



Innovative Technology® TVSS/SPD Products

2008 Product Line Brochure

A dramatic background image of a dark, stormy sky with multiple bright white lightning bolts striking downwards. The sky has a purple and black color palette.

**Transient Voltage
Surge Suppression and
Surge Protective Devices**

Eaton's Innovative Technology TVSS Products



Since 1980, Innovative Technology products have solved the most difficult electrical transient problems for business, industry, government and defense sectors. Now as a part of Eaton® Corporation's electrical business, we are even better positioned to deliver state-of-the-art customer solutions.

TVSS pioneer

We have been designing and manufacturing industry leading transient voltage surge suppression (TVSS) products for over 25 years. We hold the patents and intellectual resources that have been leading the way in transient voltage surge suppression. Innovative Technology products and technologies protect electrical, data, telecom circuits and electronic equipment from the effects of lightning induced voltages, external switching transients and internally generated electrical transients.

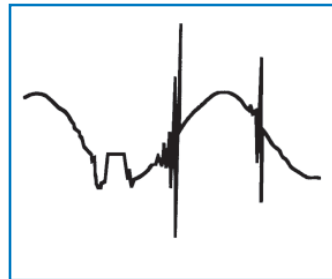


Why Eaton?

As a premier diversified industrial manufacturer, Eaton meets your electrical challenges with advanced electrical control and power distribution products, industrial automation, world-class manufacturing, and global engineering services and support. Customer-driven solutions come in the form of industry-preferred product brands such as Cutler-Hammer®, MEM®, Holec®, Heinemann®, Powerware® and Innovative Technology. Engineering service specialists are available around the clock and around the world. Products, solutions and services are designed to meet recognized standards such as those of Underwriters Laboratories (UL), the National Electrical Manufacturing Association (NEMA®), the American National Standards Institute (ANSI), Consultants Europe (CE), the Canadian Standards Association (CSA) and the International Electrotechnical Commission. Eaton personnel are active in numerous industry groups, including ANSI/IEEE and UL Steering Committees.

What are surges?

A *surge* is a random, high energy, short duration voltage event. Also referred to as *transients*, *impulses* or *spikes*, these random electrical disturbances can damage or destroy sensitive microprocessor-based equipment.



Typical Voltage Impulse Waveform

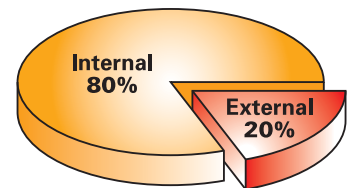
The cost of downtime – the \$26 billion per year problem

Your power distribution system and attached load equipment is under constant attack from various types of power line disturbances. Transient voltage surges comprise the most severe, common and immediate danger to sensitive electrical and electronic equipment. The cumulative effect of transients causes semiconductor degradation, equipment destruction, control process disruption and circuit board damage. Transients frequently cause premature equipment failure, resulting in costly downtime and lost productivity.

The cost, according to *Business Week*, is an estimated \$26 billion per year in lost time, equipment repair and equipment replacement. All mission-critical electronic systems should be shielded to prevent disruption, damage and destruction.

Sources of surges

Although external transient surges including lightning strikes, utility grid switching and equipment action at adjacent buildings are easily recognized high-energy surge events, they only account for 20% of all surges faced by a facility. 80% of surges are the results of internal switching transients (turning on/off motors, transformers, photocopiers, etc.). Wiring, grounding errors and surges (also known as transient voltages) are among the most common power quality issues facing facilities today – resulting in safety concerns, equipment damage and costly downtime.



How To Protect Equipment, Resources, and Investments

TVSS is not luxury. It's a necessity.

In today's highly competitive markets, surge suppression is recognized as the key to solving transient related power quality problems. Small businesses, manufacturers, multinational corporations and defense research facilities worldwide have learned that their initial investments in surge suppression can be quickly returned by reducing equipment damage, decreasing maintenance costs and improving system uptime.

