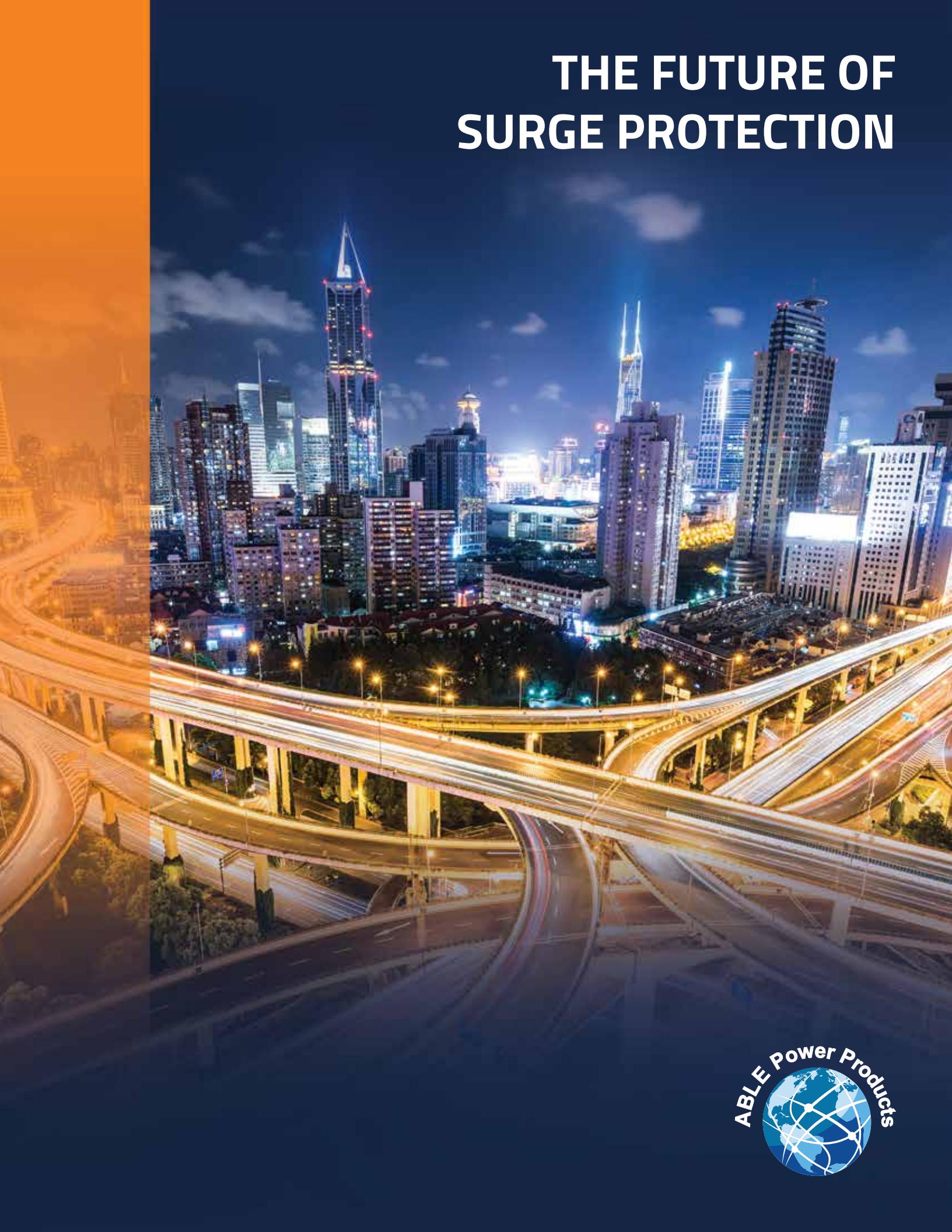


THE FUTURE OF SURGE PROTECTION



Parking Lot Lighting
Fast Plugin Surge Protection



Architectural Lighting
Hardwired Surge Protection



Bus/Train Lighting
Retrofit Surge Protection



Park Lighting
Hardwired Surge Protection



Street Lighting
Shorting Cap Surge Protection



Stadium Lighting
Hardwired Surge Protection



Highway Lighting
Photocell Surge Protection



Multiple Surge Protection Solutions for Multiple LED Applications



ABLE Power Products
Protecting The World's Innovations

Over Voltage & Under Voltage Cut-Off with Safe Restore™ & Surge Protection

Over/Under Voltage Cut-off Device



Features

- Extends the life of your fixture by eliminating temporary over/under voltages that can harm sensitive electronic components
- Safe Restore™
 - 30 second delay on power-up
 - Instant drop on Over/Under Voltage condition
 - 30 second delay reconnect when nominal voltage returns to normal
- Automatically shuts off power to the fixture when nominal voltage decreases by 45V
- Automatically shuts off power to the fixture when nominal voltage increases by 45V

Over/Under Voltage Cut-off with Surge Protective Device (SPD)



Features

- Extends the life of your fixture by eliminating temporary over/under voltages that can harm sensitive electronic components
- Safe Restore™
 - 30 second delay on Power-up
 - Instant Drop on Over/Under Voltage Condition
