

How to connect the busbar to the low-voltage switchgear

Article Overview

Connecting busbars in low-voltage switchgear requires proper contact area, pressure, material preparation, and torque control to ensure safe and reliable operation.

Busbar Preparation

Before connecting, prepare the busbar surfaces to ensure good conductivity and prevent corrosion. For copper busbars, polish the contact surfaces with fine sandpaper until a mirror finish is achieved, then apply a power compound grease compliant with EN 50165. For aluminum busbars, use an aluminum-specific anti-oxidation agent and, if connecting to copper, employ copper-aluminum transition joints with insulating heat-shrink tubing rated $\geq 125^{\circ}\text{C}$ to prevent electrochemical corrosion and withstand high temperatures .

Contact Area and Pressure

The contact area between busbars is critical for heat dissipation and current flow. For main busbar continuity links, the contact area should be at least five times the cross-section of the bar ($S_c > 5 \times S_b$). Branch busbars can have smaller contact areas but must still meet this minimum. For equipment connection plates, ensure contact over the entire surface to handle nominal current . Contact pressure is provided by bolts or screws. Use the correct size, number, and torque according to the busbar dimensions and current rating. Over-tightening can exceed the bolt's elastic limit and cause copper creep, while insufficient torque reduces contact pressure and increases resistance. Devices like paint marks or brittle coatings can indicate loosening and verify proper tightening .

Mechanical Connection Steps

- o Access the busbar joint by removing protection plates in front of the bars.
- o Align the joint pieces with the busbars of adjacent cubicles.
- o Insert and tighten bolts using a torque wrench to the specified torque (e.g., 20 Nm for typical low-voltage connections). For double joint pieces, ensure both are positioned correctly at the front of the bars .
- o Reinstall protection plates to maintain safety and insulation.

Compliance and Safety

Follow IEC 61439 requirements for low-voltage switchgear, which specify minimum clearances, creepage distances, and short-circuit withstand strength. Proper spacing, support, and insulation coordination are essential to prevent overheating, electrical faults, and ensure personnel safety .

Summary Tips

How to connect the busbar to the low-voltage switchgear

- o Always polish and clean busbar surfaces before connection.
- o Apply appropriate anti-oxidation compounds for the material.
- o Ensure sufficient contact area and correct torque on bolts.
- o Use transition joints for dissimilar metals.
- o Verify compliance with IEC 61439 and manufacturer specifications. Following these steps ensures reliable, safe, and efficient busbar connections in low-voltage switchgear, minimizing maintenance and operational risks.

The IEC 61439 standard applies to busbars, especially when they are part of low-voltage switchgear and control gear

It houses the main busbar system, which is connected to the fixed upper isolating contacts of

General preliminary comments The present technical manual is intended as an aid in project design and the application of low

Low-voltage switchgear fundamentals What is switchgear? Electrical switchgear refers to a centralized collection of circuit breakers,

Main Busbars The MNS main busbar system is arranged in the rear of the switchgear. This assures a maximum distance between

A busbar is a metal bar, usually made of copper or aluminum, that carries electricity inside switchgear. It connects the

These guidelines govern the busbar processing and installation procedures for all low-voltage switchgear and power

busbar is provided in the busbar compartment above the lower A-phase horizontal busbar. For four-wire systems that have no line-to

All busbars and current carrying parts shall be manufactured to carry a current density of not more than 1.55 A/mm²; and shall be

In summary, the bus bar is the backbone of the switchboard--its design directly impacts reliability, safety, and

Busbar design in switchgear ensures safe, reliable power distribution by balancing current

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Insulated Busbars & Trunking Systems In indoors MV and LV installations, namely with high currents and

Properties and performances (design verifications) of assemblies and a guide for the carrying out of routine

Power is taken from busbar trunking by the use of tap off units which connect at defined

It is usually located at the backside of the breaker compartment, which is also

Low Voltage Bus Bars for Switchgear play a pivotal role in efficient power distribution within electrical systems. By offering

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