Cable trays passing through building expansion joints



Overview

Managing Thermal Expansion and Contraction in Cable Learn how to manage thermal expansion and contraction in cable tray systems with expert tips on expansi.

Key Takeaways

Cable trays passing through building expansion joints must include properly designed expansion joints and guides to accommodate thermal expansion, contraction, and structural movement.

Key Considerations

Thermal Expansion and Contraction: Cable trays, especially metal ones, expand and contract with temperature changes. Steel and aluminum trays have different expansion rates; for example, a 100-foot aluminum tray can expand about 2 inches with a 100°F temperature change, while steel expands less, around 1 inch for the same conditions. Without proper accommodation, trays can bend, “snake,” or tear from supports.

Expansion Joints Placement: Expansion joints should be installed at or near building expansion joints, typically within 500 mm (about 20 inches) on both sides. The joint must allow movement equal to the building joint width plus an additional 20 mm to ensure full compensation. For long straight runs, NEMA VE 1 and VE 2 standards recommend spacing based on material and temperature differential: steel trays every 128 feet and aluminum trays every 65 feet for a 100°F differential.

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Support and Anchoring: Supports should be located within 2 feet of each side of the expansion joint splice plates. Trays must not be clamped too tightly; expansion guides should be used at all other support points to allow sliding movement. The tray should be anchored at the midpoint between expansion joints with hold-down clamps.

Splice Plates and Hardware: Standard splice plates are insufficient for expansion. Slotted or elongated holes in expansion plates allow bolts to slide as the tray moves, preventing stress and deformation. Bonding jumpers are recommended to maintain electrical continuity across expansion joints.

Material-

Specific Considerations: Aluminum trays expand more than steel, so joint spacing and guide design must account for the material's thermal coefficient. Environmental factors, such as rooftop installations or outdoor exposure, may require closer spacing or additional expansion guides. Standards Compliance: Installation should comply with NEC Section 300-7(b) and NEMA VE 1 guidelines, ensuring that trays can safely accommodate thermal and structural movements without compromising system integrity.

Summary

When cable trays pass through building expansion joints, it is essential to: Install expansion joints near the building joints with sufficient movement allowance. Use expansion guides and proper anchoring to allow sliding and prevent distortion. Select material-appropriate spacing and hardware, including slotted splice plates.

Follow NEC and NEM

A standards to ensure long-term reliability and safety. Properly designed expansion provisions prevent mechanical stress, maintain alignment, and protect both the tray and the cables from damage due to thermal or structural movement.

Article Content

Managing Thermal Expansion and Contraction in Cable

Learn how to manage thermal expansion and contraction in cable tray systems with expert tips on expansion joints, guides, and spacing to ensure

Cable Tray Expansion Joint Installation: Comprehensive Guide

Discover best practices for cable tray expansion joint installation to accommodate thermal changes, ensuring structural integrity and compliance with NEC and NEMA standards.

Cable Tray Thermal Expansion Guidelines

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1) Cable trays need expansion joints to allow for thermal contraction and expansion due to temperature changes. The NEC requires expansion joints where necessary, while NEMA standards provide

Cable Tray Thermal Expansion Guidelines

Thermal expansion and contraction of cable trays must be accounted for through the use of expansion joints. Proper installation of expansion joints is important to prevent tearing, bending, or damage

Cable tray expansion joint setting method

Reasonable setting of cable tray expansion joints is a key link to ensure the safe operation of the cable tray system, and factors such as thermal expansion compensation, vibration

Microsoft Word

The cable tray needs to be anchored at the support closest to the midpoint between the expansion joints with hold down clamps and secured by expansion guides at all other support locations. The

Expansion joint

The CEI EN 61537 standard states that the maximum acceptable longitudinal inflexion is 1/100 of the distance between supports, and that the maximum acceptable transversal one is 1/20 of tray width.

CTI-S65001_A01

It is important that cable tray installations incorporate features which provide adequate compensation for their thermal contraction and expansion. The length of the continuous cable tray straight run, and the

Best Practice Guide to Cable Ladder and Cable Tray Systems

This guide covers cable ladder systems, cable tray systems, channel support systems and associated supports intended for the support and accommodation of cables and possibly other electrical

Cable tray (expansion joints) | Information by Electrical Professionals ...

Is there anywhere else in the NEC book that says cable tray has to have an expansion splice plate every so many feet? Alls I have found is 392.44 which says- Expansion splice plates for

Cable Tray Technical Guide A practical guide to product selection and ...

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Cable Tray Technical Guide A practical guide to product selection and installation This guide for engineers and installers has been developed by ABB as a practical reference regarding cable tray

Thermal Expansion of Cable Tray

A cable tray system may be affected by thermal expansion and contraction, which must be taken into account during installation. To determine the number of expansion splice plates you

INSTALLATION GUIDE

At the midpoint between two expansion joints the tray should be secured (no longitudinal movement). At all other support locations, the tray is secured to the supports using the expansion guide portion of

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Step 2: Determine the gap setting between the cable tray expansion splice joints at the time of the installation to account properly the movement due to thermal expansion/contraction (See Figure 65

Thermal Contraction and Expansion of Cable Tray

It is important that cable tray installations incorporate features which provide adequate compensation for their thermal contraction and expansion.

Cable Tray Ladder Trunking Wire Basket Installation Guidelines

Make expansion connections wherever cable tray and trunking are crossing building expansion joints. Cable trays are to be made good at all joints or holes, first treat the surfaces with a suitable rust

The impact of cable tray thermal expansion and contraction

All materials expand and contract due to temperature changes, including cable tray systems. Understanding where and how often to allow for thermal expansion and contraction is an

Cable Tray Trunking & Ladder Installation Method Statement

Cable Trays and Trunking shall be fixed with metal bracket at an interval of 1200mm or less as per manufacturer recommendations and at 250mm from bends, intersection and termination points with

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