



**Thomas Research Products**

SSL Solutions Faster Than The Speed Of Light®

# LUMINAIRE SURGE PROTECTORS



## 2014 APPLICATION & PRODUCT GUIDE

# APPLICATION GUIDE

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

- Electrostatic discharge events, induced by nearby lightning strikes
- System switching

Surges are not 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.

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 relatively more fragile, and need robust protection. LEDs themselves are also fragile, making for a natural weak point 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 divert transient currents to ground. These products are designed to provide an additional level of protection in commercial and industrial applications. Inexpensive and easy-to-wire, these devices can be mounted inside the luminaire, or inside the base of the pole.

## Major Applications:

- Streetlights
- 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, transportation & government facilities.



## Strike Number:

An important factor, that many do not readily understand, is that Surge Protectors do not work indefinitely. Their life is shortened with every strike. So the strike number (or Pulse Rating) for the device is important.

Luminaire Surge Protectors utilize MOVs (metal oxide varistors) to handle large surges. These are clamping devices that short the transient to Ground, and recover automatically after the surge. However, MOVs age slightly with each surge they handle, reducing effectiveness over time. So the strike number becomes an important indicator of product capability and life. TRP's devices are highly-capable, yet inexpensive.

## TRP SURGE PROTECTOR COMPARISON

|                                   | GOOD             | BETTER    | BEST              |                   |
|-----------------------------------|------------------|-----------|-------------------|-------------------|
|                                   | BSP3 / BSP3 (LC) | BSP3-20KA | FSP3-20KA         | EOL3-20KA         |
| Number of Leads                   | 3                | 3         | 4                 | 4                 |
| Voltage compliance                | 10kV             | 10kV      | 10kV              | 10kV              |
| Current compliance                | 10kA             | 20kA      | 20kA              | 20kA              |
| Fails                             | Open             | Shorted   | Open              | Open              |
| At End-of-Life, Turns Off Fixture | No               | No        | Yes               | Yes               |
| Protection Status Indicator       | No               | No        | Yes (Operational) | Yes (End-Of-Life) |



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## PREMIUM SURGE PROTECTORS

These 4-leaded devices protect Line-Ground, Line-Neutral, and Neutral-Ground 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, they still protect by opening voltage to the fixture, turning it off.



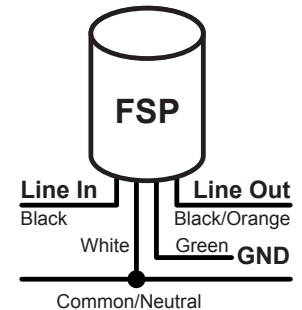
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Of Imported And Domestic Components

- 20,000 Amp protection for 277V power
- 7.0 Amp maximum load
- UL Recognized Component for the US & Canada: UL1449
- Surge Location Rated Category C3
- High temperature, flameproof plastic enclosure, 85°C max surface temp rating



### FSP3-277-20KA

- **Operating Indicator:** Lit LED shows that unit is functioning to protect the fixture. Unlit indicates unit needs to be replaced.
- Nominal Dimensions: 1.89" Ø x 2.95" H
- Weight: 0.5 lbs / 197g



| Model         | Clamping Voltage | UL1449 & CE |
|---------------|------------------|-------------|
| FSP3-277-20KA | 825              | ✓           |

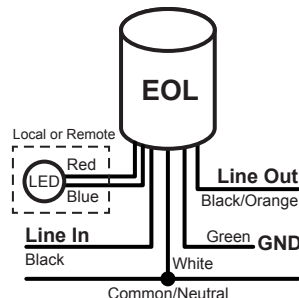
#### Pulse Rating (8 x 20 µSec)

|               |
|---------------|
| 1 @ 22,000 A  |
| 2 @ 15,000 A  |
| 15 @ 10,000 A |
| 120 @ 3,000 A |

|                | cRUus | CE  |
|----------------|-------|-----|
| I <sub>n</sub> | 10kA  | 5kA |

### EOL3-277-20KA

- **End-of-Life indicator:** LED lights up when unit needs to be replaced.
- LED indicator flashes at "power-up" to confirm that LED is functional.
- Two models:
  - L model includes local LED indicator
  - R model operates a remote-mounted LED indicator (*purchased separately*)
- Nominal Dimensions: 1.89" Ø x 3.44" H
- Weight: 0.6 lbs / 272g



| Model           | Clamping Voltage                   | LED Indicator | UL1449 & CE |
|-----------------|------------------------------------|---------------|-------------|
| EOL3-277-20KA-L | 825                                | Local         | ✓           |
| EOL3-277-20KA-R | 825                                | Remote        | ✓           |
| EOL3-LED-18-B   | LED (blue) assembly with 18" leads |               |             |

