

How to calculate the busbar of a high-voltage switchgear



AI Overview

Busbar sizing for high-voltage switchgear involves calculating the required cross-section, material, and spacing to safely carry rated current, withstand short-circuit forces, and limit temperature rise according to IEC and IEEE standards.

Step 1: Determine the Design Current

The first step is to calculate the design current based on the system power, voltage, and power factor. For a three-phase system:

$$I = \frac{P}{\sqrt{3} \times V \times PF}$$

where P is the load power in watts, V is the line-to-line voltage, and PF is the power factor. Apply a safety factor (typically 1.25) to account for future load growth, temporary overloads, and manufacturing tolerances.

Step 2: Select Busbar Material

Choose between copper (high conductivity, 58 MS/m) or aluminum (lighter, 35 MS/m). Copper allows smaller cross-sections for the same current, while aluminum requires larger dimensions but is cost-effective and lighter.

Step 3: Calculate Cross-Section for Continuous Current

The busbar cross-section is determined using the current density:...

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Busbar Calculator — Current Rating, Temperature Rise,

Busbar sizing calculator for copper and aluminum per IEC 61439. Current rating, temperature

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Busbar Size Calculation Formula | Aluminium and Copper Examples

The size of a busbar is determined by the current rating, type of material, shape, and cross-sectional area. Of course

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Busbar Size Calculator

Busbar size calculator is an online calculator tool to determine copper (or) aluminum busbar

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How to Calculate Busbar Size & Cross-Section for Your Load

Distribution Boards Low Voltage (LV) and High Voltage (HV) Switchgear Electric Vehicle (EV) Charger Power Cabinets Automatic

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Electrical Calculations

The Busbar and cable calculations provide maximum current ratings and voltage drop figures under varying conditions. The Busbar

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Study on Design of Main Busbar System of Large-current High-voltage ...

Through analysis on the common factors which affect the safety operation of equipment, including heating and eddy, of the large

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IEC Standard for Busbar Sizing: IEC 61439 Requirements

For busbar sizing, the primary references are IEC 61439 (for low-voltage switchgear and

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Switchgear Busbar Sizing Guide: Current, Temperature Rise, and

Understand switchgear busbar sizing by rated current, temperature rise, material, enclosure ventilation, and fault

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High Voltage Switchboard Busbar Design Basics

Learn busbar design using IEC 61439 rules and ABB guidelines for current, temperature, and clearances to keep panels safe,

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Busbar Sizing Calculator | EgSwitchgear Engineering Hub

The Busbar Sizing Calculator is designed for professionals who need to determine the proper busbar dimensions for switchgear and

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Medium Voltage technical guide

Several categories are defined, according to “the extent to which the switchgear and controlgear are intended to remain operational

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Busbar Calculator — Current Rating, Temperature Rise,

The busbar sizing calculator determines the required busbar dimensions based on the

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Busbar Design in Switchgear: Key Principles & Best

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

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A Guide to Electrical Busbars: Common Uses & Design

What Are Electric Busbars? An electric busbar (also written as bus bar) is a metallic bar, strip, tube, or rod

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Schneider Technical Guide

This document provides guidance on designing medium voltage switchgear. It discusses key considerations like voltage, current,

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How to design and size a busbar

The introduction of the IEC 61439 switchgear and control standards has had significant implications for the design and

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Low Voltage Switchgear Design & Calculation Presentation

Low Voltage Switchgear: Design & Calculation Internal OBJECTIVE • To acquire basic LVSG design & construction •

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Switchgear Rating Calculator

This comprehensive low voltage switchboard design calculator goes beyond basic Ohm's Law. It automatically applies

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Free Busbar Sizing Calculator: Current Capacity,

Professional busbar sizing calculator with current-carrying capacity per IEC 61439,

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Busbar Sizing by Current and Temperature Rise: A

IEC 61439-1 is the primary international standard governing busbar sizing in low-voltage

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Busbar Design in Switchgear: Key Principles & Best Practices

Choosing the right busbar material is a key step in switchgear design. Material choice affects electrical performance,

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Busbar Dimensions Calculation : Electrical Engineering Hub

Busbars are a critical part of electrical power distribution systems. They are widely used in switchgear, panel boards,

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Copper Busbar Calculator: Size, Derate & Short Circuit Check

A copper busbar calculator is an essential tool for electrical engineers and panel builders who must size conductors

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Bus Bar Design for an Electrical Switchboards

Standards such as IEC 61439 for “low-voltage switchgear and controlgear assemblies” define allowable temperature

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Power Engineering: Busbar size and calculation

At extra-high voltages (more than 300 kV) in outdoor buses, corona around the connections becomes a source of

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Technical Application Papers No.11 Guidelines to the construction of a ...

1 Standards on low voltage assemblies and relevant applicability The recent publication of the new Standard IEC 61439 has imposed

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Standard cubicle configurations for a medium voltage metal ...

MV metal-enclosed switchgear This technical article will shed some light on the standard design of medium voltage

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Busbar Rating -

Busbar rating is a critical specification in electrical engineering, because it determines the current-carrying

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