



Eaton 9390 UPS Equipment Life Extension and Modernization services (ELEM)

For customers with aging 9390s (10+ years old) who want to reset the clock, avoid risk of electronics wear-out, and extend the reliable service life of their UPSs.

9390 UPS's were manufactured from 2004-2019. If properly maintained, 9390s can last 15–20 years with preventive maintenance and proactive replacement of consumable parts. However, like all electronics, UPS electronics have an increasing risk of “wear-out failure” over time as they are susceptible to high heat, dust/dirt collection, and humidity. For customers with aging 9390s (10+ years old) who want to avoid risk of electronics wear out Eaton recommends replacing your UPS or now Eaton offers the 9390 Equipment Life Extension and Modernization services (ELEM). With the ELEM **Eaton installs a new UPS inside your existing UPSs frame with all new and improved electronics** (power modules, power supplies, control boards, interface boards, communications card and terminal blocks). Consumable parts (capacitors, fans, and batteries) are optionally replaced as needed at the same time. The service comes complete with a 1 year factory parts and labor warranty and an entitlement to purchase full-service coverage for a minimum of 10 years after the ELEM installation (reviewed annually for extension). Since the 9390 Equipment Life Extension and Modernization services does not require an electrical contractor, it can save considerably on the overall site refresh costs and be completed quickly in 1 day.

Frequently asked questions

Q: What do UPS electronics do?

A: Power electronics are the heart of a UPS. They perform the conversion of power from AC to DC and then DC back to AC in a double conversion system. These devices contain the high current, high speed semiconductors that are the hottest, hardest-working components of any UPS. Control electronics handle all of the features and functions of the UPS and house the firmware that runs the day to day UPS operation.

Q: Are there any UPS applications that increase stress on UPS electronics?

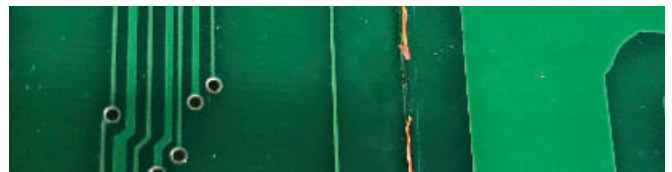
A: Yes. UPSs operating with constant heavy loads, or those that support frequent load fluctuations (large motors, HVAC, medical imaging equipment) can place the UPS electronics under more stress and accelerate the wear of the internal components. UPSs that endure frequent battery discharges add stress, too. And of course, heat is the enemy of any electrical device, so high ambient temperatures can increase the risk of early failure.

Q: What are the UPS electronics that are susceptible to “wear-out failures”?

A: The UPS electronics that are susceptible to “wear-out” failure as the unit ages are power modules, power supplies, control boards, interface boards, communications card and terminal blocks. Consumable parts like capacitors, fans and batteries wear out as well, but are typically proactively replaced on defined schedules.

Q: Can UPS electronics degrade over time under normal use?

A: Yes, while they contain no moving parts, they consist of capacitors, circuit boards, and high power IGBT transistors. These components are susceptible to degradation over time, and can be sensitive to fast-changing humidity, or to airborne chemical contaminants and corrosives. For example, long lasting high temperature/high humidity conditions in a power semiconductor can allow the formation of dendrites, which create a short circuit, and cause device failure. Long term metallic dust buildup on the outside of electrical components can also create the same short circuit condition, with the same resulting failure.



Close-up photo of a circuit trace opening on a 13 year old 9390 printed circuit board. Trace opened due to heat burning off solder mask, typically caused by overcurrent through the trace.

Q: Can you tell if a UPS electronic component is going to fail?

A: Eaton technicians have the tools and techniques to evaluate the condition of these electronics. However, it is extremely difficult to assess the internal condition of an electronic component without full disassembly which is impractical. Cyber Secured Monitoring can further assist the technician in his evaluation of the condition of the electronic component.

Q: What is the benefit of a full UPS electronics replacement?

A: The benefit of UPS electronics replacement for 10+ years old UPSs is to reduce the risk of internal component failure and to extend the reliable service life of the UPS.

Q: What happens when a UPS electronic component fails?

A: Depending on the specific component, failure could result in an immediate transfer of the critical load to utility bypass or to other UPS modules in a parallel redundant system. In a single-module (non-parallel) UPS, a transfer to bypass would leave the critical load unprotected. If a UPS electronics component fails, replacement must be scheduled with an Eaton service technician.

