

# POWERTRIP®



## Are You Protected?



# PowerTrip® is the Industry Leader in Protection Against Transients

## If you are concerned about...

- ☐ Replacement of expensive circuit boards and electronic equipment
- ☐ The necessity to re-boot or re-program software
- ☐ Telephone, signal and data equipment failure during or after a storm
- ☐ Down time and loss of production
- ☐ The need to replace lamps and electronic ballast early and often
- ☐ Failed compressors and controls on refrigeration and A/C units
- ☐ Shortened life of UPS and less-than-stated battery life

If you are experiencing any of these costly events, your distribution system is experiencing over voltage damage caused by surges or transients.

## Electrical Surges Cause Damage from Overvoltage Transients

The IEEE definition of a surge:

### Description

A subcycle disturbance in the AC waveform that is evidenced by a sharp, brief discontinuity of the waveform. IEEE 1100-2005 2.2.84

### Strength

Standard waveforms for demonstrating surge susceptibility within a facility go up to 6,000 volts to simulate transients regularly observed on branch panels and outlets. Higher voltage power distribution systems experience even higher energy levels of surges. ANSI/IEEE C62.41

### Speed

Power Surges can travel 10 inches in a nano-second (1 billionth of a second)

## Damaging Effects

Consequences include both the subtle as well as the obvious. Subtle damage (for example, insulation breakdown) can occur without being detected. Obvious damage would be burned circuit board traces or evidence of a flashover at a panel or at an equipment location.

## Causes of Transients

### 1. External

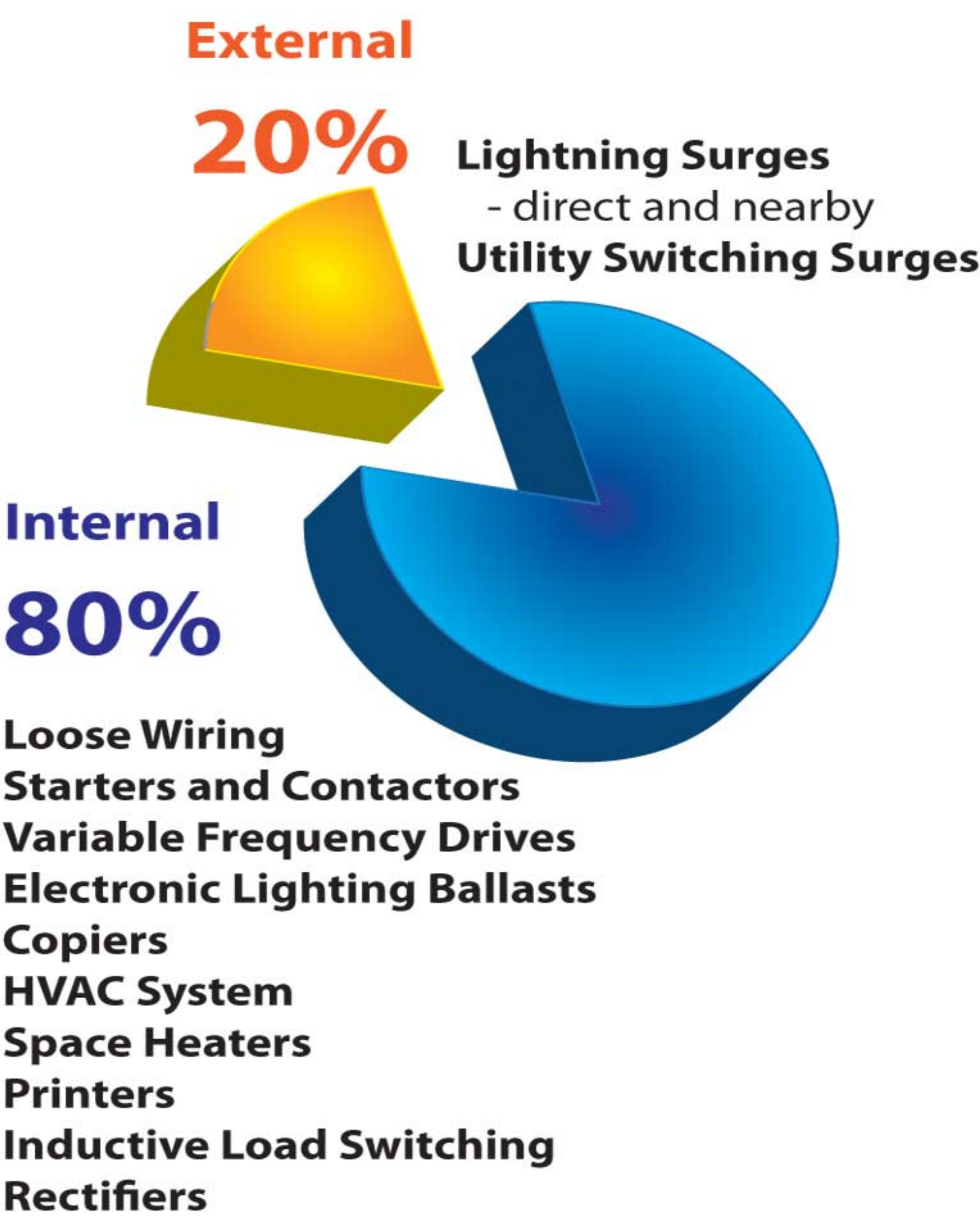
These types of surges represent the highest energy level and constitute about 20% of total surge activity.