 - 30 second delay reconnect when nominal voltage turns to normal
- Automatically shuts off power to the fixture when nominal voltage decreases by 45V
- Automatically shuts off power to the fixture when nominal voltage increases by 45V

SPD Features

- Thermally-Fused MOVs (TFMOV)
- Gas Discharge Tube Technology
- Multi-Function Diagnostic Indicators
- All-Mode Protection (L-N, L-G and N-G)
- Small Footprint with Mounting Tabs

Surge Protection Selection Criteria

Origins of Transient Voltage

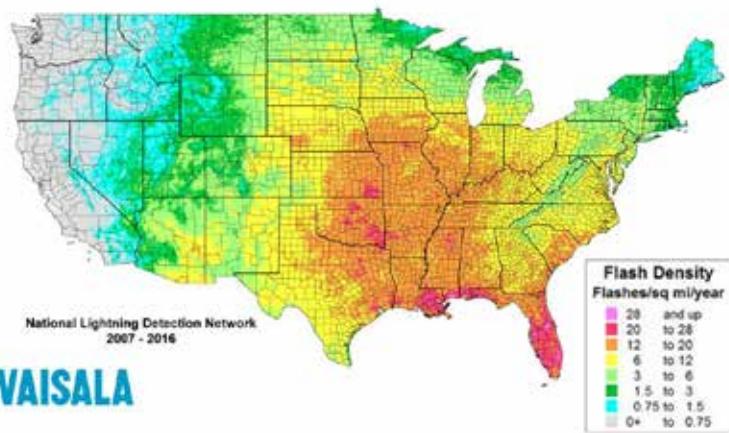
Power or voltage surges are brief bursts of energy caused by a sudden change in the electrical conditions of a circuit; they are virtually inevitable. Wherever electrical or electronic equipment is used, power surges can and do occur. While often lasting only a millisecond, power surges can raise the voltage in electronic circuits from a few hundred to as much as several thousand volts. They are one of the most severe, common and immediate dangers to modern, sensitive electronic equipment. In fact, Business Week estimates that power surges cost \$26 billion a year in lost time, equipment repair and replacement costs.

The most well-known cause of power surges is electrical storms. When lightning strikes near power lines, even if there is no direct contact, the rapid ionization of the air and the sheer amount of energy in the lightning are enough to induce additional potential energy in the lines, causing a power surge.