Choosing a surge suppression manufacturer with a reputation for quality products and services is vital to ensure your investments in valuable systems, hardware and operations are safeguarded. Eaton is that manufacturer.

The System Shield® solution

System Shield is a proven, effective method for total facility protection. This layered approach protects all of your electrical and electronic equipment, from powerful motors to sophisticated lighting controls and sensitive computer-based controllers.

With System Shield, protection begins at the incoming power panels and extends to system distribution centers, panel breakers, points of use, and even individual equipment. This coordinated approach is supported by the Emerald Book (IEEE Std. 1100-2005), a definitive reference published by the Institute of Electrical and Electronics Engineers (IEEE). This standard states "It is recommended that additional [SPDs] be applied to downstream electrical switchboards and panel boards if they support electronic load equipment."

ANSI/IEEE C62.41-2002 separates a typical facility into three location categories, each characterized by differing exposure levels, transient wave shapes, voltage/current levels and transient sources. The category locations illustrated here (C, B & A) serve as the basis for a simplified explanation of the System Shield.

Service entrance locations (Category C)

These locations are subject to high-power externally generated transients caused by lightning, power company grid switching, power system faults, severe weather and neighboring facilities. Surge suppressors installed at high exposure service entrance

locations provide the first line of defense. Here, transient amplitudes are suppressed to levels that subsequent layers of the System Shield can eliminate.

Distribution panel locations (Category B)

These locations are subject to a mixture of externally generated impulse transients and internally generated switching/ringing transients caused by equipment such as motors, HVAC equipment, manufacturing and office equipment. Surge devices installed at these high to medium exposure locations provide the second layer of defense against the externally-generated transient activity as well as suppression of much more prevalent (80%) internally-generated transients.

Branch panel locations (Category A)

These locations experience a large amount of switching/ringing wave transients generated by a wide variety of load equipment, including office equipment, lighting controls, commercial and industrial systems. Typically, sensitive and critical load equipment is fed from these highly important branch panels. Innovative Technology SPDs installed at branch panel locations are designed to address ringing transient characteristics via the Active Tracking Network.

Individual circuit protection

Process control, sensing/monitoring and DC power supplies may all require individual equipment protection. In addition, plug-in units installed at point-of-use locations provide added protection against externally generated transients as well as addressing internally generated transients.

