SIEMENS

# SIPROTEC 7UM85

## Generator protection

www.siemens.com/siprotec

### Description

The generator protection device SIPROTEC 7UM85 has been designed specifically for the protection of generators and power units. It contains all necessary main protection functions and a large number of other protection and monitoring functions. With its modular structure, flexibility, and the high-performance DIGSI 5 engineering tool, SIPROTEC 7UM85 offers futureoriented solutions for protection, control, automation, monitoring, and Power Quality – Basic. For motors in explosive environments, the SIPROTEC 7UM85 is also available with EN 60079-14 or VDE 0165, Part 1, ATEX (Verband der Elektrotechnik, Elektronik und Informationstechnik) certification

| Main function | Typical generator protection functions |
|---|---|
| Inputs and outputs | 5 predefined standard variants with up to 16 current transformers and 8 voltage transformers, 7 to 15 binary inputs, 9 to 20 binary outputs 4 fast measuring transducer inputs (10 V or 20 mA) |
| Hardware flexibility | Flexibility 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 inches to 2 × 19 inches |

### Applications

- Protection of generators in busbar connection of different power, with directional stator ground-fault protection.
- Protection of generators in unit connection of different power (using the 100 % stator ground fault (20 Hz) with larger generators)
- Protection of power units with one device per protection group. In the generator transformer variant, the 7UM85 implements both generator and transformer protection.

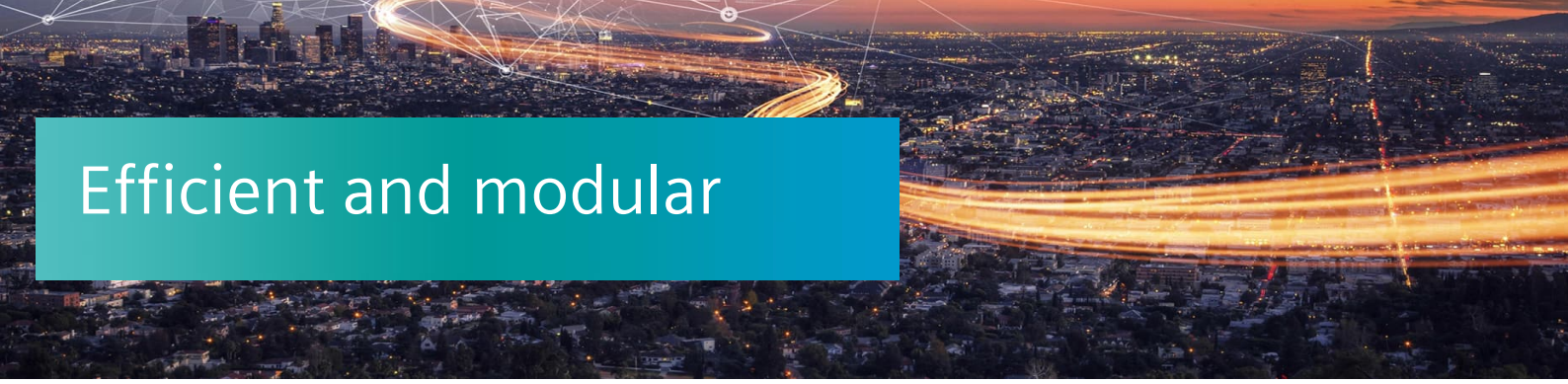
SIPROTEC 7UM85 Generator Protection (width: 1/3 x 19" to 2 x 19")

- In more complex power units (unit connection with generator circuit breaker and several auxiliary transformers), additional SIPROTEC 5 devices are used, for example, 7UT8x, 7SJ82, or 7SJ85 and 7SA, SD, SL86, at the upper-voltage side of the generator transformer.
- Using motor and generator protection functions (for example, underexcitation protection) to protect synchronous motors
- 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.

- Short-circuit protection (overcurrent protection, impedance protection, differential protection)
- Stator ground-fault protection (90% non-directional or directional, 100% with 3rd harmonic, real 100% protection with 20-Hz voltage interference)
- Rotor ground-fault protection with different measuring methods (ground current or ground-resistance monitoring)
- Underexcitation and overexcitation protection



# Efficient and modular

- High-precision reverse-power protection and universal power protection
- Unbalanced-Load Protection
- Overload protection and temperature supervision via external RTD unit (with PT 100, for example)
- Universal overvoltage and undervoltage protection with different measuring methods
- Overfrequency and underfrequency protection, frequency change protection and monitoring of dwell time in frequency bands as turbine protection (protection against abnormal frequencies)
- Protection functions for network decoupling (voltage and frequency protection, directional reactive power undervoltage protection (QU protection) and vector-jump protection)
- Inadvertent energization protection to detect incorrect activation of the circuit breaker
- Circuit-breaker failure protection
- Circuit breaker reignition monitoring
- Single-channel parallel connection function (synchronization) with adjustment commands for rotational speed (frequency) and voltage
- Graphical logic editor to create powerful automation functions in the device
- Integrated electrical Ethernet RJ45 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 sharing (IEEE 802.1Q - VLAN)
- Reliable data transmission via PRP and HSR redundancy protocols
- PQ-Basic: voltage unbalance; voltage changes: overvoltage, dip, interruption; TDD, THD and Harmonics
- Extensive cybersecurity functionality, such as role-based access control (RBAC), protocolling security-related events, signed firmware or authenticated network access IEEE 802.1X
- Simple, fast and secure access to the device via a standard Web browser to display all information and diagnostic data, as well as 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
- Capturing operational measured variables and protection function measured values for the evaluation of the system, to support commissioning, and to analyze faults
- Frequency tracked protection functions over a wide frequency range (10 Hz to 80 Hz) and the option to assign the protection functions in a single device to different frequency tracking groups.
- Powerful fault recording (buffer for a max. record time of 80 sec. at 8 kHz or 320 sec. at 2 kHz)
- Flexibly adjustable I/O quantity structure within the scope of the SIPROTEC 5 modular system

**Benefits**

- Safe and reliable automation and control of your systems
- 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 populated printed circuit boards

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

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