



# Surge protection for LED street lighting

Application example

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## Application

In Germany, approximately 9,000,000 light points are installed for street and urban lighting. Increasingly, many municipalities and operators are relying on the use of LED lamps for their future lighting needs.

Compared to conventional lighting, LED lamps can reduce energy consumption by up to 70% at the same light output. A significantly higher proportion of the energy used is now converted into light rather than generating unwanted heat. As a result, the reduced energy costs are a key factor for reducing amortization time to a significant degree. That has never before been possible with previous technology.

Modern LED post lamps boast an electric strength of 4 kV. However, the surge currents and surge voltages generated in the grid can significantly exceed this value. Due to their exposed location, the lamps are also particularly susceptible to direct effects of lightning.

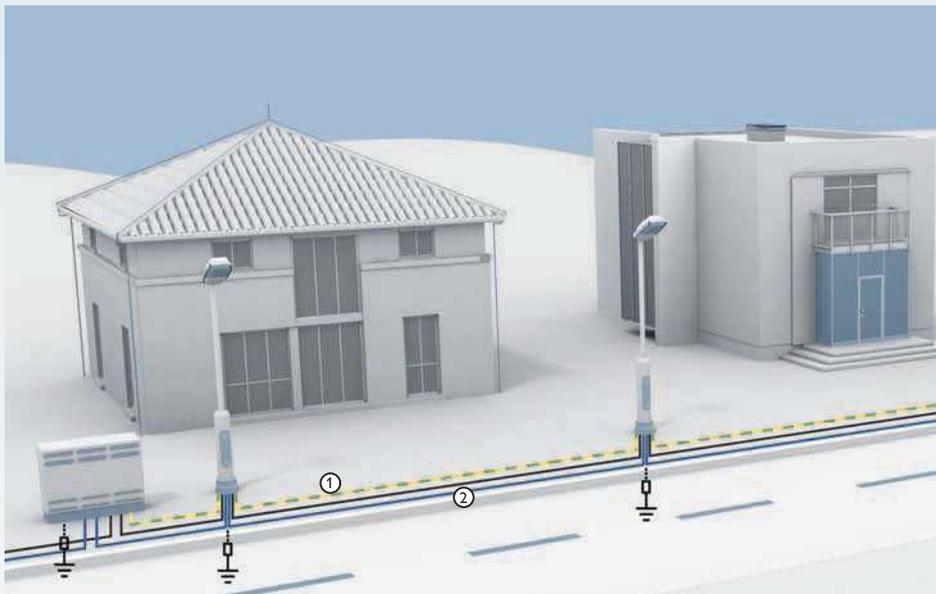


Street lamp with LED technology

Additional high costs are incurred to pay for personnel to perform repairs on defective lamps and for the necessary elevated work platform. This significantly increases the amortization time. A suitable protection concept allows users to protect LED street lighting effectively.



Cable junction box for a street lamp with integrated surge protective element



Laying the grounding cable and supply cable

## General technical design

Typically, the supply cables for a post lamp are guided through the soil and into the post from below.

The lower area of the lamp post includes a wiring space that houses a cable junction box for holding the fed-in cables and for securing the lighting.

## Grounding

Ideally, in newly planned lighting systems that are being installed, the supply cable (2) should be laid using a corrosion-resistant grounding cable (1) located above.

The distance between the grounded supply cable and the grounding cable must be 0.5 meters in accordance with DIN EN 62305-3 (Supplement sheet 2). The grounding cable equalizes the potential and prevents possible flashovers to the supply cable.

