

## Precautions for use

### Introduction

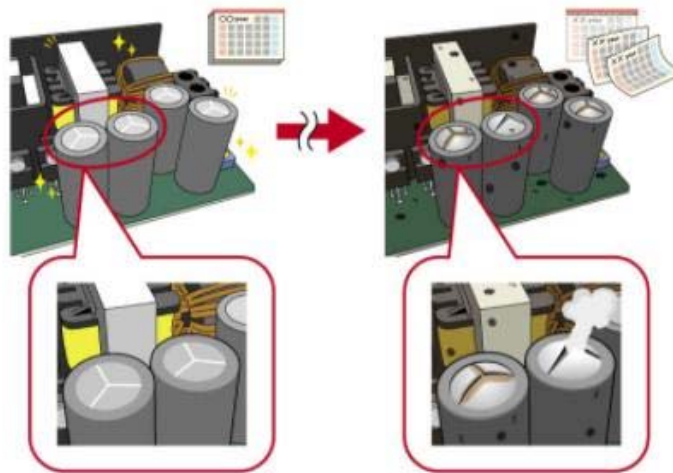
Power supplies convert an AC input to a regulated, isolated DC output or DC outputs through the use of high voltage switching circuits. They are designed, tested to international standards and manufactured to ensure they are safe and provide reliable operation. If the power supply is installed incorrectly, operated above the recommended ratings or exposed to contamination, damage may occur and lead to early failures.

This page details several potential issues and how best to counter them.

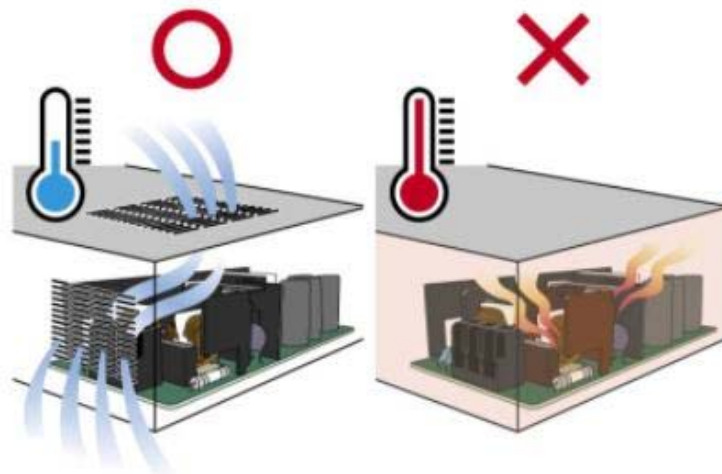
### Excessive heat

High voltage electrolytic capacitors are used to store energy to avoid an output loss during brief interruptions of AC power. Lower voltage capacitors on the DC output help filter ripple voltages and reduce transients that may occur during rapid changes in load.

These capacitors contain small amounts of electrolyte and over time this will gradually evaporate, depending upon its operating temperature. Generally for every 10°C rise in temperature, the capacitor lifetime halves. At the end of its life, internal pressure may cause the capacitor to vent through engineered weak points in the can. As there is very little or no free electrolyte left in the can, the release is typically gaseous and unlikely to cause a short circuit, however it will be hot.



The countermeasure is during the system design, to ensure that there is sufficient distance around the power supply to allow free air to circulate. If a fan is being used to cool the product, the airflow should be directed across the power supply as detailed in the installation manual. Temperature measurements of key components should be performed inside the end system.



Furthermore, inspection of the power supply should be carried out during routine servicing of the end equipment to visually check the condition of the capacitors. Estimated capacitor life data can be found in the reliability reports posted on the website. This can be used to determine if a product needs to be replaced as part of a preventative maintenance program.

### The operating environment

If the power supply is being operated in a dirty environment, ensure that no airborne pollutants, particular those that are conductive, can enter the enclosure. Such particles include metal filings from machining or even particles from equipment that processes bank note payments. In sufficient amounts, the spacing between high voltage traces can be breached, causing sparks and power supply failure.

Similarly moisture during high humidity (or dew) can cause even dust to become conductive.

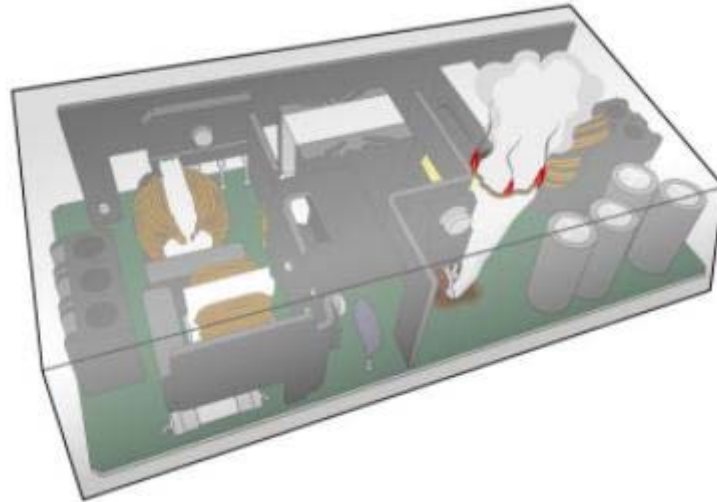
Corrosive gases should be avoided and damage can occur from vehicle or generator exhausts and or even cooling oils vapours.

Countermeasures include replacing system fan filters, specifying power supplies with circuit board protection and internal cleaning with air pressure.

### Placement of flammable materials

If relatively thin paper or plastic combustible materials are placed close to the power supply, these may catch fire during an abnormal condition. Such events are rare, but may include surges from electrical storms.

The countermeasure is to avoid the use of combustible materials, even during system servicing. If a plastic sheet is temporarily placed over the power supply to prevent the technician from receiving an electrical shock, it may cause the power supply to generate excessive internal temperatures. Use flame retardant materials.



### Excessive mechanical stress

Flexing or bending a power supply, particularly an open frame model, can cause stress and failure of surface mount components or printed wiring board traces. A small fracture to a component can worsen over time as natural expansion and contraction occurs. A high voltage ceramic capacitor may burn as a result.

Although our products are subjected to shock and vibration testing during development, resonance inside the end system can cause higher levels of vibration to be present.

As a countermeasure, do not use power supplies that have been mishandled or dropped. Avoid flexing the boards during installation and applying pressure to the components during handling of the product. During system vibration testing, monitor levels on the power supply too.