VERTIV.

Vertiv™ Liebert® APM2

10-600kW, 208V and 480V/415V

Technology-driven, efficient, and scalable power solution for mission critical facilities

LIB
Lithium-ion
Batteries

ENERGY STAR

Pre-Approved
HCAI (OSHPD)
SEISMIC

Highlights

The Liebert® APM2 UPS is an online, three-phase (in/out), 208/220V; 480V and 415V UPS, optimized with a flexible high-density design.

Key Benefits

- Vertiv™ Liebert® APM2 is OSHPD (HCAI) OSP-certified, making it pre-approved for seismic compliance in California's most demanding healthcare and critical infrastructure environments
- Higher capacity and more flexible ratings 10-150kVA 208/220V or 20-600kVA 480V/415V
- Maximum efficiency up to 99% ECO mode, 98.8% Dynamic Online mode and 97.5% in Double Conversion mode
- Diverse application scenarios- In-Row, Room and Against-the-wall and for high-density architectures
- Unity power factor delivers more usable power
- Modular and scalable design provides optimal flexibility
- Easy serviceability due to hot swappable power modules, bypass modules, HMI and communication modules and internal battery modules
- Improved battery management with intelligent BMS for VRLA and Lithium-ion internal batteries 10-120kVA
- High-capacity continuous rated battery charger enables quicker charging recovery and flexibility with battery energy storage applications
- Compatible with external VRLA or Lithium-Ion cabinet solutions optimized for modern applications
- Integrated paralleling capability up to 4 units for capacity and redundancy
- Operate up to 50 °C and reduce cooling costs and expand application use
- Intelligent real-time monitoring and controls improve system performance visibility and reaction time

Liebert APM2 is poised to lead in the industry and is designed with latest technological advancements, and innovative features.

Consider the Vertiv™ Liebert® APM2, The next-generation mid-size UPS for mission critical applications.

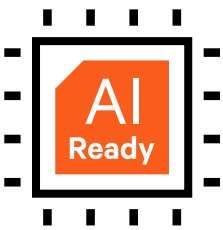
Introducing the innovative Liebert® APM2 Modular UPS, a flexible high-density solution designed for mission-critical applications in small, medium and large data centers, including high performance compute (HPC), or commercial, light industrial, retail telecommunications, and healthcare applications. Derived from the reliable Vertiv™ Liebert® EXM, the next-gen Liebert APM2 builds on its proven track record and widespread usage in thousands of critical power sites.

The Liebert APM2 UPS uses advanced three-level IGBT technology and Silicon Carbide converters to achieve a remarkable 97.5% peak efficiency driving operational cost savings and reducing environmental impact. The modular and scalable construction provides optimized flexibility for capacity growth and is built with system redundancies to mitigate single point of failures.

Vertiv™ Liebert® APM2 10-150kVA, 208/220V

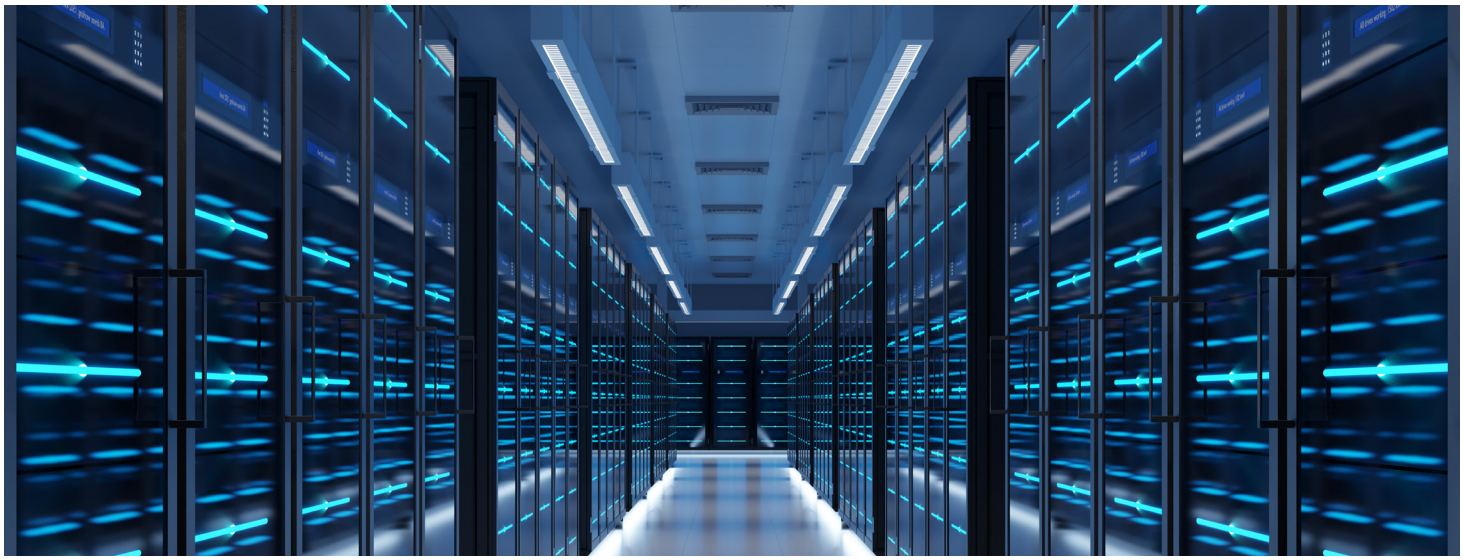
Vertiv™ Liebert® APM2 20-300kVA, 480V/415V

Vertiv™ Liebert® APM2 300-600kVA, 480V/415V



Saves footprint of up to 55%

Vertiv™ Liebert® APM2 provides exceptional performance and reliability for critical power in data centers along with critical infrastructure in commercial and industrial settings.



Vertiv™ Liebert® APM2 UPS is Optimized for a Variety of Critical Power Applications

Banking

- Highly reliable back-up for banks, financial services and Insurance companies including imaging equipment
- IT branches- support server room computers, ATMS and other onsite equipment
- Protect critical processes and customer data in case of an outage

Retail

- Highly reliable back-up for retail stores back offices and ecommerce operations
- Maintain uptime for critical daily business operations
- Protect inventory log data in case of an outage

Healthcare

- Provides maximum equipment uptime to non-life critical medical equipment including imaging equipment
- Provides a wide power capacity range to support small to large site and campus deployments
- Support back up operations and critical data processing

Manufacturing And Light Industrial

- Deliver efficient power to manufacturing equipment
- Reliable back up power for testing environments of manufacturing operations to avoid interruptions and maintain quality
- Reduce downtime and support monitoring systems to maintain processes
- Ideal for room-based applications in electrical rooms of industrial facilities

Flexible And Optimized Design

Seamlessly Integrate Aesthetic Design into Your Infrastructure

- Ideal for In-Row server rack applications requiring front to rear airflow
- Place against the wall with integrated top fan for front to top airflow, limiting the amount of required footprint
- Compact high-density footprint saves significant floor space in all configurations

Designed for Easy Service and Maintenance

Designed for ease of service

Vertiv™ Liebert® APM2 is designed with-front access serviceability which allows easy accessibility and a plug-and-play replacement experience thanks to the enhanced modular features including power modules, bypass, controls internal battery, and HMI that provides an efficient and user-friendly process to minimize downtime and service labor.

Modular and Hot-swappable Design- Optimized Mean Time to Repair <0.5h

Hot-swappable and modular architecture building blocks sub-assembly enables an easy and fast on-site replacement, thus reducing MTTR. It is quick and easy to add, replace, or remove modular components and minimize downtime.

Internal modular battery modules in Liebert® APM2 10-120kVA are also hot-swappable, and easy to expand or replace offered in both VRLA and Lithium-Ion

Easy detection of power modules

Liebert APM2 effortlessly detects the newly added power modules and updates its configuration settings and notifies the status-at-a glance through the LED light bar of the monitoring system.

