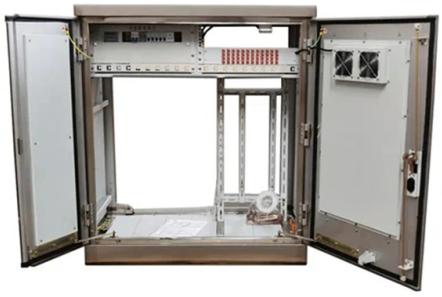
Low-voltage busbar interconnection



Overview

Catalog Extract LV 10 · 10/2022 Our busbar systems for electrical installations offer a particularly easy way of fitting distribution systems with electrot.

Key Takeaways

Low-voltage busbar interconnection provides a modular, efficient, and safe method for distributing electrical power in industrial and commercial installations.

Overview of Busbar Systems

A busbar is a solid conductive bar, typically made of copper or aluminum, used to centralize and distribute electrical current in low-voltage systems (up to 1000 V AC or 1500 V DC) efficiently. Busbars replace multiple cable connections, reducing clutter, improving reliability, and ensuring symmetrical current distribution. They are commonly used in switchgear, control gear assemblies, and power distribution networks.

Interconnection Methods

Modular Busbar Systems

Modern low-voltage busbar systems are modular, allowing easy assembly and expansion. Components include: Busbar supports and inlays: Secure the bars and provide insulation and finger-safe protection. Trunking units: Enclose busbars for horizontal or vertical distribution, often with IP66 protection for dust and water ingress.

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Adapters and reducers: Connect busbars of different types or current ratings while maintaining electrical continuity. Tap-off units: Allow connection of external loads at defined positions along the busbar trunking, typically protected by overcurrent devices.

Connection Considerations

Symmetry: Ensure equal current sharing in multi-branch systems to prevent hotspots and imbalance. Cross-sectional sizing: Determined by continuous current requirements and current density guidelines (e.g., 1. 5–2.

5 A/mm² for copper in enclosed environments),. Thermal limits: IEC 61439 specifies maximum operating temperatures (e.g., 140°C for busbars at full load) and requires verification of thermal performance. Diversity factor: Used to calculate main busbar current based on total equipment load, reducing oversizing.

Standards and ComplianceIEC 61439: Defines design verification, testing, and thermal performance for low-voltage busbar assemblies.

BS E

N 61439-6: UK-specific standard aligned with IEC 61439, covering safe installation, tap-off units, fire barriers, and interconnection practices. Compliance ensures electromagnetic compatibility, corrosion resistance, and safe operation under rated loads.

Advantages of Busbar Interconnection

Reduced installation time and labor compared to multiple cable runs. Scalability: Easy to extend or reposition distribution outlets. Safety: Finger-safe covers, fire barriers, and standardized tap-off units.

Efficiency: Lower voltage drop and heat generation due to solid conductive paths. Integration with digital tools: Planning software (e.g., SIMARIS) allows digital twin modeling, energy monitoring, and IoT integration.

Practical Tips

Plan busbar layout to minimize hotspots at terminations and studs. Use modular adapters to connect different busbar types or ratings safely. Verify thermal and current ratings against IEC/BS EN standards.

Consider future expansion and tap-off flexibility during initial design. In summary, low-voltage busbar interconnection provides a reliable, modular, and standard-compliant solution for distributing electrical power efficiently, with advantages in safety, scalability, and operational monitoring. Proper design, sizing, and adherence to IEC 61439 or BS EN 61439-6 standards are essential for optimal performance and longevity.

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Article Content

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Our busbar systems for electrical installations offer a particularly easy way of fitting distribution systems with electrotechnical components. The modular design saves space, while quick assembly contacts

Catalog Extract LV 10 · 04/2023

Take advantage of the benefits of digitalization at every step of the project with the SIVACON 8PS busbar trunking systems – from planning to installation on up to operation.

IEC 61439 Busbar Standard: A Guide to Low-Voltage

This standard covers busbars used for low-voltage assemblies, power distribution, photovoltaic power systems, and electrical energy control. The IEC

Layout 1

Busbar trunking systems (BTS) are better suited for power distribution than cables when a low magnetic induction is required, as the BTS construction facilitates the optimum arrangement of conductors to

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