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SIPROTEC 7SJ86

Overcurrent Protection as Backup Protection for Line Protection

www.siemens.com/siprotec

Description

The SIPROTEC 7SJ86 overcurrent protection device has specifically been designed as backup or emergency protection for the line protection devices. With its modular structure, flexibility and the powerful DIGSI 5 engineering tool, the SIPROTEC 7SJ86 device offers future-oriented system solutions with high investment security and low operating costs.

Main function	Overcurrent protection (V/inverse-time-overcurrent protection)
Tripping	3-pole
Inputs and outputs	3 predefined standard variants with 4/4 current transformers/voltage transformers, 11 to 23 binary inputs, 9 to 25 binary outputs
Hardware flexibility	Flexibly adjustable and expandable I/O quantity structure within the scope of the SIPROTEC 5 modular system
Housing width	1/3 × 19 inch to 2/1 × 19 inch

Applications

- Backup and emergency protection for line protection
- Detection and selective 3-pole tripping of short circuits in electrical equipment of star networks, lines with infeed at one or two ends, parallel lines and open-circuited or closed ring systems of all voltage levels
- Used in switchgear with breaker-and-a-half layout configuration
- Detection of ground faults in isolated or arc-suppression-coilground power systems in star, ring, or meshed arrangement



SIPROTEC 5 Device with Expansion Module

- Backup protection for differential protection devices of all kind for lines, transformers, generators, motors, and busbars
- Phasor Measurement Unit (PMU)
- Reverse-power protection

Functions

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

- Overcurrent protection as backup / emergency line protection for all voltage levels with 3-pole tripping
- Optimized tripping times due to directional comparison and protection data communication
- Detection of ground faults of any type in compensated or isolated electrical power systems using the following functions: 3I0>, V0>, fleeting contact, $\cos \phi$, $\sin \phi$, harmonic, dir
- Detection of intermittent ground faults and admittance

Modular and flexible

- Ground fault detection using the pulse detection method
- Arc protection
- Automatic frequency relief for underfrequency load shedding, taking changed infeed conditions due to decentralized power generation into consideration
- Overvoltage and undervoltage protection
- Frequency protection and frequency change protection for load shedding applications
- 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
- Control, synchrocheck and switchgear interlocking protection
- Circuit-Breaker Failure Protection
- Circuit breaker reignition monitoring
- 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)
- 4 optional pluggable communication modules, usable for different and redundant protocols (IEC 61850, 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 (IEEE C37.94, and others), including automatic switchover between ring and chain topology
- Reliable data transmission via PRP and HSR redundancy protocols
- Extensive cyber security functionality, such as role-based access control (RBAC), protocolling security-related events or signed firmware
- Simple, quick and secure access to device data via a standard Web browser - without additional software
- Phasor measurement unit (PMU) for synchrophasor measured values and IEEE C37.118 protocol
- 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
- Flexibly adjustable I/O quantity structure within the scope of the SIPROTEC 5 modular system

Benefits

- Safety due to powerful protection functions
- Highest availability even under extreme environmental conditions by "conformal coating" of electronic boards
- Cyber security in accordance with NERC CIP and BDEW Whitepaper requirements



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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.