL9540A tested according to HPL6 design

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