Flexible Architectures

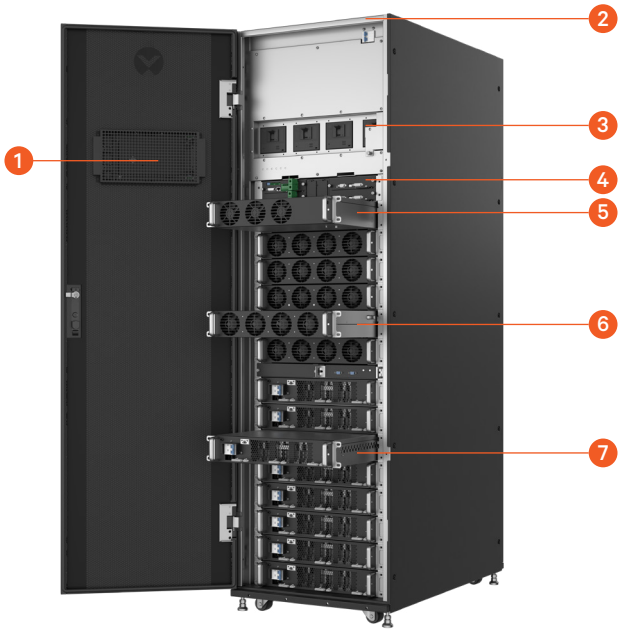
The innovative and flexible architecture of the Vertiv™ Liebert® APM2 reduces cost, improves management, and speed of deployment. The modular architecture of the Liebert® APM2 allows a single unit capacity to be scaled up to a maximum of 600 kW in one single unit and up to 2.4MW solution in parallel. There are three different product architectures available, each with a specific maximum cabinet capacity and feature set.

Vertiv™ Liebert® APM2 10-120 kW

Compatible with Lithium-Ion/VRLA internal modular batteries
External Modular VRLA, Standard VRLA, and Lithium-Ion Battery Cabinets

1. 9”Touch-Screen- GHMI
2. Top Cable Entry
3. Integrated Four Breaker Maintenance Bypass:
   - Rectifier input breaker (RIB)
   - Maintenance-isolation breaker (MIB)
   - Bypass-input breaker (BIB)
   - Maintenance-bypass breaker (MB)
4. Control Module
5. Bypass Module
6. Power Module -2U 30kW
7. Lithium- Ion Battery Module

Modular Lithium-Ion Internal Batteries



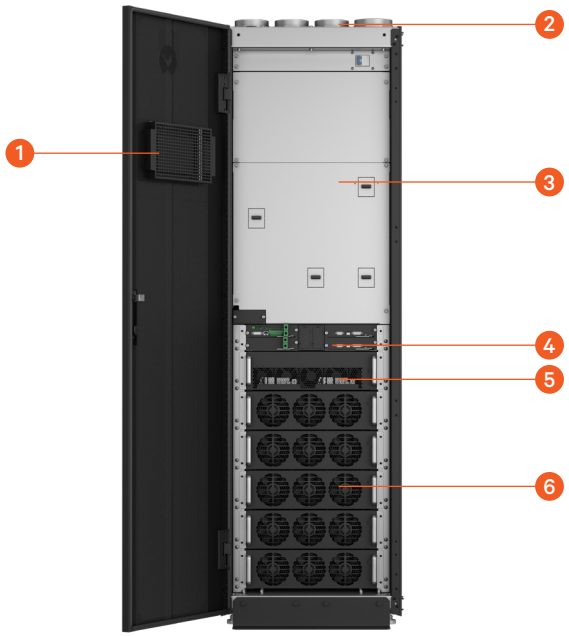
Modular VRLA Internal Batteries

Modular VRLA External Battery Cabinet

Vertiv™ Liebert® APM2 60-300 kW

Compatible with External standard VRLA and Lithium-Ion battery cabinets

1. 9” Touch-Screen - GHMI
2. Top Cable Entry
3. Integrated Four Breaker Maintenance Bypass:
   - Rectifier input breaker (RIB)
   - Maintenance-isolation breaker (MIB)
   - Bypass-input breaker (BIB)
   - Maintenance-bypass breaker (MB)
4. Control Module
5. Bypass Module
6. Power Module- 3U 60kW



Vertiv™ Liebert® APM2 300-600 kW

Compatible with External standard VRLA and Lithium-Ion battery cabinets

1. 9” Touch-Screen - GHMI
2. Top Cable Entry
3. IO Section*
4. Control Module
5. Bypass Module
6. Power Module- 3U 60kW

*IO Section includes Backfeed contactor (standard)

Flexible Configurations - Vertiv™ Liebert® APM2 at-a-glance

Liebert® APM2

Unit Capacity Range	10-120kVA	60-300kVA	300-600kVA
Ratings			
208V/220V	**10-60kVA**	**60-150kVA**	**N/A**
480V/415V	**20-120kVA**	**120-300kVA**	**300-600kVA**
Hot Swappable Power Modules Size			
208V/220V	15kVA (2U)	30kVA(3U)	N/A
480V/415V	30kVA (2U)	60kVA(3U)	60kVA (3U)
Wiring Configurations			
208/220V 4W	10-60kVA	30-150kVA	N/A
480/415 3W/4W	20-120kVA	60-300kVA	60-600kVA
Internal Modular Batteries			
VRLA	Yes	No	No
Lithium-Ion	Yes	No	No
Power Module Redundancy N+1	Yes	Yes	Yes
Paralleling	Yes	Yes	Yes
BMS	Yes (1U)	No-External Battery Cabinet	No-External Battery Cabinet
Internal Maintenance Bypass Breakers	Optional	Optional	No
DC Ground Fault	Optional	Optional	Optional
Backfeed protection	Yes	Yes	Yes
Dimensions (WxDxH) mm	600x1030x2000	600x1030x2000	1200x1030x2000
Ancillaries			
Maintenance Bypass Cabinet (MBC)	Yes	Yes	No
MBC +UPS Width Dimensions (mm)	800mm-1600mm	900mm-1600mm	No
Bypass Distribution Cabinet (BDC)	Optional – distribution (≥250kVA), input (≥100kVA), output transformer (≥150kVA)	BDC (up to 150kVA 480V/208V out)	No
BDC+UPS Width Dimensions(mm)	1200mm	1200mm	No
Dual Input Transformer Cabinet	Yes (208V UPS)	Yes- (≥100kVA 208V UPS)	No
Distribution Cabinet	Yes	Yes (≥250kVA 480V UPS)	No
External Battery Cabinet			
Standard VRLA	Yes	Yes	Yes
Modular VRLA	Yes	No	No
Lithium-Ion	Yes	Yes	Yes

Flexible Configurations and Deployment Options

Adapt and Scale with Ease

The flexible, scalable, redundant design of the Vertiv™ Liebert® APM2 UPS is available in many system configurations to ensure optimal power protection.

