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SIPROTEC 7SJ81

Feeder and overcurrent protection

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Description

The SIPROTEC 7SJ81 has been designed for a cost-effective and compact protection of feeders and lines in medium-voltage systems. With its flexibility and the powerful DIGSI 5 engineering tool, the SIPROTEC 5 device offers future-oriented solutions for protection, control, automation, monitoring, and Power Quality – Basic.

Main function Feeder and overcurrent protection

Inputs and outputs
4 current transformers, 11 binary inputs, 9 binary outputs
4 current transformers, 18 binary inputs, 14 binary outputs
4 current transformers, 4 voltage transformers, 11 binary inputs, 9 binary outputs
4 current transformers, 4 voltage transformers, 16 binary inputs, 11 binary outputs

Hardware flexibility
Different hardware quantity structures for binary inputs and outputs are available in the 1/3 base module. 1 plug-in module position, available with large or small display

Housing width 1/3 × 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-coilground power systems in star, ring, or meshed arrangement
- Backup protection for differential protection devices of all kind for lines, transformers, generators, motors, and busbars
- Universal power protection



SIPROTEC 7SJ81

- Simple load shedding applications
- 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.

- Directional and non-directional overcurrent protection with additional functions
- Detection of ground faults of any type in isolated or arc-suppression-coil-ground 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
- Detection of intermittent ground faults with automatic blocking of statically measuring functions to avoid message and fault-record flooding Arc protection (note the resulting communication restrictions)
- Overvoltage and undervoltage protection
- Frequency protection and frequency change protection for load shedding applications

Compact and flexible

- Power protection, configurable as active or reactive power protection
- Directional reactive power undervoltage protection (QU protection)
- Control with switchgear interlocking protection
- Synchrocheck
- Circuit-breaker failure protection
- Detection of current and voltage signals up to the 50th harmonic with high accuracy for selected protection functions and operational measured values
- PQ - Basic: Voltage unbalance; voltage changes: over-voltage,
- dip, interruption; TDD, THD, and harmonics
- 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)
- 1 optional, plug-in module for a) communication protocols or b) for arc protection
- Redundant and simple communication protocols according to IEC 61850-8-1, IEC 60870-5-103, IEC 60870-5-104, Modbus TCP, DNP3 serial and TCP, PRO-FINET IO
- 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, singleline and device display pages
- Time synchronization using IEEE 1588
- Standard fault recording (buffer for a max. record time of approx. 40 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



Siemens 2020
Smart Infrastructure
Digital Grid
Humboldtstrasse 59
90459 Nuremberg,
Germany

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

100 Technology Drive
Alpharetta, GA 30005
United States

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

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SIPROTEC 7SJ81_Profile V1.docx_12.20

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.