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# Lightning

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# Protection of Low-Voltage Equipment and Systems



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**Abstract** This chapter describes the main aspects related to the protection of electrical equipment and low-voltage systems. It initially addresses the way lightning surges can occur in such systems—they can be induced by lightning strikes inside the clouds, or between different clouds; those conducted by low-voltage network conductors due to direct lightning strikes; surges from lightning strikes on medium-voltage networks; discharges that reach points near networks and are, therefore, induced in low-voltage systems; discharges that reach the LPS (Lightning Protection Systems) and return to the systems by the MEB (Main Earthing Busbar), and those induced in low-voltage systems by lightning strikes through the LPS conductors are also analyzed. The chapter details the main surge protection measures, such as earthing and bonding, shielding, routing, surge protection devices coordination, and isolating interfaces. The chapter defines the concept of Lightning Protection Zone (LPZ) for the positioning of Surge Protection Devices (SPD) and specified and detailed, types and characteristics of these devices. The chapter also covers grounding concepts, resistance and resistivity measurements, and describes the main elements and use of the earth-termination system.

**Keywords** Surge Protection Devices · Earthing · Overvoltage protection · Surge Protection Measures · Lightning Protection Zone