Here are some additional sources of transient energy:

Lightning

- Proximity strikes
- Magnetic & electric fields
- Electromagnetic radiation



Grid Infrastructure Problems

- Grid switching - evening vs daytime
- Downed or damaged power lines

Blackouts or Intentional Power Outages

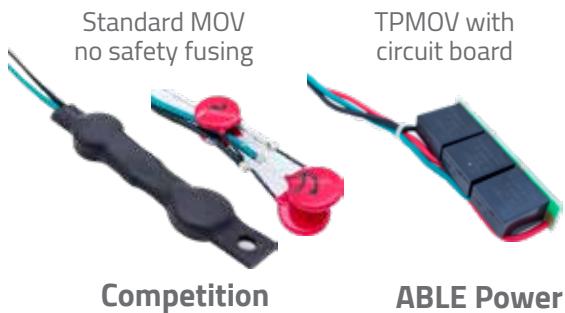
- Current inrush when power is restored

Safety Thermal Fusing	Hybrid Gas Discharge Tube/MOV Circuit	Voltage Protection Rating	All Mode L-N, N-G, L-G	Parallel or Series Circuit Option	Diagnostic Indicator Light	IP 66	UL 1449 4th
✓	✓	✓	✓	✓	✓	✓	✓

When determining the true value of a surge protective device (SPD) there is a minimum number of criteria that must be met in order to achieve the highest performing and the safest most reliable SPD. Able Power Products has incorporated all of these critical features in the design, testing and manufacture of every surge protection product and component we sell.

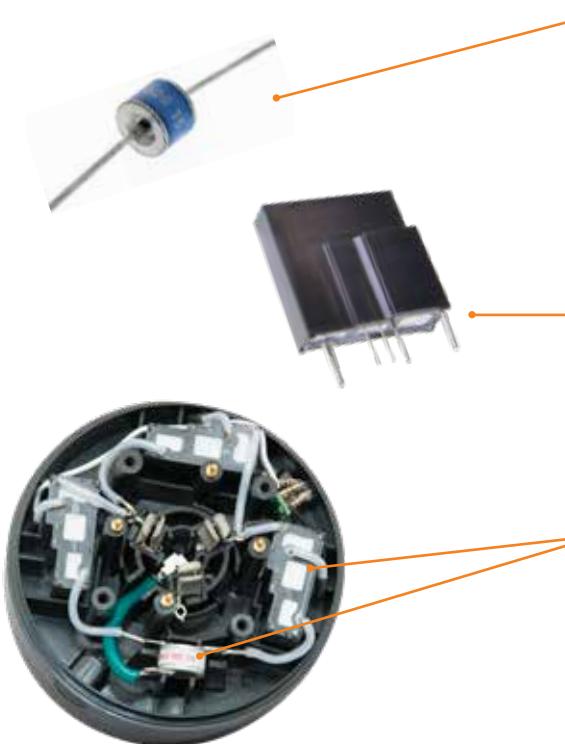
Surge Protection Selection Criteria

Whether you're designing, retrofitting or upgrading your LED lighting installations, ABLE Power Products offers a full line of solutions. We offer easy step-by-step design options and retrofit customization leveraging our design engineers, our world-class manufacturing facility and our UL certified design center.



Safety Thermal Fusing

Our innovation begins with safety at the component level. ABLE Power Products is in the unique position to not only manufacture the devices but also the thermally protected metal oxide varistors (TPMOV) used in their design and manufacture. This safety feature separates us from the competition and is incorporated in every product we sell.



Hybrid Gas Discharge Tube/MOV Circuit

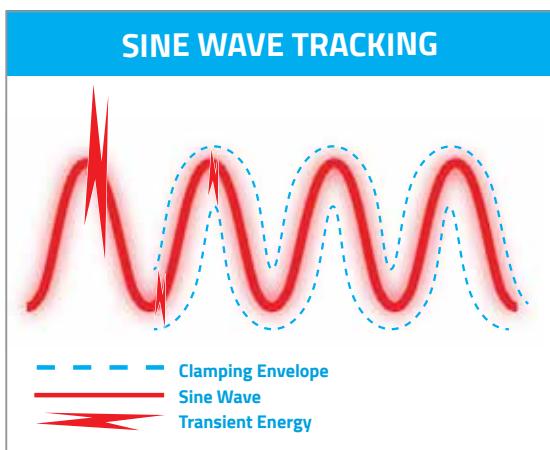
A sealed glass-enclosed device containing a special gas mixture trapped between two electrodes, which conducts electric current after becoming ionized by a high voltage spike. Gas tubes eliminates MOV leakage which may triple the life of your surge protector and can handle higher surges.

