



Vertiv Powers Imaging Equipment



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Background

Technology is rapidly transforming healthcare and playing a significant role in improving personal health. Advanced technology has become critical in diagnosing, monitoring, and treating patients. This means that technology is not only helping to save lives, but it is also speeding up recovery for millions.

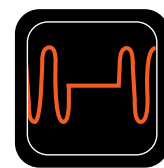
The need for critical equipment and systems to maintain a functioning medical facility has never been more vital. As a result, a new era in healthcare has arrived, placing ever-escalating demands on technology. In addition, IT Systems must collect and maintain medical records, rigorous medical regulations and expectation for round the clock fail-safe operations.

Advancements have left providers more dependent than ever on electronic systems, and an emphasis is now routinely being placed on supporting these systems with proper power quality and power availability.

Owing to the recent advancements in electronics, imaging technologies such as MRI, X-Ray and Ultrasound require accuracy, compact footprint and affordable price. Large portions of the population now have better access to these facilities providing a range of diagnostic technologies resulting in quicker path to treatment.

As a result, imaging equipment has become a critical tool for medical professionals who need 24/7 access, uninterrupted and efficient operations. In the midst of technology advancements, IT and facilities managers must remain focused on economic pressures and sustainability initiatives as well.

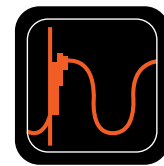
Protection from critical power problems



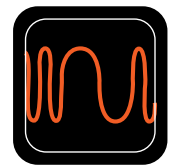
Outages



Sags



Transient



Frequency Deviation



Surges



Spikes



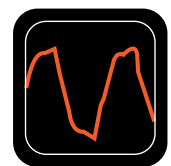
Under Voltage



Over Voltage



Noise



Harmonics

Challenge

What are the possible outcomes if the power is compromised at a health care facility or medical imaging center?

In today's healthcare landscape, increased reliance on technology has emphasized the need for continuous clean power.

Despite major advancements in technology, there continues to be utility power sags, surges and outages which can damage critical computer equipment, medical imaging devices and may be responsible for interrupting medical procedures.

The need to maintain a consistent source of clean and efficient power increases as medical imaging evolves into a digitally oriented environment. The integrity of the data output by the imaging technology is at high risk if they are not well protected from damage or failure caused by power fluctuations or anomalies.

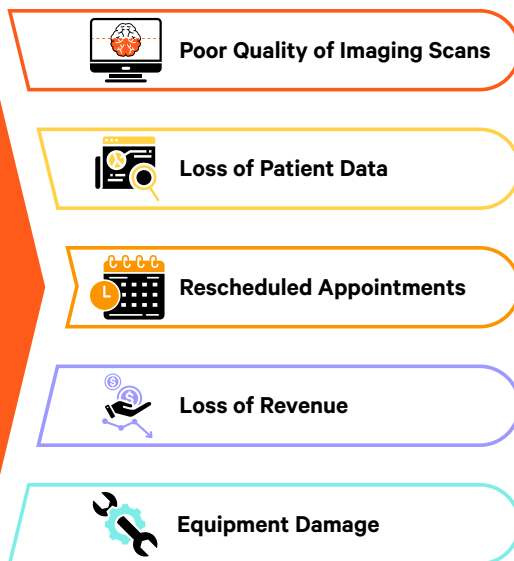
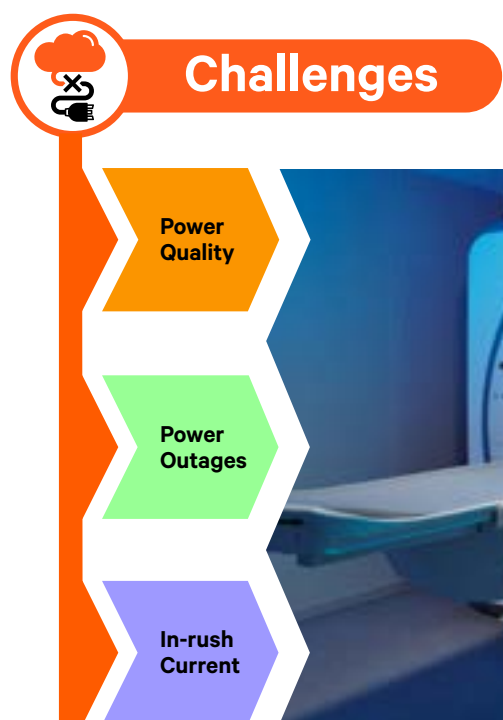
MRI, X-Ray, and other imaging technologies are critical for patient care. Though these procedures do not consume more than few minutes, if there is an electrical outage, it can have a major impact on the operations of these facilities and patient care.