Up to 60kW 208V 4W

Up to 120kW 480V/415V 3W/4W

Up to 150kW 208V 4W

Up to 300kW 480V/415V 3W/4W

Up to 600kW 480V/415V 3W/4W

GROW	FROM	TO
Flexible Scalability Paths Meet Your Capacity/ Redundancy Plans	10kW 208V Internal Batteries	60kW 208V Internal Batteries
• Rapid deployment with ease	60kW 208V	150kW 208V
• Provide flexibility to support growing power needs	30kW 480V	120kW 480V
• Eliminate point of failures with power module or unit parallel redundancy.	120kW 480V	300kW 480V
	300kW 480V	600kW 480V

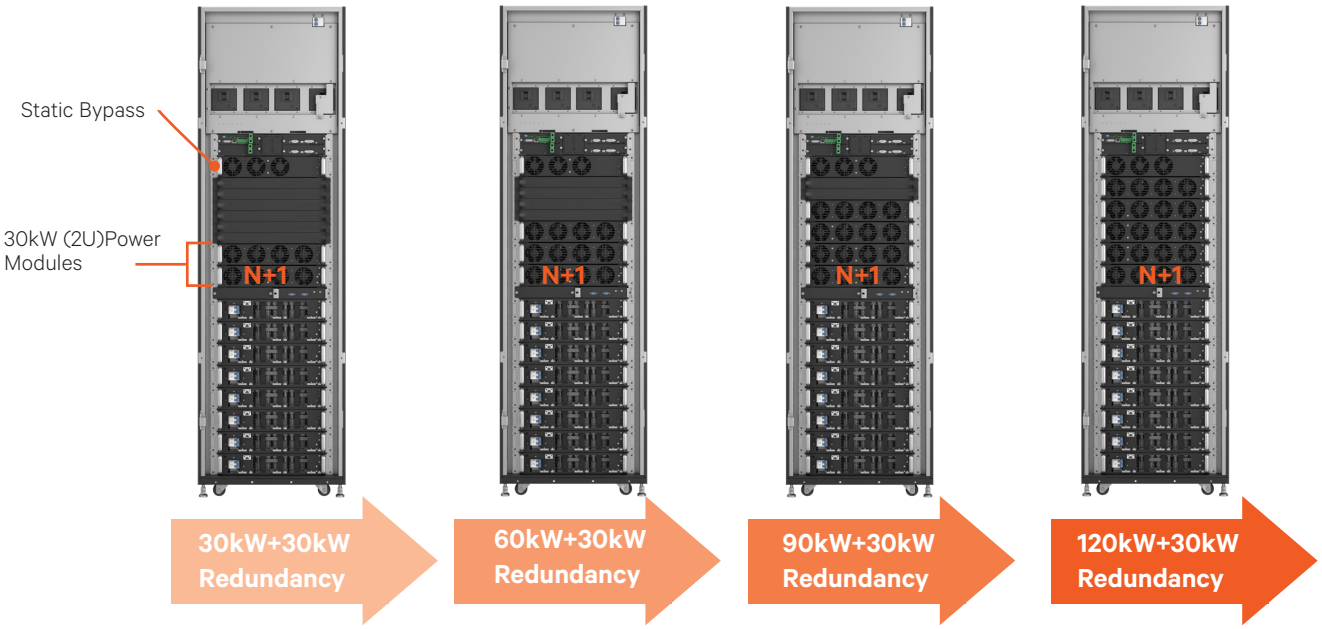
* 400V and 415V 4W are available at 480V ratings

Highly Available Fault Tolerant and Reliable Design

- On-line double conversion design delivers the most reliable power protection and highest levels of uptime
- Advanced modularity features enhances the reliability and availability of UPS systems by mitigating the risk of single-point failures. Multi-module (MMS) parallel configurations provide redundant power protection with enhanced availability.
- Internally redundant component design protects uptime and reduces potential bypass occurences
- Redundancy can be easily combined with power scalability
- Enhanced performances due to high power factor, high density and highest efficiency making it a complete fault tolerant and a resilient design
- Higher short circuit withstand capacity of 65kA
- Designed to seamlessly operate up to 40 °C without any capacity impact and further can sustain high ambient temperatures up to 50 °C with auto-derating
- Increased environmental protection and PCB life expectancy provided by conformal coating
- Increased availability due to high mean time between failure (MTBF) performance
- Easy access to key components and reduced mean time to repair (MTTR < 0.5 hrs.) owing to modular hot swappable design ensuring reduced risk of downtime
- Redundant parallel and LBS communication mitigates system point of failure

Scalabilty and Redundancy

The Vertiv™ Liebert® APM2 modular UPS design allows for quick and easy slide in or out connection for capacity expansion or redundancy for both power and battery thus reduces downtime and costs incurred. The advantage of this feature lies in its ability to enhance cost savings by leveraging existing equipment instead of investing in a new UPS system. Simply purchase a base factory installed capacity to the current required capacity and install more capacity on site within the limits of the product purchased.



The Liebert® APM2 10-120kW N+1 packs an entire UPS system including power, maintenance bypass and battery into a single 600mm wide footprint, which provides atleast 20% more power within its feature set compared to alternative products on the market. This new generation power module is our highest density solution achieving 15kW/2U 208/220V or 30kW/3U 480/415V. Modular battery runtimes can be achieved with 9Ah VRLA internal modular batteries with BMS and can be extended using an external matching modular battery cabinet. The product also includes an optional ultra-high density lithium battery module designed specifically for Liebert APM2.

Similarly, Liebert APM2 is offered at larger configurations including 60-150kW 208/220V with 30kW/3U power modules and up to 120-600kW 480/415V with 60kW/ 3U power modules with a variety of runtimes and energy storage technologies including matching external VRLA or Lithium- Ion cabinet solutions.

Intelligent Paralleling

Increases in capacity and redundancy can be made within the unit through power module expansion and within a parallel system configuration up to 4 units up 2.4MW total system capacity. Integrated and redundant parallel and LBS communication ports provides a user friendly and robust single touch to initiate inverter ON/OFF for all parallel connected UPS systems. The intelligent paralleling controls on Liebert APM2 provide real time controls and operation of the system that manages unit performance to provide peak efficiency operation by actively balancing power module and system capacities based on load variation to achieve greatest operating efficiencies.

Liebert® APM2 Intelligent Paralleling 10-120kVA up to 4 units.

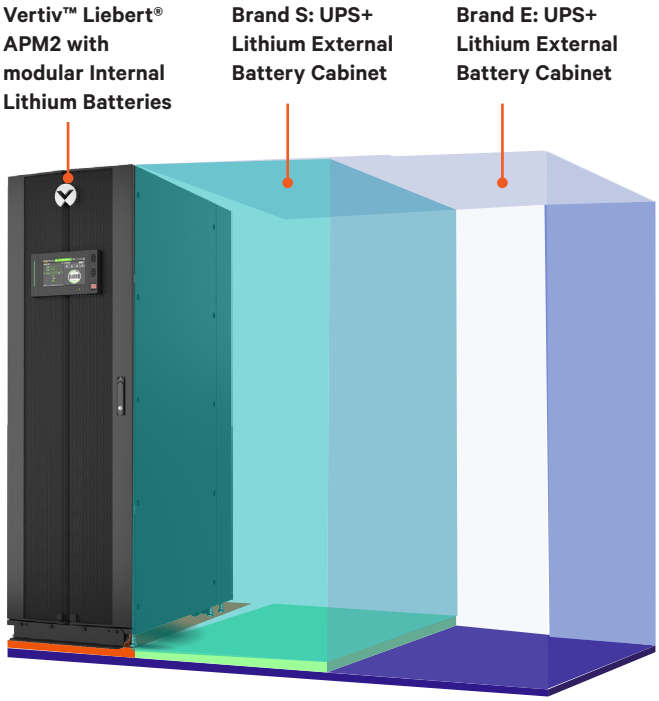
2 units at 30% load each=97.2%;

Compact and Resilient Footprint

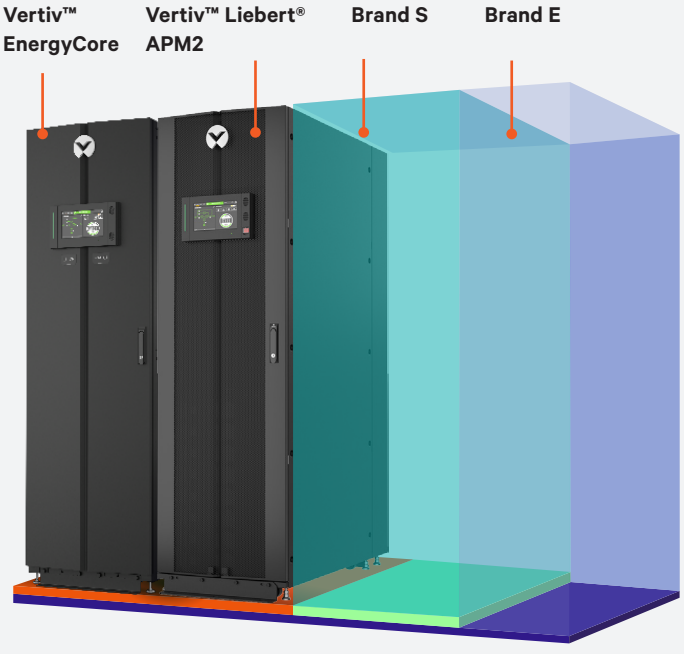
High Power Density

Thanks to the innovative design of the Vertiv™ Liebert® APM2 new generation power module, it's three-level IGBT topology coupled with Silicon carbide (SiC) converters provides the highest power density kvA/kW per U space, up to 100% from prior generation products. Liebert® APM2 is designed with the latest technology components to offer high-density 30kW(2U) and 60kW(3U) power module building blocks to achieve the most optimized power capacity footprint within the power ratings offered. Coupled with advancements in the battery solutions and technologies offered with Liebert APM2, and the internal maintenance bypass feature option, this product provides superior density and space utilization which can be alternatively deployed for other revenue generating equipment.

