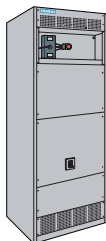
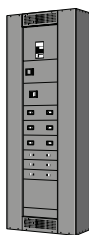




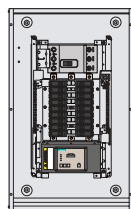
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Ideally, every electrical panel should be surge protected. However, this may not be practical or feasible. Proven surge protection practices do not have to be complicated or costly. All you need to do is address the following:

- 1- Where should hardwired SPDs be installed on the electrical system?
- 2- What size and type SPD should be used?

In today's electronic world, electrical systems for the home or business just aren't complete unless they incorporate surge protection. The most effective way to defend and safeguard this environment against damaging surges is by hardwiring surge protective devices (SPDs) throughout the electrical distribution system.

Government studies suggest that the most efficient way to surge protect an electrical system is by applying hardwired surge protective devices at the main incoming electrical and communications services. Additional hardwired suppressors were recommended to prevent backfed surges that could bypass the primary electrical service SPD. Also, localized equipment SPDs are recommended to protect against residual and internally generated surges.

Following these practices, 5 common SPD electrical systems installation points can be identified. Applying surge protection at these points will maximize a facility's surge immunity. These locations can easily be remembered by using the following acronym, "The best surge protection installation is a S.O.L.I.D. one." Where S.O.L.I.D. stands for the following:

- Service Entrance
- Outside loads powered from distribution panels
- Lower voltage distribution panels
- Individual critical equipment
- Data, telephone, and coaxial cables

The following example applies S.O.L.I.D. SPD protection to a School's electrical system. Listed to the side are SPDs with appropriately sized redundancies that we have found over the years to provide years of uninterrupted protection.

Surge Protecting **SCHOOLS**

APT design guide

APT SOLID Solutions

SERVICE ENTRANCE

External SPD



TEXAS30E1

Increased Redundancy

TEXAS45E1

External - 10 Mode



TEXAL30E1

Increased Redundancy

TEXAL45E1

OUTSIDE LOADS

External SPD



TEXDS154X

Increased Redundancy

TEXAS30E1

External - 10 Mode



TEXAL15E1

Increased Redundancy

TEXAL30E1

LOWER VOLTAGE PANELS

External SPD



TEXCS104X

Increased Redundancy

TEXDS154X

External - 10 Mode



TEXAL15E1

Increased Redundancy

TEXAL30E1

INDIVIDUAL EQUIPMENT

External SPD



S50A

Increased Redundancy

TEXCS104X

DATA LINES

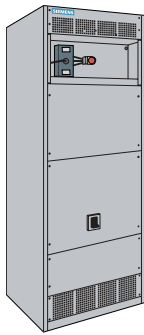
External SPD



S50A

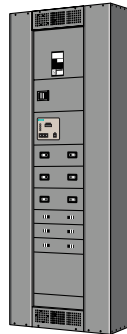


APT DIN RAIL



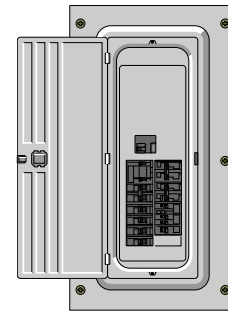
Service Entrance

Applying surge protection at the incoming electrical service "Stops Surges Before They Get In." These types of surges contain the largest surge energy warranting 200 kA or more of surge current redundancy.



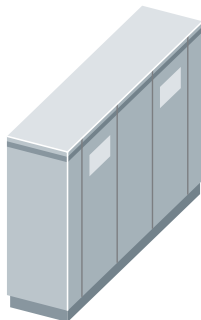
Outside Loads

SPDs should be installed at distribution panels feeding remote classrooms or portable, parking lot lights, etc. to prevent back feeding surges entering the main building.



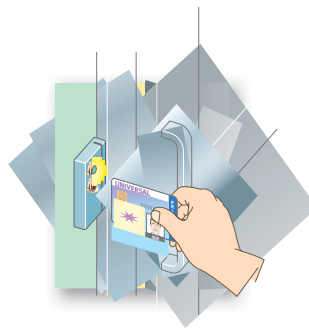
Lower Voltage Panels

If the campus is supplied with a higher system voltage (i.e. a 277/480V service), 120V panels need SPDs to condition residual surges leaving the service entrance SPD as well as any internally generated surges. Examples could be panels power computer labs, auditoriums with audio-visual equipment, or any other panel powering sensitive electronic-rich classrooms.



Individual Equipment

Even if surge protection is applied at the previous locations, redundant protection may be warranted for sensitive, costly equipment. This may include data centers, audio/video equipment, chillers and drives.



Data Lines

Security, fire alarm, and telephone systems using copper communications lines need protection especially for communication circuits running to and from separate buildings across the campus.



Advanced Protection Technologies

14550 58th Street North
Clearwater, Florida 33760

727.535.6339

fax: 727.539.8995

800.237.4567

www.apttvss.com

info@apttvss.com