

Article Overview

For small busbars in Serbia, low-impedance differential relays like Toshiba GRB100 or GE B90, and high-impedance or distributed protection IEDs from Hitachi Energy, provide reliable, low-noise busbar protection.

Key Considerations for Small Busbar Protection

1. Protection Type:

- o Low-impedance differential relays (e.g., Toshiba GRB100) are ideal for small busbars, offering fast fault detection and clearance with minimal noise due to precise current comparison and optional CT saturation countermeasures .

- o High-impedance schemes (e.g., GE B90) are suitable for applications where CT mismatches or long feeder runs exist, providing sub-cycle tripping and low operational noise .

- o Distributed protection IEDs (Hitachi Relion series) allow flexible deployment across small busbars, supporting both phase-to-phase and phase-to-earth faults with fast clearance and low electromagnetic interference .

2. Busbar Configuration:

- o Single, double, one-and-a-half, or ring busbars can be protected using these relays. Centralized or decentralized architectures are available depending on the substation layout .

- o Phase-segregated protection ensures selective fault isolation, reducing unnecessary tripping and operational noise .

3. Noise Reduction Features:

- o Modern numerical relays minimize mechanical noise by eliminating electromechanical components.

- o Optional undervoltage fault detectors and CT saturation countermeasures reduce false trips and associated relay actuation noise .

- o Sub-cycle tripping times (as low as 0.75 cycles in B90) reduce prolonged fault currents, further limiting acoustic and electromagnetic noise .

4. Additional Functionalities:

- o Integrated metering, data recording, and communication capabilities allow monitoring without additional noisy devices .

- o Circuit breaker failure protection and optional remote control enhance reliability while maintaining low operational noise.

5. Implementation Tips:

- o Ensure proper CT selection and ratio matching to avoid false differential currents.

- o For small busbars, centralized low-impedance relays are often simpler and quieter, while distributed IEDs provide flexibility for complex layouts.

- o Compliance with IEC61850 standards ensures interoperability and future-proofing .

Recommended Solutions

Relay protection for Serbian small busbars with low noise

- o Toshiba GRB100: Low-impedance differential relay, suitable for single or double busbars, low-noise operation, optional undervoltage and breaker failure protection .
- o GE B90: High-impedance bus protection, sub-cycle tripping, scalable for up to 24 feeders, low-noise numerical operation .
- o Hitachi Relion Busbar IEDs: Distributed protection, supports phase-to-phase and phase-to-earth faults, IEC61850 compliant, low-noise digital operation .
- o ABB Busbar Protection Relays: Phase-segregated short-circuit protection, suitable for small busbars, low-impedance applications, and residual earth-fault protection . By selecting a numerical low-impedance or high-impedance relay with integrated digital features, Serbian small busbars can achieve reliable protection with minimal operational noise, while maintaining flexibility for future expansion or reconfiguration.

For bus differential protection, high- or low-impedance relays are normally used. High-impedance relays can handle

The REB670 IED (Intelligent Electronic Device) is designed for the protection and monitoring of busbars, T

This document discusses busbar protection in substations. It is divided into 8 parts that cover general principles, operating principles

The B90 Bus Differential Relay provides protection of multiple segment busbars, using a phase-segregated, centralized protection

The differential protection should maintain security during CT-SAT for external faults while keeping high sensitivity and

REB611 is a dedicated busbar protection relay designed for phase-segregated short-circuit protection, control, and supervision of

Numerical Busbar Protection Relay Scheme The MiCOM P740 numerical busbar protection scheme provides scalable and complete

Eventually, electrical system relay protection typically, will not give the needed cover. Such protection may be sufficient for small

Safe and economic connection ABB busbar systems enable safe and easy cross-wiring of miniature circuit breakers, residual current

ABB's busbar protection is designed for phase-segregated short-circuit protection, control, and supervision of

single busbars. The

In the early days, only conventional over-current relays were used for busbar protection. The goal was to ensure that

GE Multilin provides protective relays that support all busbar protection techniques, including overcurrent, high-impedance

GRB100 is a numerical low impedance differential relay for busbar protection, available in centralised and de-centralised

Busbar protection (BBP) This technical article discusses criteria and requirements for

A general overview of busbar protection principles is given starting from simple interlocking schemes for single-incomer

Precision and reliability are important factors when designing a busbar protection scheme.

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