



Vertiv™ Liebert®

APM

18 to 600kW

The Versatile and Modular
UPS Fit for Row and Room
Applications



Vertiv™ Liebert® APM : 18 to 600 kW

The Vertiv™ Liebert® APM is a versatile and modular, transformer-free UPS designed to operate with a maximum energy efficiency of up to 96.5% for the protection of medium to large-sized business-critical applications. Its modular and scalable configuration may house both power and battery modules inside the same UPS cabinet, or simply include power modules depending on the UPS rating. This guarantees maximum adaptability to every possible requirement in terms of footprint, power and runtime. Liebert APM's architecture allows for scalability while delivering an ideal balance of high availability, reliability and efficiency. With its high power density it also reduces system footprint in either row or room applications.

The built-in scalability of the Liebert APM also allows for fast, simple increases in system capacity through featured FlexPower technology™. Each power module combines scalable power with independent DSP control to auto-regulate operation, thus enhancing overall availability.

The Liebert APM is able to reach a total of 600 kW of active power in a single unit and up to a maximum of 2.4 MW in a complete parallel configuration. At the same time, it delivers an excellent integrated autonomy of up to 30 minutes for a 30 kW configuration and up to five minutes in the 90 kW configuration. For higher ratings, runtime extension is still possible via external battery cabinets.

HIGHLIGHTS

- Remarkable double conversion efficiency - up to 96.5%
- Flat efficiency curve
- High power density
- Fit for row or room applications
- Modular and scalable
- Flexible configuration with 18 kW, 30 kW, and 50 kW power module capacities
- Hot-swappable power modules
- Independent module control system
- Unitary output power factor and symmetrical power factor diagram
- Integrated parallel and load bus synchronization
- Integrated autonomy solutions
- Intelligent parallelling function

**Installed
Capacity Over
4GW
Worldwide**



Modular, Scalable Configuration

The modular architecture of the Liebert® APM allows a single unit capacity to be scaled up to a maximum of 600 kW in one single unit. There are five different models available, each with specific power module and maximum cabinet capacity:

- **Liebert APM 18 kW - 90 kW:**

reaching up to 90 kW in a single server rack cabinet in 18 kW increments and allowing for integrated runtime inside the cabinet

- **Liebert APM 30 kW - 150 kW:**

reaching up to 150 kW in a single server rack cabinet in

30 kW increments and allowing for integrated runtime inside the cabinet

- **Liebert APM 50 kW - 250 kW:**

reaching up to 250 kW with 50 kW power increments in a frame 1.65 times larger than a server rack cabinet, with the ability to extend runtime with dedicated battery cabinets

