



# THOR SYSTEMS, INC.

## SURGE APPS SA-017: SILENT ELECTRICAL STORM

(Guidelines and application tools to promote improved Power Quality)

3621 Saunders Avenue  
Richmond, VA 23227-4354

### The Silent Electrical Storm

The development and use of electrical power has changed the world exponentially. Veritably everything we need to be a viable society uses some semblance of electrical power. We have come a long way from candles, oil lamps, and hand-pumped wells to where we are today. The relatively recent advent of the microchip and computer has brought us to a level only dreamed about 100 years ago.

A computer 30 years ago would fill a large room and take hours to complete solutions. Today, they fit in the palm of your hand or occupy a small part of a desk and have the answers to complex equations in seconds. As these devices have become more powerful and smaller, they also have become more susceptible to damage from the silent electrical storm that surrounds them.

A properly engineered and installed electrical system operates most efficiently if it is balanced. Every time an electrical device is turned on or off, it creates a slight imbalance. This could be caused by a lighting contactor (or switch), a heat pump, air conditioner or any motor driven load, as well as a myriad of other sources. These demand changes cause electrical transients or surges. Have you ever seen a flicker of the lights or television when the heat pump or air conditioner turns on or off? It is actually that demand change affecting the rest of the electrical system.

Actually 80% of all transient voltage surges in a building *originate* within the building through everyday operations causing changes in electrical demand (starting and stopping of electrical motors, machine processes, computers, printers, copiers, elevators, pumping equipment, HVAC systems, etc.) Only 20% of transients are generated by outside sources such as lightning, utility grid, high winds causing power line arcing, electrical accidents, etc.

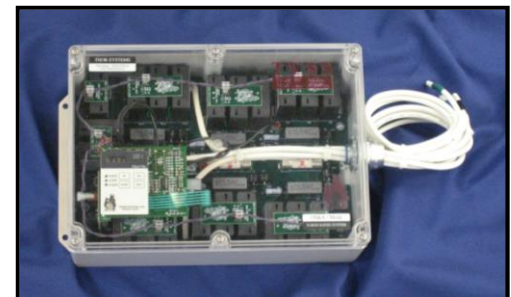


**Failed Microchip**  
(Inexpensive Components  
Cause Large Financial Losses)

Most transient surges occur without our notice -- silently, but consistently. Eventually this can lead to the failure of sensitive electronics or, at the very least, a shortened life expectancy. As electronic components and computer chips are becoming a major part of most electrical devices, it is more of a necessity rather than a luxury to consider protecting them from this silent electrical storm. Even if a surge or transient event isn't of a large enough magnitude to cause immediate failure, over a given period of time these transients will hasten such failures.

One of the best solutions to lessen this type of concern is to have properly sized and well designed surge protection installed at the electric panel. The modest cost today will help prevent early and often costly failures of those devices that allow us to enjoy the benefits they bring to us.

Thank you for your interest in THOR SYSTEMS, INC. We would like to become an information resource for surge protection applications. THOR SYSTEMS offers products and services that provide protection from the more *obvious external* to the more *frequent internal* transient voltage sources.



Series TSn150

Our consistent focus on improved product performance and increased value to the customer is conveyed by our products' transparent cover enclosures, showcasing the TILE Architecture, unique component configurations, and providing per mode status indication.

#### Ref. Documents:

- SA-001 Why THOR SYSTEMS' Surge Protection
- SA-004 Risk Assessment/Sizing SPD
- TSI 068 Product Overview
- TSI 0119 Site Risk Assessment Spreadsheet

Should you have any questions, please feel free to contact us (804.355.1100) or visit our Web site, [www.ThorSystems.us](http://www.ThorSystems.us).