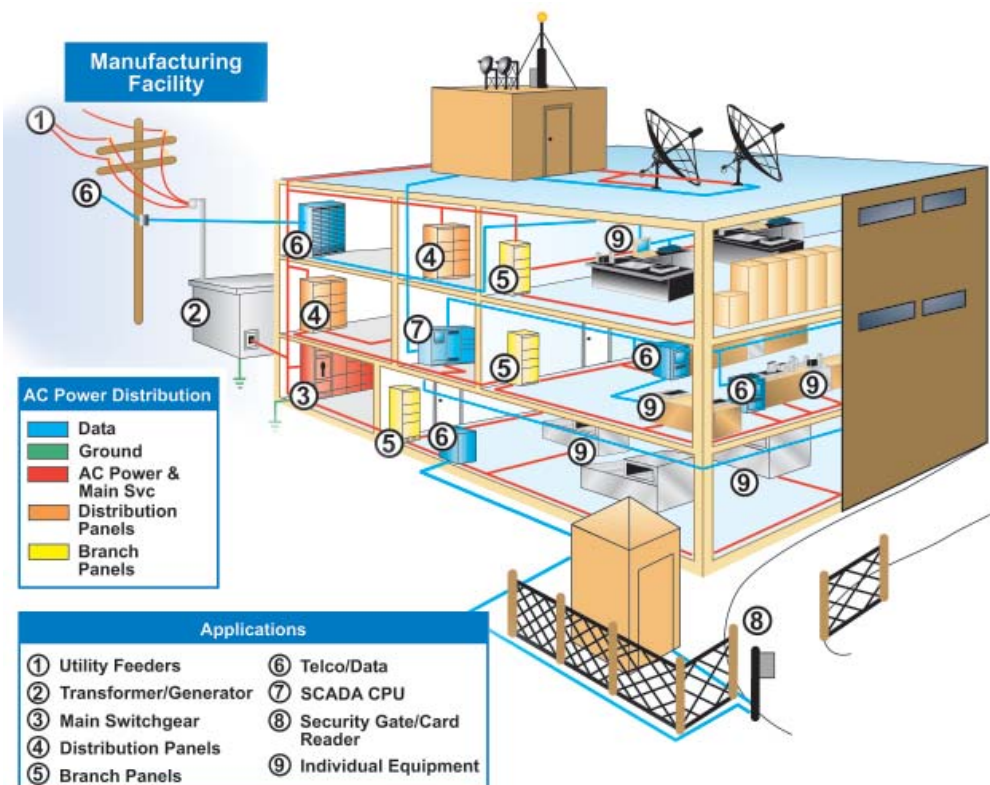
Telecom and data circuits

Telecom and data circuits are extremely vulnerable to transients, especially at building entry points (Category C locations). Even relatively low energy transients can take down computer, LAN, telephone and other systems. Devices installed at these locations provide the best possible protection for these sensitive and mission-critical systems.

TVSS experts – Innovative Technology Distributors

Every TVSS application is unique, depending on the sensitivity of the equipment, the criticality of the process being protected, the location of conductors and electrical distribution equipment, and many other factors. The right TVSS product in the right place, or the wrong TVSS product in the right place, will result in less than optimum transient protection. Knowing what product to use and where and how to install that product in your distribution system is critical to effective surge suppression.

Independent distributors who sell Innovative Technology products are factory trained and have extensive experience applying surge suppression to solve transient voltage issues; their experience spans virtually every industry and application. Your Innovative Technology representative can provide you with a comprehensive, facility-wide audit, including system layouts, load equipment mixture, and transient surge exposure levels. This on-site audit of your individual needs is a service that has no equal in the TVSS industry, and assures you that your Surge Protection solution provides optimal equipment protection. To find an Innovative Technology Master Distributor in your area, please visit www.itvss.com and click the "where to buy" link on the right.



it[®] PROTECTOR

INNOVATIVE TECHNOLOGY
Brooksville, Florida USA

PTX 400

it[®] PROTEC

INNOVATIVE TECHNOLOGY
Brooksville, Florida USA

PTX300

it[®] PROTECTOR

INNOVATIVE TECHNOLOGY
Brooksville, Florida USA

Suppression Circuit Status
1 LED per phase, normally on - OK

PTE 160



**DANGER
HIGH VOLTAGE
SEE WARNING LABEL**

Remove Alarm
Dry Contacts



Access Point

Suppression Circuit Status
1 LED per phase, normally on - OK

ECTOR[®]

NOLOGY
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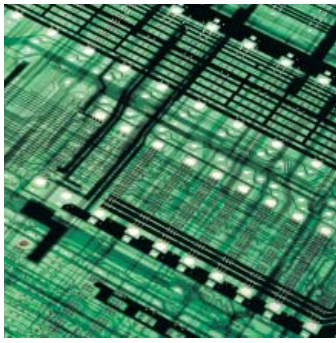


LISTED
TVSS
843F

**! HIGH
SEE WA**



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The Innovative Technology Protector series is a premier line of surge protective devices designed to provide excellent protection under the harshest electrical conditions. These UL 1449 and UL1283 listed products meet strict guidelines for durability and protection and are backed up by a 20-year free replacement warranty. Available in peak surge current capacities from 48 kA to 400 kA per phase and with the optional Power Event Monitor, Eaton has all your surge protection needs covered with the I.T. Protector!