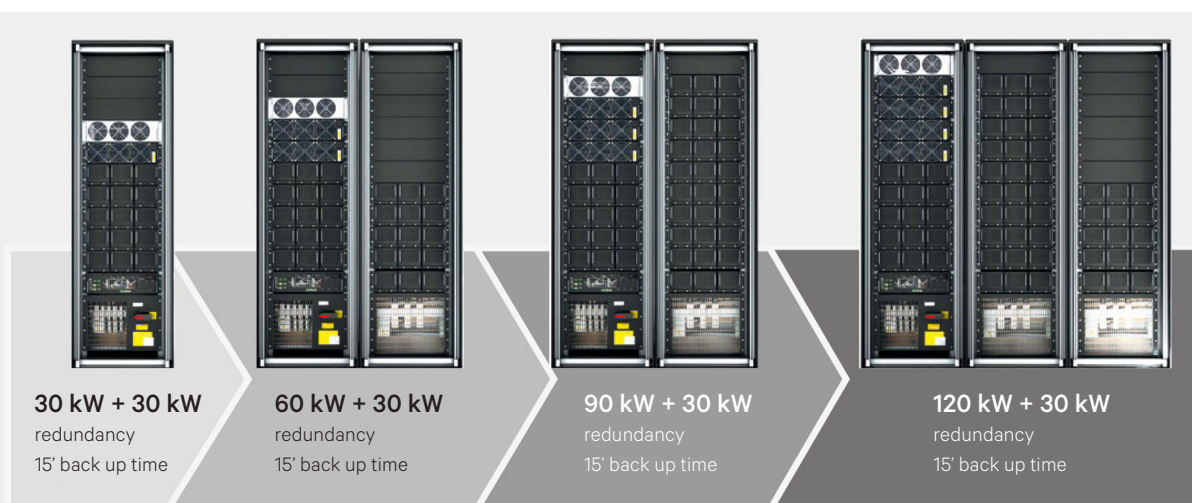
- **Liebert APM 50 kW - 400 kW:**

reaching up to 400 kW with 50kW power increments in a frame about 2.5 times larger than a server rack cabinet, with the ability to extend runtime with dedicated battery cabinets

- **Liebert APM 50 kW - 600 kW:**

reaching up to 600 kW with 50kW power increments in a frame about 3 times larger than a server rack cabinet, with the ability to extend runtime with dedicated battery cabinets

Increases in capacity and redundancy can be made both vertically and horizontally by adding power modules to an existing UPS cabinet or by connecting complete UPS systems in parallel in order to reach a maximum of 2.4 MW of active power.