MOV

A voltage dependent resistor (metal oxide varistor) – The resistance decreases with rising voltage. MOV's prevent damage from transient events by acting as a voltage "clamp", or limiting voltage to a desired level.

Combined GDT / MOV Circuit

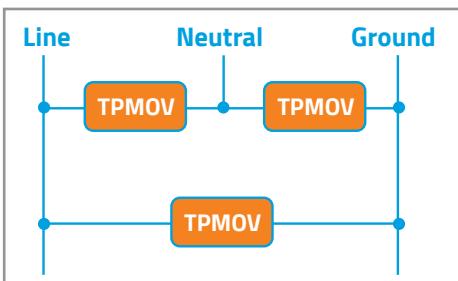
This circuit uses each component to do what each does best: the gas discharge tube diverts the high energy portion of the transient and the MOV provides the fast, accurate clamping of the low energy leading edge.



Voltage Protection Rating (VPR)

Also referred to as peak let-through voltage rating, is the amount of voltage a surge protector permits to pass through it to the attached equipment, in this case an LED driver. During this process the surge protector provides a clamping envelope around the electrical sine wave. For example, a surge protector might limit a 6,000V surge so that only 700V is 'visible' to the LED driver. The VPR or let through voltage is 700V.

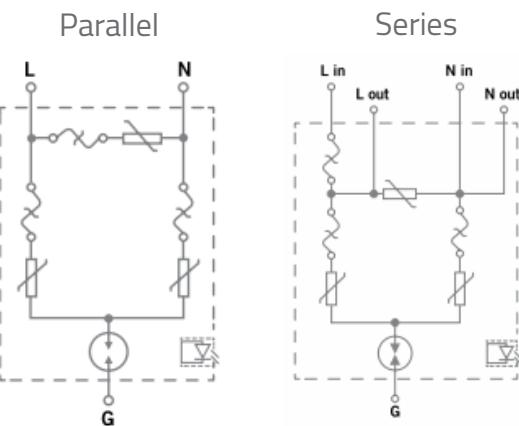
Surge Protection Selection Criteria



All Protection Modes L-N, N-G, L-G

IEEE modes of protection: electrical paths where the SPD offers defense against transient overvoltages.

—For a single phase ac power SPD connecting to line, neutral, and ground conductors, the modes of protection shall be line-to-neutral (L-N), line-to-ground (L-G) and neutral-to-ground (N-G).



Parallel or Series Circuit Option

Series Circuit

- Surge protector in series with the load
- Failed surge protector disconnects power to the load.
- Equipment isolated from future surges

Parallel Circuit

- Surge protector in parallel with the load
- Failed surge protector does not disconnect power
- Equipment vulnerable to future surges



Diagnostic Indicator Light

If the surge light is off, this means that the surge protector has either received a powerful enough electrical surge (s) that it damaged the MOV inside or that normal fluctuations in electricity that cause minor power surges and have caused the MOV to wear out. The surge protector needs to be replaced.



IP 66

IP rated as "dust tight" and protected against heavy seas or powerful jets of water.



UL 1449 4th

The newly issued UL 1449 4th Edition is the standard for safety and is the preferred standard for all AC surge protection devices (SPDs).

