Philips Surge Protection Device G3

For Philips Outdoor LED luminaire

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Product Marketing, Professional Growth Markets Outdoor Category
3rd Jan, 2017 / v1

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Introduction

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- Light-emitting diode (LED) lighting is fast-becoming the lighting design of choice for contemporary lighting projects, both residential and commercial. Touted for its green properties such as low maintenance costs, long life and the reduction of power use, LED lighting is becoming very popular, especially in outdoor applications such as airport, highway and street lighting.

- In the case of streetlights, LEDs are sold on the basis of low maintenance and long life. So designers must ensure that their designs are well protected in order to realize the expected savings. However, one problem for LED lighting installations is protecting against transient overvoltage events.

- Two major causes of transient overvoltage have long been recognized; system switching transients and transients triggered or excited by lightning discharges (in contrast to direct lightning discharges to the power systems, which are generally destructive and for which economical protection may be difficult to obtain). Median peak currents can range anywhere between 30 to 50kA per strike.

- Typical outdoor lighting includes not only street lighting but also parking lots and walkways. In most traditional lighting designs using sodium lamps, the inductive ballast acts as lamp current limiter and also provides lightning protection for the lamp. In addition, high-pressure sodium and mercury vapor lamps are inherently rugged and therefore there is little need for protection beyond basic fire safety.

- LED lighting, on the other hand, is considerably more susceptible to overvoltage transients caused by lightning strikes for a number of reasons. For starters, LED lighting designs use switch mode power supplies (SMPS) whose inputs don’t provide the protection afforded by the inductive ballast in traditional street-lighting circuits. Furthermore, an SMPS itself requires sophisticated protection. And LEDs themselves are fragile, solid-state devices. All of these factors combine for a need for additional protection for LED lighting applications.

Importance to have SPD

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- Drivers usually have a certain level of immunity (2 to 4 kV) to transient over voltages. This is enough to pass the tests for luminaires but insufficient to withstand voltage surges caused by lightning (10 kV/10 kA or even higher) under field conditions.

- The experience of the installed base of the LED lighting industry has shown that without a proper SPD, a high percentage of luminaires reach end of life prematurely. This leads to a number of costs for the replacement of equipment, maintenance costs, continuity of service, etc which end up adversely affecting project ROIs and their image.

- Continuity of service is vital in lighting installations where good illumination is a key safety issue (crime, road safety, workplace lighting, etc.).

Importance to have SPD

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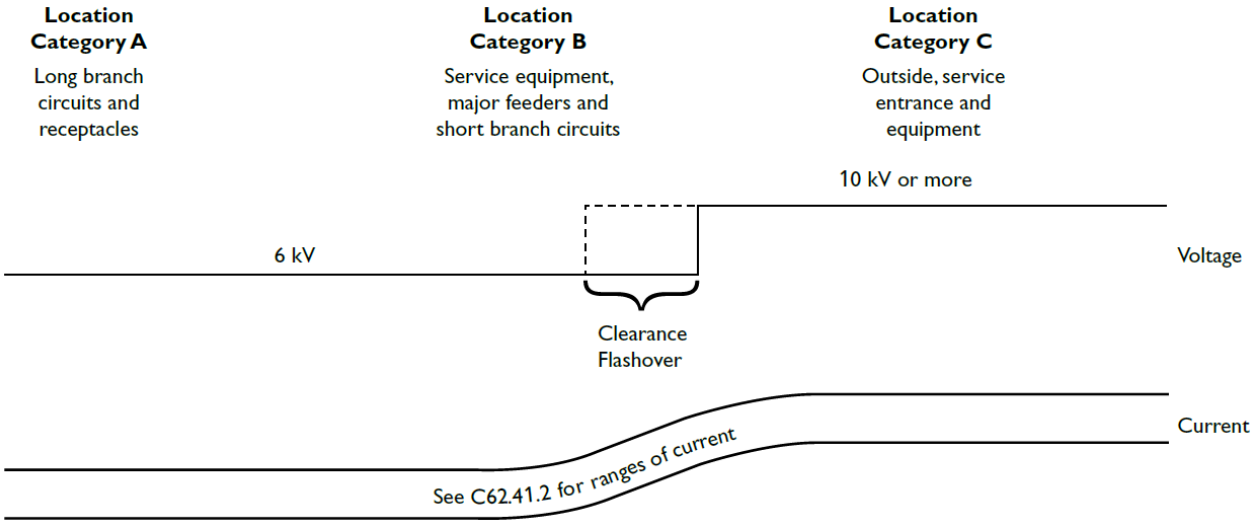
Surge Immunity (Combo wave) 1.2x50us Voc/ 8x20us Isc	United States	Europe South America Asia
LED Outdoor Luminaires	DOE MSSLC V1.0 (Based on IEEE C62.41.2) Cat C Low - 6kV/3kA High - 20kV/10kA ANSI/NEMA C136.2	IEEE C62.41.2 Low - 6kV/3kA High - 10kV/10kA
Safety Test Standards	UL1449	IEC61643-11



