

Metal-Oxide Varistor Overload and Heating in a Surge Protector

Metal-oxide varistor (mov) technology has come a long way since the 1980's. With improved manufacturing techniques and advances in design, the mov maintains its position as the technology of choice for power surge suppressors. Today's movs combine high energy absorbing capability with low cost to provide the consumer with an extremely economical and reliable method of protection for practically any electrical application.

A mov acts like a switch. Very simply, when the power spikes high the mov will turn on and pass the spike to the other wires and eventually to ground. This action equalizes the electrical system preventing damaging levels of voltage from reaching electric devices. Most mov based surge protectors send the spike ultimately to ground where it is safely dissipated.

Large spikes or prolonged transient events create a lot of heat in surge suppressors employing mov technology. A power spike heating the mov is not necessarily a bad thing because the energy on the power spike is being used create the heat, and therefore is not going into your electrical devices.

With most power transient spikes, the heat generated in the mov is negligible. For large spikes the heat can be divided among many movs or absorbed by the bulk of a very large mov. If the spike is too much for the device to handle, then the movs may overheat. An overheated mov may go "shorted" or behave like the wires have been crossed. Modern surge suppression device designs incorporate thermal fuses that will disconnect an overheated mov and provide indication that the device needs service. This type of occurrence is rare and is most likely caused by the power being too high for a long period of time (the surge suppressor sees this as one really long spike), or a spike so large it overloads the device. Underwriters Laboratories (UL) tests surge suppressors thoroughly to ensure that overloaded devices will not cause a safety concern. These products will have the UL mark signifying that it has passed the testing standard (UL1449 4th Edition) for product safety.

Under normal conditions a mov based surge suppressor will last indefinitely. Even in an electrically hostile environment you can expect decades of service from industrial grade devices and years of service from smaller plug in products. Today's quality engineered mov based surge suppressors are much more advanced than those of forty years ago and continue to provide the backbone of modern power surge suppression.