#### Pulse Rating (8 x 20 µSec)

|               |
|---------------|
| 1 @ 22,000 A  |
| 2 @ 15,000 A  |
| 15 @ 10,000 A |
| 120 @ 3,000 A |

|                | cRUus | CE  |
|----------------|-------|-----|
| I <sub>n</sub> | 10kA  | 5kA |





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## STANDARD SURGE PROTECTORS

**BSP3** series offer protection up to 10,000 Amps. Includes threaded nipple.

**BSP3-LC** series offer the same protection in a compact, lower-cost housing.

**BSP3-20K** series offer up to 20,000 Amp protection, for 277V or 480V power. Available "TN" option for threaded nipple.

- 3-lead devices protect Line-Ground, Line-Neutral, and Neutral-Ground, in accordance with IEEE/ANSI C62.41.2
- Protects against surges according to IEEE C62.41.2 C High (10kA and 10kV)
- Universal input, handling any voltage up to the rating indicated in the model number
- Surge Location Rated Category C3
- High-temperature, flameproof plastic enclosure, 85°C max surface rating
- Thermally Protected Transient Over-voltage Circuit (*BSP3, BSP3-LC models*)
- UL Recognized Component for the USA and Canada: UL935, UL1029
- Some models Recognized to stringent UL1449 standard

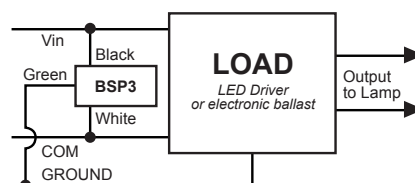
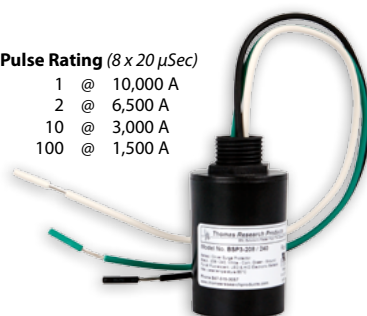
### BSP3

- Nominal dimension: 1.55" Ø x 2.82" H
- Weight: 0.33 lbs / 128g

| Model        | Clamping Voltage | UL1449 Recognized |
|--------------|------------------|-------------------|
| BSP3-120     | 345              |                   |
| BSP3-208/240 | 710              |                   |
| BSP3-277     | 840              | ✓                 |
| BSP3-347     | 1120             | ✓                 |
| BSP3-480     | 1500             | ✓                 |

#### Pulse Rating (8 x 20 µSec)

- 1 @ 10,000 A
- 2 @ 6,500 A
- 10 @ 3,000 A
- 100 @ 1,500 A



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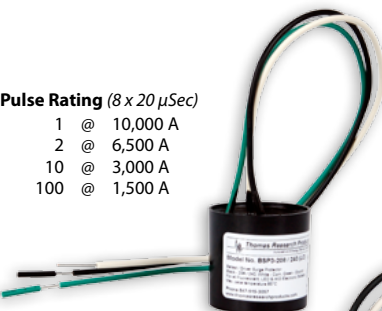
### BSP3 (LC)

- Nominal dimension: 1.55" Ø x 1.51" H
- Weight: 0.22 lbs / 87g

| Model             | Clamping Voltage | UL1449 Recognized |
|-------------------|------------------|-------------------|
| BSP3-120 (LC)     | 345              |                   |
| BSP3-208/240 (LC) | 710              |                   |
| BSP3-277 (LC)     | 840              |                   |
| BSP3-347 (LC)     | 1120             | ✓                 |
| BSP3-480 (LC)     | 1500             | ✓                 |

#### Pulse Rating (8 x 20 µSec)

- 1 @ 10,000 A
- 2 @ 6,500 A
- 10 @ 3,000 A
- 100 @ 1,500 A



### BSP3-20KA

- Nominal dimension: 1.55" Ø x 2.25" H
- Weight: 0.35 lbs / 138g

| Model         | Clamping Voltage | UL1449 Recognized |
|---------------|------------------|-------------------|
| BSP3-277-20KA | 825              | ✓                 |
| BSP3-480-20KA | 1475             | ✓                 |

#### Pulse Rating (8 x 20 µSec)

- 1 @ 22,000 A
- 2 @ 15,000 A
- 15 @ 10,000 A
- 120 @ 3,000 A



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

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