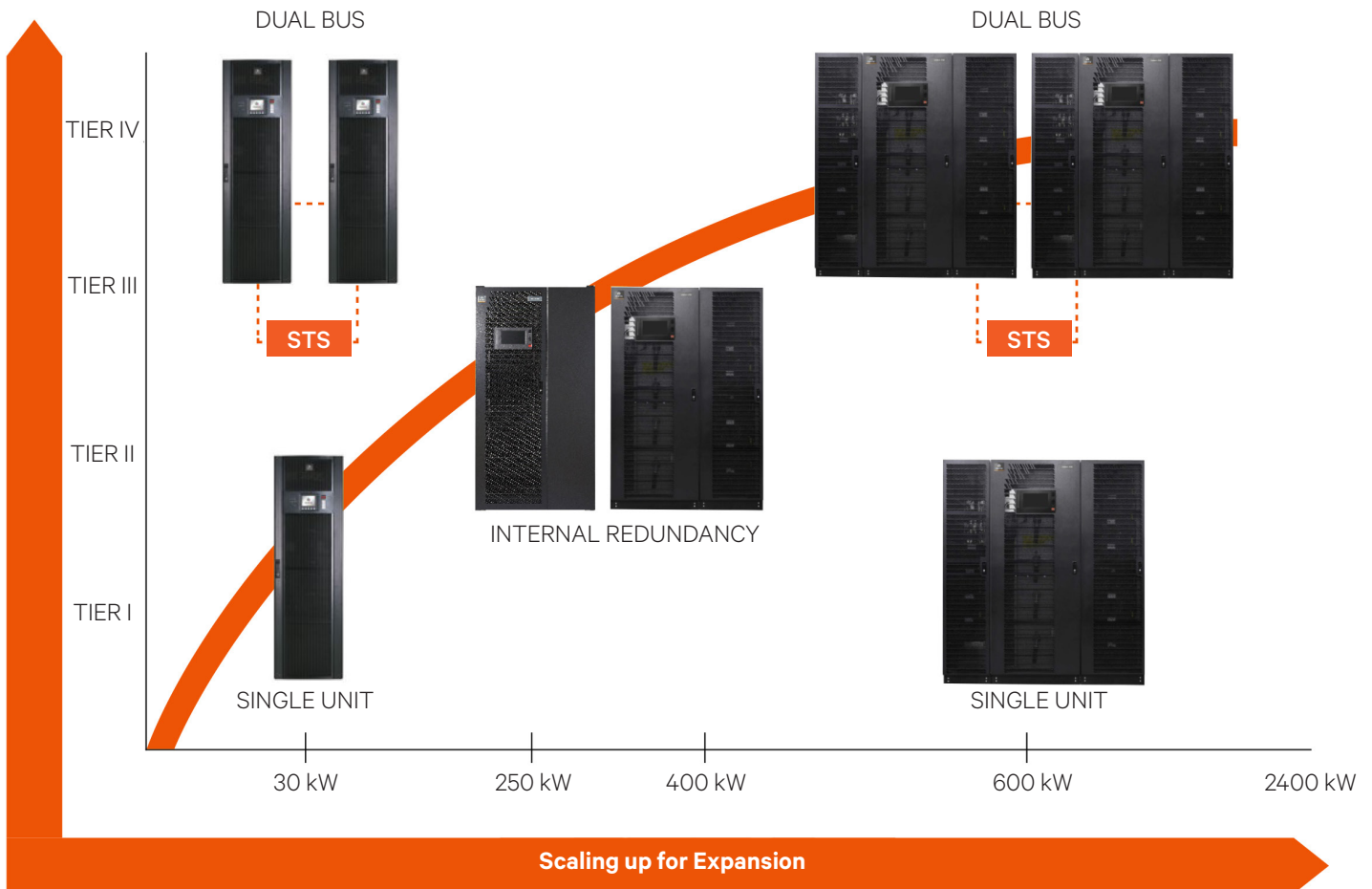
Vertiv™ Liebert® APM | 18 to 600 kW

Parallel and Dual Bus Ready¹

Liebert® APM can be connected with up to two or four units in parallel depending on the configuration.

A single unit can be set up to work in parallel through the use of a communication cable set, allowing the system to be customized for the required configuration.

Additionally, Liebert APM allows easy deployment of Tier 4 architecture through its integrated dual bus control.



FLEXIBLE BATTERY CONFIGURATION

The flexible battery configuration of the Liebert APM is designed to meet individual installation availability and back up time requirements.

Liebert APM is compatible with numerous battery configurations including internal² and external modular solutions, as well as traditional external battery banks with string lengths varies between 30 and 44 batteries.

In a parallel system batteries can be installed in a common bank to maximize cost effectiveness and minimize floor space. Alternatively, a single battery bank can be dedicated to each UPS, delivering full redundancy and avoiding the possibility of a single point of failure.

Extended battery life is further ensured through a temperature compensated charging algorithm which prevents battery damage, thus prolonging life span.

READY FOR



Lithium-ion Batteries

1. Liebert APM 90 can be paralleled up to 2 units
2. Valid for Liebert APM 90 & 150 kW only

In-house Power Distribution & Management¹

- Unique in its class, the Liebert® APM offers efficient power protection and distribution in single server rack cabinet thereby optimizes space and simplifies the operational management.
- Accommodate up to four distribution modules. Each distribution module contains 18-poles.
- Features hot-pluggable distribution feeder as an optional item. This feature allows easy expansion and phase adjustment without any need of power shutdown.
- For your branch monitoring needs, it incorporates intelligent server power management system which provides real-time monitoring of voltage, current, PF, harmonics, electricity consumption of each outgoing branch and many other related parameters. It also provides provision to set prewarning alarms to defined over and under current limits. This is an option feature.

1. Applicable for 90 & 150kW models only



In the Field

Communication

Liebert APM features a large multilingual touch screen LCD display² giving users access to key operating information including alarm status, configuration, start-up/shutdown, transfer and advanced metering. The micro-processor based display functions independently from the system control and provides access to:

- Real-time meter readings of system currents, voltages, active and reactive power
- Status reports and history files
- System power flow one-line diagram

2. Valid for 250, 400, and 600 Frames

Liebert APM also offers

communication features through Web (HTTP), Modbus and SNMP protocol.

Software Connectivity

Vertiv™ Nform™ network communications system enables customers to leverage the distributed monitoring capabilities of network connected equipment for providing centralized management of distributed systems.

Vertiv SiteScan® is a centralized site monitoring system which ensures maximum visibility and availability of critical operations. SiteScan Web allows users to monitor and control virtually any piece of critical support equipment. Its features include realtime monitoring and control, data analysis, trend reporting, and event management.

Serviceability and Maintainability

The Liebert APM is designed to facilitate effortless installation and simplify service with its easy to remove power modules. The hot-swappable module-based architecture considerably decreases the mean time to repair (MTTR) and facilitates maintenance operations by allowing single modules to be serviced while the remaining modules continue to power the load. All power modules and critical components are easily accessible from the front of the unit.