Protector features

FEATURE	BENEFIT
Symmetrical current distribution and high current density capability. Fault current tested at 200 kAIC & surge current tested to in excess of rated per mode peak surge current, per NEMA LS-1. Ultra-low junction impedance connection points. Up to 20-year warranty.	Long-term reliable solution to transient problems.
Integrated design utilizes advanced computer modeling and circuit simulation for total coordination of all circuit elements.	Assures balanced performance with low measured limiting voltage.
ATN® - Suppresses both switching generated ringing and high-energy impulse generated transients. Provides highest level of protection for critical and sensitive loads plus effective real world UL 1283 listed EMI/RFI filtering. Superior performance is independently tested and verified.	Confidence that sensitive equipment will be protected from the corrosive effects of frequent transients.
LED per phase diagnostics and dry relay contacts continuously monitor the SPD and electrical system. Optional S.M.A.R.T. diagnostic adds an audible alarm, surge counter and phase loss monitor.	Quick assessment of TVSS functionality. Optional surge counter indicates transient activity that the TVSS has addressed. Instant indication of suppression circuit faults and circuit status.
All-mode protection - Assures all possible transient paths to load equipment are covered. Provides highest level of load equipment protection.	Confidence that all possible and probable paths are covered.
NEMA 4 and 4X enclosure - Allows weatherproof installation in the most demanding industrial and commercial environments. Optional stainless steel (316) enclosure available.	Strength, versatility and wide array of installations.
Power Event Monitor - Continuously monitoring, logging and reporting power quality events in real time with time- and date-stamped event recordings.	Enables facility managers to pinpoint the source and location of harmful power events, both internal and external.



**Standard features:
I.T. Protector provides
quality protection**

**Advanced Encapsulation
Technology**

Extends product life and prevents adverse effects from environmental factors.

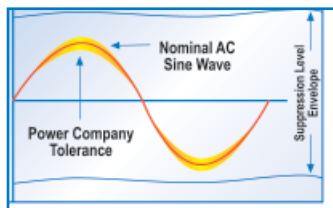
- Maintains consistent long-term performance
- Protection from extreme environmental elements
- Protection against vibration and movement – high tensile strength
- High dielectric strength
- Environmentally friendly

Diagnostics

Green LEDs and dry relay contacts monitor suppressor status.

**Threshold Suppression
Network (TSN)**

The I.T. Protector offers the best suppression of high energy impulse generated transients and widest range of application compatibility. We use large diameter metal oxide varistors to mitigate high energy impulses.



TSN Performance Curve

EMI/RFI tracking filter

This tracking filter suppresses disruptive electrical noise & low level transients. (UL 1283 listed EMI/RFI filter network. Standard on models PTE.)

Parallel configuration

Provides maximum efficiency and single unit Multi-Circuit Transient Voltage Surge Suppression (MCTVSS) capability.

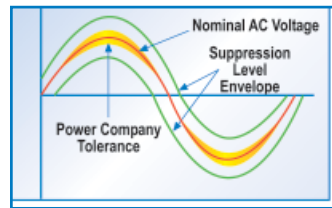
**Optional features: I.T.
Protector options are
designed to meet your
specific requirements**

**Active Tracking
Network (ATN)**



This premier sine wave tracking filter provides the industry's best suppression of both switching generated ringing and high energy impulse generated transients. As a result, it provides the highest level of protection for critical and sensitive loads. UL1283 listed EMI/RFI filter network.

ATN is standard on PTE models.



ATN Performance Curve

**S.M.A.R.T. - Suppression
Monitoring and Recording
Technology**

S.M.A.R.T. delivers comprehensive monitoring of critical system functions, including real time audible and visual reporting of unit status, phase loss/protection loss and transient events (alarm with reset and mute). The dual function surge counter provides non-volatile event history recording. It is high, medium, and low sensitivity programmable.



Power Event Monitor

Eaton's I.T. TVSS Power Event Monitor is designed to increase uptime and system reliability. Continuously monitoring, logging and reporting power quality events in real time with time- and date-stamped event recordings, the I.T. Power Event Monitor is a key component of today's comprehensive power protection solution.



Internal fusing

200 kAIC rated surge fuses provide internal interrupt protection.



Integral disconnect switch

Allows unit to be taken off line with minimal impact to facility operation. Includes 200 kAIC surge rated and listed internal fuses so that the unit can be installed without external circuit interrupt for maximum application flexibility.



