



VERTIV™

Services to keep your operation running, even when your AC power fails.

A disruption in your critical power system becomes catastrophic if the DC Power doesn't perform the way you expect it to. Vertiv leverages years of experience, along with decades of UPS and battery performance data, to ensure total power system availability while providing the insight into asset health and operating trends required to effectively optimize infrastructure performance.

Maintain the highest availability even in the harshest industrial environments.

The industrial UPS is designed to operate in a rugged, often harsh environment where temperatures are extreme, airborne contaminants are present, and power quality is often very poor. In an industrial plant, an interruption of AC power may cause dangerous chemical process instability or expensive damage to the processing systems. With so much at stake, a holistic [approach including proper maintenance and testing of the entire system including UPS, batteries, chargers, inverters and static switches is required to ensure optimum performance throughout the life of the system.](#)

Renew and Maintain Your Vertiv Single-Phase UPS Population

Power Continuity Services offers flexible and complete lifecycle power renewal options for Liebert® GXT and Liebert® PSI UPS systems. This comprehensive program ranges from customer battery replacement to full-service replacement of battery and UPS with service contracts. This equipment renewal program maximizes uptime and simplifies replacement, driving seamless power continuity.

UPS restoration lets you use your IT resources to install and startup a UPS battery pack shipped from Vertiv

UPS refresh includes a battery pack that is installed and started by our factory-authorized technicians, a wellness check, spent battery removal and disposal, optional two-year service contract, and optional remote services

UPS replacement gives you a new UPS with installation, startup, legacy equipment removal and disposal, an optional five-year protection plan, and optional remote services

| Power Continuity Services | | |
|---------------------------|-----------------------|---|
| Restore | Customer DIY | Battery Only |
| Refresh | Vertiv Service | Battery Change and Wellness Check Option: 2-year Service Contract with LIFE Services |
| Replace | Vertiv Service (Opt.) | UPS and/or External Battery Replacement with opt. 5-Year Power Assurance Package |

POWER CONTINUITY SERVICES

Equipment Upgrades and Replacements



BENEFITS

Partner to Maximize UPS Uptime

When it comes to ensuring power in small or remote IT sites, out of sight is certainly not out of mind, especially with the proliferation of your network edge and its vital role in meeting business and customer demands. Yet, maintaining the health of the uninterruptible power supply (UPS) in each of these locations may require more time or resources than you are able to allocate.

The reality is that continuous power in support of your vital applications remains a top priority even in the face of tightening budgets or limited manpower. That's why having options for deploying, installing, and maintaining UPS units in these critical facilities is essential for meeting business challenges.

With Power Continuity Services, you can choose to restore, refresh or replace your UPS options that meet virtually any budget and come with varying levels of support from Vertiv Services. From a battery kit to UPS replacement with full service protection, you'll have peace of mind knowing we are your UPS management partner focused on maximum uptime.

Benefits

- Assured critical power
- Optimized use of your IT staff
- Simplified small site UPS deployment and maintenance
- Improved and hassle-free power protection



Comprehensive Uptime Options for Your Small Site UPS

Power Continuity Services is a complete line of battery and UPS replacement services for the Liebert® GXT and PSI systems, commonly used at the edge of an IT network in small or remote sites.

With Power Continuity Services from Vertiv, you gain an uptime partner. We offer three levels of services that help ensure continuous power for your vital applications. These options were created to help you maintain your critical power despite budget or resource constraints.

You can choose to restore, refresh, or replace your UPS. From do it yourself (DIY) to Vertiv doing it all for you, our service levels are intended to give you peace of mind through improved and hassle-free power protection delivered by technical experts.

