

How to route control lines in cable trays

Article Overview

Control lines should be routed in separate trays or compartments from power cables, using proper spacing, shielding, and tray types to prevent interference and ensure maintainability.

Separation and Interference Prevention

Control and instrumentation cables are sensitive to electromagnetic interference (EMI) from high-voltage power lines. Always keep control lines in separate trays from power cables. If sharing a tray is unavoidable, maintain sufficient physical separation and use shielded cables to minimize noise and signal distortion . Solid-bottom trays are recommended for delicate instrumentation cables exposed to EMI, while ladder trays are suitable for multi-core cables requiring good airflow .

Tray Selection

Choose the tray type based on cable characteristics and environmental conditions:

- o Ladder Trays: Ideal for heavy multi-core cables, allow airflow, and reduce heat buildup .
- o Perforated Trays: Flat-bottom trays with holes for ventilation and drainage .
- o Solid Bottom Trays: Provide maximum protection from dust, moisture, and EMI .
- o Wire Mesh (Basket) Trays: Lightweight, flexible, and suitable for low-voltage or data cables .
- o Channel Trays: Single closed channels for a few sensitive cables .

Routing and Support

- o Maintain minimum bend radius for control cables when exiting trays to prevent damage .
- o Use rung spacing of 6-9 inches (150-230 mm) for small instrumentation and control cables to support and protect them .
- o Plan routing to avoid sharp turns, congestion, and interference with other systems .
- o Ensure adequate tray width and fill capacity; for example, an 18-inch tray has an allowable fill area of 21 square inches .

Planning and Documentation

- o Define cable tray systems and lines in your project environment to manage routing efficiently .
- o Use software tools or spreadsheets to monitor tray fill, routing, and future expansion .
- o Clearly mark control line trays to alert other disciplines and avoid conflicts during installation .

Environmental Considerations

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- o Use stainless steel trays in corrosive or humid environments, such as chemical plants or coastal areas .
- o Solid covers protect sensitive cables from dust and moisture, while ventilated trays prevent heat buildup . By following these practices, control lines can be routed safely, efficiently, and with minimal risk of interference, ensuring reliable operation and easier maintenance.

2.3.7 Cables and Cable Routes A major scope of work in electrical, control, instrument, and telecomm includes cable material takeoff

In designing supports for a cable tray system, consideration should be given to the loads associated with future cable additions and

Efficient Cable Tray Design for Electric Systems Efficient Cable Tray Design for Electric Power Systems In

Learn how to install cable trays correctly. Get the ultimate step-by-step guide on setting up a seamless and reliable

Explore the essentials of cable tray layout and section design in electrical systems, ensuring optimal cable

What is cable routing? Cable routing is a structure used to protect the cable from mechanical stress and harsh situation

Cable tray installation guidelines for industrial EPC projects with support spacing, earthing, routing, safety and real site

Cable tray layout and section design forms a vital component of detailed engineering in electric and power

In the interest of safety and longevity, one cannot simply route electrical power and signal

Key Factors Impacting Cable Tray Spacing Understanding cable tray spacing is key to

SOLID-BOTTOM CABLE TRAY Providing additional cable protection, solid-bottom cable tray is sometimes preferred to support and

In the electrical wiring of buildings, a cable tray system is used to support insulated electrical cables used for power distribution,

Here are some simple, practical tips for mastering cable routing and maintaining a clean, functional workspace.

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Here, we see a motor-operated control valve with two running liquid-tight channel conductors

The document provides guidelines for installing cable in cable trays, including design considerations and formulas for calculating

Instead of large conduits, cable channel may be used very effectively to support cable drops from the cable tray run to the equipment

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