### 2. Internal

Internally generated surges represent about 80% of the amount of damaging surges found in the typical power distribution system.

### 3. Systems Interaction Overvoltage

Most facilities have communication lines that enter along with the electricity. Over voltages can be induced between different systems during the flow of surge currents in one of the systems. Protection for both systems is required.





## Why You Need Surge Suppression...

Today's advanced electronic technology and devices have weak tolerance to power disturbances. They are designed to operate at greater speeds and off lower operating voltages.

According to the IEC 62305-1, lightning induced current values can approach levels up to 200,000 Amps at the point of the strike. This energy is dissipated over the ground and up to 100kA of the surge current can be expected to flow into a facility via power and data cables. The primary purpose of a Surge Protection Device (SPD) is to reduce surge voltages to a level that can be tolerated by the Power Distribution System (PDS) and the equipment connected to the system<sup>(IEEE C62.72-2007)</sup>. The benefit of a properly designed and installed surge protection system is the reduction of premature equipment failure and downtime.

PowerTrip® meets these recommendations with quality surge protection devices to meet either IEC or ANSI/UL application demands.

## Proper Protection for Every Application



### Industrial

- Power Plants
- Substations
- Manufacturing Plants
- Oil and Gas Facilities
- Government
- Military
- Airports
- Wind Energy Systems



### Commercial

- Data Centers
- Banks
- Retail Centers
- Grocery Stores
- Warehouses
- Restaurants
- Health Care
- Small Business

### Selection Chart for Power Line SPDs

## Staged Protection Method / Cascade Coordination

Properly designed lightning protection system should be undertaken in a segmented approach, as called for by IEC 61312-1. Cascade Coordination is the planned interaction between two or more surge protection devices on the same power distribution system. This method provides the best protection for the distribution system and valuable connected equipment.

IEEE recommends a full system coverage approach to provide effective facility protection<sup>(IEEE 1100)</sup>. PowerTrip models are comprehensive enough for all of your low voltage and data applications, from line side main service entrance to sensitive equipment levels.



Main Entrance

Distribution Panel

Equipment Level



- Outside and service entrance
- Any underground lines
- Overhead line to detached building

- Feeders and short branch circuits
- Distribution panels
- Lighting systems in large buildings