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.

The Vertiv™ LIFE™ Services remote diagnostic and preventive monitoring service provides early warning of UPS conditions and out of tolerances. This allows effective proactive maintenance, fast incident response and remote troubleshooting, giving customers complete security and peace of mind. With Vertiv LIFE Services you will benefit from:

Uptime Assurance

Constant monitoring of UPS parameters, thus maximizing the system's availability.

First Time Fix Rate

Pro-active monitoring and data measuring ensure that when our customer engineers are dispatched on-site, they arrive prepared for first time resolution.

Proactive Analysis

From Vertiv LIFE Service centers, our experts proactively analyze the data and trends of your equipment, to recommend actions to ensure their best performance.

Minimized Total Cost of Ownership of Your Equipment

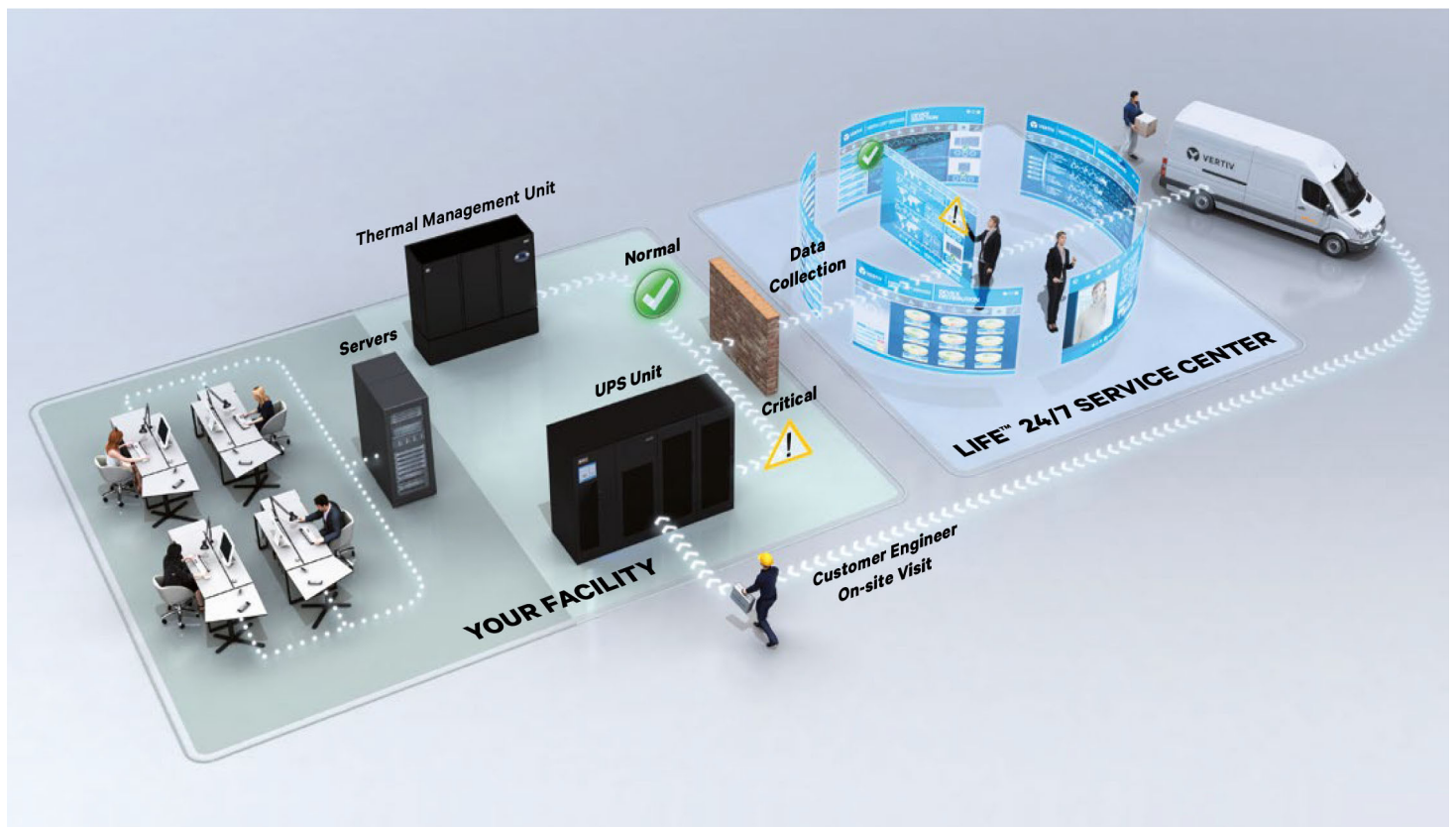
The continuous monitoring of all relevant parameters in turn maximizes unit performance, reduces on-site maintenance and extends the life of your equipment.

