ENERGY AUTOMATION PRODUCTS

SIPROTEC 7SJ82

Feeder and Overcurrent Protection

Description

The SIPROTEC 7SJ82 overcurrent protection has been designed specifically for a cost-effective and compact protection of feeders and lines in medium-voltage and high-voltage systems. With its flexibility and the high-performance DIGSI 5 engineering tool, the SIPROTEC 7SJ82 device offers future-oriented solutions for protection, control, automation, monitoring, and Power Quality – Basic.

Main function	Feeder and overcurrent protection for all voltage levels
Inputs and outputs	4 current transformers, 4 voltage transformers (optional), 11 or 23 binary inputs, 9 or 16 binary outputs, or 8 current transformers, 7 binary inputs, 7 binary outputs
Hardware flexibility	Different hardware quantity structures for binary inputs and outputs are available in the 1/3 base module. Adding 1/6 expansion modules is not possible; available with large or small display.
Housing width	1/3 x 19" inches

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

- Detection of ground faults in isolated or arc-suppression-coil-ground power systems in star, ring, or meshed arrangement

- Backup protection for differential protection devices of all kinds for lines, transformers, generators, motors, and busbars

- Protection and monitoring of simple capacitor banks

- Phasor Measurement Unit (PMU)

- Reverse-power protection

- Load shedding applications

- Automatic switchover

- Regulation or control of power transformers (two-winding transformers)

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

Functions

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

- Directional and non-directional overcurrent protection with additional functions

- 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

- Ground-fault detection using the pulse-detection method

SIEMENS

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

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

- Arc protection

- Overvoltage and undervoltage 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

- Power protection, configurable as active or reactive power protection

- Protection functions for capacitor banks, such as overcurrent, overload, current unbalance, peak overvoltage, or differential protection

- Directional reactive power undervoltage protection (QU protection)

- Control, synchrocheck and switchgear interlocking protection, circuit-breaker failure protection

- Circuit-Breaker Failure Protection

- Circuit breaker reignition monitoring

- Graphical logic editor to create powerful automation functions in the device

- 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

- Single-line representation in small or large display

- Integrated electrical Ethernet RJ45 for DIGSI 5 and IEC 61850 (reporting and GOOSE)

- Two optional, pluggable communication modules, usable for different and redundant protocols (IEC 61850-8-1, 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 cybersecurity functionality, such as role-based access control (RBAC), logging of security-related events, signed firmware, or authenticated IEEE 802.1X network access

- Accesso 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 Whitepaper 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

- Compact and low-cost overcurrent protection

- Safety due to powerful protection functions

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

- Cybersecurity according to NERC CIP and BDEW Whitepaper requirements (for example, logging security-related events and alarms)

- 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