For example, the consequences can be serious if there's a power outage while the radiology team is conducting and creating medical imaging with CT Scanner, MRI or with other technologies. An interruption can cause serious issues if the medical imaging equipment is not shut down properly. Potentially patient data could be lost, which can result in lost revenue for the clinical practice as well as causing inconvenience to the patient. This creates more hassle in terms of rescheduling appointments, travel and wait time which is frustrating and time consuming for everyone involved.

Medical facilities located in areas with the potential of having incimate weather including tornadoes, hurricanes, or severe storms, must prioritize protecting the medical imaging equipment and data it produces.

Since abrupt power disruptions or sags, can damage electronics, it is essential to plan and deploy a robust solution to supply clean power for potential power interruptions and manage the high in-rush current requirements of medical imaging devices.

The role of a high-quality UPS such as the Vertiv™ Liebert® EXM in the hospital infrastructure cannot be overemphasized to ensure reliable performance of imaging infrastructure and provide the best possible patient care.



How Vertiv's Solutions Help Support Healthcare Applications



Solution

Vertiv™ Liebert® has a long history of providing reliable and resilient uninterrupted power supplies (UPS) with the Liebert® family of products. Providing robust protection to sensitive equipment, the Liebert EXM is the right product to protect equipment in the healthcare space. Along with providing clean and consistent power quality, the Liebert EXM can handle high inrush current from imaging devices without affecting scan quality and ensure continuous operation.

In the event of long power outages, generators are effective in sustaining proper systems operations, and are essential to bridge the power time gap between the loss of electrical power until the generator is back online. The Liebert® EXM also provides necessary power conditioning to ensure the highest power quality while the systems are on generator and can provide the necessary power allowing the systems to shut down gracefully while avoiding any loss of data.

Vertiv's solutions support healthcare and medical imaging and diagnostic applications including:

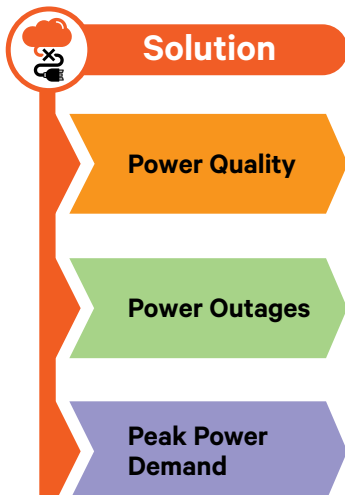
- MRI (Magnetic Resonance Imaging)
- X-Ray equipment
- CT (Computed Tomography), Ultrasound
- IT (Information Technology)
- Computing, Networking
- PET (Positron Emission Tomography),
- PACS (Picture Archive Communication System),
- Mammography,
- Digital Radiography,
- Gamma cameras,
- Laboratories [Forensic, Pathology, Blood Analysis, Bacteriological Analysis, Dental and Ophthalmic labs].

