

# SIEMENS

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## SIPROTEC 7UM85

Generator protection

[www.siemens.com/siprotec](http://www.siemens.com/siprotec)

### Description

The SIPROTEC 7UM85 generator protection device has been designed specifically for the protection of generators and power plant 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 powerful DIGSI 5 engineering tool, SIPROTEC 7UM85 offers future-oriented system solutions with high investment security and low operating costs.

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 plant units with one device per protection group. In the generator transformer version, the 7UM85 implements both generator and transformer protection
- In more complex power plant units (unit connection with generator circuit breaker and several auxiliary transformers), additional SIPROTEC 5 devices are used, such as 7UT8x, 7SJ82 or 7SJ85 and 7SA, SD, SL86, at the upper-voltage side of the generator transformer
- Using motor and generator protection functions (underexcitation protection, for example) to protect synchronous motors

### Functions

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

- Stator ground-fault protection (90% non-directional or directional, 100% with 3rd harmonic, real 100% protection with 20-Hz voltage interference)

# Efficient and modular

- Rotor ground-fault protection with different measuring methods (ground-current or ground-resistance monitoring)
- High-precision reverse-power protection and universal power protection
- Underexcitation and overexcitation protection
- Unbalanced-load protection
- Overload protection and temperature monitoring via external RTD unit (with PT 100, for example)
- Out-of-Step Protection
- Rotor and stator overload protection with cold gas consideration (coolant temperature)
- Power plant decoupling protection
- Shaft-current protection (in particular with hydropower applications)
- 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))
- Switching 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)
- Optional pluggable communication modules, usable for different and redundant protocols (IEC 61850, IEC 60870-5-103, IEC 60870-5-104, Modbus TCP, DNP3 serial and TCP, PROFINET IO)
- Secure serial protection data communication, even over great distances and all available physical media (optical fiber cable, 2-wire connections and communication networks)
- Redundancy protocols PRP and HSR
- Cyber security to NERC CIP and BDWE Whitepaper requirements
- 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 to evaluate the plant state, to support commissioning, and to analyze faults
- Powerful fault recording (buffer for a max. record time of 80 sec. at 8 kHz or 320 sec. at 2 kHz)
- Auxiliary functions for easy tests and commissioning
- Flexibly adjustable I/O quantity structure within the scope of the SIPROTEC 5 modular system

## Benefits

- Safe and reliable protection of your systems
- Purposeful and simple operation of the devices and software thanks to a user-friendly design
- High safety due to a consistent implementation of safety and security
- Powerful communication components ensure safe and effective solutions



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