Saves footprint of up to 30-72%



*Vertiv™ Liebert® APM2 10-120kW with modular internal Lithium-Ion Batteries – **Saves Up to 72% space.***



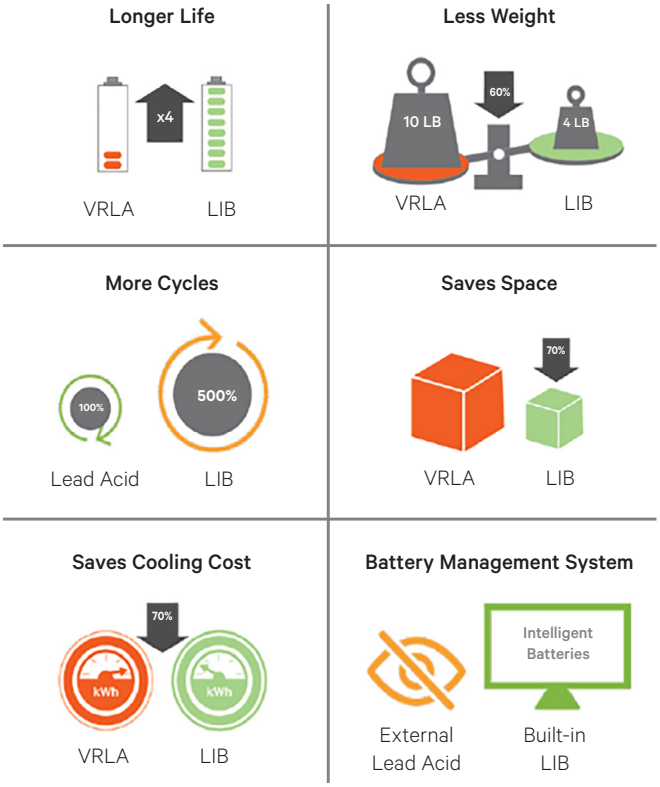
Saves footprint of up to 55%

Vertiv™ Liebert® APM2 is Compatible with Vertiv™ EnergyCore Li-Ion Battery Cabinet

Liebert® APM2 is designed to work efficiently with a variety of battery solutions, including the Vertiv™ EnergyCore battery system. Optimize efficiency and free up space by pairing it with the Vertiv EnergyCore Lithium-Ion battery system that fits your requirements. The Vertiv EnergyCore features a features a high-power density energy storage solution optimized at 250kW+ and arrives fully equipped to streamline deployment. Vertiv EnergyCore is the ultimate 5-minute EOL solution that removes the need for extra cabinets compared to other Lithium solutions in the market.

Lithium-ion battery compatibility

- Considering the benefits lithium-ion batteries provides over traditional battery deployments. Not only do users enjoy the longer life, more cycles and fewer replacements, they also benefit from the compact, smaller size and lower weight. Plus, the higher operating temperature and lower maintenance add to the savings.
- All these advantages directly impact IT facilities to drive and impressive total cost of ownership experience.
- 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.



Internal Modular Lithium-ion battery compatibility

High Energy Density

- **High power:** The 14Ah energy packed modular design utilizes the latest high-density lithium-ion technologies to deliver superior power and life expectancy compared to traditional VRLA solutions.
- More runtime, less space: Delivers up to 10 minutes at 120kVA 480V without the need of an external lithium-ion battery cabinet.

Simple and Easy:

- **Modular design:** plug-in and lock, unlock and pull-out
- **Easy:** Easy and fast installation and startup, self-configuring
- **Hot-swappable:** Easy and fast on-site replacement within few minutes

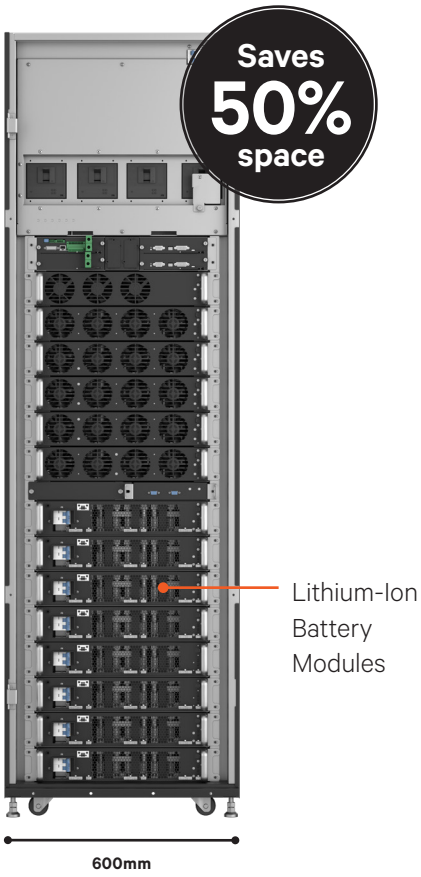
Smart and Flexible

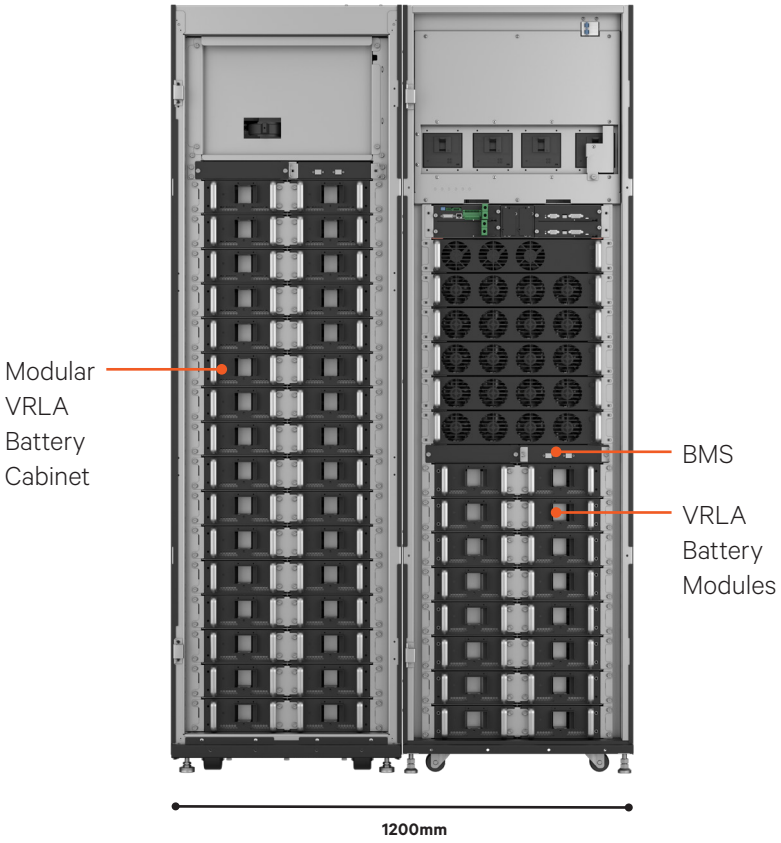
- **Rich battery data and information on display:** All battery cell voltage and temperature. SOC, SOH, Runtime
- **Optimized runtime:** Install between 1 and 8 modules to optimize your runtime/load configuration
- **Pre-charging circuit:** pre-charging the battery with temperature monitoring algorithm

