



# **Lightning and surge protection for outdoor lighting systems**

Outdoor lighting systems can be installed at the outside walls of a building and in open terrain. In both cases, it must be checked whether the outdoor lighting systems are located in lightning protection zone LPZ 0<sub>A</sub> or LPZ 0<sub>B</sub>. Outdoor lighting systems in LPZ 0<sub>A</sub> are subjected to direct lightning strikes, impulse currents up to the full lightning current and the full lightning field. In LPZ 0<sub>B</sub> they are protected against direct lightning strikes, however, they are subjected to impulse currents up to partial lightning currents and the full lightning field.

Lamp poles in LPZ 0<sub>A</sub> have to be connected to one another in the soil and to the earth electrodes of the buildings by means of suitable earthing conductors. It is advisable to use Table 7 of IEC 62305-3 (EN 62305-3) when selecting the materials and cross-sections to be used. **Table 9.2.1** shows an excerpt of the before mentioned table for practical use. The relevant material must always be selected with regard to its corrosion resistance.

It must be checked in each individual case whether measures to reduce the probability of electric shock hazard resulting from touch and/or step voltage must be taken.

To reduce touch voltages, the IEC 62305-3 (EN 62305-3) standard requires, for example, an asphalt layer with a thick-

ness of at least 5 cm in a radius of 3 m around the lamp pole (**Figure 9.2.1**).

To reduce step voltages, the IEC 62305-3 (EN 62305-3) standard requires, for example, potential control. To this end, four rings are buried around the lamp pole at distances of 1.0 m; 4.0 m; 7.0 m and 10.0 m at depths of 0.5 m; 1.0 m; 1.5 m and 2.0 m. These rings are interconnected by means of four connecting cables at right angles to each other and are connected to the lamp pole (**Figure 9.2.2**).

Material	Configuration	Earthing conductor
Copper	Stranded/ round / tape	50 mm <sup>2</sup>
Steel	Round, galvanised Tape, galvanised	78 mm <sup>2</sup> 90 mm <sup>2</sup>
Stainless steel (V4A)	Round Tape	78 mm <sup>2</sup> 100 mm <sup>2</sup>

Table 9.2.1 Minimum dimensions of earthing conductors for interconnecting lamp poles in LPZ 0<sub>A</sub> and connecting lamp poles to the earth-termination systems of the buildings

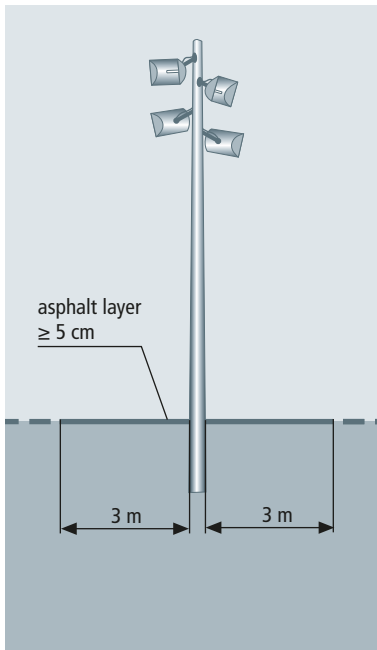


Figure 9.2.1 Standing surface insulation to reduce the risk of touch voltage in case of a lightning strike to a lamp pole

