Subject: Re: Surge protectors
Posted by Wayne Parham on Fri, 02 Apr 2010 18:18:24 GMT
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There are plenty of different technologies of surge protectors. The ones we're talking about are secondary protectors, by the way. Secondary surge protectors include things like barrier strips and other equipment that contain surge clamping devices. Primary protectors are usually outside the building, and are larger capacity but their tolerance isn't as great - they tend to take the big hit but not clamp to as specific a range.

Examples of primary arresters are lightning rods and spark gaps. Secondary protectors are smaller devices, usually things like metal oxide varisters and surge clamping diodes. These days, you can find primary arresters with some of the same technologies as are found in secondary protectors, but the real determiner is size and location. The primary takes more of the hit and is mounted at the point of entry, whereas secondary protectors are inside, often at the recepticle.

I tend to like primary devices that are very simple and can take a whallop, like gaps and rods. They're just going to arc over when the voltage is high enough, and the only real damage they take is from melting or pitting. For secondaries, I like MOV devices for high voltage lines and SCD devices for low voltage lines. Surge clamping diodes tend to clamp at more precise voltage levels, and so I like them for signal level lines. MOV's are fine for AC, and tend to fuse shorted when "cooked", so they really should be used with a breaker. That's how most barrier strips are made. Once it is damaged, throw it away and replace it.

Secondary protectors are rated in Joules and in voltage, and in general, the larger the energy (Joules) rating, the better. The voltage should be roughly equal to the signal it's intended to protect, or slightly less. So for example, a device intended to protect a 12VDC line should not clamp below 14-18V or so. If the line ever rises above that level during normal operation, you definitely don't want the protection device to kick in, so it should be sized accordingly. If AC, don't forget that power lines are usually described in RMS, so multiply by 1.414, minimum. In other words, a 120VAC line will tend to swing from +170V to -170V. The protector should not clamp until at least 180V in either direction.