Hardwired Surge Protection

Hardwired Solutions

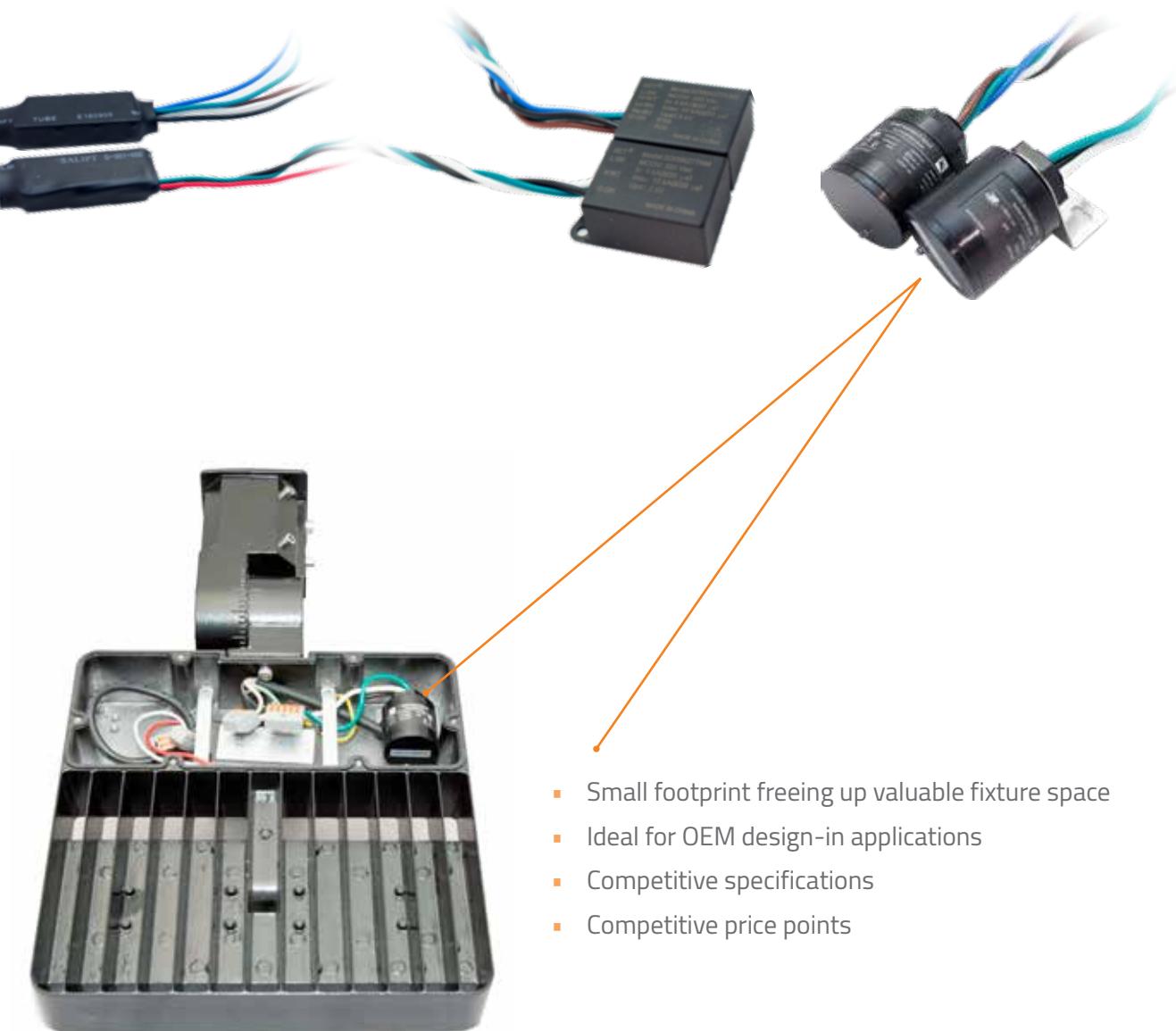
These Surge Protective Devices (SPDs) are the ideal solution for protecting street and roadway lighting, parks and stadium lights, parking lots and walkway lighting. This technology is especially valuable in high-risk areas or problem sites due to lightning activity or power related problems like blackouts and utility grid-switching.