Outdoor Lighting Products fall under Location C based on IEEE C62.41.2

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Philips SPD's Feature

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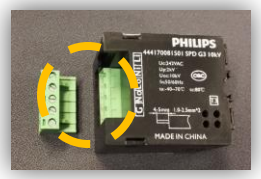
Quality

CB certification (issued by DEKRA) where all points of IEC 61643-11 have been tested.

*Up to 15KV/KA lightening surge protection
*MOV thermal protection for end of life
*SPD replacement indication
***LED fixture investment protected**

Double end-of-life Indication

Disconnection If installed in series, the SPD will turn the luminaire off when it comes to its end-of-life.
Visual LED indication
It contains an LED indicator to show active operation when Power is switched ON for ease of checking.



Easy installation & Maintenance

Terminal use quick plug.
Insert piece structure for easy handling. It is designed for tool-less replacement and should be replaced into existing installed luminaires if there are SPD replacements to be made for ease of servicing.

Applicable Philips outdoor Luminaire

Road – RoadFlair, Xceed, RoadGrace.

Tunnel – BWP352

Flood – Tango G2/G3 LED, SportsStar LED

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Specifications (Two versions)

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SPD Key Parameters	
SPD Model name	**SPD G3 10KV**
Number of ports	One port
Method of mounting	Fixed
Short-circuit current rating	150A
Uoc	10KV
Indication of disconnector operation	LED indicator:Light on->Light off
Temperature and humidity range	-40℃ to 70℃
	5% to 95% RH
Follow current interrupt rating	N-PE:100A
Residual current	≤0.1mA
Imax	N/A
Type of power system	TN-System
Temporary overvoltage rating	UT=336.6V/5s
	UT=442V/120min
Modes of protection	L-N,L-PE,N-PE

SPD Key Parameters	
SPD Model name	**SPD G3 15KV/KA**
Number of ports	One port
Method of mounting	Fixed
Short-circuit current rating	150A
Uoc	15KV
Indication of disconnector operation	LED indicator:Light on->Light off
Temperature and humidity range	-40℃ to 70℃
	5% to 95% RH
Follow current interrupt rating	N-PE:100A
Residual current	≤0.1mA
Imax	15KA
Type of power system	TN-System
Temporary overvoltage rating	UT=336.6V/5s
	UT=442V/120min
Modes of protection	L-N,L-PE,N-PE

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Dimension drawing – 10KV version