Solution:

Liebert® EXM, 10-250 kVA/kW

Efficient, Scalable, Intelligent Power

- Robust power back up in the event of unexpected power outages
- Help ensure round the clock availability of critical equipment
- Simplified installation, management and maintenance of the medical imaging facility's back up power solution
- Extended UPS service life and battery run time.
- Integrated battery health monitoring to enable proactive management and reduce failure risks
- Maintenance bypass solutions to avoid powering down IT systems
- Flexibility to meet extra capacity/redundancy demands
- Enhanced data insight and visibility with user-friendly, menu-driven monitor panel that supports secure visibility and management
- Remote service diagnostics to proactively identify problems and prevent or enable a quick efficient response.



Clean Power

Vertiv™ Liebert® EXM



Vertiv's power solutions offer high reliability, efficiency, and remote monitoring. Vertiv™ Liebert® EXM 3 Phase on-line double conversion UPS functions efficiently as an essential safeguard against power issues, including voltage spikes, voltage sags, and total outages. The Vertiv™ Liebert® EXM 3-Phase AC Power UPS solution is able to address facility and equipment needs and will recover necessary power for medical devices and imaging for successful results. Implementing this UPS from Vertiv will offer ultimate reliability and performance when your patients need it the most.

Vertiv is actively committed to environmental sustainability by designing critical digital infrastructure to address energy usage and efficiency and to support customers who want to transition to renewable energy sources.



Liebert® EXM

At Vertiv we believe that being mindful of product design, development, use, and disposal are important to the longevity of our industry.

Checkout these environmentally conscious features of the Liebert® EXM:

- Saves cost with up to 99.1% efficiency in ECO Mode compared to average industry standard of 96.5% efficiency
- Up to 96.6% efficiency when using double conversion mode
- Can sustain high ambient temperature up to 40 °C

The Vertiv™ Liebert® EXM UPS is ideal for:

- Small to midsize IT applications
- Edge of the network operations
- Midsize/regional colocation facilities
- Testing, medical and telecom systems
- UL 924 Emergency lighting



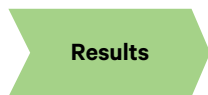
Superior Quality of Imaging Scans

Patient Data Integrity

No Rescheduled Appointments

Maximized Revenue

No Equipment Damage



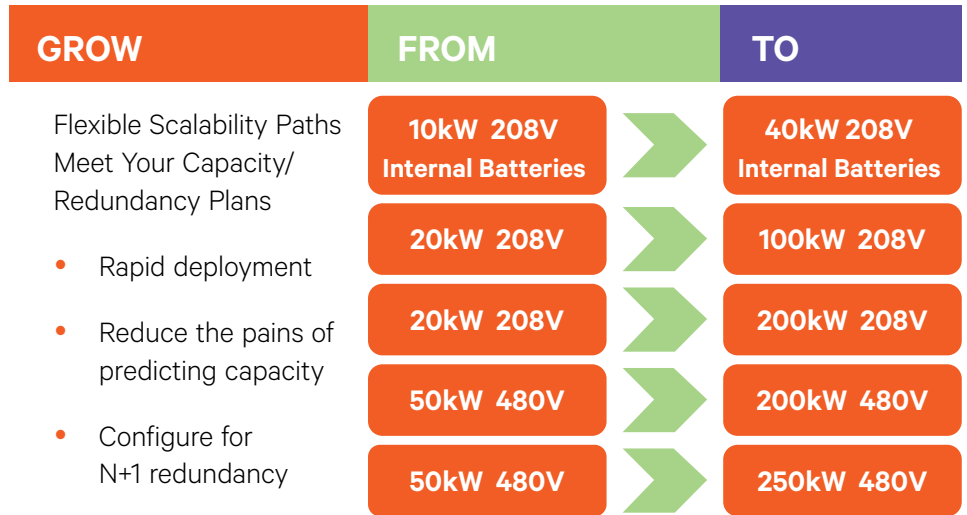
Best Patient Care

Solution: Vertiv™ Liebert® EXM 3-Phase AC UPS

A Midsize UPS As Dynamic As Your Needs

Liebert® EXM 3-Phase AC UPS

- 10-250kVA, 208 & 480 Volt Native
- Unity Power Factor
- Up to 99% Efficient
- Optimized Ancillaries provide Flexible Deployment
- UL 924 Emergency Lighting
- Scalable Functionality
- Full Color Graphic Touchscreen Control Panel
- 480V Models Qualified for Use with Lithium-ion Batteries and Flywheels



Efficient and Economical So You Can Control Your Costs

The Liebert EXM UPS was purposefully designed to provide efficient power protection that can meet your operating and capital requirements.