Safety and Availability

- Smart BMS inside each lithium battery module provides enhanced protection for the battery health and optimal operation, performance and safety.
- Isolation between battery strings provides benefits of utilizing available capacity if one string fails.
- **Quick charging:** UPS can charge the battery from 0% to 100% in 1.8h
  [Note: This quick charging time does not include the battery cooling time after high power discharging]

Internal Lithium-Ion Battery Modules offers Superior Energy Density Compared to VRLA





Vertiv™ Liebert® APM2 10-120kW with modular internal Lithium-Ion batteries

Vertiv™ Liebert® APM2 10-120kW with modular internal VRLA batteries and Modular Battery Cabinet

Voltage Ratings	Capacity (kVA/kW)	Lithium-Ion Peak Runtime	VRLA Batteries and Battery Cabinet
208V	60kW	**20 mins**	**19.7 mins**
480V	120kW	**10 mins**	**7.8 mins**

NOTE: Runtimes are given at power factor 1 with 100% load, beginning of life (BoL)

Vertiv™ Liebert® APM2 208V Internal Modular Battery Runtimes (Minutes)

VRLA

208V VRLA

Output Load (kW) Battery Module Quantity	10	15	20	25	30	40	45	50	60	Installed Location
2	2.2									UPS
4	8.0	4.0	2.2							
6	14.7	8.0	5.0	3.4	2.2					
8	21.8	12.7	8.0	5.6	4.0	2.2	1.2			
10	29.1	17.1	11.5	8.0	6.0	3.7	2.9	2.2		
12	37.7	21.8	14.7	10.7	8.0	5.0	4.0	3.0	2.2	
14	44.5	27.0	18.2	13.5	10.1	6.6	5.4	4.5	3.2	
16	53.5	31.7	21.8	16.1	12.7	8.0	6.7	5.6	4.0	
18	61.3	37.7	25.8	18.8	14.7	9.6	8.0	6.9	5.0	UPS &Modular Cabinet 600mm
20	72.3	42.5	29.1	21.3	17.1	11.5	9.5	8.0	6.0	
22	81.3	47.5	33.4	25.1	19.2	13.2	11.1	9.3	7.1	
24	88.6	53.4	37.7	27.9	21.8	14.7	12.7	10.7	8.0	
26	90.0	58.5	41.4	30.4	24.6	16.5	14.1	12.2	9.1	
28		65.2	44.5	34.3	27.0	18.2	15.4	13.5	10.1	
30		72.3	49.1	37.7	29.1	19.7	17.1	14.7	11.5	
32		78.4	53.4	40.7	31.7	21.8	18.5	16.1	12.7	
34		83.9	57.3	43.3	34.9	23.9	19.8	17.5	13.7	
36		88.7	61.3	46.2	37.7	25.8	21.8	18.8	14.7	
38		90.0	67.1	50.0	40.2	27.5	23.7	19.9	15.8	
40			72.3	53.4	42.5	29.1	25.4	21.8	17.1	
42			77.0	56.6	44.5	30.9	27.0	23.5	18.2	
44			81.2	59.4	47.5	33.4	28.4	25.1	19.2	
46			85.1	63.7	50.6	35.6	29.7	26.5	20.2	
48			88.7	68.2	53.4	37.7	31.7	27.9	21.8	

NOTE: Runtimes are given at power factor 1 with 100% load, beginning of life (BoL)

Lithium-Ion

208V Lithium-Ion

Output Load (kW) Battery Module Quantity	10	15	20	25	30	40	45	50	60	Installed Location
1	15.0	10.0	7.2	5.2	3.8					UPS
2	30.0	20.0	15.0	12.0	10.0	7.2	6.0	6.0	3.8	
3	45.0	30.0	22.0	18.0	15.0	11.0	10.0	10.0	7.2	
4	60.0	40.0	30.0	24.0	20.0	15.0	13.0	13.0	10.0	
5	75.0	50.0	36.0	30.0	25.0	18.0	16.0	16.0	12.0	
6	90.0	60.0	45.0	36.0	30.0	22.0	20.0	20.0	15.0	
7	105.0	70.0	51.0	42.0	35.0	26.0	24.0	24.0	17.0	
8	120.0	80.0	60.0	48.0	40.0	30.0	26.0	26.0	20.0	

Vertiv™ Liebert® APM2 480V Internal Modular Battery Runtimes (Minutes)

VRLA

480V VRLA

Output Load (kW) Battery Module Quantity	20	30	40	50	60	80	90	100	120	Installed Location
4	2.4									UPS
8	8.5	4.3	2.4							
12	15.3	8.5	5.3	3.6	2.4					
16	22.9	13.3	8.5	5.9	4.3	2.4	1.5			
20	30.0	17.8	12.1	8.5	6.4	3.8	3.1	2.4		UPS &Modular Cabinet 600mm
24	39.2	22.9	15.3	11.3	8.5	5.3	4.3	3.6	2.4	
28	46.4	28.0	18.9	14.1	10.8	6.9	5.7	4.7	3.4	
32	55.5	33.4	22.9	16.9	13.3	8.5	7.1	5.9	4.3	
36	64.8	39.2	26.9	19.5	15.3	10.0	8.5	7.2	5.3	
40	75.4	43.8	30.0	22.9	17.8	12.1	9.9	8.5	6.4	
44	84.0	49.7	35.0	26.1	19.9	13.8	11.7	9.7	7.4	
48	90.0	55.5	39.2	28.8	22.9	15.3	13.3	11.3	8.5	

NOTE: Runtimes are given at power factor 1 with 100% load, beginning of life (BoL)

Lithium-Ion

480V Lithium-Ion

Output Load (kW) Battery Module Quantity	20	30	40	50	60	80	90	100	120	Installed Location
2	15.0	10.0	7.2	5.2	3.8					UPS
4	30.0	20.0	15.0	12.0	10.0	7.2	6.0	5.2	3.8	
6	45.0	30.0	22.0	18.0	15.0	11.0	10.0	9.0	7.2	
8	60.0	40.0	30.0	24.0	20.0	15.0	13.0	12.0	10.0	

NOTE: Runtimes are given at power factor 1 with 100% load, beginning of life (BoL)

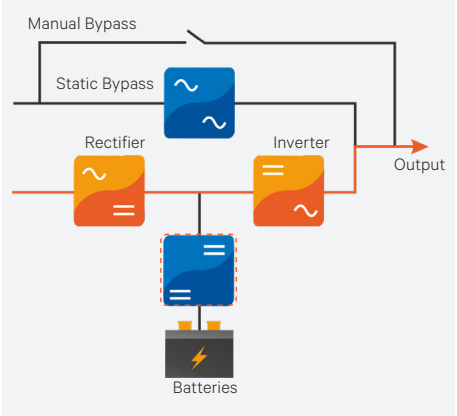
Provides Optimum Performance with Maximum Efficiency

Vertiv™ Liebert® APM2 delivers an **exceptional Double conversion efficiency of up to 97.5%**, which further increases up to 98.8% with the Dynamic online mode, consequently **reducing operating costs and energy dissipation (kW)** to a minimum. Dynamic online mode also supports in parallel operation, this significantly minimizes the consumption of the cooling system, providing an overall TCO reduction and rapid payback time.

