Connection of the outgoing busbar of the high-voltage switchgear

Overview

It connects the incoming power to circuit breakers and outgoing circuits, helping power flow smoothly and evenly.

Key Takeaways

Outgoing busbars in high-voltage switchgear connect feeders via circuit breakers, isolators, and protective devices to ensure safe power distribution and maintenance flexibility.

Busbar Role and Design

Busbars act as the main current pathways inside high-voltage switchgear, linking incoming feeders, outgoing circuits, and protective devices in a compact and safe structure. Proper busbar design ensures mechanical and thermal stability, reduces losses, and allows flexible system expansion for future feeders or bays. Materials like copper or aluminum are chosen based on current capacity, resistance, and mechanical strength, with copper offering lower resistance and compact size, while aluminum reduces weight and cost but requires larger cross-sections ( ).

Outgoing Feeder Connection

Outgoing feeders are connected to the busbar through a combination of circuit breakers, isolating switches, and earthing switches. Each feeder typically includes: Circuit Breaker: Provides switching and protection against overcurrent or short circuits. Feeder Disconnecting (Isolator) Switch: Allows safe isolation of the feeder from the busbar for maintenance.

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Earthing Switch: Ensures the feeder is safely grounded during maintenance or fault conditions. Current Transformers (CTs) and Potential Transformers (PTs): Installed for protection and measurement; CTs are usually placed on the busbar side of PTs to detect faults in the PTs ( ). Surge Arresters and Coupling Devices: Protect against transient overvoltages and enable communication/control signals if required ( ).

In installations without individual PTs for each feeder, the PT is mounted on the busbar to monitor voltage without being affected by individual feeder faults ( ). Busbar ConfigurationsHigh-voltage switchgear may use single or double busbar systems. Double busbar arrangements allow: Isolation of one bus for maintenance without interrupting supply.

Flexible operation of feeders from either bus. Coupling fields to connect both busbars via a circuit breaker for operational flexibility ( ). The outgoing feeder is connected to the busbar through the circuit breaker, which can be controlled manually or remotely via protective relays or SCADA systems.

Auxiliary contacts on isolators and breakers provide status indication and interlocking to prevent unsafe operations ( ).

Summary

The outgoing busbar connection in high-voltage switchgear ensures safe, reliable, and flexible power distribution. It integrates circuit breakers, isolators, earthing switches, and measurement devices to protect equipment and personnel while allowing maintenance and future expansion. Proper busbar design and configuration are critical for operational efficiency and system safety ( ).

Article Content

Busbar Design in Switchgear: Key Principles & Best

It connects the incoming power to circuit breakers and outgoing circuits, helping power flow smoothly and evenly. Good busbar design helps

High Voltage Switchboard Busbar Design Basics

What is the main purpose of a busbar in a high voltage switchboard? A busbar provides a solid, low-resistance path to distribute power from incoming sources to multiple outgoing feeders within the

Circuit configurations (single line diagrams) for HV and MV switchgear ...

Installations without voltage transformers in each feeder are also found: in this case the voltage transformer is placed at the busbar. In addition, the feeders are equipped with surge

Busbars and Connectors in HV and EHV installations

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In HV and EHV installations and in outdoors MV installations bare busbars and connectors are used and the conductors may be tubular or stranded-wires.

Air-insulated medium voltage switchgear, 12 kV/17.5 kV ...

When setting up the switchgear in two rows, the busbar sectionalizing can be combined with a bar connection between the two sets of switchgear. In equipment without busbar sectionalizing, a direct

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