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SIPROTEC 7SS85

Busbar Protection

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Description

The SIPROTEC 7SS85 busbar protection is a selective, safe, and fast protection against busbar short circuits in medium-voltage systems, high-voltage systems, and systems for very high voltage. The proven, fast, and reliable algorithms from the SIPROTEC 7SS52 in conjunction with the flexible, scalable, open, and user-friendly SIPROTEC 5 platform set the new bar for the SIPROTEC 7SS85 busbar protection.

The SIPROTEC 7SS85 is the right solution for interoperable, compatible busbar protection as per IEC 61850, a cost-effective extension of your electrical power system with busbar protection or as the replacement for the SIPROTEC 7SS52.

ONE platform, ONE device, ONE configuration tool for all applications, voltage levels, and busbar-protection systems. The new SIPROTEC 7SS85 offers various options for the busbar-protection architecture: Centralized, distributed or – for the 1st time in the history of busbar protection – a hybrid busbar-protection system where process information can be connected directly as well as measured by distributed bay devices.

The selection of the device base functionalities (significant features) and the modular hardware structure allow optimum adaptation of the SIPROTEC 7SS85 to a large variety of system configurations and functional requirements up to a complete station protection.

Functions

Characteristic Key Values of SIPROTEC 7SS85

- Phase-selective measurement and display

- Selective tripping of faulty bus zones

- Disconnector-independent check zone as additional tripping criterion

- Shortest tripping times to ensure network stability and minimize damage to the system:
  - Centralized busbar protection:
    3 ms/7 ms (relay type HS/type F)
  - Distributed busbar protection:
    8 ms/12 ms (relay type HS/type F)

Busbar Protection SIPROTEC 7SS85

- Highest stability in case of external faults, even in case of transformer saturation, through stabilization with flowing currents

- Operate curve with freely adjustable characteristic curve sections

- Additional operate curve with increased sensitivity for lowcurrent errors, for example in resistance-grounded power systems

- Fast recognition of internal or external errors requires only 2 ms of saturation-free time of the current transformers

- Using closed iron core or linearized current transformers in a plant is possible

- Adaptation of different current transformer ratios per parameterization

- Straight-forward dimensioning of current transformers and stabilization factor

- 3 interacting methods of measurement allow minimum tripping times after busbar faults and ensure maximum stability in case of large short-circuit currents

- The integrated circuit-breaker failure protection (CBFP) detects circuit-breaker faults in case of a busbar short circuit and provides a trip signal for the circuit breaker at the line end. The adjacent busbar trips if a circuit breaker in the bus coupler fails.

Selective and Safe

- Expensive monitoring of current-transformer circuits, measured-value acquisition and processing, and trip circuits to avoid overfunction and underfunction of the protection and effort reduction for routine testing.

- Various control possibilities, such as bay out of order, acquisition blocking from disconnectors and circuit breakers, blocking of protection zones, or circuit-breaker failure protection make the adaptation to operationally-caused special states of your plant easier.

- 1/3-pole or 3-pole circuit-breaker failure protection using the integrated disconnector image for tripping all circuit breakers of the busbar section affected

- End-fault protection for the protection of the section between circuit breaker and current transformer for feeders and bus couplers

- Direct tripping of protection zones through external signals

- Release of the tripping of a protection zone through additional external signals

- Release of tripping through additional, external phase-selective signals

- Cross stabilization against overfunctions in case of transformer influence on the secondary side

- Bus coupler differential protection for fault clearing in couplers with 2 current transformers

- With distributed busbar protection, any feeder protection function can also be implemented using any modular SIPROTEC 5 device as the bay device.

- Extensive cybersecurity functionality, such as role-based access control (RBAC), logging of security-related events, signed firmware, or authenticated IEEE 802.1X network access

Benefits

- Fast and secure – Proven and reliable algorithms since 1989

- Cyber Secure – Compliant with NERC CIP and BDEW white paper requirements

- Robust – Highest availability even under extreme environmental conditions

- Consistent – One platform, one device, one configuration tool

- User-friendly – Configuration by the user during the entire service life

- Clear – Fully graphical engineering and online plant visualization with DIGSI 5

- Flexibility – Centralized, decentralized or combined (hybrid) architecture

- Universal – SIPROTEC 5 protection devices and merging units as a bay unit

- Powerful – Busbar protection device as centralized feeder protection

- Economical – Extension of power-system protection with busbar protection

- Interoperable – Compatible with merging units according to IEC 61850 Rev. 2.1

The performance and flexibility of the SIPROTEC 7SS85 allow the implementation of the most varied, customer-specific secondary- equipment concepts and solutions, such as:

- IEC 61850 compatible and interoperable distributed busbar protection

- Cost-efficient extension of power-system protection using busbar protection

- Replacement solution for the proven SIPROTEC 7SS52 in the electrical power system