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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 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 ϕ, sin ϕ, 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 inhomogenous 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 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
- 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

Siemens 2020

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

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United States

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

SIPROTEC 7SJ85_Profile V1.docx _12.20