Fast Incident Response

Vertiv LIFE Services allow for immediate definition of the best course of action, as a result of the regular communication between your Liebert® APM system and our Vertiv LIFE Service centers.

Reporting

You will receive a comprehensive report detailing the working order of your equipment and its operational performance.



Technical Specifications

Technical Characteristics

Power Module (kW)	18	30	50	50	50
Power (kW)	18 - 90	30 - 150	50 - 250	50 - 400	50 - 600

System Efficiency

AC - AC on-line double conversion efficiency (%)	94%	Up to 96%	Up to 96.5%
AC - AC Eco mode efficiency (%)	>98%		>99%

Input Parameters

Rated input voltage (VAC)	380/400/415 VAC, three-phase four-wire			
Rated operating frequency (Hz)	50/60 Hz			
Input voltage range (VAC)	477 VAC - 305 VAC at full load, 477 VAC - 228 VAC at 70% load			
Input frequency range (Hz)	40 Hz - 70 Hz			
Input power factor	>0.99 at full load, >0.98 at half load		>0.99	
Input THDI (%)	<3%			

DC Parameters

Battery number	30, 32, 34, 36, 38, 40	32, 34, 36, 38, 40, 42, 44
Battery compensation	Yes	
DC ripple current	≤0.05C ₁₀	

Output Parameters

Inverter output voltage (VAC)	380/400/415 VAC, three-phase four-wire			
Inverter output frequency (Hz)	50/60 Hz			
Output frequency stability (Hz)	50Hz/60 Hz ±0.02%			
Voltage stability in steady state	±1%			
Voltage stability in transient state	Complies with IEC/EN 62040-3, class 1			
Inverter overload capacity	1 hour for 110%, 10 mins for 125%, 1 min for 150%, 200 ms for >150%			

THDv

100% linear load (%)	<2	<1	<1
100% non-linear load (%)	<4		<3

Environmental Conditions

Operating temperature range (°C)	0 - 40 °C*			
Storage temperature (°C)	-25 to 70 °C			
Maximum operating altitude	≤1 000 m, when operating at 1000 to 2000m, derated by 1% for every 100m increase of altitude		≤3000 m above sea level	
Relative humidity	≤95%			
Noise (1m)	52 - 62 dBA, adjusted according to load rate and number modules		<70 dBA	
Protection level	IP20			

Standards

Low Voltage Directive	2006/95/EC with the Amendment Directive 93/68/EEC Directive for electromagnetic compatibility 2004/108/EC			
General and safety requirements for UPS used in operator access areas	IEC/EN 62040-1:2008			
Electromagnetic compatibility (EMC) requirements for UPS	IEC/EN 62040-2: Immunity category C2, Emission category C2	IEC/EN 62040-2: Immunity category C3, Emission category C3	IEC/EN 62040-2: Immunity category C3, Emission category C3	

Dimensions and Weight

Dimension ¹ , W x H x D (mm)	600 x 2000 x 1100	1000 x 2000 x 1000	1400 x 2000 x 1000	1800 x 2000 x 1000
Weight (kg) ² - excluding batteries	90 kW: 340	150 kVA: 366	250 kVA: 583	400 kVA: 948 600 kVA: 1250

1. Height of the APM 400 & 600 kVA UPS with top ventilation option is 2100 mm

2. Conditions apply