- Unity Power Factor ensures more power is provided in a smaller footprint, thus increasing system capacity while minimizing cabling and installation costs
- Delivers high efficiency levels throughout the capacity range
- 208 or 480 volt systems
- Transformer-free design saves space, weight and shipping costs
- Superior operating efficiencies are realized through both the Eco-Mode option, which performs at 99% and the Double Conversion Mode, which delivers 97% (480V models)
- ENERGY STAR qualified

Availability Designed In

On-line, double conversion design delivers reliable power and highest levels of uptime.

- Multi-module configurations enhance availability
- Internally redundant design reduces switches to bypass
- Standard 65kA short circuit withstand rating (certain conditions may apply)
- Easy access to key components
- High Mean Time Between Failure (MTBF) performance
- Redundant communication paths ensures reliable control

Capacity, Redundancy, Flexibility

The Liebert EXM UPS provides future-proof scalability along with matching ancillary cabinets to address your power system demands.

- Maintenance bypass cabinet
- Bypass and distribution cabinet
- Battery cabinet (many run time options), Lithium-ion available with 480V models
- Dual input transformer cabinet
- Paralleling cabinet (parallel for higher capacity or redundancy)

Improve Power System Visibility and Intelligence at Diagnostic Facilities

Lack of visibility into the imaging facilities power system's performance can lead to costly mistakes and business productivity loss. Asking staff to manage power protection in addition to day-to-day responsibilities could hinder productivity and produce unintended problems.

How to Solve:

Facilities need power systems that provide instant access to critical operating information. Intelligent, easy-to-use UPS display panels allow both experienced and inexperienced staff to quickly obtain operating status while reducing the likelihood of human error. If the provider lacks resources to manage critical power, the need for a partner who can provide both remote and local onsite support to ensure an accurate and timely response is vital.

Touch-Screen Control Panel Offers Intelligent Control

- Intuitive, easy to use to reduce chances of human error
- Improves productivity by providing information you need
- Power performance parameters visualized
- Service and maintenance support at your fingertips
- Compatible with The Vertiv™ Power Insight



Capacity



Humidity



Temperature



Access



Leaks

Service and Support

Vertiv Services can support the degree of services required to ensure the availability needed for critical systems. Several programs are available to meet the needs of your operation.

Software

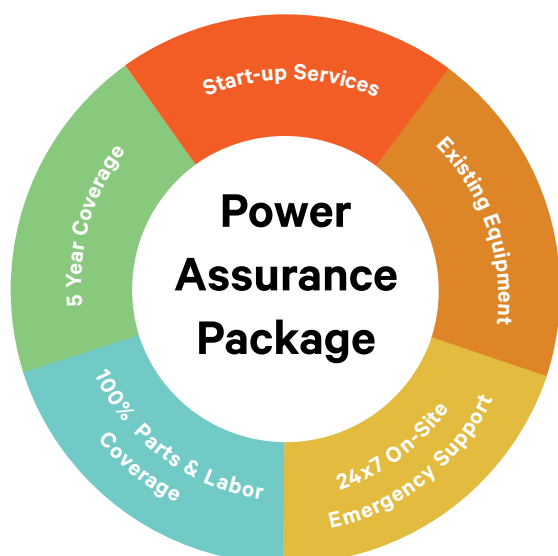
Vertiv connects and protects systems with unmatched expertise. For maximum visibility and effective monitoring in one view, pair your Vertiv™ UPS with a software solution.



