Model of outdoor tubular busbar

Overview

How does temperature rise affect the mechanical integrity of aluminium busbars, and what are the mitigation strategies?

Key Takeaways

Outdoor tubular busbars are available in copper or aluminium, designed for 33kV, 66kV, and 132kV substations, with hollow tubular structures optimizing current capacity and heat dissipation.

Material and Design

Outdoor tubular busbars are typically made from high-purity copper or aluminium. Aluminium busbars often use alloys such as 6061 or 6063, providing a lightweight, corrosion-resistant, and cost-efficient solution. The tubular design—a hollow round conductor—maximizes mechanical strength while reducing weight and improving heat dissipation compared to solid or flat busbars.

Copper busbars offer higher conductivity and are preferred where maximum current-carrying capacity is required.

Voltage Ratings and Applications

These busbars are designed for high-voltage outdoor substations, commonly rated for 33kV, 66kV, and 132kV. They serve as the main conductors connecting transformers, switchgear, and other substation equipment, ensuring reliable power distribution and minimal voltage drop.

© 2026 CJC FIBRE CONSULTANTS - All rights reserved

Dimensions and Current Capacity

Typical aluminium tubular busbars feature conductor diameters around 120 mm with wall thicknesses of approximately 10 mm, providing a high cross-sectional area for efficient current flow and low resistance. Copper busbars are available in similar ranges, with dimensions tailored to the required current rating and mechanical constraints. The tubular structure also enhances heat dissipation, reducing temperature rise during operation.

Connectors and Accessories

Outdoor tubular busbars are compatible with a variety of rigid, expansion, and tee connectors, and bespoke connections can be manufactured to suit specific substation layouts. Accessories include clamps, insulators, and mounting hardware to ensure safe and reliable installation.

Manufacturer Support

Companies like Alcomet and HC Aluminium provide technical support for selecting the appropriate busbar model, interpreting substation drawings, and offering quotations for custom configurations. Early consultation with manufacturers can optimize design efficiency, cost, and installation time. In summary, outdoor tubular busbars are available in copper or aluminium, with hollow tubular designs for high-voltage substations, supporting 33kV to 132kV, and are supplied with a range of connectors and accessories to meet specific installation requirements.

Article Content

Design Guide for bus bars

Important characteristics of laminated bus bars are resistance, series inductance, and capacitance. As performance parameters of electronic equipment and

Bus Bar Design and Sizing Guide | PDF | Electrical Conductor ...

How does temperature rise affect the mechanical integrity of aluminium busbars, and what are the mitigation strategies? Temperature rise can cause aluminium busbars to become soft, losing

Busbar Design and Sizing Calculations | PDF | Electric Current

Busbar Design and Sizing Calculations This document provides specifications for an electrical busbar including its size, number of phases, fault level, and temperature limit.

Tubular Busbar And Connectors | Copper And

© 2026 CJC FIBRE CONSULTANTS - All rights reserved

We offer Copper and Aluminium Tubular Busbars in a range of sizes, as well as the accessories to suit 33kV, 66kV and 132kV substations.

Aluminium Tubular Busbar Manufacturer | Lightweight and Efficient

Aluminium tubular busbars, unlike traditional flat or solid busbars, feature a tubular design with a hollow cross-section. This configuration maximizes weight reduction while maintaining high rigidity and

Business Documentation (DBD)

1. Purpose The purpose of this document is to detail the requirements of Northern Powergrid in relation to the tubular busbar systems and associated fittings detailed within this document.

Aluminium Busbars and Tubular Conductors | Hydro

Hydro manufactures extruded aluminium busbars, tubular conductors, and flat wire profiles for OEMs and panel builders. Aluminium offers strong electrical conductivity at roughly half the weight of

(PDF) Bus Bar Sizing Calculation For Substation.

Steps in bus bar design for substation: The cross section of conductors is designed on the basis of rated normal current and permissible temperature rise. The value of cross section so obtained is verified

Review of Substation Busbar Component Reliability

Of importance are equipment and component mechanical and behavior under static and dynamic conditions. Types of connections Flexible: single or multi bundle stranded conductor connections

Aluminum Tubular Busbars for HV Use

Aluminium Tubular Busbars for Hv Substat - Free download as PDF File (.pdf), Text File (.txt) or read online for free. The document discusses the advantages of using aluminum tubular busbars rather

Aluminium Tubular Busbar Manufacturer | Lightweight and Efficient

Aluminium tubular busbars are made from high-purity aluminium or its alloys (e.g., 6061, 6063). Their tubular design optimizes the balance between material usage and performance, fully utilizing

Investigation of the dynamic rating of tubular busbars in ...

With the help of a physical model, weather-dependent current-carrying capacities were calculated for an exemplary tubular busbar. The potential of dynamic rating for busbars is shown by

© 2026 CJC FIBRE CONSULTANTS - All rights reserved

Comparison of Insulated Tubular Busbars with Different

In this paper, epoxy/paper composites insulated tubular bus was investigated and a two-dimensional model was preferred in the simulation due to the axial symmetry of insulated tubular bus.

High-Performance Aluminum Tubular Busbars for Efficient Power ...

Aluminum tubular busbars are the ideal solution for modern electrical applications. Designed for efficiency and high performance, these busbars ensure stable power transmission while reducing

Busbar Design and Sizing Calculations | PDF | Electric Current

This document provides specifications for an electrical busbar including its size, number of phases, fault level, and temperature limit. It then lists inputs for designing the busbar such as the maximum load

Microsoft Word

In many instances HV outdoor substations with a high current rating are constructed more economically with aluminium tubular busbars rather than with stranded conductors.

How to Design Busbar Systems for Substations

A well-designed busbar system ensures minimal energy losses, improved reliability, and enhanced safety. This guide provides a detailed technical description, calculations, design

Aluminium Tubular Busbar Ampacity Guide | PDF

This document contains calculations for the ampacity of aluminium tubular busbars. It lists the system voltage, busbar rating, short circuit current, duration of short circuit, initial and final conductor

Related Video Reference

This video was associated with the source search result. Verify technical details against current product documentation and project requirements.

© 2026 CJC FIBRE CONSULTANTS - All rights reserved

Contact Us

Continue your research online:

Website: https://cjcconsultants.co.za
Technical inquiry: https://cjcconsultants.co.za/contact.html

This document is for preliminary research. Verify specifications against current standards, product documentation and project requirements.

© 2026 CJC FIBRE CONSULTANTS - All rights reserved