



**SIEMENS**

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# TPS3 Design Guide

## Data Center

## Surge Protection Solutions

[usa.siemens.com/surge](http://usa.siemens.com/surge)

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.

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 that is required to effectively surge protect your facility is to answer the following questions:

1. Where should hard wired SPDs be installed on the electrical system?
2. What size and type SPD should be used?

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, five 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:

<b>S</b>	Service Entrance
<b>O</b>	Outside Loads Powered From Distribution Panels
<b>L</b>	Lower Voltage Distribution Panels
<b>I</b>	Individual Critical Equipment
<b>D</b>	Data, Telephone and Coaxial Cables

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

# TPS3 Design Guide

## Surge Protecting a Data Center



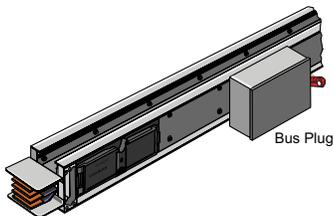
### Service Entrance

Applying surge protection at the incoming electrical service “Stops Surges Before They Get In.” These types of surges contain the largest surge energy warranting 300 kA or more of surge current redundancy.



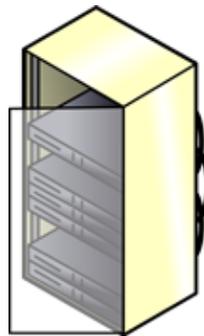
### Outside Loads

SPDs should be installed at distribution panels feeding exterior rooftop loads, AHUs, parking lot lights, etc. to prevent direct or nearby lightning surges back feeding system via exterior circuits.



### Busway

If the facility is supplied with a higher system voltage (i.e. a 277/480V service), 120V busway need SPDs to condition residual surges leaving the service entrance SPD as well as any internally generated surges from servers. A well protected bus run is one consisting of SPDs installed at the beginning and terminating ends of the busway run.



### Individual Equipment

Even if surge protection is applied at the previous locations, redundant protection maybe warranted for sensitive, costly equipment. This may include server racks, AC controls, VFDs, etc.



### Data Lines

Security, fire alarm, and telephone systems using copper communications lines need protection especially for computers and automation control circuits.

### Siemens TPS3 SOLID Solutions

#### Service Entrance

Internal SPD	External SPD
TPS3L630	TPS3L1230
Increased Redundancy	
TPS3L645	TPS3L1245

#### Outside Loads

Internal SPD	External SPD
TPS3L515	TPS3L12150X02
Increased Redundancy	
TPS3L530	TPS3L12300X02

#### Busway

Internal SPD	External SPD
TPS3L115	TPS3L12150X02
Increased Redundancy	
TPS3L130	

#### Individual Equipment

External SPD	
TPS30910	TPS30305

#### Data Lines

External SPD	
Contact Siemens SPD support at 888.333.3545	

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