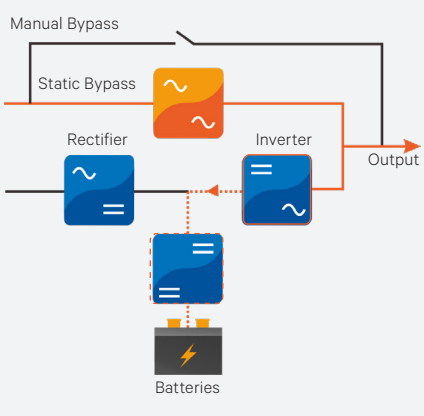
Furthermore, the Liebert® APM2 can optimize efficiency at partial load thereby attaining additional cost savings through the intelligent paralleling feature. The efficiency and electricity cost savings of Liebert APM2 can be attributed to:

- Silicon Carbide technology
- Latest generation IGBT
- Three-level converter topology
- DC-controlled fan speed
- Intelligent paralleling operation
- Advanced digital technology and fast transfer

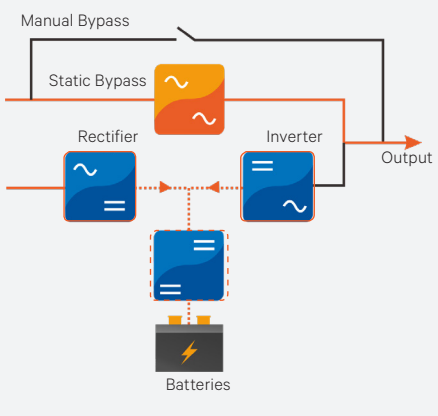
Double Conversion
Maximum Power Control (VFI)
Up to 97.5%



Dynamic Online Mode
High Efficiency &
Power Conditioning (VI)
Up to 98.8%



ECO Mode
Maximum Energy Saving (VFD)
Up to 99%



Vertiv Liebert APM2 series is powered by the latest generation three-level IGBT topology in conjunction with Silicon Carbide (SiC) converter that helps to reduce recovery losses and thereby improves system efficiency.

The seamless activation of Liebert APM2's functioning modes ensures the highest level of efficiency without **compromising power quality and availability**. The Dynamic online mode ensures Class 1* output performance under most stringent conditions:

- Network fault (voltage variation, high/ low impedance mains failures)
- Load fault (short circuit downstream of the UPS)
- Type of load connected (PDU transformer)

The unit discriminates between various interferences and responds rapidly, meanwhile also **ensures compatibility with downstream equipment** (such as Transformers, STS, mechanical loads, etc).

Matching System Ancillary Suite Provides an Optimized UPS Solution

The Vertiv™ Liebert® APM2 UPS includes optional OEM matching ancillary cabinet products to provide the ultimate line-in-match solutions to optimize the overall UPS system, integration, and performance.

External Battery Cabinets (EBC)

The flexible battery configurations of the Liebert® APM2 provides a superior range of optimized energy solutions to meet various applications and user requirements.

Liebert APM2 is compatible with numerous battery configurations including internal modular solutions (VRLA/Lithium-Ion), modular VRLA cabinet (10-120kVA), traditional VRLA external battery cabinets, and premium Lithium-Ion cabinet technologies.

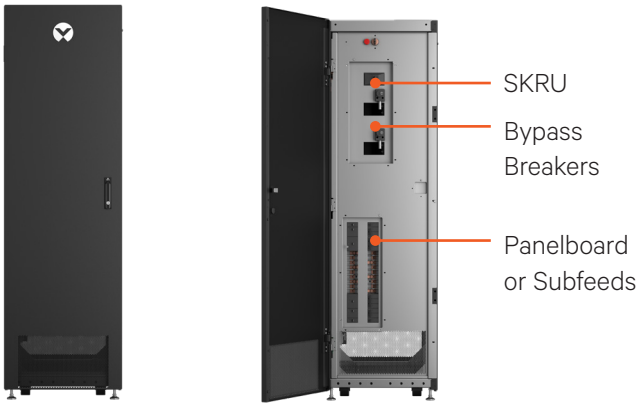
Standard VRLA EBC (600,880,1200mm)

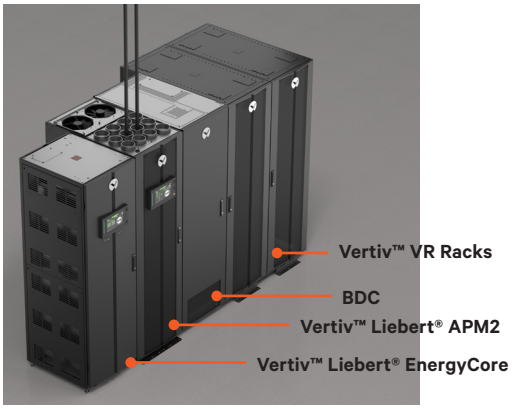
Modular VRLA Battery Cabinet 10-120kVA

Vertiv™ Liebert® EnergyCore – Lithium-Ion

Bypass Distribution Cabinet (BDC)

The Liebert APM2 BDC is one of the most flexible and optimized maintenance bypass solutions on the market. The Liebert APM2 BDC has been further enhanced to include optional input or output transformers, subfeed or panelboard distribution, and a three-breaker bypass with optional solenoid key released unit (SKRU). Configurations include up to 100kVA input or 150kVA output transformers and distribution or up to 250kVA.

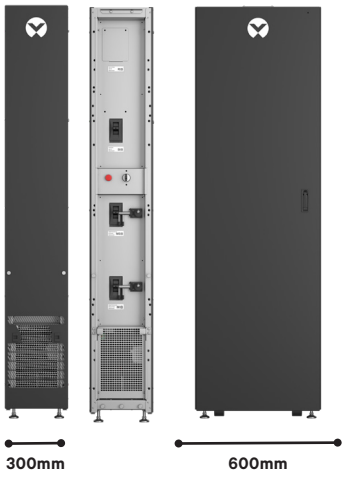




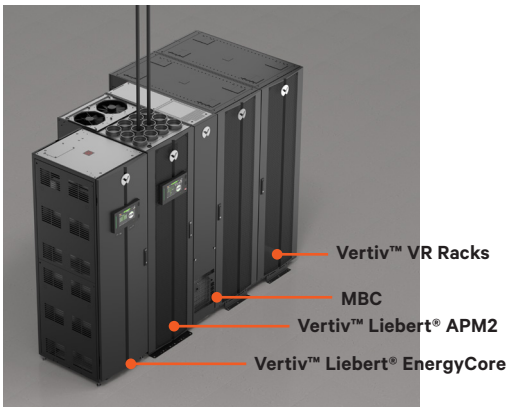
Bypass Distribution Cabinet (600mm W)

Maintenance Bypass Cabinet (MBC)- [Various sizes available]

The Maintenance Bypass Cabinet ancillary provides a factory line-in-match wrap around bypass OEM solution that can be attached to the UPS for close-coupling. The MBC is designed with varying sizes ranging from 200-800mm for Vertiv™ Liebert® APM2 to provide solutions for ratings up to 300kVA and can be configured in Three (3) or Four (4) breaker configurations. The MBC allows for transfer of connected loads to an alternate power path allowing full isolation of the UPS. The UPS can then be turned “OFF” and removed from service with no interruption of power to connected loads.



Maintenance Bypass Cabinet



Powering Critical Cooling Equipment

The Liebert® APM2 provides robust performance features and technologies that enable compatibility to supply power backup for critical liquid cooling equipment including the Vertiv™ Liebert® XDU and Vertiv™ Liebert® XDM liquid cooling products used for liquid cooling of high performance compute (HPC) applications. Liebert APM2, with it’s modular and compact high-density architecture, wide range of capacities and operating voltages, and battery technologies makes this a leading product on the market in this application. Please consult with Vertiv technical support for sizing and equipment verification.