Our Power Continuity Services for Liebert GXT and PSI systems includes:

- UPS restoration
- UPS refresh
- UPS replacement

POWER CONTINUITY SERVICES

RESTORE

Product:
DIY Battery Change

REFRESH

Product + Service:
Battery Change and Wellness Check
Optional 2-Year Service Contract with LIFE Services

REPLACE

Product or Product + Service:
UPS &/or External Battery Cabinet Replacement
with optional 5-Year Power Assurance Package

UPS Restoration

In cases where you have IT resources that are dedicated to maintaining the power in your small or remote IT sites, Vertiv has a DIY option in which we will ship you a UPS battery pack that you install and start up. To ensure optimal lifespan, Vertiv replacement batteries are guaranteed to have a born-on date no older than six months. Along with installation, you will also be responsible for the removal and disposal of your old UPS battery. UPS restoration at the Battery Kit level is an option for any age of Liebert® GXT 3, 4 or PSI system.

UPS Refresh

Our Pro Refresh service level is also for any age of Liebert GXT 3, 4 or PSI, but it eliminates the challenges you face in small or remote IT site management. It is hassle-free because Vertiv does all the work. With the Pro Refresh level, you get the battery pack with installation and checkup by our factory-authorized technicians. We remove spent batteries and ensure disposal and recycling that is in accordance with all government and industry regulations. This includes the management of any regulatory paperwork you may require.

With the Pro Refresh Plus level, you also get a two-year services contract on Liebert GXT 3, 4 or PSI units that are up to six years old. This contract offers 24x7 emergency response with 100 percent coverage of travel, parts, and labor including a failed battery replacement. It also includes LIFE™ Services for continuous monitoring and data analysis by our remote system engineers, giving you additional power protection from our equipment and service experts.

UPS Replacement

Another hassle-free option is full UPS replacement combined with a protection plan, which our New UPS with Power Assurance Package service level offers. Our team will handle the installation and checkup of your new UPS, as well as removal and recycling of your legacy unit. This level also includes an optional five-year protection plan featuring 100 percent parts, labor, and travel coverage; 24x7 emergency response; and on-demand access to reports and service histories via our Customer Service Network portal. LIFE Services is also an option at this level.

Summary

Is battery replacement the best solution for your Liebert GXT 3, 4 or PSI? Just replacing the batteries in your older model UPS may not be the best use of your dollars for ensuring power protection at your small or remote IT sites.

With Power Continuity Services from Vertiv, you have a partner in ensuring small UPS uptime. Our experts work to find the best solution for your needs by guiding you through a comprehensive range of options — from DIY battery replacement to UPS replacement with full service protection.

While you may be equipped to handle battery replacement on your own, having our factory-authorized technicians do the work for you allows you to augment busy IT staff with a team of experts who can literally do the heavy lifting for you, ensuring continuous power for support of your vital business applications.

Ordering Information

To learn more about these services and other Vertiv solutions, visit VertivCo.com or call 1-800-543-2378.

| POWER CONTINUITY SERVICES | | | | | |
|---------------------------|--------------------------------------|--|--|--|---|
| OPTIONS | Battery Kit (BATKIT, VBATT) | Vertiv Battery Install & Wellness Check with Removal | 2-Year Service Contract with LIFE Services | New UPS &/or External Battery Cabinet GXT4/PSI5 | 5-Year Power Assurance Package with Removal |
| RESTORE | Battery Kit | DIY | Any Age GXT3, 4/PSI | | |
| | Pro Refresh | Battery/Vertiv Installation, Wellness Check | | Any Age GXT3, 4/PSI | |
| REFRESH | Pro Refresh Plus | Battery/Vertiv Installation, Wellness Check and 2-Year Contract with LIFE Services | | Available for GXT3, 4/PSI up to 6 Years Old | |
| | New UPS with Power Assurance Package | | | Vertiv Installation & Optional 5-Year Contract Optional LIFE Services | |

Contact Chess Controls at 705 682 2828 for more details

Startup faster and ensure reliable operation

Startup is typically performed on a single piece of equipment prior to initial operation to ensure it will perform its intended function. [Vertiv startup services are performed by factory trained](#) and authorized technicians, following a step-by-step startup procedure to bring the unit up to normal operation. Once the unit has been started up successfully, the Vertiv warranty will be validated. Product registration is recommended to ensure access to product updates and factory change notifications.

