Lightning protection measures for cable trays



Overview

A Guide to BS EN 62305 Protection Against LightningThe standard thus sets out a defined set of lightning current parameters where protection measures, adop.

Key Takeaways

Cable trays exposed to lightning must be properly grounded, shielded, and, in some cases, integrated with building lightning protection systems according to NFPA 780 and NEC guidelines.

Key Considerations

Location and Exposure: Lightning protection is critical for cable trays installed on rooftops, outdoor areas, or other exposed locations where they may be in the path of lightning currents. Overhead cable systems can help reduce direct exposure to lightning strikes. Grounding: Metallic cable trays should be effectively grounded to ensure electrical continuity and safely conduct fault currents.

Grounding is essential for both power and signal cables, particularly when sensitive circuits are present. Grounding practices must comply with NEC and OSHA requirements, ensuring that all metal parts are bonded and capable of carrying potential lightning currents. Shielding: Cable trays can provide electromagnetic shielding against lightning-induced surges.

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Solid-bottom trays and covers offer some protection, while steel trays are effective up to approximately 100 kHz. For higher frequencies in the megahertz range, aluminum or copper shielding is more effective. EMI/RFI-shielded trays are recommended for sensitive signal or communication circuits.

Separation of Circuits: To minimize coupling of electrical noise from power wiring into sensitive circuits, power and signal cables should ideally be installed in separate trays or separated by barriers within the same tray. This reduces the risk of lightning-induced surges affecting low-voltage or communication systems. Integration with Lightning Protection Systems: NFPA 780, Standard for the Installation of Lightning Protection Systems, provides criteria for protecting buildings and associated cable systems.

Cable trays in lightning-prone areas should be considered part of the overall lightning protection strategy, including bonding to air terminals, down conductors, and grounding electrodes. Material Selection: The choice of tray material (steel, aluminum, or copper) affects both mechanical strength and shielding effectiveness. Steel is commonly used for structural and low-frequency shielding, while aluminum or copper may be preferred for high-frequency protection.

Maintenance and Inspection: Regular inspection of grounding connections, tray integrity, and shielding effectiveness is recommended to ensure ongoing protection against lightning and electrical surges. By following these guidelines, engineers and installers can ensure that cable trays are protected from lightning hazards, maintain electrical continuity, and safeguard sensitive circuits in compliance with NFPA 780, NEC, and OSHA standards.

Article Content

A Guide to BS EN 62305 Protection Against Lightning

The standard thus sets out a defined set of lightning current parameters where protection measures, adopted in accordance with its recommendations, will reduce any damage and consequential loss as

Lightning protection guide

Just like its predecessors, this edition of the lightning protection guide offers assistance in installing profes-sional lightning protection systems in line with the very latest standards.

GUIDE CABLE TRAYS TECHNICAL

The cable management system''s electromagnetic performance characterises its ability to protect its cables from external electromagnetic disturbance; if this is controlled, the data carried by the cables

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IEC 62305 & 62561 Standards for Lightning Protection Explained!

It covers risk assessment, structural protection, and surge protection measures to safeguard buildings, equipment, and human life from lightning strikes. Following IEC 62305 ensures

Lightning Protection Guide

A lightning protection system comprising external lightning protection (air-termination system, down-conductor system and earth-termination system) and internal lightning protection (light-ning

Job Hazard Analysis for Lightning Protection | PDF | Personal ...

The document provides a job hazard analysis for installation of earthing and lightning protection systems and cable tray installation at a work site. It identifies potential hazards such as electric shock, soil

Safely Installing, Maintaining and Inspecting Cable Trays

A generic guideline developed by the Cable Tray Institute indicates that cable trays should not be filled in excess of 40-50% of the inside area of the tray or of the tray''s maximum weight based on the cable

Engineers Corner | Harger Lightning and Grounding

To aid engineering firms and specification designers, we have assembled a filterable collection of generic installation details and relevant specification sections. Please contact us if you have any

TECHNICAL HANDBOOK

Protection measures, at an appropriate lightning protection level (LPL), are then implemented to reduce the risk to or below the acceptable risk. The lightning protection level determines the spacing of the

Design of Lightning Protection Systems

With the new DEHNselect SPD Tool you can plan internal lightning protection and surge protection measures, making it considerably easier to implement a professional surge protection concept.

Safely Installing, Maintaining and Inspecting Cable Trays

Cable trays are not raceways, but they are treated as a structural component of a facility''s electrical system. Cable trays are a part of a planned cable management system to support, route, protect and

Prevention is the Best Defense Against Lightning

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Best Practices for Lightning Defense Lightning strikes present a serious threat to critical facilities, leading to costly downtime, hazardous working conditions, and potentially irreversible damage to operations

Lightning Protection Overview

General Industry Information The Lightning Protection Institute is a nationwide not-for-profit organization founded in 1955 to promote lightning

Surge Arrester (Lightning Protection) System Solution: Integrated ...

External Lightning Protection System (ELPS): Primarily designed to defend against direct lightning strikes. Internal Lightning Protection System (Surge Protection, SPD System): Primarily designed to

Technical Guidelines for Cable Tray Installation and

1. Route Planning and Layout Principles Coordinate with Building Structure: Cable tray routing should align with architectural design, avoiding unnecessary

NEC Standards for Cable Trays: Grounding, Fill Capacity

The flexibility and scalability of cable trays make them an ideal choice for environments where cable density and organization can significantly impact operational efficiency. However, any

Lightning protection guide

A lightning protection system consists of both external and internal lightning protection measures. It protects people from injury, structures from damage and electrical equipment from failure due to

Technical Specification

If an LPS is deemed necessary, it must achieve the required Lightning Protection Level (LPL) and implement the necessary protection measures to achieve a tolerable risk design as indicated through

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