The key benefits to using SPDs include extending the life of drivers and controls, reducing maintenance and service costs, and minimizing fixture downtime which all equate to increased customer satisfaction.

Thermally-fused MOVs
10kV Uoc

Thermally-fused MOVs
10kV Uoc
(Gas discharge tube option)

Thermally-fused
20kV Uoc
(Gas Discharge Tube option)



- Small footprint freeing up valuable fixture space
- Ideal for OEM design-in applications
- Competitive specifications
- Competitive price points

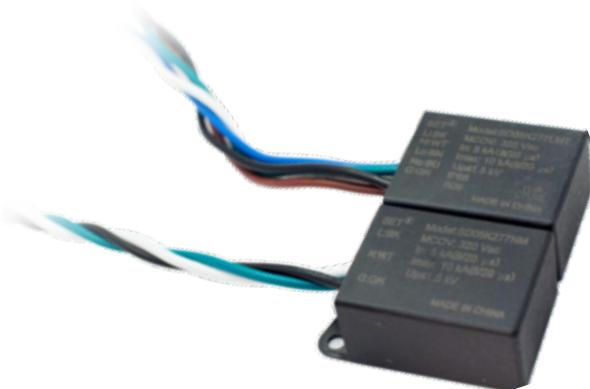
Hardwired Surge Protection

The hardwired surge protectors have a small footprint but include thermal safety fusing, low clamping levels and all-mode protection. Ideal for Lighting OEMs, this line offers a compact installation freeing up valuable housing space.



SPB05K Series

- Small footprint, compact installation
- 10kA I_{max} maximum surge capacity
- 5kA I_n nominal discharge current
- 10kV U_{oc}/V_{max} maximum overvoltage current
- Operating voltage: 120V - 277V and 480V
- UL 1449 4th edition
- Series and parallel options available



SD05K Series

- Small footprint, compact installation
- 10kA I_{max} maximum surge capacity
- 5kA I_n nominal discharge current
- 10kV U_{oc}/V_{max} maximum overvoltage current
- Operating voltage: 120V-277V
- UL 1449 4th edition
- Mounting tab
- Diagnostic indicator
- Gas Discharge Tube option
- IP 66 rated



SD05C/10C Series

- 10kA, 15kA or 25kA I_{max} maximum surge capacity
- 5kA or 10kA I_n nominal discharge current
- 10kV or 20kV U_{oc}/V_{max} maximum overvoltage current
- Operating voltage: 120V - 277V and 480V
- UL 1449 4th edition
- Mounting bracket included
- Diagnostic indicator
- Series and parallel options available
- Gas Discharge Tube option
- IP 66 rated

Receptacle Surge Protection

As the LED lighting industry continues its Smart City transformation, photocells, controls and sensors are becoming smarter, more sophisticated, more critical and more valuable.

To keep pace with this evolving technology, surge protection companies need to constantly re-invent themselves and develop innovative new products and components to support this transformation.



Patented Design

Our latest innovation was created with this evolving technology in mind. Our patented 3-pin and 7-pin receptacles have a unique grounding system that when used with our Fast Plug-in Surge module will remove electrical disturbances from the system before they can cause damage or downtime. In addition to providing premium protection for the drivers and controls, placing the surge device outside the fixture makes it more accessible, serviceable and ideal for retrofit applications.



One Change: Field Replaceable
7 Pin Surge Protection for
OEM Design-in and Retrofit
Applications



7 Pin Connector with
Built-in Ground Screw

Surge Protection Receptacle Based

- Patented 3-pin & 7-pin
- Receptacle with ground connection
- Surge Protectors installed outside the fixture
- Modular, Replaceable, Accessible

Design-in Receptacle Surge Protection

The Design-in surge line includes a Fast Plugin surge module, a photocontrol surge module, and a shorting cap surge module with a unique patented ground design used in conjunction with our patented 7-pin and 3-pin grounded receptacle. Ideal for OEM's providing solutions for roadway and street lighting applications.

