LUMINAIRE SURGE PROTECTORS

2019 APPLICATION & PRODUCT GUIDE

APPLICATION GUIDE

There are two main sources of transient over-voltages in powerlines:

- Natural sources are typically from lightning strikes
- Man made sources include utility power switching, electric motors and switch mode power supplies

Surges are not necessarily direct lightning strikes. A direct hit by lightning is not really survivable. But nearby lightning strikes can induce sudden powerline voltage disturbances. Powerline transients can also be caused by municipal utility switching. Commercial or industrial equipment with electric motors or printers and computers can all produce transients.

Magnetic ballasts in older HID technology offered an inherent ability to absorb transients within the ballast. However, electronic power supplies such as LED Drivers, electronic ballasts for fluorescent or HID lighting, and induction lighting ballasts are more intricate and need robust protection. LEDs themselves are also fragile, making for a natural weak points in the system, and power surges are a common cause of LED Driver failure.

Powerline disturbances are easy to circumvent with TRP's surge protectors, which clamp down on voltage spikes. These surge suppressors ae cost effective in comparison to the labor and material cost of replacing a driver or whole fixrture.

Major Applications:

- Streetlights
- LED signage
- All Outdoor Lighting Applications
- Industrial Applications, such as heavy industry manufacturing
- Any Critical 24/7 Applications

Pole-mounted outdoor lights are particularly vulnerable to surges. However, any luminaire in outdoor applications should be considered vulnerable: including parking decks, big-box retail, warehouses, tunnels, transportation & government facilities.

Magnitude and Number of Strikes

An important factor is that Surge Protectors do not work indefinitely. Surge suppressor life is directly connected to the number of strikes and magnitude of each strike.

Luminaire Surge Protectors utilize clamping devices to handle large surges. These devices reduce the transient voltage, and recover automatically after the surge. However, surge protectors age slightly with each surge strike they encounter, reducing effectiveness over time. So the strike number becomes an important indicator of product capability and life. The magnitude of each strike is important too. A few large strikes can reduce life as much as many small strikes. TRP's devices are highly-capable, at handling surge events and prolonging the life of your lighting products.

TRP Surge Protector Model Comparison

	GOOD	BETTER	BETTER	BEST	
Series	BSP3 / BSP3 (LC)	SSP3	BSP3 (20KA)	FSP3-277 (20KA)	FSP3-480 (20KA)
Number of Leads	3	3	3	4	5
MAX Surge Current	10kA	20kA L-L, L-N 12kA L-G, N-G	20kA	20kA	20kA
Luminaire Connection	Parallel	Parallel	Parallel	Series	Series
At End of Life, Fails	Shorted	Shorted	Shorted	Open	Open
At End-of-Life, Turns Off Fixture	No	No	No	Yes	Yes
Protection Status Indicator	No	No	No	Yes *(Operational)*	Yes *(Operational)*

PREMIUM SURGE PROTECTORS

These 4-leaded and 5-leaded devices protect Line, Neutral and Ground connections in accordance with IEEE / ANSI C62.41.2 guidelines. They add in-line fusing to TRP's popular surge protector design, and include an LED status indicator. At End-Of-Life, the fuse opens and shuts off the luminaire power. At the same time, the indicator light will shut off confirming there is no voltage present.

- 20,000 Amp protection
- 7.0 Amp maximum load
- Surge Location Rated Category C3
- High-temp, flameproof enclosure (85°C surface max)
- UL1449 Recognized for US & Canada
- Operate on AC or DC circuits
- 277V versions are designed to protect LED Drivers with universal input range of 120 through 277V, as well as 277V Max input
- 480V versions are designed to protect LED Drivers with universal input range of 277 through 480 volts or 347V through 480V, as well as 480V Max input

Patent Pending

FSP3-20KA Series

Model	Nominal Line Voltage	Continuous Max Current Rating	Max Continuous Operating Voltage		Measured Limiting Voltage (MLV)	Nominal Current (In)	Max Clamping Voltage 8/20 µS @ 20kA	UL1449	LED Indicator
			AC	DC					
FSP3-277-20KA	277V	7.0A	320V	420V	L-N: 1470V L-G: 1340V N-G: 2360V	10kA	2100V	•	•
FSP3-277-20KA-NI	277V	7.0A	320V	420V	L-N: 1470V L-G: 1340V N-G: 2360V	10kA	2100V	•	
FSP3-480-20KA	480V	4.0A	550V	745V	L_A-L_B: 2010V L_A-G: 2140V L_B-G: 2140V	10kA	3800V	•	•
FSP3-480-20KA-NI	480V	4.0A	550V	745V	L_A-L_B: 2010V L_A-G: 2140V L_B-G: 2140V	10kA	3800V	•	

TEST QUALIFIED FOR TEXAS DOT, DEPARTMENTAL MATERIALS SPECIFICATION FOR LED ROADWAY LIGHTING

- Operating Indicator: Green LED lights up to show unit is functioning. Unlit indicates unit needs replacing.
- Includes In-line fusing
- NI models eliminate indicator
- 1.89" Ø x 2.95" Nom, four leads
- Weight: 0.5 lbs / 197g
- Made in USA of US and imported parts
- 4.75" 1.13" x 0.75" Nom (480V model), three leads
- Weight: 0.15 lbs / 68g (480V model)
- Made in China

