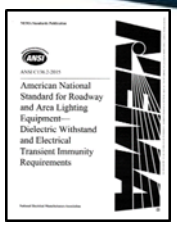


Surge Protection for LED Roadway and Area Lighting

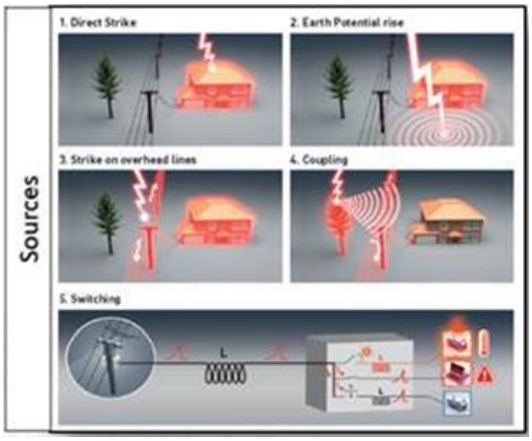
NEMA ANSI C136.2-2015

Overview of NEMA ANSI C136.2-2015

The latest release of ANSI C136.2-2015 provides surge protection requirements for luminaires and control devices. Based on performance requirements and transient immunity testing, these devices can be classified into three categories:

1. Typical – 6kV/3kA
2. Enhanced – 10kV/5kA
3. Extreme – 20kV/10kA

Threat to LED Luminaires



LED luminaires are expected to use less electricity and have a longer life span However, Lightning and switching surges can threaten or destroy these LED drivers.

These Threats can include:

Disruption

Surges can enter data lines through inductive coupling which can result in corrupt data processing

Degradation

Repeated stress can cause component degradation and shorten the lifespan of equipment. This may not result in any visual damage

Destruction

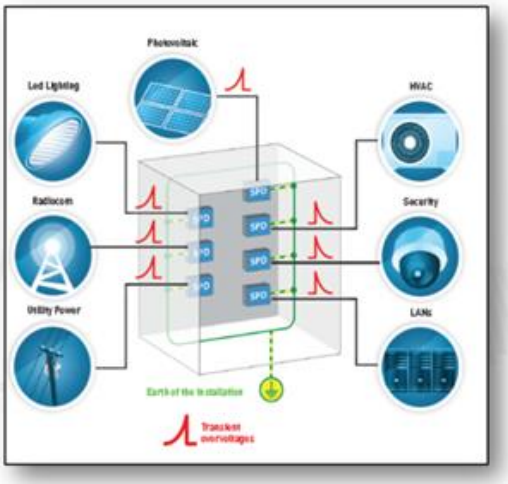
Immediate failure to a device due to a high level of energy from a surge. This can include burnt PCB's and melting electronic components

The Solution for ROI of LED Luminaires

To maintain the expected ROI, end users should select luminaires that are designed and fully tested to comply with ANSI C136.2-2015.

This table shows the recommended C136.2-2015 transient immunity levels for common outdoor lighting applications:

The "Box Concept"



Protect All Copper Wires!
Leave No Vulnerabilities!

Lighting Application	Electrical Transient Immunity Level		
	Typical (6kV/3kA)	Enhanced (10kV/6kA)	Extreme (20kV/10kA)
Building entrance, building exterior	X		
Parking garage, parking lot, tunnel		X	
Street, roadway, stadium, airport			X

Selecting the appropriate SPD

Surge Protective Devices (SPDs) should be UL 1449 Type 4CA Recognized or better and tested to specific levels of ANSI C136.2-2015. UL Type 4CA devices have gone through more safety testing than those that are only UL 1449 Type 5 Components. The C136.2-2015 level should be selected based on the location of the Lighting application shown in the chart above.

In addition, the luminaire should be tested to ANSI C136.2-2015 with the SPD installed. Coordination of the SPD is key in making sure that the luminaire and control devices pass C136.2-2015 and not only the SPD by itself passes. CITEL can help with this coordination and testing!

LED Luminaire SPDs Per Application

Application	CITEL Solution Reference	CITEL Solution Pictures
Luminaires with Drivers up to 277Vac and if UL 1449 Listed is required	MLPC1-277L-V	
Luminaires with Drivers up to 277Vac Requiring IP66 or at Base of Pole	MSB10-400	
Luminaires with Drivers up to 480Vac requiring IP66 or at Base of Pole	MSB10-480	
UL Type 1 Listed AC power protection in the Control Cabinet	DS70US series	
Ethernet Protection for Communications Equipment	MJ8-CAT5E	
Protection for Control Systems	DLA series	

UL Listing ensures the highest quality safety testing has been conducted

LED Lighting SPD Primary Location

References

ANSI C136.2-2015 Roadway and Area Lighting Equipment - Dielectric Withstand and Electrical Transient Immunity Requirements retrieved from: https://webstore.ansi.org

ANSI, 2017 American National Standards Institute retrieved from: www.ansi.org

NFPA 70 National Electrical Code, (2017) National Fire Protection Association® One Battery march Park, Quincy, Massachusetts 02169-7471

Citel Inc. general brochure retrieved from: http://www.citel.us/literature/CITEL_GENERAL_Brochure_USA.pdf