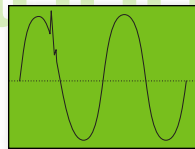


transient voltage surge suppressors

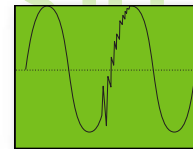
power quality program

transient voltage surge suppressors

Transient voltage surge suppressors (TVSS), also called arrestors, varistors, movs, avalanche diodes, sparkgaps, etc., protect against over-voltage conditions known as:



impulses or spikes, and



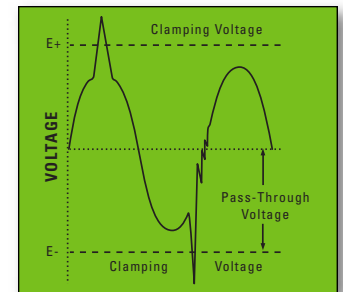
transients or ringwaves

These disturbances distort the shape of the AC voltage waveform and last about 1/120 of a second. They are the result of lightning, utility and customer load switching operations, the switching of power factor correcting capacitor banks and many other actions of man and nature. Since the magnitude and duration of these disturbances varies depending on their cause and location, multiple surge suppressors with varying levels of protection may be required to adequately protect your system.

How they work:

Surge suppressors sense when voltage rises above the normal level and prevents the excess energy from reaching your equipment by diverting this excess energy to ground. The point at which the surge suppressor begins to react against the spike is called the clamping voltage.

The amount of voltage that passes through the device up to the clamping voltage is called the pass-through voltage.



In general, the lower a suppressor's clamping voltage, the better it will protect your system. However, since most electronic equipment has some withstand capability built into the equipment, protecting for spikes less than this could result in the suppressor wearing itself out protecting against spikes which are not powerful enough to damage your equipment. To ensure adequate protection, some overlap should occur between the surge withstand capability of your equipment and the surge protection provided by the suppressor. In general, surge suppressors should protect your equipment from all possible sources of disturbances: hot, neutral and ground. In addition to surge protection, some units also offer EMI/RFI (electromagnetic interference/radio frequency interference) noise filtration.



What to look for when purchasing a surge suppressor:

- Metal housing (plastic may catch fire).
- UL approved (meets UL1449 specifications).
- Clamping voltage – the clamping voltage of the surge suppressor should fall slightly below the withstand voltage of your equipment (i.e. if your equipment can withstand voltage impulses of 800 volts, a surge suppressor with a clamping voltage of less than 800 volts should be used).
- Other needs: RJ11 phone jack, TV/VCR, EMI/RFI noise filtration, etc.
- Watch out for claims of power savings; to date, none of these claims have been substantiated.
- Response time – how quickly a surge suppressor begins to react against a disturbance. The faster the response time the better.
- Joule rating - the energy withstand capability of the surge suppressor. The higher the joule rating, the more rugged the surge suppressor.
- How long a surge suppressor remains effective depends on the type of environment it is installed in. In general, surge suppressors should be replaced every 5-10 years.

There are presently over 200 different suppliers of surge suppressors on the market today. These units vary widely in price, performance and durability. While UL approval should be required, testing performed by other independent sources can provide valuable insight on the merits and downfalls of various makes and models.

transient voltage surge suppressors

SURGE SUPPRESSION

Standards

IEEE 587	Lists the maximum expected surge at three locations on a typical electrical system.
Category A	Long branch circuits and outlets located more than 30 feet from the main electrical panel. Ringwave with 6,000 volts or 200 amps.
Category B	Short branch circuits and outlets located less than 30 feet from the main electrical panel, main electrical feeders and heavy appliance circuits. Impulse with 6,000 volts or 3,000 amps, Ringwave with 6,000 volts or 500 amps.
Category C	The service entrance, main electrical panel and all outdoor circuits and receptacles. Impulse with 10,000 volts or 10,000 amps.
ANSI C62.41	Same as IEEE 587. Referred to as ANSI/IEEE C62.41.
UL 1449-1987	Defines construction and performance requirements based upon sound engineering principles, research and field experience.

Warranties

Most manufacturers offer a warranty on their surge suppressors. Often times, these warranties are very vague and ambiguous on what, if any, equipment is covered by the warranty. These warranties range from replacement of the surge suppressor only, to replacement of the surge suppressor and repair of whatever was plugged into it.

Refer to the manufacturer's literature for more information on the coverage provided.