Benefits of system startup by factory trained technician

**NEARLY 70% OF
EARLY EQUIPMENT FAILURES
CAN BE TRACED
TO DESIGN, INSTALLATION,
OR STARTUP
DEFICIENCIES.**

- **Visual inspection** detects potential problems indicated by broken, damaged, or stressed components caused during transit or installation
- **Cleaning** of dust or any foreign material from equipment ensures contaminants don't affect component operation
- **Connections check** is completed to verify the tightness of nuts, bolts, screws and connectors
- **Installation check** verifies the system is installed correctly
- **Operational test** ensures that the proper parameters and system configuration are set to support the load or equipment downstream
- **Operational tour** trains you on equipment operation at the time of startup

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Protect power system availability

A regular preventive maintenance program performed by expert technicians is the key to ensuring maximum reliability of data center and industrial plant equipment including batteries, uninterruptible power supply (UPS) units, switchgear, generators and more.

POWER PREVENTIVE MAINTENANCE

Preventive Maintenance



BENEFITS

Protect Power System Availability

Data center downtime is expensive, costing an average facility more than \$740,000 per outage. And the impact of a power system failure is far reaching when considering potential damage to data and equipment, business disruption, remediation costs, legal ramifications, and damage to your brand and reputation. Avoiding these significant costs is a simple matter of prevention.

A regular preventive maintenance program performed by expert technicians is the key to ensuring maximum reliability of data center equipment including batteries, uninterruptible power supply (UPS) units, and power distribution. System issues that are just beginning to appear are detected through systematic inspection. This process allows you to correct these issues before they translate into a costly downtime event.

Benefits

- Maximize power system availability
- Avoid costly unplanned downtime
- Extend the useful life of power system equipment
- Minimize emergency repairs



Utilize a proven approach for dramatically increasing the reliability and availability of your data center's power system

While UPS systems are designed to offer power stability and protection, they are not failure proof.

Factors such as application, installation, design, component manufacturing, real-world operating conditions, and maintenance practices can impact the reliability and performance of these systems.

Fortunately, a program of scheduled preventive maintenance and proactive replacement of key UPS components and batteries can greatly reduce the chances for failure during power outages, utility spikes, switching transients, incidents of line noise, and other unexpected power related issues.

Preventive maintenance performed by highly skilled, factory-trained technicians has been proven to increase the reliability of power systems. One study revealed that the mean time between failures (MTBF) of UPS units that received two preventive maintenance visits a year is 23 times better than a unit having no preventive maintenance. The importance of regular service is clear.

Our power preventive maintenance services include:

- Operational checks
- Component replacement
- Comprehensive report

Operational Checks

During a power preventive maintenance visit, all high-temperature areas within the data center are reported and repaired as to not affect critical component and UPS unit performance.

In addition to inspection maintenance of individual batteries, a complete visual inspection is performed including checks of the following:

- Subassemblies
- Wire Harnesses
- Contacts
- Cables
- Air filters
- Other major components

Inverter and rectifier boards, and all mechanical connections, are also checked for heat discoloration and tightness.

Component Replacement

All power systems contain life-limited components that need to be replaced according to the manufacturer’s specifications. And as the service team for Liebert® equipment, Vertiv™ Services knows your power system best.

Our team replaces any life-limited component that may have failed or shows signs of failure. We replace swelled and leaking power AC and DC capacitors.

Our technicians, who have direct access to engineering specifications from the original equipment manufacturer (OEM), will also install all factory-recommended field change notices as needed.

Comprehensive Report

Reports on all preventive maintenance activities are automatically generated and are easily accessible via a robust, web-based customer portal.

These reports provide peace of mind that all necessary maintenance was performed. They also include recommendations for system improvements from the OEM’s service team, which is specifically trained to optimize the performance of your Liebert power equipment.

Summary

There are many threats lurking in the power system that can take down a data center. To significantly lower your risk and avoid the heavy financial impact of data center downtime, regular inspection and maintenance is needed.

Implementing a comprehensive preventive maintenance program where service is performed by highly experienced and OEM-trained technicians is the key for maximizing power system availability.

