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SIPROTEC 7SJ85

Feeder and overcurrent protection

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Description

The SIPROTEC 7SJ85 overcurrent protection has been designed specifically for the protection of feeders and lines. With its modular structure, flexibility and the powerful DIGSI 5 engineering tool, the SIPROTEC 7SJ85 device offers future-oriented system solutions with high investment security and low operating costs.

Main function	Feeder and overcurrent protection for all voltage levels
Inputs and outputs	5 predefined standard variants with 4 current transformers, 4 voltage transformers, 11 to 59 binary inputs, 9 to 33 binary outputs
Hardware flexibility	Flexibly adjustable and expandable I/O quantity structure within the scope of the modular SIPROTEC 5 system; 1/6 expansion modules can be added, available with large or small display, or without display
Housing width	1/3 × 19 inch to 2/1 × 19inch

Applications

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

Feeder and overcurrent protection SIPROTEC 7SJ85 (housing width 1/3 x 19" to 2/1 x 19")

- Load shedding applications
- Automatic switchover
- Regulation or control of power transformers (two-winding transformers, three-winding transformers, grid coupling transformers)

Functions

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

- Directional and non-directional overcurrent protection with additional functions
- Protection of up to 9 feeders with up to 40 analog inputs
- 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 ϕ, sin ϕ, harmonic, dir.

Efficient and modular

- Detection of intermittent ground faults and admittance
- Ground fault detection using the pulse detection method
- Arc protection
- Overvoltage and undervoltage protection
- Power protection, configurable as active or reactive power protection
- Frequency protection and frequency change protection for load shedding applications
- Automatic frequency relief for underfrequency load shedding, taking changed infeed conditions due to decentralized power generation into consideration
- Protection functions for capacitor banks, such as overcurrent, overload, current unbalance, peak overvoltage, or differential 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 peak overvoltage protection for capacitors) 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)
- 2 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
- Control of Power Transformers
- 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

- Safety due to powerful protection functions
- Data security and transparency over the entire lifecycle of the plant, saving time and money
- Increased reliability and quality of the engineering process
- Cyber security in accordance with NERC CIP and BDEW Whitepaper requirements
- Highest availability even under extreme environmental conditions by “conformal coating” of electronic boards
- Full compatibility between IEC 61850 Editions 1 and 2

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SIPROTEC 7SJ85 Profile E7.8.docx
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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.