SSP3 Low Profile Series

Model	Nominal Line Voltage	Max Continuous Operating Voltage		Measured Limiting Voltage Mode: (MLV)	Nominal Current I_n	Max Clamping Voltage 8/20 µS @ 20kA	UL 1449
		AC	DC				
SSP3-277	277V	320V	420V	L-N: 1140V L-G: 1290V N-G: 1280V	5kA	L-G: 2600V L-N: 1800V L-G: 1800V	•
SSP3-480	480V	550V	745V	L_A-L_B: 1880 L_A-G: 2200 L_B-G: 2200	5kA	L_A-L_B: 2700V L_A-G: 3800V L_B-G: 3800V	•

- Good protection with small, linear form factor
- 20,000 Amp protection (L-N, L-L)
- 12,000 Amp protection (L-G, N-G)
- Universal input voltage ranges: up to 277V or 277-480V

See our website for TRP Surge Protector data sheets, 3D models, COA files and additional reference materials.

STANDARD SURGE PROTECTORS

BSP3 Protection up to 10,000 Amps for 120 to 480V power. Includes threaded nipple.

BSP3-LC The same protection in a compact, low-cost housing.

BSP3-20K Protection up to 20,000 Amps, for 277V or 480V power. "TN" option includes threaded nipple.

- 3-lead devices protect Line-Ground, Line-Neutral, and Neutral-Ground connections
- The BSP3 Series are 3-leaded devices that protect Line-Ground, Line-Neutral, and Neutral-Ground connections
- Suitable for luminaires tested to ANSI C82.77-5 2015
- Protects luminaires from surges and transients per IEEE/ANSI C62.41.2-2002 Guidelines
- Universal voltage input, up to the rating indicated
- Surge Location Rated Category C3
- Operate on AC or DC circuits
- High-temp, flameproof enclosure (85°C surface max)
- UL Recognized Component for USA and Canada: UL935, UL1029
- Some models Recognized to stringent UL1449 standard

BSP3 Series

- Threaded fitting for easy mounting
- 1.55" Ø x 2.82" Nom, three leads
- Weight: 0.33 lbs / 128g
- Made in USA of US and imported parts

Model	Nominal Line Voltage	Continuous Max Voltage Rating		Measured Limiting Voltage Mode: (MLV)	Nominal Current (In)	Max Clamping Voltage 8/20 µS @ 10kA	UL1449	UL935/ UL1029
		AC	DC					
BSP3-120	120V	150	200	L-N: 590V L-G: 590V N-G: 590V	3	600		•
BSP3-208-240	240V	275	350	L_A-L_B: 920V L_A-G: 920V L_B-G: 920V	3	1000		•
BSP3-277	277V	320	420	L-N: 1160V L-G: 1160V N-G: 1160V	3	1500	•	•
BSP3-347	347V	420	560	L-N: 1460V L-G: 1460V N-G: 1460V	3	1900		•
BSP3-480	480V	550	715	L_A-L_B: 1930V L_A-G: 1930V L_B-G: 1930V	3	2500	•	•

BSP3 (LC)

- Very short case for smallest BSP3 form factor
- 1.55" Ø x 1.51" Nom, three leads
- Weight: 0.22 lbs / 87g
- Made in USA of US and imported parts

Model	Nominal Line Voltage	Continuous Max Voltage Rating		Measured Limiting Voltage Mode: (MLV)	Nominal Current (In)	Max Clamping Voltage 8/20 µS @ 10kA	UL1449	UL935/ UL1029
		AC	DC					
BSP3-120 (LC)	120V	150	200	L-N: 610V L-G: 610V N-G: 610V	3	600		•
BSP3-208-240 (LC)	240V	275	350	L-N: 1050V L-G: 1050V N-G: 1050V	3	1000		•
BSP3-277 (LC)	277V	320	420	L-N: 1140V L-G: 1140V N-G: 1140V	3	1500	•	•
BSP3-347 (LC)	347V	420	560	L-N: 1250V L-G: 1250V N-G: 1250V	3	1900		•
BSP3-480 (LC)	480V	550	715	L-N: 1950V L-G: 1950V N-G: 1950V	3	2500	•	•

BSP3 (20KA)

- Great protection with multiple form factors.
- 1.55" Ø x 2.25" Nom, three leads
- Weight: 0.35 lbs / 138g
- Made in USA of US and imported parts

Model	Nominal Line Voltage	Continuous Max Voltage Rating		Measured Limiting Voltage Mode: (MLV)	Nominal Current (In)	Max Clamping Voltage 8/20 µS @ 10kA	UL1449	UL935/ UL1029	CE	Threaded Fiting
		AC	DC							
BSP3-277-20KA	277V	320	420	L-N: 610V L-G: 610V N-G: 610V	3	1600	•	•	•	
BSP3-277-20KA-TN	277V	320	420	L-N: 610V L-G: 610V N-G: 610V	3	1600	•	•		•
BSP3-480-20KA	480V	550	745	L_A-L_B: 1050V L_A-G: 1050V L_B-G: 1050V	3	3000	•	•		
BSP3-480-20KA-TN	480V	550	745	L_A-L_B: 1050V L_A-G: 1050V L_B-G: 1050V	3	3000	•	•		•