



ENERGY AUTOMATION PRODUCTS

SIPROTEC 7SD80

Line Differential Protection

Description

The line differential protection SIPROTEC 7SD80 has been conceived for selective line protection of power cables and overhead lines up to 24km for all kind of starpoint configurations.

The implemented phase comparison algorithm is a fast and stable method for line protection in industry and distribution grids. The protection interface communication is carried out directly without external equipment over copper wires, optical fibers or both in redundancy. The wide scope of non directional and directional functions can be applied miscellaneously as emergency functions as well as backup functions. For instance, the SIPROTEC 7SD80 enables simplified and cost saving concepts for meshed grids and busbar protection by means of reverse interlocking.

Fast and selective tripping is guaranteed even if the communication fails between the relays. The scope of functions includes protection functions as well as functions for control and monitoring. The interoperable connectivity to substation control systems is given by standard protocols like IEC 61850.

The general concept of redundancy for protection and its communication gets completed by Ethernet redundancy protocols (PRP, HSR, RSTP) and thus increases the total system availability. Integrated functions for commissioning help and easy settings lead to short commissioning times

Applications

Line protection

SIPROTEC 7SD80 devices are suitable as selective line protection for application in high-voltage and medium-voltage systems of all types of neutral designs (solid, low-resistance or high-resistance earthed, isolated or compensated). The SIPROTEC 7SD80 is especially suitable as a replacement for analog differential protection applications.

Apart from the main protection function, the line differential protection, SIPROTEC 7SD80 offers a lot of additional protection functions. These can be used in parallel as a backup protection function, or as an emergency function if the main protection function fails, and they complement the range of functions of 7SD80 for application in transmission lines.

Hardware

- 4 current transformers
- 0/3 voltage transformers
- 3/5/7 binary inputs (thresholds configurable using software)
- 5/8 binary outputs (2 changeover)
- 1 life contact
- Pluggable current and voltage terminals.

Highlights

- Integrated interfaces for exchanging differential protection data (fiber-optic up to 24 km / 15 miles and/or two-wire copper cables up to 20 km / 12 miles)
- Transmission of a circuit-breaker intertripping signal and 16 further binary signals to the opposite end.
- Secondary current transformer values (1 A / 5 A) settable using DIGSI
- 9 programmable function keys
- 6-line display
- Buffer battery exchangeable from the front
- USB front port
- 2 additional communication ports
- Integrated switch for low-cost and redundant optical Ethernet rings
- Ethernet redundancy protocols RSTP, PRP and HSR for highest availability
- Relay-to-relay communication

Functions

- Differential protection, line (87L)
- 3I0 differential protection (87N L)
- Ground-fault differential protection for systems with resonant or isolated neutral (87Ns L)
- Definite time-overcurrent protection with delay for phase and earth (50TD/50N TD (3 stages)
- Inverse time-overcurrent protection (phase and ground) (51/51N)
- Inrush current detection
- Circuit-breaker failure protection (50BF)
- Trip-circuit supervision (74TC)
- Lockout (86)
- Circuit breaker intertripping scheme (85 DT)
- Undervoltage/overvoltage protection (27/59)
- Underfrequency/overfrequency protection (81 U/O)
- Directional time-overcurrent protection (phase and ground) (67/67N (3 stages))
- Automatic reclosing (79)
- Flexible protection functions for current, voltage, power, $\cos \varphi$, frequency
- Thermal overload protection (49)
- Control functions

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