

# SURGE PROTECTION 101

## Protecting Your Equipment, Resources and Investments

### WHAT IS A SURGE?

Power surges can also be referred to as transients, impulses or spikes. They are random, short bursts of excess electrical energy into a system and are typically measured in its duration of micro or milli-seconds. While seemingly innocent, these events can wreak serious havoc on inadequately protected facilities by damaging or destroying electrical equipment. Posing significant risk to all electrical infrastructure, investment in surge protection is a vital consideration for any business.

### WHERE DO THEY COME FROM?

80% of surges or transients are generated from internal sources such as load switching, motors or pumps starting up or even turning on air-conditioning systems. The other 20% of surges or transients

are typically generated from external sources such as lightning strikes, power company grid switching or electrical switching in adjacent buildings. Like it or not, most electrical systems are subjected to some level of surges or transients and consequent risks of damage.

### WHY DO I NEED SURGE PROTECTION?

The direct and indirect costs to a business affected by a surge can become very costly when considering not only production downtime, but the very real risk to staff and expensive equipment. Carefully selected surge protection devices are an inexpensive investment particularly when compared to the potential costs incurred by an unprotected system. Surge protection devices are designed to reduce the amount of harmful energy that flows into a system.

### SYSTEM DESIGN

System design has become easier as surge protection technology has evolved and become more sophisticated and accessible. Understanding what the correct risk rating is, what needs to be protected vs. what does not, what product to use and how to install it for full performance benefit can be difficult.

As long as the basic principles of the relevant electrical standards are applied, the job at hand is to provide protection in the following areas:

#### Point of entry protection

Basically, all installations should be protected at the point of entry. The starting point for protection is the surge diverter. Surge diverters effectively clamp the incoming lines to neutral or earth, protecting switchboards, contactors, transformers and motors from burnout due to extreme voltages.

#### Secondary point of protection

Once past the main board, most protection involves both surge diversion and filtering. Non-critical loads such as lighting and general-purpose power circuits do not necessarily require protection. If high levels of filtering are required for applications such as home automation, high-end audio-visual or other noise critical equipment the sub circuits supplying these systems should be protected at the switchboard.

#### Point of use protection

When protecting final sub-circuits and power points there are two options. Depending on the load you can either fit hard-wired filters to the circuit or install plug-in filters on the equipment to be protected. Generally, a plug-in filter used in conjunction with protection at the switchboard will provide suitable protection. ■

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## CSFI

Sub-board Secondary Point Protection providing shunt surge suppression and series filtering in a single package. 1 phase 3-25A, 25kA Primary

### Applications

- Secondary power circuits, Sub-boards
- UPS systems and rectifiers
- Telco & security systems
- Process and Controls Systems

### Key Features

- Modular design
- Din rail mountable (4 pole wide), 72mm
- Protection Fail Alarm Relay
- 3 mode, 3 stage protection



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Surge Protection 101  
article in this edition  
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magazine

## PSFI

Plug in Point of Use Protection providing surge protection and filtering in a single package. Available in 10Amp and 16 Amp form factors. PSF10I / PSF16I

### Applications

- Servers
- Portable instrumentation
- POS systems
- Industrial and rural surge prone sites

### Key Features

- IEC input and output connectors
- Surge suppression rating of 40kA (L-N)
- Protection Fail and On Indicators
- 3 mode protection



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