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SIPROTEC 7SJ85

Feeder and overcurrent protection

Description

The SIPROTEC 7SJ85 overcurrent protection has been designed specifically for the protection of feeders and lines. With its modular structure, flexibility, and the high-performance DIGSI 5 engineering tool, the SIPROTEC 7SJ85 device offers futureoriented solutions for protection, control, automation, monitoring, and Power Quality – Basic..

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 1 or 2 ends, parallel lines, and open-circuited or closed ring systems of all voltage levels up to AC 400 V

- 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

- Load shedding applications

- Automatic switchover

- Regulation or control of power transformers (two-winding transformers, three-winding transformers, grid coupling transformers)

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

- Detection and recording of power-quality data in the mediumvoltage and subordinate low-voltage power system

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>, transient ground-fault function, $\cos \phi$, $\sin \phi$, dir. detection of intermittent ground faults, harmonic detection, and admittance measurement

- Arc protection

- Ground fault detection using the pulse detection method

- Detection of intermittent ground faults with automatic blocking of statically measuring functions to avoid message and fault-record flooding

- Arc protection

Efficient and modular

- Fault locator plus for accurate fault location with in-homogenous line sections and targeted automatic overhead-line section reclosing (AREC)

- 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 over-current, 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

- PQ - Basic: Voltage unbalance; voltage changes: overvoltage, dip, interruption; TDD, THD, and harmonics

- Point-on-wave switching

- Control, synchrocheck, and switchgear interlocking protection

- Circuit-breaker failure protection

- Circuit-breaker reignition monitoring

- Graphical logic editor to create high-performance automation functions in the device

- Single-line representation in the small or large display

- Fixed integrated electrical Ethernet RJ45 interface for DIGSI 5 and IEC 61850 (reporting and GOOSE)

- 2 slots for optional communication modules, usable for different and redundant protocols (IEC 61850-8-1, IEC 61850-9-2 Client, IEC 60870-5-103, IEC 60870-5-104, Modbus TCP, DNP3 serial and TCP, PROFINET IO, PROFINET IO S2 redundancy)

- Virtual network partitioning (IEEE 802.1Q - VLAN)

- Serial protection communication via optical fibers, two-wire connections, and communication networks (IEEE C37.94 and others), including automatic switch-over between ring and chain topology

- Reliable data transmission via PRP and HSR redundancy protocols

- Extensive cybersecurity functionality, such as role-based access control (RBAC), logging of 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 protocol

- Time synchronization using IEEE 1588

- Control of power transformers

- High-performance fault recording (buffer for a max. record time of 80 s at 8 kHz or 320 s at 2 kHz)

- Auxiliary functions for simple tests and commissioning

Benefits

- Safety due to powerful protection functions

- 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