

Add expansion joints to cable trays

Article Overview

Expansion joints in cable trays are essential to accommodate thermal expansion and contraction, preventing structural stress, misalignment, and damage to the tray or cables.

Purpose of Expansion Joints

Cable trays, especially metal ones, expand when heated and contract when cooled. Without proper expansion joints, trays can bend, tear from supports, or cause bolt elongation at splice plates, particularly in outdoor or high-temperature environments . Expansion joints absorb these movements, maintaining system integrity and ensuring safe electrical performance.

Standards and Guidelines

- o NEC Section 300-7(b) requires raceways, including cable trays, to have expansion joints where necessary to compensate for thermal expansion or contraction .
- o NEMA VE 1 and VE 2 provide detailed guidance on metallic cable tray systems, including allowable tray lengths between expansion joints, gap settings, and installation of expansion guides .
- o The number and placement of expansion joints depend on the material of the tray (steel or aluminum) and the expected temperature differential, not a fixed distance . For example, a 100°F temperature change may require an expansion joint every 128 feet for steel and every 65 feet for aluminum .

Installation Practices

- o Anchoring and Guides: Anchor the tray at the midpoint between expansion joints using hold-down clamps, and use expansion guides at other supports to allow longitudinal movement .
- o Support Placement: Supports should be within 2 feet of each side of the expansion joint splice plate .
- o Clamping: Do not clamp the tray too tightly at supports; it must be able to slide freely to prevent distortion .
- o Expansion Gap Setting: Determine the gap based on the maximum and minimum expected tray temperatures and the installation temperature using NEMA VE 1 nomographs .

Material Considerations

- o Aluminum: Lightweight, portable, and corrosion-resistant, but expands and contracts more than steel. Requires more frequent expansion joints .
- o Steel: Heavier and more stable under temperature changes, requiring fewer expansion joints, but needs stronger supports .

Safety and Performance

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Properly installed expansion joints prevent misalignment, cable damage, and electrical hazards. Expansion guides ensure smooth movement while maintaining grounding continuity, which is critical for safety . Incorrect installation can lead to tray failure, cable strain, or unsafe electrical conditions.

Summary

Expansion joints are a critical component of cable tray systems, especially in environments with significant temperature fluctuations. Following NEC and NEMA standards, selecting the appropriate material, calculating the correct spacing, and installing anchors and expansion guides properly ensures long-term reliability, safety, and structural integrity of the cable tray system .

The cable tray needs to be anchored at the support closest to the midpoint between the expansion joints with hold down clamps and

Learn how to manage thermal expansion and contraction in cable tray systems with expert

An expansion splice plate may have slotted holes to allow for movement in the cable tray. A bonding jumper is required where cable

At the midpoint between two expansion joints the tray should be secured (no longitudinal movement). At all other support locations,

Cable trays shall not be used to support any rigging for cable installation Guidelines for Engineers. Cable clamps or straps suitable

Reasonable setting of cable tray expansion joints is a key link to ensure the safe operation of the cable tray system,

Cable Tray Technical Guide A practical guide to product selection and installation This guide for engineers and installers has been

Thermal expansion and contraction of cable trays must be accounted for through the use of expansion joints. Proper installation of

Cable trays and cable ladders are indispensable components in modern electrical wiring systems, providing organized

Cable Tray Thermal Expansion Guidelines 1) Cable trays need expansion joints to allow for thermal

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contraction and expansion due

Technical data on fiberglass cable tray thermal expansion, contraction, installation, and gap settings. Includes tables and diagrams.

Comprehensive technical drawing illustrating various cable tray installation details for electrical systems. The document includes

A cable tray system may be affected by thermal expansion and contraction, which must be taken into account during installation. To

7.2.16. Where necessary, movable expansion joints should be provided for trunking runs. This should be according to

A bonding jumper is required where cable tray systems are mechanically discontinuous. Code Change Summary: New code section

Discover best practices for cable tray expansion joint installation to accommodate thermal changes, ensuring

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