Ordering Information

To learn more about this service and other Vertiv solutions, visit VertivCo.com or call 1-800-543-2378.

| | Response Time (Hours) | Preventive Maintenance 24x7 | Preventive Maintenance 8x5 | Emergency |
|-----------|-----------------------|-----------------------------|----------------------------|-----------|
| Preferred | 4 | • | | • |
| Essential | 4 | | • | • |
| Basic | 4 | | | • |
| PM Only | n/a | • | • | |

UPS / POWER

UPS & PCD Service Levels*

| SERVICE PROGRAM | EMERGENCY RESPONSE | COVERAGE | EMERGENCY SERVICE | PREVENTIVE MAINTENANCE | PREVENTIVE MAINTENANCE SCHEDULES |
|-----------------------------------|--|-----------|---|-----------------------------|---|
| **Preferred | Within 4 hours 7 days 24 hours | 150 miles | Parts, Labor & Travel 7 days 24 hours | 7 days 24 hours | Choose 1, 2, 3, or 4 Preventive Maintenance visits per year *Recommended service includes 2 PM visits for 3-phase UPS and 1 PM visit for PCD & single-phase UPS equipment. |
| Essential | Within 4 hours 7 days 24 hours | 150 miles | Parts, Labor & Travel 7 days 24 hours | M thru F 8 a.m. - 5 p.m. | Choose 1, 2, 3, or 4 Preventive Maintenance visits per year *Recommended service includes 2 PM visits for 3-phase UPS and 1 PM visit for PCD & single-phase UPS equipment. |
| Basic 7x24 | Within 4 hours 7 days 24 hours | 150 miles | Parts, Labor & Travel 7 days 24 hours | Not Included | Preventive Maintenance not available with this service level |
| PM Only 7x24 | Not Included | 150 miles | Not included | 7 days 24 hours | Choose 1, 2, 3, or 4 Preventive Maintenance visits per year *Recommended service includes 2 PM visits for 3-phase UPS and 1 PM visit for PCD & single-phase UPS equipment. |
| PM Only 8x5 | Not Included | 150 miles | Not included | M thru F 8 a.m. - 5 p.m. | Choose 1, 2, 3, or 4 Preventive Maintenance visits per year *Recommended service includes 2 PM visits for 3-phase UPS and 1 PM visit for PCD & single-phase UPS equipment. |
| Remote Monitoring | Remote Monitoring, providing remote network alarm management Remote Monitoring contracts cover equipment monitoring 24 hours a day, 365 days a year. This service is sold separately from the above service levels. | | | | |
| Customer Success Management (CSM) | The CSM program provides Vertiv Services resources specifically trained to enhance the value of a customer's account on all critical support services. Vertiv Services will manage preventive, corrective, conforming, diagnostic, and engineering change services at customer facilities through a single point of contact. Vertiv Services will initiate the management of the account by establishing an implementation plan that is customized to the customer's specifications. | | | | |
| Customer Services Network | A secure internet connection to your service information Customer Services Network provides real time information about service and maintenance activities These services are available to customers with preferred or professional services contracts | | | | |

- SEE SCOPE OF WORK FOR DETAILED DESCRIPTION OF SERVICE OFFERINGS BY PRODUCT LINE.
- ABOVE SERVICES ONLY INCLUDE A VISUAL INSPECTION OF THE BATTERIES, UNLESS OTHERWISE NOTED IN THE SCOPE OF WORK.
- FOR FULL SERVICE ON BATTERIES PLEASE REFER TO THE BATTERY SERVICES SECTION.

Contact Chess Controls at 705 682 2828 for more details.

Achieve power system consistency and regulatory compliance with expert battery replacement

Batteries are electrochemical devices that require regular checks to ensure safe and proper operation. As soon as they are placed into service, it is important to maintain batteries with a program that identifies system anomalies and trends end of life. It is this battery performance information, along with the extensive industry experience leveraged by Vertiv™ technicians, that allows you to truly understand battery health and ensure timely, cost-effective replacement. Vertiv can help you evaluate your batteries and determine the most cost-effective solution to extend the life and minimum battery failure.

