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Connection of Tubular Busbar Switchgear

Overview

Busbar Design in Switchgear: Key Principles & Best PracticesLooking for a safe, efficient, and standards-compliant busbar solution for your switchgear proj.

Key Takeaways

Tubular busbars are hollow conductors used inside switchgear to distribute electrical power efficiently while improving cooling and reducing weight.

Role of Tubular Busbars in Switchgear

A tubular busbar is a hollow metal conductor, typically made of copper or aluminum, installed inside switchgear to carry and distribute electrical current. In switchgear systems, busbars serve as the backbone, connecting incoming power sources to circuit breakers and outgoing feeders, ensuring smooth and reliable power flow . Tubular busbars are particularly advantageous in high-current applications because their hollow design reduces weight while increasing surface area, which enhances heat dissipation and thermal performance .

Integration with Switchgear Components

Inside switchgear, tubular busbars connect to various components such as:

- Circuit breakers: providing a stable path for current to flow into protective devices.
- Outgoing feeders: distributing power to downstream circuits.
- Neutral and ground bars: maintaining system stability and safety .

The connection quality is critical. Proper contact area, pressure, and torque on bolts ensure low resistance, minimize heating, and maintain mechanical stability under normal and short-circuit conditions . Tubular busbars are often supported on insulators to maintain safe spacing and prevent electrical faults .

Advantages in Switchgear Design
• Weight reduction: Hollow design reduces material usage compared to solid bars.

• Improved cooling: Increased surface area allows better heat dissipation, reducing temperature rise during high-current operation .

• Mechanical strength: Tubular busbars can withstand electrodynamic forces during short-circuit events if properly supported .

• Flexibility in layout: Easier to route in compact switchgear designs while maintaining compliance with spacing and insulation standards .
Standards and Reliability

Design and installation of tubular busbars in switchgear must comply with international standards such as IEC 61439 and ANSI/IEEE guidelines, which ensure thermal performance, mechanical strength, and electrical integrity . Proper adherence to these standards guarantees long-term reliability, safety, and efficient operation of the switchgear system.

In summary, tubular busbars are integral to switchgear, providing a lightweight, thermally efficient, and mechanically robust solution for power distribution, while their connections to breakers, feeders, and supports are critical for safe and reliable operation .

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