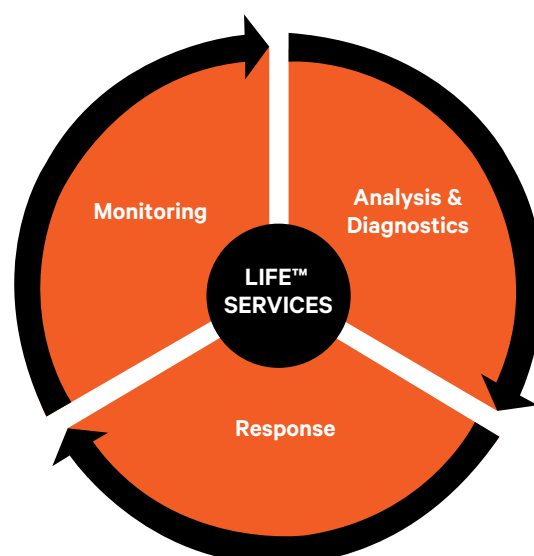
Vertiv™ Power Insight

Vertiv™ Environet™ Alert provides industry companies with critical facility monitoring software that is affordable and easy to use. This solution delivers superior monitoring, alerting, trending and data organization.

Vertiv™ Power Insight is a complimentary web-based software designed for users with a distributed infrastructure that need a way to manage multiple devices.



The Power Assurance Package from Vertiv Services gives you a trusted partner and a complete, worry-free power protection solution to assure uptime at your small or remote IT sites.



Vertiv™ Life™ Services provides secure, remote monitoring by experts to provide early detection and response