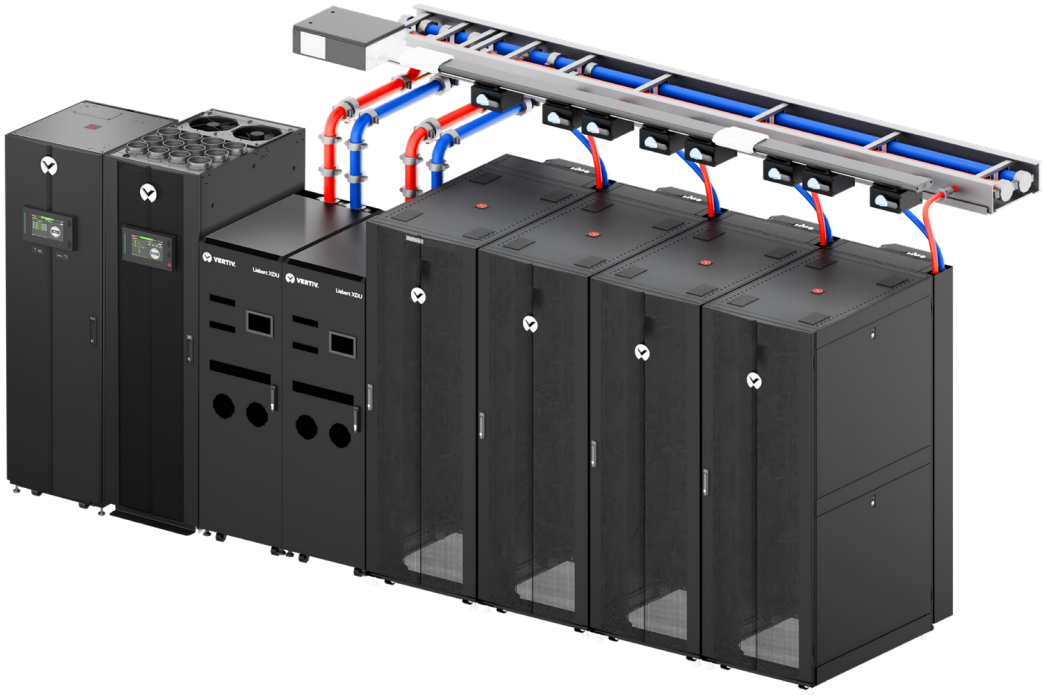
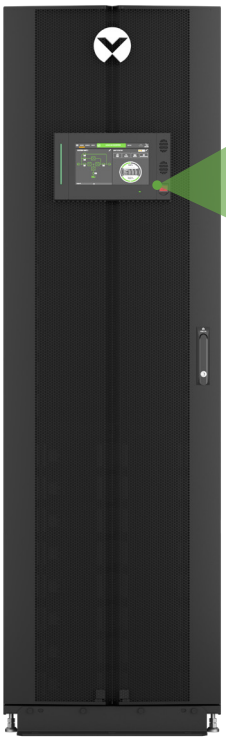
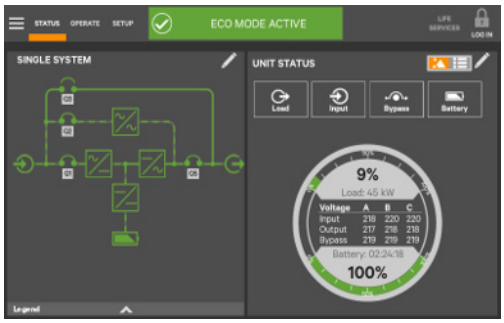


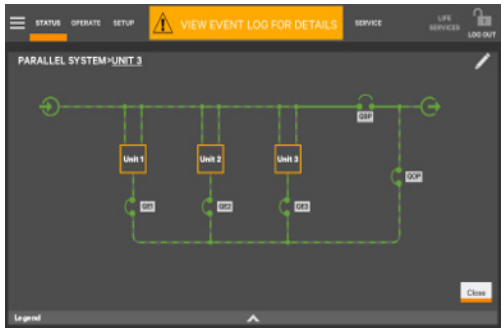
Illustration of liquid cooling high-density compute row

User Interface and Advanced Diagnostic





- **Intuitive** to use
- **Consistent** with other Vertiv touchscreens
- **Customer Configurable data** & views
- **Status-At-A Glance** LED light bar
- **Multiple** screen colors available



Vertiv™ Liebert® APM2 makes your mission critical space a peaceful place through its advanced diagnostic capability, measuring and logging, enhanced event analysis as well as an intelligent colored multi-language touch screen display.

Liebert® APM2 advanced DSP control platform together with the Vector Control technology enables increased performance of the three-level power converters and real-time control of output power quality, guaranteeing continuous operation and premium protection for your business.

65kA Short-circuit Withstand Capacity

The Liebert APM2 product architecture features a robust withstand short circuit protection of 65kA.

Liebert APM2 includes a standard 65kA withstand rating to clear short circuit capacity and provide protection of the SCRs against short circuits or overloads which protects the equipment and the safety of operation during a fault interruption.

KAIC fuses

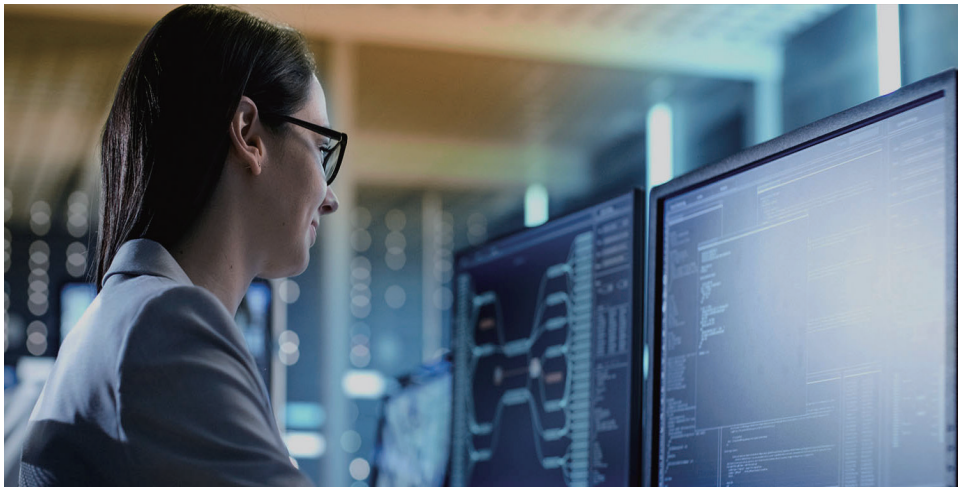
Flexible Monitoring and Management Options

Hardware Connectivity

Vertiv™ Liebert® APM2 allows for the monitoring and control of networked UPS through different protocol options.

The integration of UPS with network management systems, via SNMP protocol, and building management systems, via MODBUS TCP/RTU and BACnet MSTP/IP. As an option, environmental sensors can also be attached to the UPS via a monitoring card.

The integration with synoptic panels via a dry contact board.



Software

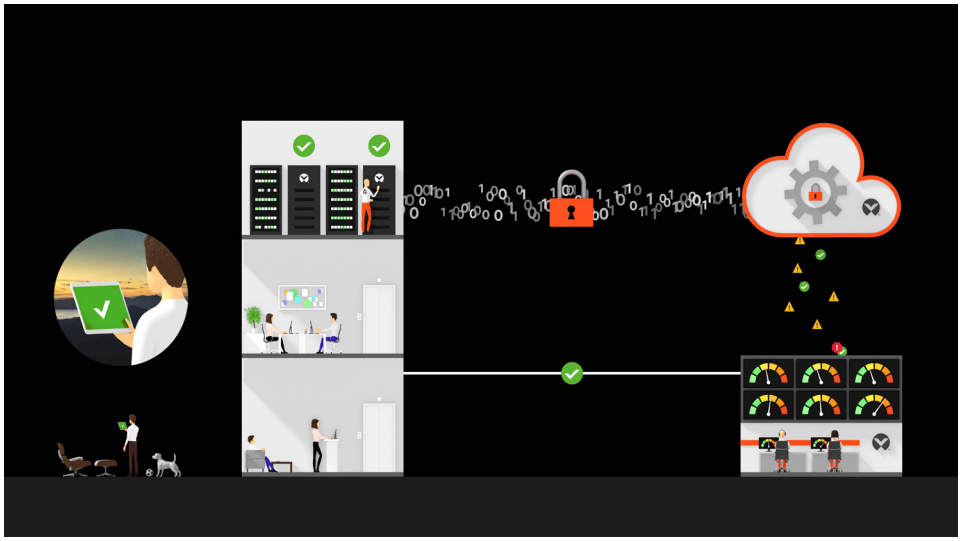
Vertiv connects and protects your network with core-to-edge solutions and unmatched expertise.

