

SurgeX Impedance Tolerant® EMI/RFI Filter

The SurgeX Impedance Tolerant® EMI/RFI filter is a technical advancement in the field of EMI/RFI filtering. Incorporated into the higher performance SurgeX® surge protectors, it offers real-world performance improvements over conventional EMI/RFI filters. This is in keeping with the *SurgeX Series Mode®* technology, which offers the highest level of performance and reliability in the field of surge protection.

Conventional EMI/RFI filters are designed for the standard bench source and load impedance of 50 Ohms. This standard is used throughout the electronics and communications industries and has a historical legacy dating back to the early days of radio. However, this standard has no real-world bearing on the power industry - source and load impedances will, most likely, be anything but 50 Ohms. Therefore to design an AC power filter to operate with a 50 Ohm source and load impedance is an academic exercise with no connection to the real-world! At best, the performance will be mediocre in real-world applications, and at worst it can be detrimental to the overall performance of the equipment. Passive electronic filters (which include EMI/RFI filters) are designed for specific input and output (source and load) impedances, which are normally resistive. The input and output resistances are actually part of the filter design, and the desired attenuation characteristic is only achieved when these exact resistances are present. Now, take a real-world situation where the input and output impedances are anything but 50 Ohms, and are also not purely resistive: the whole characteristic of the filter changes. Computer modeling has shown that, not only does the attenuation characteristic fail miserably, but resonant peaks caused by input and output mismatch can actually increase the interference level at certain frequencies!

The SurgeX Impedance Tolerant® EMI/RFI filter has been designed with real-world power line impedances in mind and is tolerant of mismatch in source and load impedance, hence the term: Impedance Tolerant®. In conjunction with the *Series Mode®* technology surge protector, the Impedance Tolerant® EMI/RFI filter provides the most effective surge protection, power filtering and conditioning available.

The three-stage design provides safe, clean power in the following manner:

- The SurgeX® Surge Reactor (6000 volt inductor) handles the heaviest surges and blocks 90% of the largest surges to be found on power lines. It also filters out transients produced by electrical switching and heavy equipment. (First stage of EMI/RFI filtering).
- The SurgeX® Clamping board clamps all remaining surge and transient energy, and also provides the second stage of EMI/RFI filtering
- The final third stage of power conditioning is provided by the Impedance Tolerant® EMI/RFI filter giving you the confidence of knowing you are supplying totally clean power to anything plugged into one of these SurgeX® products.

SurgeX® - Products that prevent problems!