



Eaton 93PM UPS Service Life Extension Program

For customers with aging 93PM UPS systems who want to reset the clock, avoid risk of electronics wear-out and extend the reliable service life of their UPSs.

93PM UPSs have been manufactured since 2014 and, if proper preventative maintenance and replacement of consumable parts is performed, can last 15–20 years. However, like all electronics, UPS electronics run the risk of "wear-out failure" over time as they are susceptible to high heat, dust/dirt collection and humidity. For customers with aging 93PMs (10+ years old) who want to avoid electronics "wear out", Eaton recommends either replacing your UPS or joining the 93PM Service Life Extension Program (SLEP).

With the SLEP, **Eaton essentially installs a new UPS inside your existing UPS's frame with all new and improved electronics.** Fans are optionally replaced as needed at the same time. The service includes a one-year parts and labor warranty and the option to purchase full-service coverage for a minimum of 10 years after the SLEP installation (reviewed annually for extension). Since the 93PM SLEP does not require an electrical contractor, it can save considerably on the overall site refresh costs and be completed in one 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 failures as the unit ages are power modules, power supplies, control boards, interface boards, resistor boards and communication service boards. For 93PM UPSs, capacitors are part of the power module assembly and are replaced during the SLEP. Consumable parts like 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 UPSs contain no moving parts, they have capacitors, circuit boards and high-powered IGBT transistors. These components are susceptible to degradation over time and can be sensitive to fast-changing humidity and airborne chemical contaminants and corrosives. For example, long-lasting high temperature/high humidity in a power semiconductor can allow the formation of dendrites, which cause a short circuit and device failure. Long term metallic dust buildup on the outside of electrical components can also create a short circuit, with the same resulting failure.



Close-up photo of an IGBT inside a power module which overheated due to effects of dirt and dust collection overtime.

Q: Can you determine when a UPS electronic component is close to failure?

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. PredictPulse 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.



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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 PredictPulse 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.

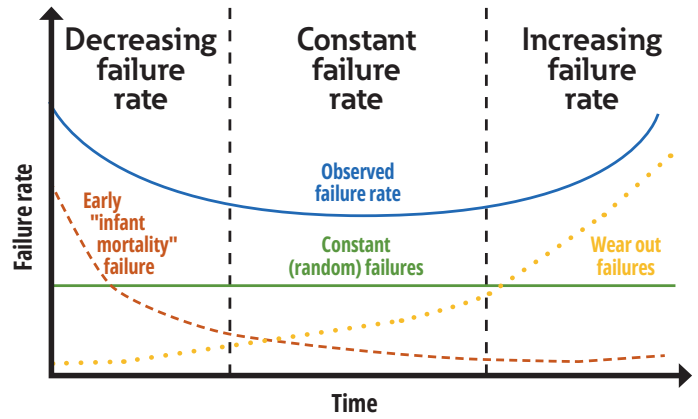
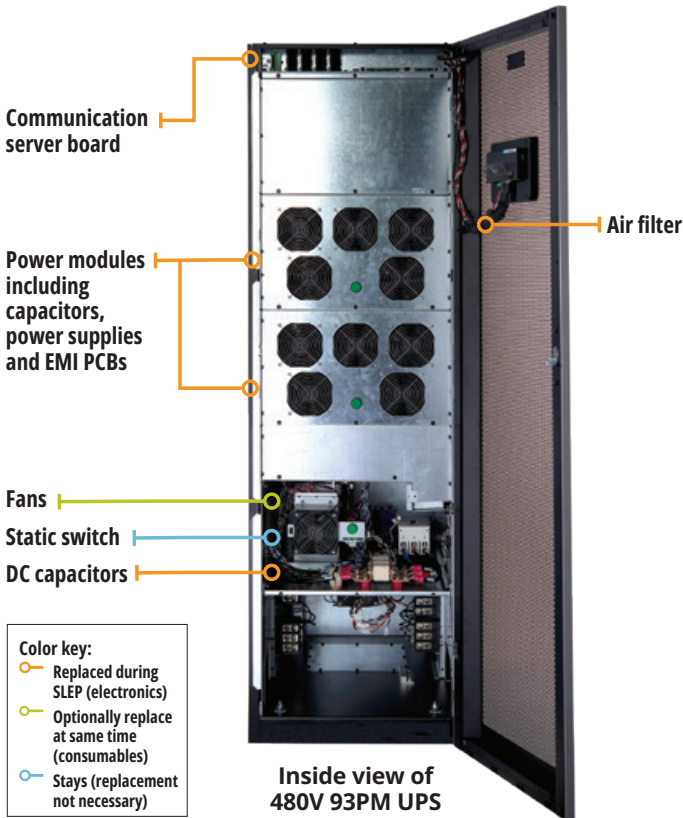


Chart illustrates typical Weibull "bathtub curve" failure rate concept. Shows an increasing risk of "wear-out failure" as a product ages.

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 with the UPS being off-line for only one 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 93PM was originally purchased (such as kVA upgrades) can be added for more capacity or redundancy.

Q: How long will Eaton provide full service coverage on the 93PM UPS?

A: Customers who invest in the 93PM SLEP can purchase full-service coverage from Eaton for 10 years after the date of the SLEP installation — extending the EOSL date. Furthermore, this new 93PM SLEP 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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