

SIEMENS

Ingenuity for life

SIPROTEC 7SD82

Line differential protection relay

www.siemens.com/siprotec

Description

The SIPROTEC 7SD82 line differential protection has been designed particularly for the cost-optimized and compact protection of lines in medium-voltage and high-voltage systems. With its flexibility and the high-performance DIGSI 5 engineering tool, the SIPROTEC 7SD82 device offers future-oriented solutions for protection, control, automation, monitoring, and Power Quality - Basic.

Main function	Differential protection for medium-voltage and high voltage applications Interoperability of SIPROTEC 5 and SIPROTEC 4 line protection devices
---------------	---

Tripping	3-pole, minimum tripping time: 19 ms
----------	--------------------------------------

Inputs and outputs	4 current transformers, 4 voltage transformers, 11 or 23 binary inputs, 9 or 16 binary outputs
--------------------	--

Hardware flexibility	2 different quantity structures for binary inputs and outputs are available in the 1/3 base module. Adding 1/6 expansion modules is not possible; housing width available with large or small display.
----------------------	--

Housing width	1/3 × 19 inches
---------------	-----------------

Applications

- Line protection for all voltage levels with 3-pole tripping
- Phase-selective protection of overhead lines and cables with single-ended and multi-ended infeed of all lengths with up to 6 line ends
- Transformers and compensating coils in the protection zone
- Detection of ground faults in isolated or arc-suppression-coilground power systems in star, ring, or meshed arrangement
- Serial protection communication with SIPROTEC 5 and SIPROTEC 4 devices over different distances and physical media, such as optical fiber, two-wire connections, and communication networks



SIPROTEC 7SD82 Line Differential Protection Device

- Phasor Measurement Unit (PMU)
- Detection and recording of power-quality data in the medium voltage and subordinate low-voltage power system

Functions

DIGSI 5 permits all functions to be configured and combined as required.

- Minimum tripping time: 19 ms
- Main protection function is differential protection with adaptive algorithm for maximum sensitivity and stability even with the most different transformer errors, current-transformer saturation and capacitive charging currents
- Directional backup protection and various additional functions
- Detection of ground faults of any type in compensated or isolated electrical power systems using the following functions: 3I0>, V0>, transient ground fault, $\cos \varphi$, $\sin \varphi$, dir. Detection of intermittent ground faults, harmonic detection and admittance measurement
- Ground fault detection using the pulse detection method
- Detection of current-transformer saturation

Compact and communicative

- Fault locator plus for accurate fault location with inhomogeneous line sections and targeted automatic overhead-line section reclosing (AREC)
- Arc protection
- Automatic frequency relief for underfrequency load shedding, taking changed infeed conditions due to decentralized power generation into consideration
- Power protection, configurable as active or reactive power protection
- Directional reactive power undervoltage protection (QU protection)
- Detection of current and voltage signals up to the 50th harmonic with high accuracy for selected protection functions (such as thermal overload protection) and operational measured values
- PQ - Basic: Voltage unbalance; voltage changes: overvoltage, dip, interruption; TDD, THD, and harmonics
- Control, synchrocheck and switchgear interlocking protection
- Graphical logic editor to create powerful automation functions in the device
- Single-line representation in small or large display
- Integrated electrical Ethernet RJ45 for DIGSI 5 and IEC 61850 (reporting and GOOSE)
- 2 optional pluggable communication modules, usable for different and redundant protocols (IEC 61850-8-1, IEC 60870-5-103, IEC 60870-5-104, Modbus TCP, DNP3 serial and TCP, PROFINET IO)
- Serial protection data communication via optical fibers, two-wire connections and communication networks (SDH networks, MPLS electrical power systems, for example using IEEE C37.94, and others), including automatic switchover between ring and chain topology.
- Reliable data transmission via PRP and HSR redundancy protocols
- Extensive cybersecurity functionality, such as role-based access control (RBAC), protocolling security-related events. signed firmware or authenticated IEEE 802.1X network access.
- Simple, fast and secure access to the device via a standard Web browser to display all information and diagnostic data, vector diagrams, single-line and device display pages
- Phasor measurement unit (PMU) for synchrophasor measured values and IEEE C37.118 protocols
- Time synchronization using IEEE 1588
- Powerful fault recording (buffer for a max. record time of 80 sec. at 8 kHz or 320 sec. at 2 kHz)
- Auxiliary functions for simple tests and commissioning

Benefits

- Compact and low-cost line differential protection
- Safety due to powerful protection functions
- Purposeful and easy handling of devices and software thanks to a user-friendly design
- Cybersecurity in accordance with NERC CIP and BDEW Whitepaper requirements
- Highest availability even under extreme environmental conditions by standard coating of the modules
- Full compatibility between IEC 61850 Editions 1, 2.0 and 2.1



Siemens 200
Smart Infrastructure
Digital Grid
Humboldtstrasse 59
90459 Nuremberg,
Germany

For the U.S. published by
Siemens Industry Inc.

100 Technology Drive
Alpharetta, GA 30005
United States

Customer Support: <http://www.siemens.com/csc>

© Siemens 2020. Subject to changes and errors.
SIPROTEC 7SD82_Profile V1.docx_12.20

For all products using security features of OpenSSL, the following shall apply:

This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit (www.openssl.org), cryptographic software written by Eric Young (eay@cryptsoft.com) and software developed by Bodo Moeller.