Tubular Busbar System

Overview

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.

Key Takeaways

A tubular busbar system is a hollow conductor, typically made of aluminium or copper, used to efficiently transmit high currents in substations and switchgear while offering mechanical strength, thermal stability, and reduced weight.

Overview

A tubular busbar is a hollow conductor designed to interconnect electrical equipment in substations, switchgear, and power distribution systems. Unlike solid or flat busbars, the tubular design provides a high stiffness-to-weight ratio, improved heat dissipation, and mechanical durability. These systems are widely used in outdoor primary substations up to 132kV and are suitable for both new installations and extensions of existing busbar arrangements.

Materials and Construction

Aluminium Tubular Busbars: Made from high-purity aluminium or alloys (e.g., 6061, 6063), offering lightweight, corrosion resistance, and recyclability. Aluminium is often preferred for new installations due to its lower weight and cost compared to copper. Copper Tubular Busbars: Used primarily for extensions to existing copper systems, providing excellent conductivity and compatibility with existing copper arrangements.

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Design: Tubular busbars are hollow, round tubes with optimized wall thickness to balance current-carrying capacity, mechanical strength, and heat dissipation. Typical diameters and wall thicknesses are selected to achieve low resistance and efficient current flow.

Electrical and Mechanical Properties

Current Carrying Capacity: Determined by the cross-sectional area; aluminium tubular busbars can handle continuous currents of 1250A or 2000A depending on design.

Short-

Circuit Resistance: Tubular busbars are designed to withstand short-circuit forces, wind loading, and other mechanical stresses. Thermal Management: The hollow design increases surface area, improving heat dissipation and reducing temperature rise during operation. Fittings and Connections: Open terminal systems use current-carrying half clamps and sliding or fixed fittings designed to prevent deformation and ensure reliable electrical contact.

Advantages

Lightweight: Aluminium tubular busbars weigh roughly half as much as equivalent copper conductors, simplifying installation and reducing structural support requirements. Corrosion Resistance: Aluminium and properly treated copper resist environmental degradation, reducing maintenance needs. High Conductivity and Capacity: Tubular design allows high current flow with minimal voltage drop.

Cost Efficiency: Reduced material usage and maintenance requirements make tubular busbars economically advantageous. Flexibility in Design: Can be customized for geometry, connection points, and mechanical layout using extruded profiles and 3D-CAD design tools.

Applications

Outdoor Substations: Up to 132kV, connecting transformers, circuit breakers, and other high-voltage equipment. Switchgear and Panel Builders: Aluminium tubular busbars are used in OEM equipment for compact, high-current assemblies.

High-

Voltage Transmission Lines: Tubular conductors can be adapted for overhead lines and specialized high-current applications. In summary, tubular busbar systems provide a reliable, lightweight, and thermally efficient solution for high-current electrical distribution, with aluminium and copper options tailored to specific installation requirements and standards.

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Article Content

Business Documentation (DBD)

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Tubular Busbar | Copper Or Aluminium | 33kV, 66kV

We offer Copper and Aluminium Tubular Busbars in a range of sizes to suit 33kV, 66kV and 132kV substations. Contact us for more information.

Understanding Busbar Systems in Power Engineering

Each type offers unique benefits: rectangular busbars are easy to fabricate and widely used, tubular busbars support high voltages with strong ventilation, while

Busbar Design in Switchgear: Key Principles & Best Practices

Tubular busbars are hollow, lighter in weight, and help improve cooling in high-current systems. Laminated, or sandwich,

Aluminium Busbars and Tubular Conductors | Hydro

A tubular busbar is a hollow aluminium conductor profile that offers improved stiffness-to-weight and heat dissipation compared to solid bars. Tubular conductors are used where mechanical layout or

Switchgear Accessories

As transmission capacities and voltage levels increase, outdoor substations are increasingly being equipped with tubular busbars.

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

Design Guide for bus bars

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

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Electrical Busbar

The busbar system consists of the isolator and the circuit breaker. Busbars are available in a variety of shapes and sizes. Rectangular, tubular, round, and many other shapes. A rectangular

Busbar Systems Explained: Key Terminology & Practical Selection

Explore the structure, materials (copper/aluminum), packaging types (solid, laminated, flexible), electrical properties, and engineering selection tips of busbar systems—empowering

Aluminium Busbars and Tubular Conductors | Hydro

Aluminium busbars, tubular conductors and flat wire are used in electrical systems where current carrying capacity, weight, thermal performance and efficient assembly are important design factors.

#busbars #powerdistribution #datacenters #electricalengineering

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Busbar systems

RiLine busbar systems for individual switchgear and controlgear up to 2100 A. Complete solutions for AC or DC applications.

Purpose and Types of Busbars in Electrical Engineering

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What makes busbars crucial in electrical systems? Busbars, key components in substations and distribution systems, efficiently transmit electrical energy. This article explores their

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