For maximum visibility and effective monitoring in one view, pair your Vertiv™ UPS with a software solution.

Vertiv™ Environet™ Alert

Vertiv™ Environet™ Alert provides industrial companies with critical facility monitoring software that is affordable and easy to use. This solution delivers superior monitoring, alerting, trending, and data organization. Get monitoring, alerting, and trending at a price that's right for your business.

Vertiv™ Life™ Services Remote Diagnostic and Preventive Monitoring



Vertiv's service program is designed to ensure that your critical power protection system is maintained in an optimum state of readiness at all times.

Vertiv™ Life™ Services provides continuous insight into critical equipment operation to improve performance, streamline service processes for faster issue resolution, and add deep equipment and service expertise to any organization without overhead.

With Vertiv Life Services you will benefit from:

- Data-Driven Insight
- Real-time Response
- Connected Service
- Reduce downtime
- Maintain optimum performance
- Minimize overhead
- Comprehensive information

Technical Specifications 208/220V

Models (kVA/kW)	Vertiv™ Liebert® APM2 10-60 kW	Vertiv™ Liebert® APM2 60-150 kW
Ratings	10, 15, 20,25,30,40,45,50,60	60,75,80,90,100,120,140,150
Input		
Power Module Capacity	15kW/kVA	30kW/kVA
Nominal input voltage	208/220V (3-phase 3-wire + N + PE)	
Input voltage range without battery discharge*	125-249V	
Nominal input frequency	50/60 Hz	
Input frequency range	40 to 70 Hz	
Input power factor at full load	0.99	
Current THD at full linear load*	< 3%	
Bypass voltage tolerance	Upper limit: +10%,15%,or+20% Vac Default: +15% Vac Lower limit: -10%,-15%,-20%,-30%, or -40% Vac Default: -20% Vac	
Bypass frequency tolerance	±10%	
Battery		
Internal Battery	Modular VRLA or Lithium Ion	External Battery Only
External Battery	VRLA, Lithium	VRLA, Lithium
Battery Bus voltage	192-288v (16~24 jars)	
Voltage temperature compensation	-3.0 mV/°C/Cell (selectable 0 to -5.0 at 25°C)	
Battery charger max. current*	140 A	600 A
Output		
Nominal output voltage	208/220V (3-phase 3-wire + N + PE)	
Nominal output frequency	50/60 Hz	
Output power factor	Unity	
THDv at full linear load	≤ 1%	
Inverter overload capacity*	≤ 105% Continuous; 105% to 125% for 10 min; 125% to 150% for 1 min; >150% for 200 ms	
Double conversion efficiency	Up to 98.4%	Up to 95.7%
ECO mode efficiency	Up to 98%	Up to 98.8%
Dynamic Online	Up to 97%	Up to 97%
Dimensions and Weight		
Frame Dimensions (W x D x H) mm Kg	600 x 1030 x 2000 mm 328 kg (without power module)	600 x 1030 x 2000 mm 332k (without power module)
Power Module (W x D x H) mm Kg	440 x 510 x 87 mm 26..4 kg	440 x 630 x 130 mm 35.5 kg
Battery Module VRLA (W x D x H) mm Battery Module Weight (Kg)	230 x 730 x 87 mm 35.5kg	-
Battery Module Li-Ion (W x D x H) mm	796 x 440 x 87	-
Battery Module Li-Ion Weight (Kg)	36 Kg	-
General		
Noise within 1 m (no fan)	≤ 65 dB	≤ 65 dB
Maximum altitude	<1500 m without derating (compliant with IEC/EN 62040-3 at altitudes exceeding 1500m)	
Operating Temperature	32°F to 122°F (0°C to 50°C)*C with automatic derating >40°C	
Relative Humidity	0% to 95%, non-condensing	
Protection level IEC (60529)	IP20	
General and safety requirements for UPS	UL 1778 5th Edition; CSA 22.2 NO 107.3	
EMC requirements for UPS	IEC 62040-2; FCC Part 15, Class A	
Transportation	ISTA Procedure 3B	

Specifications are subject to change without any further notification.

Technical Specifications 480/415/400V

Models (kVA/kW)	Vertiv™ Liebert® APM2 20-120 kW	Vertiv™ Liebert® APM2 120-300 kW	Vertiv™ Liebert® APM2 300-600 kW
Ratings	20,30,40,50,60,80,90,100,120	120,150,180,200,225,250,300	300,360,400,420,480,500,540,600
Input			
Power Module Capacity	30kW/kVA	60kW/kVA	
Nominal input voltage	380/400/415/480 V (3-phase 3-wire + N + PE); 480V (3-phase 3-wire+PE)		
Input voltage range without battery discharge*	380/400/415V: 228~478V; 480V: 288~528V		
Nominal input frequency	50/60 Hz		
Input frequency range	40 to 70 Hz		
Input power factor at full load	0.99		
Current THD at full linear load*	≤ 3%		
Bypass voltage tolerance	For 380V/400V/415V models, Upper limit selections: +10%, +15%, +20%; default +15%. Lower limit selections: -10%, -15%, -20%, -30%, -40%; default -20%. For 480V models, Upper limit selections: +10%. Lower limit selections: -10%, -15%; default -10%.		
Bypass frequency tolerance	±10%		
Battery			
Internal Battery	Modular VRLA or Lithium-Ion	External Battery Only	
External Battery	VRLA, Lithium Ion, Nickel Zinc	VRLA, Lithium Ion, Nickel Zinc	
Battery Bus voltage	384-528V (32~44 jars)	360-600V (30~50 jars)	
Voltage temperature compensation	-3.0 mV/°C/Cell		
Battery charger max. current*	140 A	600 A	1200 A
Output			
Nominal output voltage	380/400/415/480 V (3-phase 3-wire + N + PE); 480V (3-phase 3-wire+PE)		
Nominal output frequency	50/60 Hz		
Output power factor	Unity		
THDv at full linear load	≤ 1%		
Inverter overload capacity*	≤ 105% Continuous; 105% to 125% for 10 min; 125% to 150% for 1 min; 150% to 200% for 200 ms		
Double conversion efficiency	Up to 97%	Up to 97.5%	
ECO mode efficiency	Up to 99.5%		
Dynamic Online	Up to 98%	Up to 99.2%	
Dimensions and Weight			
UPS Dimensions (W x D x H), mm UPS Weight (kg) (no power modules)	600 x 1030 x 2000 mm 328 kg	600 x 1030 x 2000 mm 332kg	1200 x 1030 x 2000 mm 638.5kg
Power Module Dimensions (W x D x H), mm Power Module Weight (kg)	440 x 518 x 87 mm 26.4 kg	440 x 630 x 130 mm 35.5 kg	
Battery Module VRLA (W x D x H) mm Battery Module Weight (Kg)	230 x 730 x 87 mm 30kg		
Battery Module Li-Ion (W x D x H) mm Battery Module Li-Ion Weight (Kg)	796 x 440 x 87 36 Kg		
General			
Noise within 1 m (no fan)	≤ 65 dB		≤ 70dB
Maximum altitude	<1500 m without derating (compliant with IEC/EN 62040-3 at altitudes exceeding 1500m)		
Operating Temperature	32°F to 122°F (0°C to 50°C)*C with automatic derating >40°C		
Relative Humidity	0% to 95%, non-condensing		
Protection level IEC (60529)	IP20		
General and safety requirements for UPS	UL 1778 5th Edition; CSA 22.2 NO 107.3		
EMC requirements for UPS	IEC 62040-2; FCC Part 15, Class A		
Transportation	ISTA Procedure 3B		

Specifications are subject to change without any further notification.

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