

CHOOSING THE CORRECT POWER PROTECTION TECHNOLOGY WILL PROVIDE RELIABLE, LONG TERM PERFORMANCE FOR MISSION CRITICAL SYSTEMS.

ABSTRACT

When selecting the proper surge protector, it is important to select a device that incorporates more than just basic MOV technology. Choosing the correct technology will provide reliable, long term performance that is essential to keeping mission critical systems operating at peak efficiency.

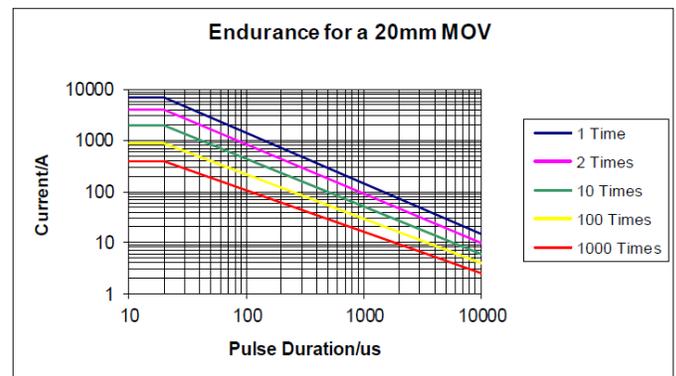
INTRODUCTION

Selecting an appropriate surge protection product can be a daunting, and sometimes frustrating, experience. When protecting a critical system, it is important to select a device that provides the highest level of protection over the entire range of its useful life. Performance ratings listed on many surge protectors are often useless and misleading. Joule ratings are misleading due to the fact that there is no set standard for measuring/calculating the Joule rating for a product. Let-through voltage ratings are also misleading because they are not indicative of how much actual "energy" is being passed through to connected devices.

Devices that provide protection in all modes (L-N, N-G, L-G) generally rely on MOV (Metal Oxide Varistor) technology as the basis for protection. MOVs do an exceptional job of handling surge events, due to their quick reaction time and ability to divert the majority of surge/transient energy away from connected equipment. There is, however, an inherent downside to relying on an MOV as the main source of protection in a surge protector. These components have a limited life, and their performance degrades substantially over time (Figure 1). Even with small surges passing through it, the performance of an MOV will decrease over time, allowing more of the surge energy to pass through to the connected equipment. Eventually the MOV will completely fail, usually with little or no indication from the surge protector, as it continues to operate normally. This means that all surges will simply be passed through to connected devices.

Proper protection therefore requires a device that utilizes more than just MOV technology to handle harmful power anomalies.

Figure 1 Note: Data from an internal IBM study showed power anomalies occurring at the rate of 50 times per month



ESP/SurgeX provides a solution to this common problem. Our patented Multi-Stage protection technology insures the lowest let-through energy after a surge/transient event, with consistent performance that won't degrade over time. MOVs are used in the design, but they are used in conjunction with a gas tube, a capacitor bank, an iron core inductor, and an avalanche diode array. The gas tube draws destructive residual energy away from the MOV, allowing it to handle surges without sacrificing performance or longevity. The rest of the components further reduce the remaining surge energy to the lowest level possible, protecting the connected equipment.

ESP/SurgeX Next Gen PCS and Defender Series protection products go a step further by incorporating another patented technology to protect connected equipment from other damaging power anomalies. According to EPRI, sag/under-voltage events account for 31% of all power anomalies. Generally, these events are caused by HVAC systems or other appliances/systems switching on and off, overloaded circuits, or local power grid problems. When these events occur, they can be followed by surges and brown-outs, caused by multiple

pieces of equipment being powered up simultaneously. The ESP/ SurgeX Hybrid Switch technology combines inrush current limiting with zero-cross voltage turn-on, and offers a substantial improvement over other surge protectors that may provide basic inrush current protection. This circuitry prevents connected equipment from generating damaging transients following a power outage or line voltage sag. These “self-induced” transients can harm the device itself or other devices on the same circuit. ESP/SurgeX Hybrid Switch technology also helps by preventing momentary brown-outs or voltage sags caused by multiple loads/devices on circuits powering up after a power outage or voltage line sag.

Conclusion

Power protection is a critical component of any comprehensive protection platform. When selecting the proper surge protector, it is important to select a device that incorporates more than just basic MOV technology. Choosing the correct technology will provide reliable, long term performance that is essential to keeping mission critical systems operating at peak efficiency (Figure 2).

To learn more about AMETEK Electronic Systems Protection portfolio of power protection and conditioning products visit espsurgex.com

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Figure 2

	Standard Surge Protectors	
	Single-Stage	Multi-Stage
Technology	Metal Oxide Varistor	Multi-Stage Technology
Description	Single-stage MOV that releases high levels of surge energy to connected equipment. Components degrade over time leaving equipment unprotected	A patented series combination of varistors and a 3 terminal gas arrester that suppresses normal and common mode surge energy. Components never degrade. <ul style="list-style-type: none"> • EMI/RFI noise filtration • Transient clamp stage • Over/Under voltage shut down • Inrush current elimination
Application(s)	Used for inexpensive, non-mission critical components	Protects sensitive, mission-critical electronic equipment and systems