Power Event Monitor



Eaton has enhanced the protection provided by the Protector line of transient voltage surge suppressors (TVSS) with the Innovative Technology TVSS Power Event Monitor. While the TVSS protects the electrical distribution system from harmful transient voltages, the TVSS Power Event Monitor notifies the facility personnel of where and when such surges occur. The TVSS Power Event Monitor helps users gauge and monitor power surges, whether onsite or remotely via standard communication protocols, so you can take corrective action.

Power Event Monitor features

FEATURE	BENEFIT
Notifies the facility personnel of where and when surges occur.	Allows for immediate corrective action.
Ethernet capabilities allow technicians to instantly access all monitoring and event data by using TVSS Power Event Monitor software.	Confidence that you can monitor your power system whether you're onsite or working remotely.
Works as an integrated device into Innovative Technology Protector series TVSS products (80, 160, 300, and 400 kA models).	Enhances system capability without increasing footprint size.
Detects, monitors and reports a wide array of power quality events (including voltage sags, swells, and transients).	Enables facility managers to pinpoint the source and location of harmful power events, both internal and external.
Operates efficiently in a wide range of environments including military, marine, manufacturing and critical facility applications.	Strength, versatility and wide array of installations.
Manufactured by Eaton's Innovative Technology group.	With over 20 years of TVSS manufacturing experience, Eaton's Innovative Technology group again raises the bar for transient protection with this innovative product feature.



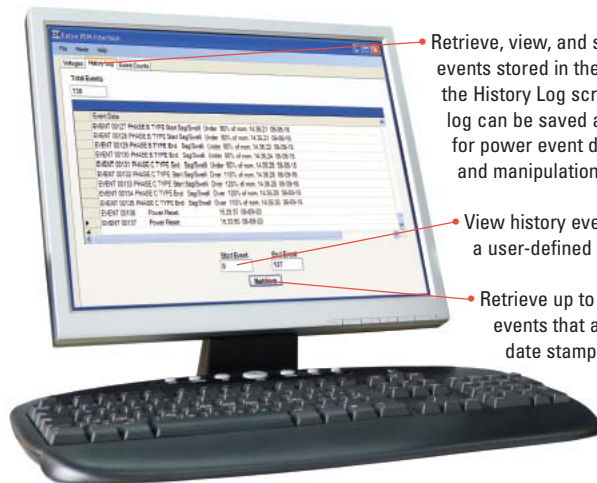
PEM Handheld Software

Real time voltages information screen

- Download event information and history logs to a PDA via infrared access
- View real time phase-to-phase voltages
- View the line-to-line average voltages
- View real time phase-to-neutral voltages
- View the line-to-neutral average voltages
- View the neutral-to-ground voltages
- Select tabs to view real time voltages, history log, event summary log, and configure the PEM from your PDA.

PEM PC Software

History log screen



- Retrieve, view, and save history events stored in the PEM through the History Log screen. History log can be saved as excel file for power event data trending and manipulation.
- View history events from a user-defined date range.
- Retrieve up to 5,000 stored events that are time and date stamped.



