

# AC - DC capacitors & Fans should be replaced?

While most all UPS system users are aware of the fact that the batteries they use for backup power wear out, they are not necessarily aware of the fact that these same UPS also utilize large banks of capacitors as well. These capacitors are used in both the DC (electrolytic capacitors) and AC (polymeric film capacitors) sections of the UPS for filtering. These capacitors age and degrade and need to be replaced before they reach failure mode. Equally critical to the safe, long term operation of the system is the planned replacement of installed DC capacitors, AC filter capacitor assemblies and cooling fans.



## DC CAPACITORS:

These are used to "smooth" the DC link battery charging current as it is drawn from the UPS rectifier. With time their effectiveness is reduced (they wear out) and if not replaced they will eventually fail. The maximum life expectancy of DC capacitors is 8 Years.

## AC INPUT/OUTPUT FILTER CAPACITORS:

These are used to filter either the reflected harmonic current of the UPS rectifier back into the input distribution (Input- Filter Capacitors) or to help shape the inverter output so that the wave form is sinusoidal. As with the DC Capacitors, with time their effectiveness is reduced and if not replaced they will eventually fail. The maximum life expectancy of AC filter capacitors is 8 years.

## CAPACITOR FAILURE:

Over time both AC and DC capacitors age, suffering from a deterioration of materials due to usage as well as from ambient conditions such as heat internal to the UPS module. A result is that they become less effective and start to fail. As capacitors fail in a 'capacitor bank', those that remain must work harder and as a result they too start to fail. When the caps fail they typically 'pop' a safety valve and can start to leak oil, in extreme cases they can rupture.

## CONSEQUENCES OF COOLING FAN FAILURES:

Most UPS systems have fan redundancy. If one or more cooling fans fail outside the redundancy level, then over a period of time the UPS (charger and/or inverter) could potentially overheat and cause the load to be transferred to bypass leaving the load unprotected. The maximum life expectancy of the cooling fans is five years. Experience has shown that AC and DC capacitors and Cooling Fans should be replaced, just like batteries before they fail, typically every 5 years, and some cases a little more frequently. Komax has been working with UPS systems for more than 14 years, and has both the experience, and the necessary capacitors, cooling fan and filters you need available when you need it.

