SIEMENS

SIPROTEC 7SJ86

Overcurrent Protection as Backup Protection for Line Protection

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Description

The SIPROTEC 7SJ86 overcurrent protection has specifically been designed as backup or emergency protection for the line protection devices. With its modular structure, flexibility and the highperformance DIGSI 5 engineering tool, the SIPROTEC 7SJ86 device offers future-oriented solutions for protection, control, automation, monitoring, and Power Quality – Basic.

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

- 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 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

- 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.

- 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>, transient ground fault, cos φ, sin φ, dir. detection of intermittent ground faults, harmonic detection, and admittance measurement

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

Modular and flexible

- 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

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

- 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)

- 4 optional, pluggable 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 – without additional software 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

- 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

- Flexibly adjustable I/O quantity structure within the scope of the SIPROTEC 5 modular system

Benefits

- Safety due to powerful protection functions

- Purposeful and easy handling of devices and software thanks to a user-friendly design

- Highest availability even under extreme environmental conditions by standard coating of the modules

- Cybersecurity in accordance with NERC CIP and BDEW Whitepaper requirements