Small busbar ring network power supply structure



Overview

WO2025246545A1 Provided in the present disclosure are a main busbar structure (200) for electrical connection between ring main units (6), and a ring netwo.

Key Takeaways

A small busbar ring network operates on a closed-loop configuration, allowing power to flow from multiple directions to ensure reliability and continuity of supply.

Core Principle

The small busbar ring network is based on a ring or loop configuration of busbars, where each feeder or load is connected at a point along the ring. This closed-loop design ensures that if one section of the network experiences a fault, power can still be supplied from the opposite direction, minimizing interruptions. The busbars themselves are typically made of highly conductive materials such as copper or aluminum and are sized to carry the expected load current while withstanding fault currents.

Key Components

Busbars: Form the continuous loop that distributes power to all connected loads. Circuit Breakers or Switchgear: Positioned along the ring to isolate faulty sections and protect the network. Ring Main Units (RMUs): Compact, sealed switchgear units that allow operators to connect, isolate, and protect feeders while maintaining supply continuity.

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Load Points: Transformers, distribution panels, or industrial loads connected to the ring.

Operational Advantages

Reliability: Multiple pathways for power flow reduce the risk of total supply interruption. Fault Isolation: Faulted sections can be quickly isolated using circuit breakers or RMUs, while the rest of the network remains energized. Flexibility: The network can accommodate future expansion without major redesign.

Maintenance: Sections of the ring can be de-energized for maintenance without affecting the entire network.

Protection and Control

Protection schemes are essential to ensure safety and reliability. Common methods include: Overcurrent Protection: Detects excessive current and isolates the affected section. Differential Protection: Compares current entering and leaving a zone to detect internal faults.

Distance Protection: Measures line impedance to locate faults.

Practical Applications

Small busbar ring networks are widely used in medium-voltage distribution systems (e.g., 11 kV, 12 kV, 24 kV) for industrial plants, commercial buildings, and secondary distribution substations. The use of RMUs allows operators to manage the network efficiently, ensuring continuity of supply even during faults or maintenance. In summary, the small busbar ring network combines a closed-loop busbar arrangement with protective devices and RMUs to provide a reliable, flexible, and maintainable power supply structure suitable for medium-voltage distribution.

Article Content

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Provided in the present disclosure are a main busbar structure (200) for electrical connection between ring main units (6), and a ring network power supply system (100).

WO/2025/246545 MAIN BUSBAR STRUCTURE FOR ELECTRICAL

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Substation Components—Part 5: Busbar Configurations

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Here, we provide an overview of common substation busbar configurations—Single Bus, Main and Transfer, Double Breaker/Double Bus,

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Chapter III

Introduction Pre-existing conditions, electrical arrangements or the criticality of the existing facility may limit this flexibility, but the interconnection arrangement must provide a high degree of reliability,

4 Different Types of Busbar Schemes in power substations ...

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