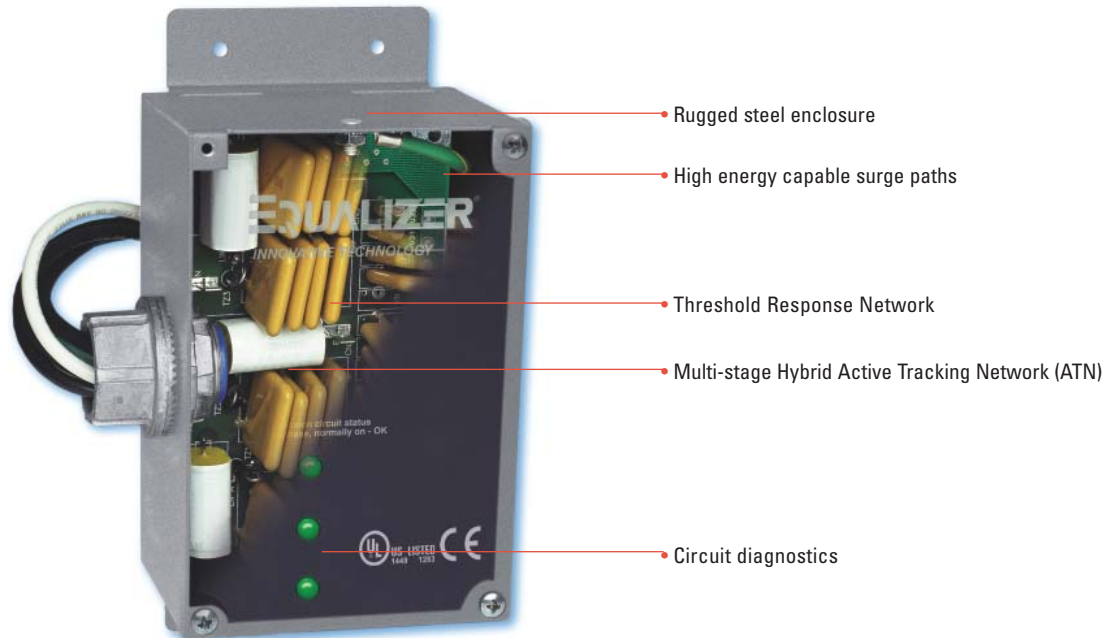
I.T. Equalizer Surge Protective Devices (SPDs) provide high quality transient voltage surge suppression for industrial and commercial applications. Field proven with unsurpassed durability, reinforced by a ten-year free replacement warranty, the EQX line is available in a variety of configurations and current capacities from 40 kA – 160 kA per phase.

The I.T. Equalizer is THE choice for cost-effective, high quality systems protection.



I.T. Equalizer features

FEATURE	BENEFIT
High energy capable surge paths	<ul style="list-style-type: none"> • Unsurpassed durability • High frequency, high surge current printed circuit board design
Rugged steel enclosure	<ul style="list-style-type: none"> • Threaded conduit fitting and integral mounting feet
Threshold Response Network	<ul style="list-style-type: none"> • Suppresses high energy impulse transients • Provides robust protection • Redundant MOVs • Peak Surge Current tested to NEMA LS-1
Active Tracking Network (ATN) EMI/RFI Filter	<ul style="list-style-type: none"> • Suppresses switching generated ringing transients • Nanosecond response time • Filters disruptive noise • UL1283 listed
Circuit diagnostics	<ul style="list-style-type: none"> • Provides indication of system status • Dry relay contacts • LED indicators



XT Series Surge Protective Devices



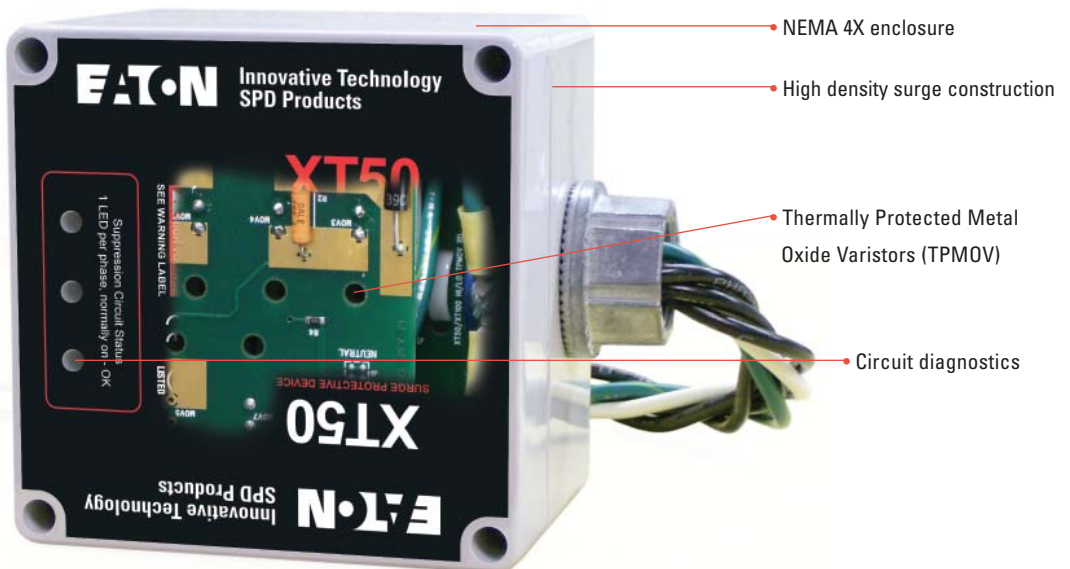
XT Series Protective Devices (SPD) provide high quality transient voltage surge suppression for light industrial, commercial, point of use and OEM applications. The XT Series is the industry's first UL1449 Third Edition listed product to achieve a best-in-class of 20,000 amp nominal discharge current.