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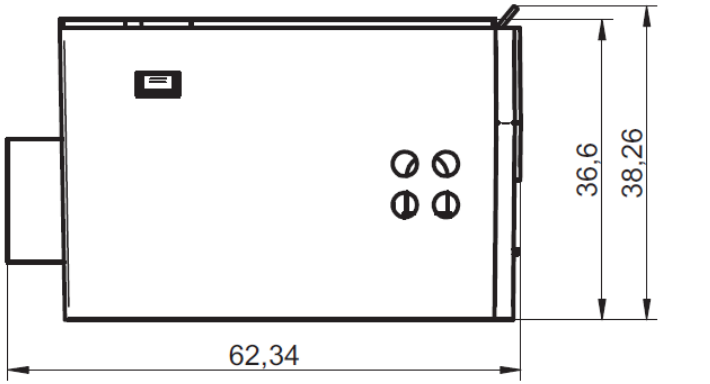
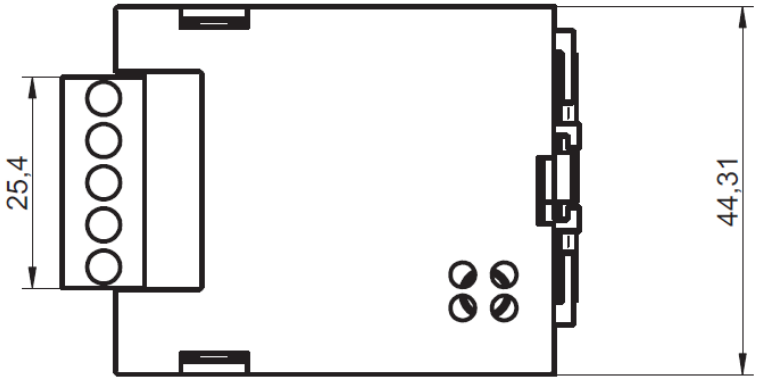
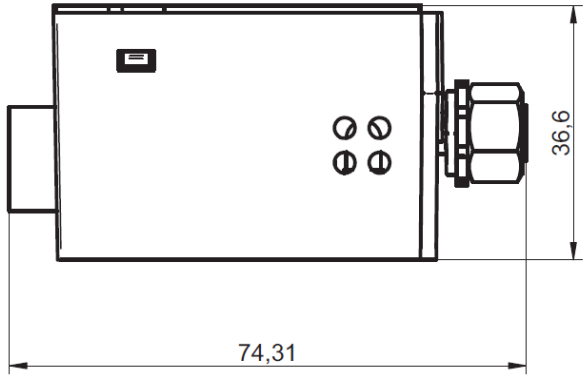
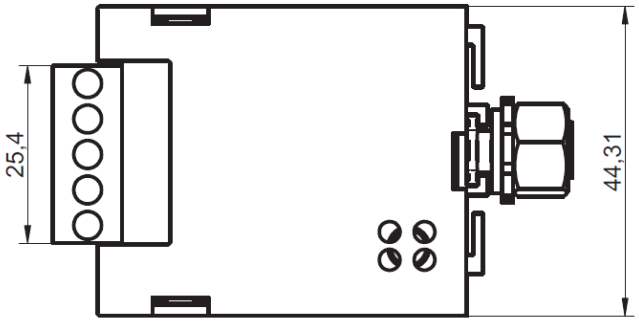
SPD G3 with metal insert accessory





SPD G3 with plastic screw insert accessory





Dimention drawing – 15KV/KA version

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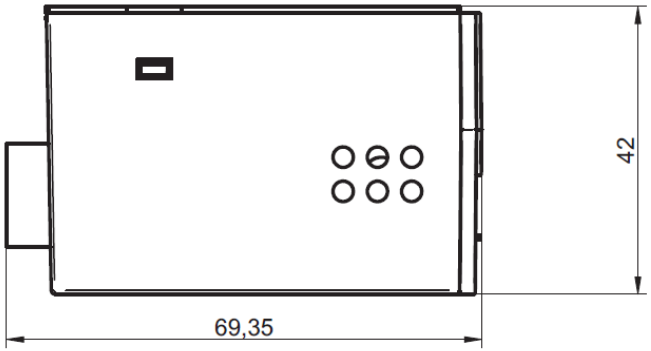
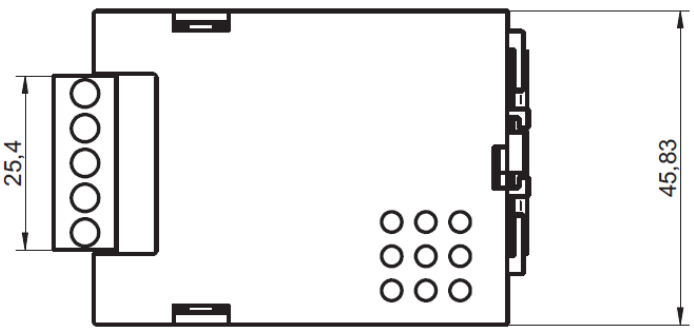
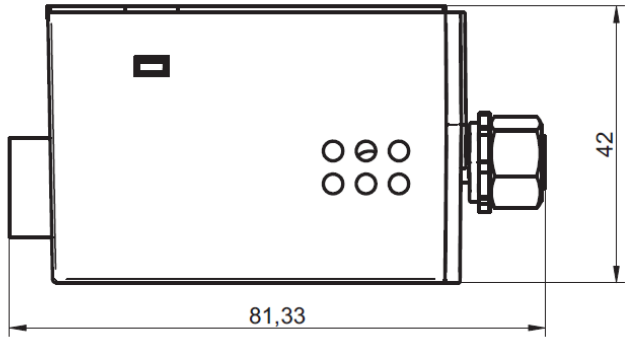
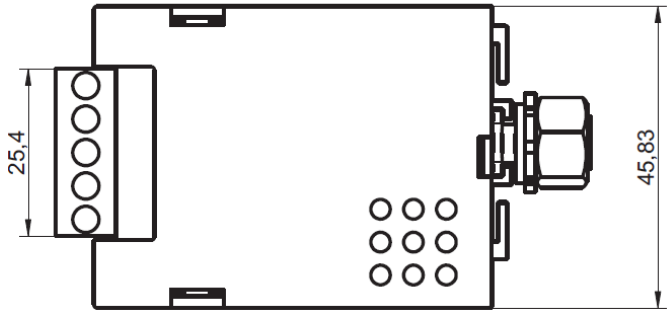
SPD G3 with metal insert accessory





