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SIPROTEC 7SK85

Motor Protection

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Description

The SIPROTEC 7SK85 motor protection device is designed for the protection of motors of all sizes. With its modular structure, flexibility and the high-performance DIGSI 5 engineering tool, SIPROTEC 7SK85 offers future-oriented solutions for protection, control, automation, monitoring, and Power Quality – Basic.

For motors in explosive environments, the SIPROTEC 7SK85 is also available with EN 60079-14 or VDE 0165, Part 1, ATEX (Verband der Elektrotechnik, Elektronik und Informationstechnik) certification.

Main function	Motor protection for motors of all sizes
Inputs and outputs	3 predefined standard variants with 4 current transformers, 4 voltage transformers, 11 to 27 binary inputs, 9 to 17 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 × 19 inch

Applications

- Protection against thermal overload of the stator from overcurrent, cooling problems or pollution
- Protection against thermal overload of the rotor during startup due to: Frequent startups, excessively long startups or blocked rotor
- Monitoring for voltage unbalance or phase outage
- Monitoring the thermal state and the bearing temperatures with temperature measurement
- Detection of idling drives of pumps and compressors, for example
- Detection of ground faults in the motor
- Protection against motor short circuits
- Protection against instability due to undervoltage.



SIPROTEC 5 Device with Expansion Module

- 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.

- Motor protection functions: Starting time supervision, thermal overload protection for stator and rotor, restart inhibit, unbalanced-load protection, load-jam protection
- Stator and storage-temperature monitoring via temperature sensors with external RTD unit.
- Differential motor protection as fast short-circuit protection for motors of high power
- Sensitive ground-fault protection (non-directional, directional) to detect stator ground faults
- Directional and non-directional overcurrent protection (shortcircuit protection) with additional functions
- Ground-fault detection using the pulse-detection method
- Overvoltage and undervoltage protection

Modular and efficient

- Detection of ground faults of any type in compensated or isolated electrical power systems using the following functions: $3I_0$, V_0 , transient ground fault, $\cos \phi$, $\sin \phi$, harmonic, dir. detection of intermittent ground faults and admittance
- Arc protection
- Power protection, configurable as active or reactive-power 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: over-voltage, dip, open circuit; TDD, THD, and harmonics
- Control, synchrocheck, and switchgear interlocking protection
- Graphical logic editor to create high-performance automation functions in the device
- Fixed integrated electrical Ethernet RJ45 interface for DIGSI 5 and IEC 61850 (reporting and GOOSE)
- Up to 4 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)
- Reliable data transmission via PRP and HSR redundancy protocols
- Certification for use in environments at risk of explosion (EN 60079-14 or VDE 0165, Part 1, ATEX)
- 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
- Secure serial protection communication, also over great distances and all available physical media (optical fiber, twowire connections, and communication networks)
- Detecting operational measured variables and protectionfunction measured values to evaluate the systems, to support commissioning, and to analyze faults
- Synchrophasor measured values with the IEEE C37.118 protocol integrated (PMU)
- 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
- 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
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 7SK85_Profile V1.docx_12.20

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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.