

Switchgear grounding busbar

Article Overview

Proper grounding busbar connections in switchgear ensure personnel safety, equipment protection, and reliable fault current dissipation.

Grounding Busbar Overview

A grounding busbar is a conductive bar, typically made of copper or aluminum, that serves as a central point for connecting all grounding conductors within a switchgear or electrical panel. It provides a low-impedance path for fault currents, ensuring that any electrical surge or short circuit is safely directed to earth, reducing the risk of electric shock, equipment damage, or fire.

Connection Principles

- **Material and Size:** Copper is preferred for its superior conductivity, while aluminum is a cost-effective alternative. The busbar size should accommodate all grounding conductors and the expected fault current.
- **Torque and Contact Pressure:** For copper busbars, the clamping force under bolts or pressure washers is critical. Current flows primarily under the highest pressure points, so proper torque is more important than full overlap of busbar surfaces.
- **Busbar Types:** Rigid solid bars are common for main connections, while flexible or laminated busbars may be used for connections to breakers or where vibration exists.
- **Earthing Conductor Sizing:** Conductor size is calculated based on fault current (I), duration (t), and material constant (k). For example, a 10,000 A fault for 0.2 s may require a 95 mm² copper conductor.

Installation Best Practices

- **Centralized Connection:** All grounding conductors from circuits, equipment, and protective devices should terminate at the busbar to maintain a uniform reference potential.
- **Separation of Functions:** Lightning protection, neutral earthing, and surge protection devices should have dedicated connections to the busbar to safely dissipate high-voltage surges.
- **Compliance with Standards:** Follow IEC 60364, IEEE 80, NEC 250, and IEC 62271-301 for grounding, busbar design, and connection torque specifications.
- **Mechanical Support:** Ensure busbars are properly supported to withstand electrodynamic forces during short-circuit events, preventing bending or deformation.

Article Content

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Proper planning of safety distances in low-voltage busbar design and installation is critical for ensuring electrical performance, operational stability, and equipment safety. Adhering to industry standards

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Theft deterrent busbar that mounts on a standard Schedule 40 ice bridge pole (3.5" or 88.9 mm nominal outer diameter) and provides a path to the buried ground ring via a connection to the post.

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Looking for a safe, efficient, and standards-compliant busbar solution for your switchgear project? Our engineering team can help you choose the right materials, layout, and design based on

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Earthing switch in MV switchgear ensures safety by grounding circuits, using interlocks and safety logic to protect personnel and equipment

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Learn how switchboard busbars are designed, sized, and verified to IEC/UL. Compare Cu vs Al, spacing, and testing. Download the RFQ checklist.

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26_05_26: Grounding and Bonding

Provide two independent grounding connections for medium voltage distribution and service transformers, switchgear and unit substations. Inspect and test grounding system in

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ABB MV Switchgear – Single Busbar Or Double Busbar?

Most switchgear installations used in industry with normal service conditions are based on single busbar arrangements. Compared to double busbar

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MV cabinets busbar earthing switch

What make/type of switchgear is this Radug? Often switchgear with withdrawable circuit breakers has a transfer earthing capability where the breaker can be racked into an alternative earth

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Switchgear Grounding | Information by Electrical Professionals for ...

Switchgear grounding Switchgear grounding In the ?ground? position, the line side is disconnected and the ?load? terminals (connected to the capacitor bank) are grounded. Those

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Chapter 16: Switchgear (Busbar) Protection

Chapter 16: Switchgear (Busbar) Protection 16.1 Importance of Busbars Busbars are the most important component in a distribution network. They can be open busbars in an outdoor switch yard, up to

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Grounding and Neutral Busbars

nVent ERICO Grounding Busbar Connector, Solid Round Conductor Connector for connecting a solid round conductor to a grounding busbar.

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Electrical Busbars

Electrical busbars conduct high current within power systems. Learn about types, maintenance, failures, and how to extend their lifespan.

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electrical

In a secondary panel (not a service panel), the grounded (neutral) bus bar is to be kept isolated from the grounding conductors (250.24 (A) (5)). In article 408, the code has this to say... National Electrical

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Busbars: Electrical Types, Sizing & Design Guide

Busbars are conductive metal bars, strips, or assemblies that collect and distribute electrical current inside power equipment. They are used where a

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Switchgear Ground Bus Design : Safety & Test Guide

This guide covers practical ground bus design for medium-voltage switchgear—from sizing calculations and bonding topology selection to EMI

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How to Ground a Busbar System: NEC Grounding Requirements

Learn how to ground a busbar system with NEC requirements. Step-by-step guide covering grounding conductors, bonding, and common mistakes to avoid.

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Copper for Busbars – Guidance for Design and Installation

For busbar systems, the maximum working current is determined primarily by the maximum tolerable working temperature, which is, in turn,

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Earthing for Electrical Switchboards: Technical Insights ...

Earthing (grounding) in LV/MV electrical switchboards is a critical engineering function, not merely a regulatory formality. It plays a key role in ensuring personnel safety, equipment

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Busbar Design Standards for MV Switchgear

Standards clearly define insulation requirements between phases and to ground, as well as the physical protection and

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Maintenance Grounding in Medium-Voltage Switchgear

Explore new approaches for safer maintenance grounding in medium-voltage switchgear. Learn about integral grounding switches and risk reduction.

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Understanding Electrical Ground Bus Bar: An Ultimate

Explore everything you need to know about the electrical ground bus bar, a critical component for safe and efficient electrical systems.

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How to earth GenieEvo busbars? | Schneider Electric UK

GenieEvo busbars can be earthed using busbar earthing panel or bus section/bus coupler panel. Details on how to earth one side of the switchgear busbars are detailed in our

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MEDIUM VOLTAGE SWITCHGEAR

alfa-12 Switchgear are withdrawable, air-insulated, tested for resistance to internal arc faults IAC AFLR in cable, busbar and CB compartments and are metal enclosed within a fourfold compartment. Our

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Grounding Busbars & Supports Protect your people and equipment during fault and transient conditions with nVent ERICO grounding solutions Proper bonding is essential to creating an equipotential plane

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Details on how to earth one side of the switchgear busbars are detailed in our Operation and Maintenance manual, Busbar earthing chapter page 26 (printed number).

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Busbar protection schemes for distribution substations

Precision and reliability are important factors when designing a busbar protection scheme. Literature review has shown that small distribution substations used for medium voltage

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Busbar Design in Switchgear: Key Principles & Best Practices

Busbar design in switchgear ensures safe, reliable power distribution by balancing current capacity, thermal performance, mechanical strength, insulation, and standards compliance.

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