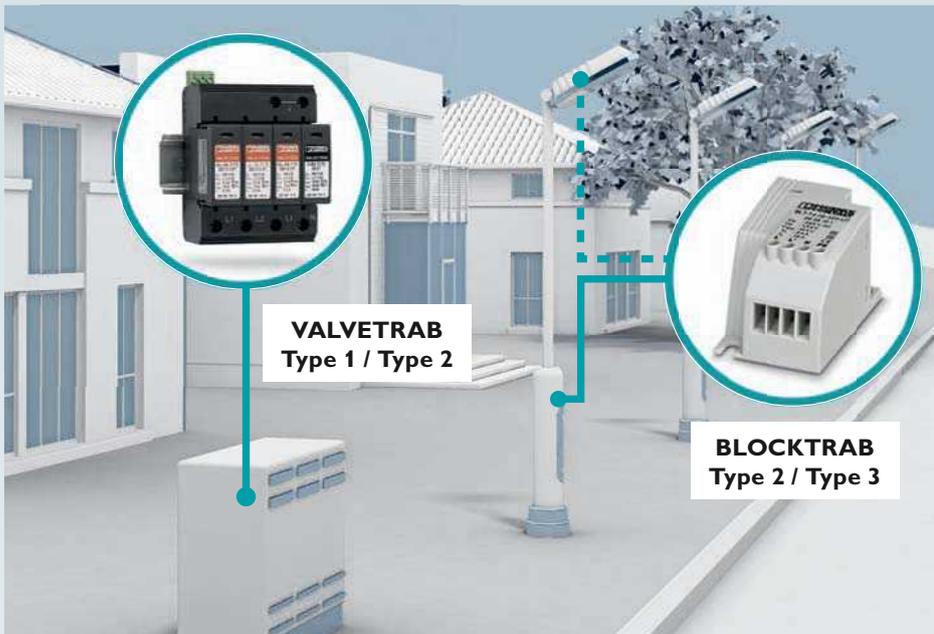
A risk assessment must be conducted to create a suitable surge voltage and lightning protection concept. The

purpose of this assessment is to evaluate the potential direct and indirect effects from lightning.

Lightning current pulses and resulting surge voltages can be caused by a wide variety of events:

- By direct effects of lightning to the lamp, supply cable or periphery of the street lighting

- By indirect effects of lightning due to capacitive or inductive coupling in the street lighting supply cable
- By switching operations, which are caused by ground faults, short circuits or when the fuses are triggered



Overview of surge protective devices and installation location

## Solution

Phoenix Contact offers you surge protection solutions that reliably protect your LED street lighting from the direct and indirect effects of lightning.

Surge protective devices should be included in the planning process of new systems, either in the street lighting distributor, cable junction box or directly in the LED lamp head. If surge protection is not taken into account in the planning stages, solutions can easily be retrofitted in the relevant areas of existing systems.

## Your advantages

- ✓ Reduced maintenance costs for lighting due to a decrease in premature failures
- ✓ Ensuring amortization times thanks to higher availability
- ✓ Optimally tailored protection concept for the whole street lighting installation
- ✓ Quick maintenance thanks to pluggable and testable protective elements
- ✓ Can be used in devices with protection classes I und II

## Products

Surge voltage protective element in the lamp head	Type	Order number
Device protection for lamps with an insulated connection (L, L', N), protection class II	BLT-T2-320-UT	2906100
Surge voltage protective element in the lamp head or cable junction box	Type	Order number
Device protection for lamps with a grounded connection (L, L', N, PE) or cable junction box, protection class I	BLT-T2-1S-320-UT	2906101
Surge voltage protective element in the street lighting distributor	Type	Order number
T1/T2 lightning current/surge protective device, with remote indication contact, 5-conductor system (TN-S or TT)	VAL-MS-T1/T2 335/12.5/3+1-FM	2800183
T1/T2 lightning current/surge protective device, with remote indication contact, 4-conductor system (TN-C)	VAL-MS-T1/T2 335/12.5/3+0-FM	2800644
Type 1 + type 2 lightning current/surge protective device, with remote indication contact, for the highest requirements up to 100 kA, 4-conductor system (TN-C)	FLT-SEC-T1+T2-3C-350/25-FM	2905469
Type 1 + type 2 lightning current/surge protective device, with remote indication contact, for the highest requirements up to 100 kA, 5-conductor system (TN-S or TT)	FLT-SEC-T1+T2-3S-350/25-FM	2905470

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