Fast Plugin Surge Module



- OEM design-in application
- 10kA, 15kA or 25kA Imax maximum surge capacity
- 5kA or 10kA In nominal discharge current
- 10kV or 20kV UoC/Vmax maximum overvoltage current
- Operating voltage: 120V-277V and 480V
- UL 1449 4th edition
- Diagnostic Indicator
- Requires ABLE Power 3/7 pin receptacle

Photocontrol Surge Protector



- OEM design-in application
- 10kA, 15kA or 25kA Imax maximum surge capacity
- 5kA or 10kA In nominal discharge current
- 10kV or 20kV UoC/Vmax maximum overvoltage current
- Operating voltage: 120V-277V
- UL 1449 4th edition
- Requires ABLE Power 3/7 pin receptacle

Shorting Cap Surge Protector



- OEM design-in application
- 10kA, 15kA or 25kA Imax maximum surge capacity
- 5kA or 10kA In nominal discharge current
- 10kV or 20kV UoC/Vmax maximum overvoltage current
- Operating voltage: 120V-277V and 480V
- Diagnostic Indicator
- UL 1449 4th edition
- Requires ABLE Power 3/7 pin receptacle

3-pin & 7-pin Receptacle



- Patented design with grounding pin & ground wire
- For use with Fast Plugin Surge Module, Photocontrol Surge Protector, & Short Cap Surge Protector

Retrofit Receptacle Surge Protection

The Retrofit surge line includes a Fast Plugin surge module, a photocontrol surge protector, and a shorting cap surge protector, and all with external ground wires for connection to the lighting fixture housing. Ideal for DOT's, Municipalities, and Utilities that have identified high risk areas or troubled sites due to lightning issues or power related problems.



Fast Plugin Surge Module with External Ground Wire

- Retrofit application
- 10kA, 15kA or 25kA Imax maximum surge capacity
- 5kA or 10kA In nominal discharge current
- 10kV or 20kV UoC/Vmax maximum overvoltage current
- Operating voltage: 120V-277V and 480V
- Diagnostic Indicator
- UL 1449 4th edition



Photocontrol Surge Protector with External Ground Wire

- Retrofit application
- 10kA, 15kA or 25kA Imax maximum surge capacity
- 5kA or 10kA In nominal discharge current
- 10kV or 20kV UoC/Vmax maximum overvoltage current
- Operating voltage: 120V-277V and 480V
- Diagnostic Indicator
- UL 1449 4th edition



Shorting Cap Surge Protector with External Ground Wire

- Retrofit application
- 10kA, 15kA or 25kA Imax maximum surge capacity
- 5kA or 10kA In nominal discharge current
- 10kV or 20kV UoC/Vmax maximum overvoltage current
- Operating voltage: 120V-277V and 480V
- Diagnostic Indicator
- UL 1449 4th edition



Receptacle with Built-in Surge Protection

- 10kA, 15kA or 25kA Imax maximum surge capacity
- 5kA or 10kA In nominal discharge current
- 10kV or 20kV UoC/Vmax maximum overvoltage current
- Operating voltage: 120V-277V and 480V
- Compatible with standard Photocontrol & Shorting Caps
- Diagnostic Indicator
- UL 1449 4th edition



**Surge Protection Design Center and Manufacturing
Campus Xiamen, China**

Company Background

The founders of ABLE Power Products have served the industrial, commercial, and utility markets for a combined 50 years by providing innovative surge protection technology and services.

We strongly believe that our customer is our most valuable asset. Unlike many of our larger competitors, we believe in working for our customers and conforming to meet their needs, not ours. We stand ready to assist and support our customers in any way possible with their own unique and urgent challenges.



Headquarters:
8535 Phoenix Drive
Manassas VA 20110
1- 800-335-8969

Florida Office:
727-304-4447
sales@ablepowerproducts.com

Factory:
361101 Xiamen P.R. China