BENEFITS

Protect Power System Availability

Arguably the weakest links in the power chain, batteries are historically a leading root cause of data center downtime. A single bad cell in a string can put your entire backup power system at risk.

Whether you use vented lead-acid (VLA), valve-regulated lead-acid (VRLA), nickel-cadmium (NiCad), or lithium-ion (Li-ion), adhering to best practices for maintenance and testing is essential for increasing mean time between failures (MTBF). Often, it is also a requirement for maintaining a valid product warranty.

A proper battery maintenance program that identifies system anomalies and trends end-of-life allows you to repair or replace batteries before they fail.

Benefits

- Achieve greater availability and reliability of your UPS system
- Have better insight to battery health
- Experience less unplanned downtime
- Improve battery performance
- Extend the useful service life of your batteries



Maximize service life and eliminate battery-related downtime with regular and comprehensive preventive maintenance

Batteries are one of the least technical components in your UPS, yet one of the most critical. They are electrochemical devices that require regular checks to ensure safe and proper operation.

From the moment they are placed into service, batteries begin to deteriorate due to use and environmental conditions. The best way to ensure high availability is through a comprehensive preventive maintenance program. When this program is executed by a team that performs millions of battery transactions a year, while adhering to all manufacturer and Institute of Electrical and Electronics Engineers (IEEE) standards, you'll maximize service life and minimize downtime.

Our battery preventive maintenance services include:

- Complete visual inspection
- Battery measurement
- Corrective maintenance and replacement
- Comprehensive report

Complete Visual Inspection

During preventive maintenance visits, Vertiv™ works to minimize battery-related UPS failures by performing a complete visual inspection in which our technicians do the following:

- Look for evidence of corrosion
- Check appearance and cleanliness of battery, rack/cabinet, and battery room
- Remove dirt accumulation on the top of jars
- Inspect for cracks, leaks, or bad cells, and check connection torques
- Re-tighten battery connections per manufacturer's specifications (if needed)

Battery Measurement

A variety of critical battery parameters are measured and recorded during preventive maintenance visits. These measurements include:

- Total float voltage and charging current
- Overall AC ripple voltage and current
- Ambient temperature
- Temperatures and float voltage of all individual jars
- Connection resistances
- All internal ohmic readings

Corrective Maintenance & Replacement

Visual inspection can identify the need to have cell connections refurbished. This corrective maintenance will be performed during the regular maintenance visit. Additionally, essential or preferred contract customers may require the replacement of defective lead-acid batteries. When the battery string meets Vertiv's defined conditions, technicians will perform replacement as needed.

Comprehensive Report

Measurement and test results are compiled into a detailed report. This report notes any deficiencies, as well as corrective action needed, taken and/or planned.

Summary

Batteries are one of the least technical components in your UPS, making it easy to overlook their importance in providing backup power. As a result, UPS battery failure is the most common cause of unplanned outages.

From the moment they are placed into service, batteries begin to deteriorate due to use and environmental conditions. The best way to ensure high availability is through a comprehensive preventive maintenance program.

As part of a proactive battery management strategy, preventive maintenance optimizes battery performance and reliability to ensure business continuity.

Ordering Information

To learn more about this service and other Vertiv solutions, visit VertivCo.com or call 1-800-543-2378.

Contact Chess Controls at 705 682 2828 for more details

Plan for full bank capacitor replacement to keep your UPS system running

Uninterruptible power supply (UPS) systems use large capacitor banks to smooth out electrical voltage. They can and do fail unexpectedly. Proactively replacing the capacitors in your UPS can help maximize your system's reliability and avoid downtime. Depending on the age and model of your UPS, Vertiv offers both standard and premium hardened capacitors that can help extend the lifespan of your UPS.

CAPACITOR REPLACEMENT

Equipment Upgrades & Replacements



BENEFITS

Extend the Service Life of Your UPS

Your UPS systems are designed with large capacitor banks made up of both DC electrolytic and AC polymeric film capacitors that degrade over time. They can and do fail unexpectedly. Proactively replacing a full bank of capacitors is strongly recommended.