- Equipment level
- Office panels

Surge Environment

ANSI/IEEE C62.41 Category C  
IEC 61643-Class I, II  
VED Classification B

ANSI/IEEE C62.41 Category B  
IEC 61643-Class II  
VED Classification C

ANSI/IEEE C62.41 Category A  
IEC 61643-Class III  
VED Classification D

PT-PM Series  
PT-PB Series



PT-PB Series  
PT-HW Series



PT-HW Series  
PT-RD Series



KSB 1S Series  
KSB 1T Series



KSB 2S Series  
KSB 2T Series

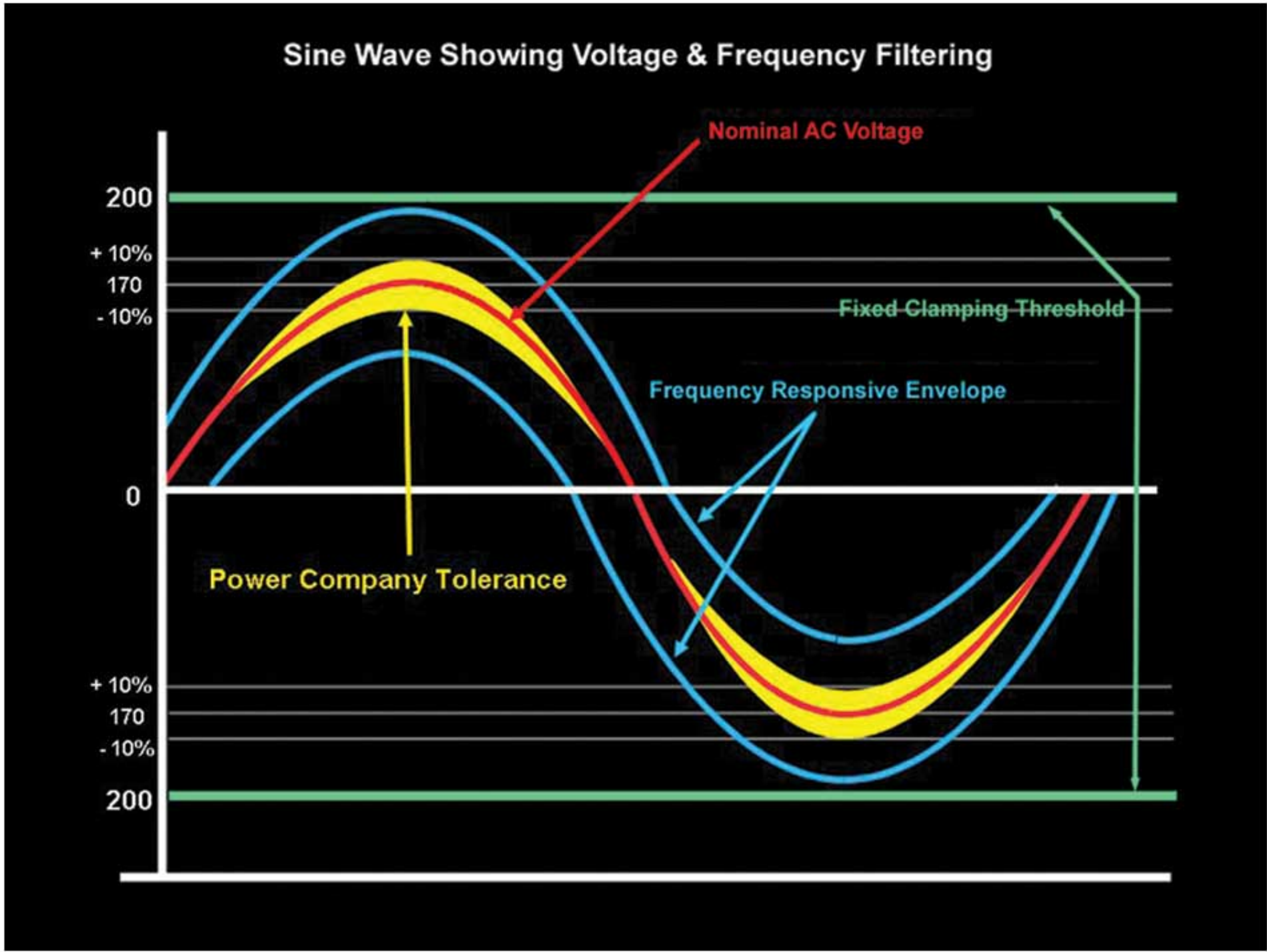


KSB 3S Series  
KSB 3T Series



This chart represents a portion of available PowerTrip® units for demonstration purposes only. A complete product line is available for differing applications. For assistance in choosing the best protection for your needs, contact an Alltec representative.

Two Technologies to Control the Damaging Effects of Transients



**Voltage Responsive Circuitry (VRC)™**  
This technology provides low let-through voltage, features high energy handling capability and fast response time, fixed across the sinusoidal waveform.

**Frequency Responsive Circuitry (FRC)™**  
Includes VRC technology, with advanced frequency filtering capabilities, to provide uniform let through voltage along all angles of the sinusoidal waveform and EMI/RFI mitigation up to 65dB @ 135 kHz.



### **PT-Series**

- ▶ Designed per ANSI/UL 1449 3rd Edition safety standards
- ▶ Available with Frequency Responsive Circuitry™ for a higher level of protection
- ▶ Parallel and series configured devices available to cover a wide range of installations
- ▶ DIN rail mount option for control cabinets and space limiting applications
- ▶ Super bright LED diagnostics for accurate visibility and monitoring
- ▶ Neutral – Ground bond integrity monitoring circuit for safety and reliability of power distribution system
- ▶ Coordinated Surge and Thermal Fusing for superior safety



***Technology + Construction =  
PERFORMANCE***

### **KSB-Series**

- ▶ Class 1 SPDs utilize Hermetical Sealed GDT Technology capable of handling high levels of shock, vibration and temperature
- ▶ Extremely low let through voltage resulting in better protection for critical equipment
- ▶ Full system coverage with a comprehensive line of SPDs for both Power and Data Applications
- ▶ Data protection units available in a two piece modular construction
- ▶ Compact DIN rail mount units allow for installation close to the critical equipment
- ▶ Power units available with multi functional grounding connection made to either conductor or busbar
- ▶ Remote diagnostic monitor by signal contact output to alarm or event counter



**For more information,  
visit [www.powertripspd.com](http://www.powertripspd.com)**



## Alltec's Protection Pyramid™

The three-tier Alltec Protection Pyramid™ begins with the installation of a code compliant, single-point, stable, low resistance/impedance **grounding** system sized to carry the full amplitude of lightning energy and rated short circuit current safely to ground. Next, **surge protection** devices are staged to dramatically filter the amplitude of voltage, current and frequency surges. Finally, a well designed **lightning protection** system is created to protect against direct lightning strikes.



## Alltec's Business

### ENGINEERING

Consulting  
Design  
Inspections/Audits

### TURNKEY SERVICES

Project Management  
Procurement  
Installation Services  
Maintenance

### MANUFACTURING

**TerraStat®** - Charge Dissipation Systems  
**TerraStreamer®** - Early Streamer Emitter System  
**PowerTrip®** - Surge Suppressors  
**TerraDyne®** - Electrolytic Grounding Systems  
**TerraFill®** - Low Resistance Earth Enhancing Backfill  
**TerraWeld®** - Exothermic Welding Equipment  
**GroundGuardian®** - Active Floating Roof Monitoring System  
& Retractable Bypass Conductors



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