SPD G3 with plastic screw insert accessory





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Dimension drawing – 15KV/KA version

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Test Report issued under the responsibility of:

DEKRA

TEST REPORT
IEC 61643-11
Low-voltage surge protective devices
Part 11: Surge-protective devices connected to low-voltage power systems- Requirements and test methods

Report Number	3186625.50
Date of issue	2016-09-08
Total number of pages	132
Applicant's name	Philips Lighting Luminaries (Shanghai) Co., Ltd.
Address	2F, Building 6, No. 1805, Huyi Highway, Malu Town, Jiading District Shanghai, China
Test specification:	
Standard	IEC 61643-11:2011 (First Edition)
Test procedure	CB Scheme
Non-standard test method	N/A
Test Report Form No.	IEC61643_11B
Test Report Form(s) Originator	OVE
Master TRF	Dated 2012-12

Test item description	Surge Protective Device
Trade Mark	PHILIPS
Manufacturer	Philips Lighting Luminaries (Shanghai) Co., Ltd. 2F, Building 6, No. 1805, Huyi Highway, Malu Town, Jiading District Shanghai, China
Model/Type reference	SPD G3 15kV/15kA
Ratings	Test class II / Type 2 & Test class III / Type 3, IP20 U_C = 242 V~, I_n = 5 kA, I_{max} = 15 kA, U_{OC} = 15 kV, I_{SCCR} = 150 A U_P = 2 kV (L→N, L→PE, N→PE);

Test item description..... : Surge Protective Device
Trade Mark..... : PHILIPS
Manufacturer ..... : Philips Lighting Luminaries (Shanghai) Co., Ltd.
2F, Building 6, No. 1805, Huyi Highway, Malu Town, Jiading District Shanghai, China
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U_C = 242 V~, I_n = 5 kA, I_{max} = 15 kA, U_{OC} = 15 kV, I_{SCCR} = 150 A
U_P = 2 kV (L→N, L→PE, N→PE);

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Installation guide

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- Caution—Risk of electric shock
- Caution—Installation and service must be performed by qualified personnel.
- Caution—Remove ALL electrical power before installation or service.
- Keep wires as straight as possible.
- Round wires rather than bending them at a hard 90 degree angle.
- Connect wires as shown in diagrams.
- Keep wires from the luminaire's terminal block to the AC/DC power supply as short as possible so that SPD is close to the AC/DC power supply.
- Do not cross/overlap protected wires (after SPD, AC or DC) with unprotected wires (before SPD, AC)
- Ensure electrical connections and mountings are correct before energizing the circuit.