Q: Are UPS electronics covered under a service contract?

A: Yes, UPS electronic parts are replaced under a full parts and labor coverage contract when they fail. Proactive full replacement of UPS electronics is an optional service.

Q: When should I consider replacing my UPS or the electronics inside my UPS?

A: Depending on environmental conditions UPS electronics may begin to show internal component wear after about 10 years. While internal components could be replaced individually, best practices dictate that the assembly be replaced. Even in the absence of an electronics failure, proactive replacement will enhance system reliability and peace of mind.

Eaton technicians use a variety of tools and techniques to evaluate the status of UPS electronics and can use the data gathered during preventive maintenance visits or via the Cyber Secured Monitoring capability to recommend proactive UPS or UPS electronics replacement.

Running a UPS in power efficiency modes like Eaton's Energy Saver System (ESS) will lengthen power component life. When the UPS is in ready-to-serve mode, the modules are subjected to less heat stress.

Additional services included:

- Cleaning of contactors and wiring (replacement as necessary)
- UPS system calibration, functional testing and reporting
- 1-year warranty (7x24, 8 hour response, parts and labor)
- Cyber Secured Monitoring (1-year subscription)
- 10-year minimum entitlement to purchase full-service coverage

Optional services:

- ESS Upgrade to 99% efficiency (as applicable)
- kVA Upgrade for additional capacity
- Full onsite commissioning/load bank testing services

Color key:

- Replaced during ELEM (electronics)
- Optionally replace at same time (consumables)
- Stays (replacement not necessary)

Inside view of 9390 120-160 kVA UPS

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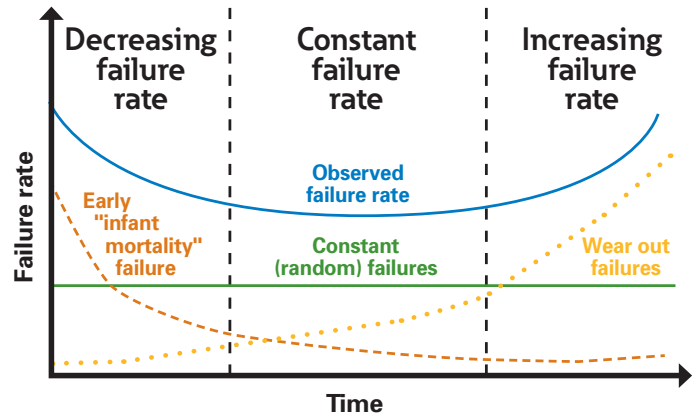


Chart illustrates typical Weibull "bathtub curve" failure rate concept. Shows an increasing risk of "wear-out failure" as a product ages.

Q: Why would you replace electronics vs. a complete UPS replacement?

A: Replacing the electronics inside your existing UPS can save considerable expense and time as the existing UPS system does not have to be removed and a new UPS system does not have to be installed by an electrician with all new conduit and connections. This reduces site planning and permitting time and can be performed quickly in 1 day. Replacing the electronics also allows the user to retain their integrated accessories and battery cabinets.

Q: When should I consider replacing the electronics inside my UPS?

A: As part of its standard preventative maintenance (PM) routine, Eaton recommends an evaluation and consideration of UPS electronics replacement after 10 years of service. It is advantageous to align electronics replacement with capacitor, fan and battery replacements to minimize disruption and cost.

Q: Are there additional benefits of upgrading UPS electronics?

A: Yes. In addition to installing all new components, enhancements that were not available when the 9390 was originally purchased such as energy saver system (ESS) can be added optionally to improve UPS efficiency up to 99%.

Q: How long will Eaton provide full service coverage on the 9390 UPS?

A: Currently in EMEA the end of service life (EOSL) date for the 9390 is January 1, 2026. For customers who invest in the 9390 Equipment Life Extension and Modernization services they are entitled to purchase full-service coverage from Eaton for 10 years after the date of the 9390 ELEM installation. This extends the current 9390 EOSL date for customers who purchase the ELEM services. Furthermore, this new 9390 ELEM EOSL date will be reviewed annually for potential extension.

Q: Can UPS electronics be monitored by my DCIM software?

A: These electronics do not signal an increased risk of failure via an alarm, so a device approaching failure may not trigger alarms that can be monitored using DCIM software.

However, if the temperature or load level increases beyond design limits, an over-temp or overload alarm can be monitored using DCIM software.

To learn more about Eaton's UPS services, visit: Eaton.com/UPSservices

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