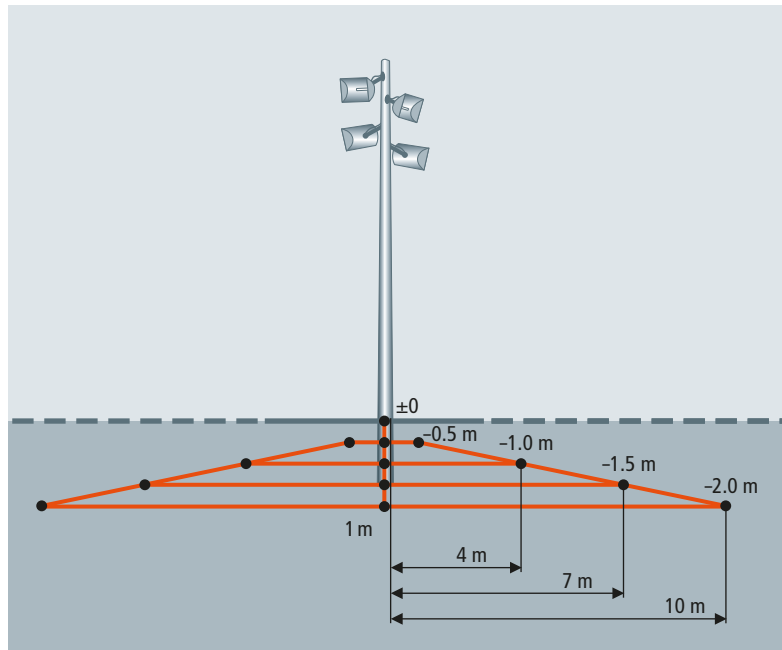
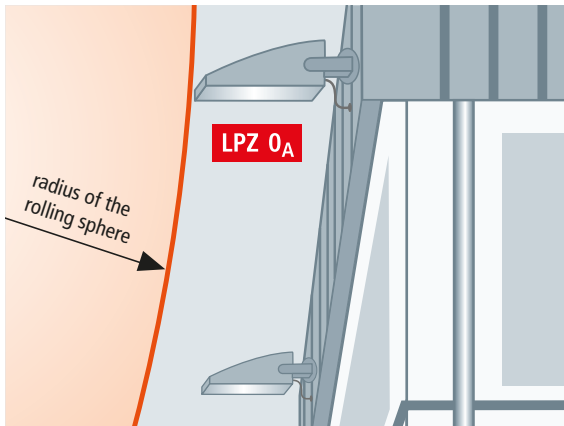
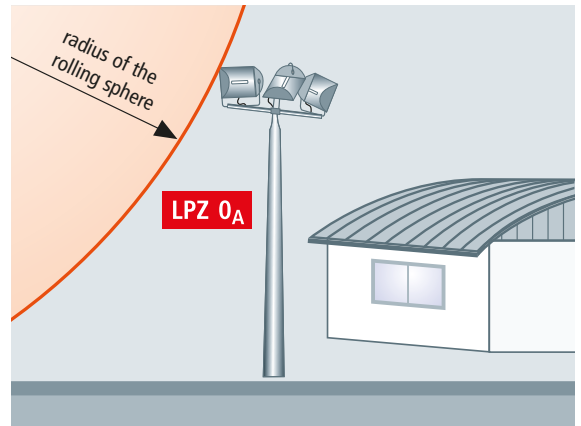


Figure 9.2.2 Potential control to reduce step voltage in case of a lightning strike to a lamp pole



Application	Type	Part No.
<b>Lightning current arresters</b>		
TN system	DB M 1 255 (2x)	961 120
TT system	DB M 1 255	961 120
	DGP M 1 255	961 101
<b>Combined arresters</b>		
TN system	DSH TN 255	941 200
TT system	DSH TT 2P 255	941 110

Figure 9.2.3 Outdoor lighting system in the form of a 230 V wall lamp in lightning protection zone  $0_A$  with lightning equipotential bonding at the entrance point into the building



Application	Type	Part No.
<b>Lightning current arresters</b>		
TN-S system	DB M 1 255 (4x)	961 120
TT system	DB M 1 255 (3x)	961 120
	DGP M 1 255	961 101
<b>Combined arresters</b>		
TN-S system	DSH TNS 255	941 400
TT system	DSH TT 255	941 310

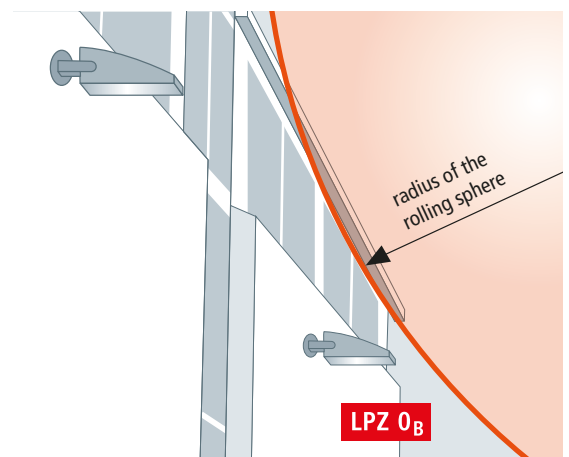
Figure 9.2.4 Outdoor lighting system in the form of a 3x 230/400 V lamp pole in lightning protection zone  $0_A$  with lightning equipotential bonding at the entrance point into the building

The recommended arrester types must be installed at the transition from LPZ  $0_A$  to 1 or from LPZ  $0_B$  to 1.

Type 1 lightning current arresters must be provided at the entrance point into the building for all outdoor lighting systems in LPZ  $0_A$ . To determine this lightning protection zone, the relevant rolling sphere is "rolled over" the outdoor lighting system from all possible directions. If the rolling sphere touches the outdoor lighting system, it is located in LPZ  $0_A$  (Figures 9.2.3 and 9.2.4).

Before installing type 1 lightning current arresters, it has to be checked whether an energy-coordinated type 2 surge arrester is already installed in the distribution board which houses the circuits of the outdoor lighting system. If this is not the case, we recommend to install combined arresters at the transition of the lightning protection zones.

Type 2 surge arresters must also be installed at the entrance point into the building for all outdoor lighting systems in LPZ  $0_B$  (Figure 9.2.5).



Application	Type	Part No.
TN system	DG M TN 275	952 200
TT system	DG M TT 2P 275	952 110

Figure 9.2.5 Outdoor lighting system in the form of a 230 V wall lamp in lightning protection zone  $0_B$