Installation guide – Electrical drawing

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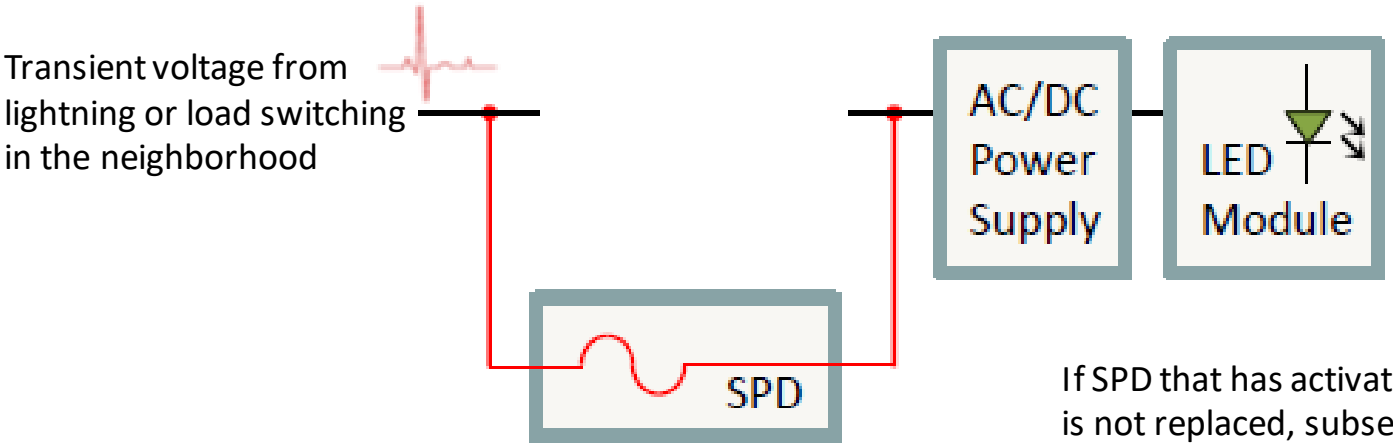

Thermal protection prevents MOV fire hazard caused by unstable line voltage and end-of-life failure

If SPD that has activated its thermal protection is not replaced, subsequent surge events can damage luminaire. Series connected SPD cuts luminaire power off to provide a clearly visible indication that SPD replacement is required.

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Product Matrix

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	Segment	Product	Product model name	Previous SPD used in luminaire	New SPD using in luminaire	Implement date
Philips Outdoor LED Luminaire	Roadlight	Xceed	BRP371/2/3	911401668601 Surge protect device 2.0 output 911401668701 Surge protect device 2.0 input	911401630003 Surge protect device 3.0 input 15kV/kA	Q4 2016
		RoadFlair	BRP391/2/4	911401668601 Surge protect device 2.0 output 911401668701 Surge protect device 2.0 input	911401630003 Surge protect device 3.0 input 15kV/kA	Q4 2016
		RoadGrace	BRP711/2	911401668601 Surge protect device 2.0 output 911401668701 Surge protect device 2.0 input	911401630003 Surge protect device 3.0 input 15kV/kA	Q4 2016
	Tunnel	FlowBase	BWP352	911401668601 Surge protect device 2.0 output 911401668701 Surge protect device 2.0 input	911401629903 Surge protect device 3.0 input 10kV	Q1/2 2017
	Floodlight	SportsStar LED	BVP621,BVP622,EVP622	NA	911401630003 Surge protect device 3.0 input 15kV/kA For 380V DMX version – Special 20KV SPD	Q4 2016
		Tango G3 LED	BVP381/2/3	NA	911401630003 Surge protect device 3.0 input 15kV/kA	Q4 2016
		Tango G2 LED	BVP281/2/3	911401668601 Surge protect device 2.0 output 911401668701 Surge protect device 2.0 input	911401629903 Surge protect device 3.0 input 10kV	Q1/2 2017

- If we use the new 10KV & 15KV SPD with the Programmable LED Drivers(Xitanium 75W .35-.7A Prog GL sXt 929000702302 & Xitanium 150W .35-.7A Prog GL sXt 929000702202), we still need to use the output SPD which is used now with old 10KV SPD to prepare LEDs.
- For SportsStar LED remote version, we shall also to use the output SPD which is used now with old 10KV SPD output (911401668601 Surge protect device 2.0 output).

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Ordering information

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Ordering information		
12NC	Product description	MOQ
911401629903	Surge protect device 3.0 input 10kV	12 PCS
911401630003	Surge protect device 3.0 input 15kV/kA	12 PCS

911401629903
Surge protect device 3.0 input 10KV
(the whole set including 3 key components Which showed in right side)

444170081501	Surge protect device 3.0 input 10kV
444170081531	SPD G3 plastic screw insert accessory
444170081521	SPD G3 metal insert accessory

For existing old SPD installation

911401630003
Surge protect device 3.0 input 15KV/KA
(the whole set including 3 key components Which showed in right side)

444170081511	Surge protect device 3.0 input 15kV/kA
444170081531	SPD G3 plastic screw insert accessory
444170081521	SPD G3 metal insert accessory

For existing old SPD installation

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Product Contact Window

Philips Surge Protection Device G3

- Product Management: Younger Yang (LED Road/Tunnel) & Wei Fujun (LED Flood)
- ETO/Customization: Wang, Hailin (hailin.wang@philips.com)

Thank you