

# PREMIUM CAPACITOR HARDENING SERVICE

Equipment Upgrades & Replacement



## BENEFITS

### Improve UPS Reliability and Extend Service Life

Uninterruptible power supply (UPS) systems use large capacitor banks to smooth out electrical voltage. Under normal operating conditions, these capacitors degrade over time, reducing their ability to withstand voltage and pressure changes. Left unchecked, this can lead to capacitor failure that causes increased stress on remaining capacitors and possibly downtime. Maximizing your system's reliability and avoiding downtime can be achieved by proactively replacing the capacitors in your UPS.

Changes to UPS technology, materials, and manufacturing methods have extended the life expectancy of capacitors from approximately seven years to 15 years in newer Liebert® UPS systems. However, in older UPS models, such as the Series 600T/610, the expected service life for capacitors remained unchanged until now. For these older units, Vertiv™ invested in research to engineer a premium capacitor that delivers improved reliability and a capacitor life of approximately 15 years.

#### Benefits

- Improve system reliability
- Extend the life of your UPS and reduce capital expense
- Minimize risk of collateral equipment damage in the event of capacitor failure
- Replace capacitors quickly and easily with no modifications to your existing UPS
- Reduce total cost of ownership



### Maximize the service life of your Liebert Series 600T/610 UPS with the latest in capacitor technology

Capacitors are not static electrical components that operate in a circuit. Over time, their ability to withstand changes in voltage and pressure is diminished. Eventually, capacitor failure can occur. The results are increased stress on other capacitors, unplanned downtime, and in some cases, damage beyond just the failed unit. Knowing how to get the most out of your capacitors and precisely when to replace them requires knowledge of your data center infrastructure and equipment. Vertiv has this knowledge and provides the proactive means to replace your capacitors based on your equipment's age, operating conditions, and when capacitors were last replaced.

Advances in technology extend the life of your capacitor and your Series 600T/610 UPS, improving system reliability. Vertiv offers premium dry film capacitors for the input and output filters that extend life,

run cooler, and eliminate the risk of collateral damage in the event of failure. The new components require no modification to your existing UPS, and have the same form, fit, and function as standard capacitors. With an upgrade to Vertiv's premium capacitors, you can help extend the lifespan of your UPS and avoid costly and unplanned downtime.

Our premium capacitor hardening service for Series 600T/610 UPS units includes:

- Advanced capacitor technology
- Expert consultation
- Installation

### Advanced Capacitor Technology

The dry film technology used in our premium capacitors provides improved performance over standard capacitors. The physical construction delivers many benefits including low internal losses, optimized current rating, and reduced operating temperature.

These capacitors underwent extensive testing to validate designs and predict life expectancy. During testing, the patented technology reduced operating temperature from approximately 54 to 34 degrees Celsius. This reduction, along with design improvements, more than doubled the life of standard capacitors. Extreme conditions were used to force capacitor failures. Because they use an oil-free design, the risk of collateral damage from rupture or leaks was eliminated.

### Expert Consultation

Our data center infrastructure experts will consult with you to discuss the upgrade process, and gain a better understanding of your UPS performance goals and priorities. We will discuss your unique

operating conditions so that you can make an informed decision when choosing between our standard and premium capacitor replacement services. Based on this consultation, we will recommend a strategy that maximizes your return on investment.

### Installation

Our factory-trained technicians install the new capacitors as efficiently as possible to minimize disruption to your data center operations. Faster installation is possible due to lighter capacitors that are designed for drop-in replacement with no modifications to your cabinet. Simplified connections further speed the process.

As the service team for the original equipment manufacturer (OEM), Vertiv™ technicians have specialized training and direct access to engineering information. This ensures they have the knowledge and experience required for a safe, error-free installation. Upon completion, our technicians will review system performance with you. Upon request, we will also dispose of removed capacitors per applicable environmental guidelines.

### Summary

New capacitor technology and designs provide longer life, higher reliability, and improved performance for your UPS systems.

Vertiv's premium capacitors for Liebert® Series 600T/610 UPS units run cooler, with an extended service life. Because they do not rupture in the event of a failure, the risk of collateral damage to the critical bus and other units in a multi-module UPS system is eliminated.

Working with Vertiv to upgrade to premium capacitors will maximize your investment and UPS system reliability.

### Ordering Information

To learn more about this service and other Vertiv solutions, visit [VertivCo.com](http://VertivCo.com) or call 1-800-543-2378.

	STANDARD CAPACITOR	PREMIUM CAPACITOR
<b>Life expectancy</b>	6-7 years	14-18 years
<b>Form, fit, function</b>	Standard	Designed to fit in same space, improve cabinet airflow
<b>Internal material</b>	Oil filled	Dry film
<b>Operating temperature</b>	50+° C	30+° C
<b>Impact to other components within unit</b>	Higher due to higher running temperature	Lower due to lower running temperature
<b>Safety</b>	Potential for collateral damage in the event of rupture	Sectional/non-catastrophic/non-pressurized
<b>Fusing/pressure interrupt</b>	Required due to encapsulated design	Not required due to non-pressurized failure mode
<b>Serviceability</b>	Dual connections for each capacitor	Lighter, less components, fewer connections
<b>Total cost of ownership (TCO)</b>	Lower initial cost, higher TCO over the life of the UPS if multiple replacements are required	Higher initial cost, lower TCO over the life of the UPS due to longer capacitor life
<b>Service interruptions</b>	Potentially more if multiple replacements are required	Fewer, due to longer capacitor life
<b>Ideal UPS age</b>	Less than 8 years to end of service life	8 or more years to end of service life