

Requirements for connecting cable trays to vertical shafts in low-voltage electrical shafts

Article Overview

Cable trays connecting to vertical shafts must ensure mechanical support, proper alignment, electrical continuity, and compliance with IEC 61537, NEC, and NEMA VE 1 standards.

Mechanical Support and Alignment

When connecting cable trays to vertical shafts, the system must be mechanically supported to handle the weight of cables and environmental loads. Support elements such as wall brackets, suspended supports, or center suspensions should be used at regular intervals to maintain stability and prevent sagging or misalignment . The support distance between adjacent elements should follow manufacturer recommendations and applicable standards to ensure structural integrity . Vertical bends or risers should maintain the minimum bend radius for cables to prevent damage .

Fittings and Accessories

Vertical transitions require specialized fittings such as vertical bends, T-pieces, or cross-overs to guide cables safely from horizontal trays into shafts . These fittings must be compatible with the tray type (ladder, ventilated, solid bottom, or wire mesh) and material (steel, aluminum, or fiberglass) to ensure proper load distribution and continuity . Covers or barriers may be required in enclosed shafts to protect cables from dust, moisture, or mechanical impact .

Electrical Continuity and Grounding

Cable trays often serve as a grounding path. Connections to vertical shafts must maintain electrical continuity across joints and fittings, as specified in IEC 61537 . Bonding jumpers or conductive connectors may be used to ensure a continuous grounding path, especially when trays are made of different metals or when transitioning to metallic shaft enclosures .

Fire Safety and Environmental Considerations

Vertical shafts may require fire-rated cable trays or fire-resistant coatings to comply with building codes and protect low-voltage cables in case of fire . Corrosion-resistant materials or coatings should be selected based on environmental conditions, such as humidity or chemical exposure . Proper ventilation and fill ratios must be maintained to prevent overheating of cables within the shaft .

Compliance with Standards

Requirements for connecting cable trays to vertical shafts in low-voltage electrical shafts

- o IEC 61537: Specifies mechanical strength, electrical continuity, and performance requirements for metal and nonmetallic cable trays .
- o NEMA VE 1: Provides guidelines for metal cable tray systems, including load/span designations and fittings .
- o UL 568: Covers fiberglass cable tray performance and safe application .
- o NEC/CEC: Local electrical codes may dictate installation practices, grounding, and fire protection requirements .

Summary

To properly connect cable trays to vertical shafts in low-voltage electrical shafts, ensure:

- o Adequate mechanical support and correct support spacing.
 - o Use of compatible vertical fittings and accessories.
 - o Electrical continuity and proper grounding across all joints.
 - o Compliance with fire safety, environmental, and ventilation requirements.
 - o Adherence to IEC 61537, NEMA VE 1, UL 568, and local electrical codes for safe and reliable installation.
- Following these requirements ensures structural integrity, cable protection, and regulatory compliance in vertical cable transitions.

Figure 4.50 Attachment of a channel cable tray in this method maintains the electrical requirements, bolted mechanical connection,

Grounding and bonding of cable trays There are three wiring options for providing an EGC in

This method statement covers the site installation of the cable tray & ladders and the requirements of checks to be

This standard specifies the requirements for nonmetallic cable trays and associated fittings designed for use in accordance with the

Cable Tray System FAQs National Electrical Code Question: We have a customer who would like to install the majority of cable tray

IEC 61537:2023 specifies requirements and tests for cable tray systems and cable ladder systems intended for the support and

Requirements for connecting cable trays to vertical shafts in low-voltage electrical shafts

Introduction This publication is intended as a practical guide for the proper and safe* installation of cable ladder systems, cable tray

This technical article discusses twelve different methods for laying high voltage cables. Out of

How to design cable tray? Most projects are roughly defined at the start of cable tray design. For projects that are not

Cable Tray Installation Method Statement 1. Cable Tray Installation Cable trays should be installed in accordance with the latest

This guide covers the critical steps, from selecting the right electrical cable tray and performing accurate cable fill calculations to

Cable tray and conduit system planning is a vital aspect of modern electrical infrastructure.

It provides rules for acceptable wiring methods that can be installed in cable trays, including conditions for use. It addresses uses

NEC Article 392 explains cable trays, their components, appropriate wiring methods for

When cables have to go outside of the cable trays or other conduits, they must have a suitable protection in E.M.C. terms, e.g.:

Electrical installation handbook users The electrical installation handbook is a tool which is suitable for all those who are interested in

Web: <https://bssoda.pl>