The XT series is available in a variety of configurations and surge current capacities of 50 and 100kA per phase.



XT Series features

FEATURE	BENEFIT
High density surge construction	<ul style="list-style-type: none"> • High surge capacity in a small footprint • High surge current printed circuit board design • Available in 50 and 100 kA per phase peak surge rating
Rugged enclosure	<ul style="list-style-type: none"> • NEMA 4X enclosure • High density Polycarbonate enclosure
Voltage ratings	<ul style="list-style-type: none"> • Available in multiple voltage ratings from 100 to 480V wye and delta configurations
Circuit diagnostics	<ul style="list-style-type: none"> • High intensity LED per phase status indicators
Component level fusing	<ul style="list-style-type: none"> • Thermally Protected Metal Oxide Varistors (TPMOV)
Certifications	<ul style="list-style-type: none"> • UL1449 Third Edition Type 1 and Type 2 SPD • CE Certified • Class I and Class II SPD, Tested to EN61643-11 conforming to IEC61643-1



I.T. Critical Load Protection

Individual circuit/critical load protection

Sensitive microprocessor-based loads often share circuits with transient-generating equipment, such as switching power supplies, HVAC systems, process controls, lighting panels, and non-linear demand loads. It is quite common to have sensitive low-voltage controls, such as PLCs, process controls, or variable frequency drive controls connected to the same circuit as the equipment they are controlling. Normal equipment operation, especially with today's non-linear load equipment, can cause thousands of internally generated transients every hour. The effects of these transients on control equipment manifest themselves as unpredictable control lock, errors in production processes, and constant re-booting of PLCs and other control devices.

Cumulative effects of repetitive transients can cause rapid circuit board degradation, premature equipment failure, and increased maintenance costs.

The Innovative Technology line of suppressors for individual circuit protection can prevent damage to a wide variety of critical single-phase equipment. Compact and easy to install individual circuit Surge Protective Devices (SPDs) are designed to fulfill your protection needs. Your Innovative Technology master distributor can help you choose the right products for your critical protection needs.



General features

- AC and DC voltage protection
- Available in voltages from 5 Vac – 275 Vac, and 5 Vdc – 300 Vdc
- Designs for circuits operating from 3A – 60A
- Series-connected and true series devices with let-through voltage ratings that are among the lowest in the industry

- Superior EMI/RFI noise attenuation (ATN models), designed to guard against internally generated transients
- High peak surge current ratings – up to 40 kA per mode
- Easy terminal strip connections
- DIN and international DIN mounts and enclosures available
- UL 1449, 2nd Edition, and UL 1283 recognized components
- Compact size



Residential Protection

Sensitive electronic products throughout a home are subjected to transients generated by home sources such as HVAC systems, garage door openers, laundry machines and other electrical loads as well as external sources such as lightning, outages and utility switching.

The Innovative Technology line of residential surge protection devices protect computers, large screen televisions, game consoles and other sensitive electronic devices from the effects of repetitive transients and light-

ning. Your Innovative Technology master distributor can help you choose the right protection for your home.