Knowing how to get the most out of your capacitors and precisely when to replace them requires knowledge of data center infrastructure and your equipment. The factory-trained technicians at Vertiv™ have this knowledge. We work with you to proactively replace your capacitors, helping you achieve a long service life for your UPS and avoid unplanned downtime.

Benefits

- Improve UPS system availability
- Achieve longer mean time between failures (MTBF)
- Minimize unplanned downtime
- Extend battery service life



Plan for full bank capacitor replacement to keep your UPS system running

The expected service life of capacitors varies significantly based on factors including age, operating conditions, and load. Over time, their ability to withstand voltage and pressure changes is diminished, which can lead to premature failure and downtime.

Leveraging historical field data, the industry-leading experts of Vertiv who replace thousands of capacitors each year, will recommend the ideal time to replace the capacitors in your UPS system. This proactive service allows you to get the most out of your capacitors, while extending the life of your UPS system and avoiding downtime.

Our capacitor replacement includes:

- Component inspection
- Installation
- Equipment restart

Component Inspection

Inevitably, the capacitors in your UPS will fail due to several influential factors. Timely replacement is the key to avoiding downtime. Therefore, full bank capacitor replacement performed by Vertiv™ technicians starts with an inspection of critical components to verify age, UPS system performance, and capacitor health. This information can then be compared to our extensive UPS portfolio and serve as a baseline when determining future capacitor replacement.

Installation

Our factory-trained technicians install capacitors that meet the engineering and safety standards of the original equipment manufacturer (OEM). They have extensive experience with Liebert® UPS systems. Having these data center infrastructure experts handle your full bank capacitor installation ensures optimal performance for your peace of mind.

Equipment Restart

Vertiv's capacitor replacement services are not complete until your UPS is operating properly. Our technicians restart your power equipment with the newly installed capacitors to ensure there are no anomalies when supporting your business-critical equipment.

Summary

Proactively replacing a full bank of capacitors is the best way to ensure they don't age to a point of probable failure, causing expensive data center downtime. Yet, knowing just the right time to perform this replacement and ensuring you get the most out of your capacitor investment requires some expertise.

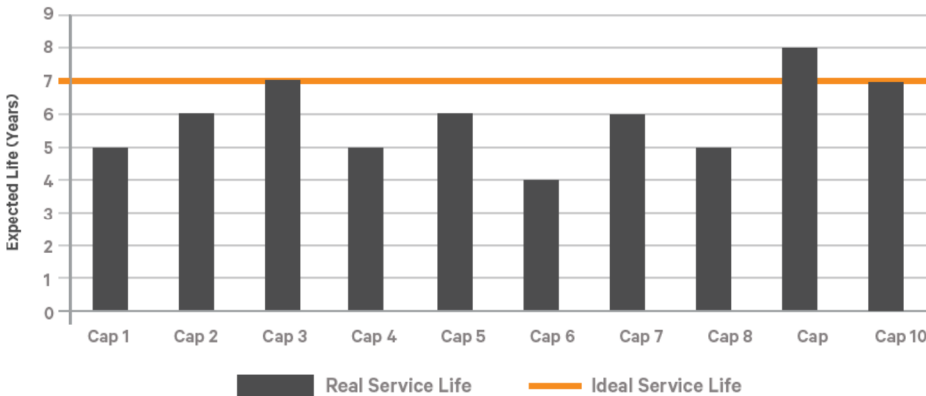
The factory-trained technicians at Vertiv have expertise built from extensive field experience and direct access to OEM tools and resources. We draw on our thorough knowledge of capacitors, UPS units, and data centers to personalize a replacement program for you.

Developing a program based on historical field data is the most reliable approach to predicting ideal replacement time and one that will ultimately help you maximize availability.

Ordering Information

To learn more about this service or other Vertiv solutions, visit VertivCo.com or call 1-800-543-2378.

Capacitor Aging - Ideal vs. Real



Failure rates witnessed in the field when a group of capacitors with the same model number are operated under the same max rated conditions.

Contact Chess Controls at 705 682 2828 for more details.