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Specifications

		208V Native	208V Native	480V Native	
	Power Rating – kW/kVA	10, 15, 20, 30, 40	60, 80, 100, 120, 140, 160, 180, 200	30, 40, 50, 75, 100, 125, 150, 175, 200, 225, 250	
	Internal Battery Supported	Y	N	N	
Input AC Specifications	Phase/Power Factor/ Freq	3 / 0.99 lagging minimum at full load / 40-70 Hz			
	Input Voltage	208, 220, 480 ¹ , 600 ¹ VAC, 60Hz, 3-phase, 4-wire plus ground			
General Specifications	UPS Technology	On-Line Double Conversion			
Battery Specifications	Battery Test Type/ Battery Technology	Online / Valve-regulated lead acid battery / Lithium-ion (for 480V only)			
Output AC Specifications	Voltage	208/120, 220/127VAC, 60Hz 3-phase, 3- or 4-wire plus ground	480VAC, 60Hz 3-phase, 3-wire plus ground		
	Frequency – Hz	60 Hza			
Communications	Options	3 Liebert IntelliSlots			
	Card Compatibility	IS-UNITY-DP, IS-UNITY-LIFE, IS-485EXI, IS-RELAY			
	Protocols Available	MODBUS-IP, MODBUS-485, BACNET-IP, BACNET-MSTP, SNMP, HTTP, LIFETM Services, Relay Contacts			
Environmental Sensors	Liebert SN Series	Temperature, Humidity, Temperature/Humidity Combination, Contact Closure			
Physical Data UPS	UPS Rating	Unit Weight lb (kg)	Dimensions, W X D X H in (mm)	Unit Weight lb (kg)	Dimensions, W X D X H in (mm)
	10kVA, 15kVA, 20kVA	604 (274)	23.6 x 39.5 x 78.7 (600 x 1000 x 2000)	N/A	N/A
	30kVA, 40kVA	678 (307.5)	23.6 x 39.5 x 78.7 (600 x 1000 x 2000)	748 (339)	23.6 x 39.5 x 78.7 (600 x 1000 x 2000)
	50kVA	678 (307.5)	23.6 x 39.5 x 78.7 (600 x 1000 x 2000)	748 (339)	23.6 x 39.5 x 78.7 (600 x 1000 x 2000)
	60kVA	807 (366)	23.6 x 39.5 x 78.7 (600 x 1000 x 2000)	N/A	N/A
	75kVA	N/A	N/A	842 (382)	23.6 x 39.5 x 78.7 (600 x 1000 x 2000)
	80kVA	881 (399.6)	23.6 x 39.5 x 78.7 (600 x 1000 x 2000)	N/A	N/A
	100kVA	955 (433.1)	23.6 x 39.5 x 78.7 (600 x 1000 x 2000)	842 (382)	23.6 x 39.5 x 78.7 (600 x 1000 x 2000)
	120kVA	1221 (553.8)	34.6 x 39.5 x 78.7 (880 x 1000 x 2000)	N/A	N/A
	125kVA	N/A	N/A	936 (425)	23.6 x 39.5 x 78.7 (600 x 1000 x 2000)
	150kVA	N/A	N/A	936 (425)	23.6 x 39.5 x 78.7 (600 x 1000 x 2000)
	160kVA	1368 (620.5)	34.6 x 39.5 x 78.7 (880 x 1000 x 2000)	N/A	N/A
	175kVA	N/A	N/A	1030 (467)	33.0 x 39.5 x 78.7 (880 x 1000 x 2000)
	180kVA	1442 (654)	34.6 x 39.5 x 78.7 (880 x 1000 x 2000)	N/A	N/A
	200kVA	1516 (687.6)	34.6 x 39.5 x 78.7 (880 x 1000 x 2000)	1030 (467)	23.6 x 39.5 x 78.7 (600 x 1000 x 2000)
	225kVA	N/A	N/A	1030 (467)	33.0 x 39.5 x 78.7 (840 x 1000 x 2000)
	250kVA	N/A	N/A	1244 (564)	33.0 x 39.5 x 78.7 (840 x 1000 x 2000)
Physical Data Ancillaries		Weight lb (kg)	Dimensions, W X D X H in (mm)	Weight lb (kg)	Dimensions, W X D X H in (mm)
	600mm Bypass Distribution Cabinet	550 (250)	23.6 x 39.5 x 78.7 (600 x 1000 x 2000)	N/A	N/A
	300mm Maintenance Bypass Cabinet	288 (131)	7.9 x 39.5 x 78.7 (200 x 1000 x 2000)	288 (131)	11.8 x 39.5 x 78.7 (300 x 1000 x 2000)
	200mm Maintenance Bypass Cabinet	198 (90)	7.9 x 39.5 x 78.7 (200 x 1000 x 2000)	198 (90)	N/A
	1200mm Battery Cabinet	N/A	N/A	4907 (2226) with HX540 batteries	1200mm battery cabinet 47.3 x 39.5 x 78.7 (1200 x 1000 x 2000)
	880mm Battery Cabinet	3649 (1656) with HX540 batteries	34.7 x 39.5 x 78.7 (880 x 1000 x 2000)	2962 (1344) with HX300 batteries	34.7 x 39.5 x 78.7 (880 x 1000 x 2000)
	600mm Battery Cabinet	2454 (1114) with HX330 batteries	23.6 x 39.5 x 78.7 (600 x 1000 x 2000)	N/A	N/A
	320mm Battery Cabinet	1432 (650) with HX205 batteries	12.6 x 39.5 x 78.7 (320 x 1000 x 2000)	N/A	N/A
	Lithium-ion Battery Cabinet (Samsung)	N/A	N/A	1200 (545) with batteries	26 x 24 x 81 (650 x 600 x 2055)
Environmental		Operating Temperature , °F (°C): UPS: 32° to 104°F (0–40°C); Battery: 68° to 86°F (20–30°C). Relative Humidity : 0% to 95%, non-condensing. Operating Altitude : Up to 3,300 ft. (1,000m) without derating. Acoustical Noise, db, at 39 in. : Less than 59 dBA typical, 3.3 ft. (1m) from the unit			
Agency/Certification/Conformance		Listed to UL 1778 , UL 924 and CSA certified. Meets current requirements for safe high performance UPS operation. ENERGY STAR® qualified. Seismic and OSHPD certified.			
Warranty Standard		1 year			