General features

- Protection for AC, cable and telephone lines
- Surge current ratings of 20 to 70 kA
- Easy installation
- Quick connection terminals
- Provide whole house protection



I.T. Data and Telecommunications Protection

Wherever uptime is essential, Eaton delivers a comprehensive, single-source power management solution to ensure maximum reliability through the life of your vital applications. Our unique surge protection systems represent a fundamental component of the complete facility solution.

Designed to safeguard against harmful and potentially disastrous surges and spikes, our data and telecommunication surge suppression solutions protect your equipment from the damage frequently caused by lightning strikes, brownouts, electrical load switching, faulty wiring, downed power lines and more. This unique line was developed to protect against the harmful surges that threaten your telecommunication and data communication circuits providing a complete and reliable surge protection solution.

General features

- State-of-the-art, avalanche diode and thyristor technology
- Easy to install, compact, in-line installation
- Manufactured in the USA and tested to meet or exceed UL 497 specifications
- Protects data and telecommunication lines for virtually any type of network or system including Ethernet, ArcNet, Token Ring, RS232, RS422, Satellite, CATV, CCTV, DDS, T1 AND ISDN applications
- Provides affordable, yet superior, equipment protection
- Improved reliability and maximized system up-time
- Five-year replacement warranty

Eaton's line of data and telecommunication surge suppression products are available for nearly any configuration and offer complete protection for computers and small to large networks, communications devices, phone systems, printers, fax machines and much more.



ECCP Series

Safeguards sensitive data networks against lightning-induced surges, AC power interference, electrostatic discharge and ground loop energies.



EDDP Series

Ensures the reliable operation of hubs, bridges, routers, switches and other networked equipment. Specifically designed to provide added security to electronic devices with a remarkably low tolerance for voltage rises or ground loop energies.



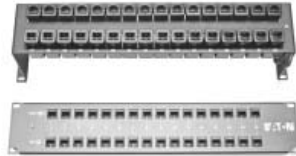
EMTJ Series

Guarantees the reliable operation of devices in a wide variety of environments, and guard sensitive data networks against lightning-induced surges, AC power interference, electrostatic discharge, and ground loop energies.



EPCH Series

Designed for high-speed data, voice and multimedia applications in structured cabling environments for medium to large-size businesses today, these units incorporate the latest in communication protection technology for mission-critical installations.



ERAK Series

Whether for a single network concentrator, or an entire relay rack of voltage-sensitive equipment, ERAK Series protectors are one of the most cost-effective and versatile devices of their kind.



ESIP Series

Ensures the reliable operation of parallel and serial devices such as printers and external modems, point-of-sale terminals, mainframes, dumb terminals, and most other devices using Subminiature D connectors, which are sensitive to destructive transient energies.



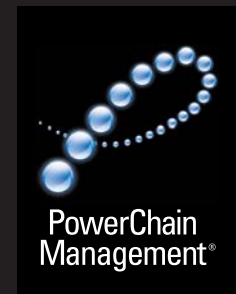
ETSP Series

Guards sensitive data networks against lightning induced surges, AC power interference, electrostatic discharge, and ground loop energies to ensure the reliable operation of networked equipment connected to most communication interfaces.

Eaton Corporation is a diversified industrial manufacturer ranked among the largest Fortune 500 companies. The electrical group is Eaton's largest division and is a global leader in electrical control, power distribution, power quality, automation, and monitoring products and services. Eaton's electrical products include brands such as Cutler-Hammer®, MGE Office Protection Systems, Powerware®, Holec®, and MEM®. Eaton provides PowerChain Management® solutions to serve the needs of the industrial, institutional, IT, data center, mission critical, utility, residential and OEM markets worldwide.

PowerChain Management solutions help enterprises achieve sustainable and competitive advantages through proactive management of the power system as a strategic, integrated asset throughout its life cycle. With Eaton's distribution, generation and power quality equipment; full-scale engineering services; and information management systems, the power system is positioned to deliver powerful results: greater reliability, operating cost efficiencies, effective use of capital, enhanced safety, and risk mitigation.

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