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SIPROTEC 7UT87

Transformer Differential Protection

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Description

The SIPROTEC 7UT87 transformer differential protection has been designed specifically for the protection of multi-winding transformers (up to 5 sides). Furthermore, it is to be used where numerous measuring points (up to 7 3-phase current measuring points) are required. Another application is simultaneous protection of two parallel transformers (additional fast backup protection). The SIPROTEC 7UT87 is the main protection for the transformer and contains many other protection and monitoring functions. The additional protection functions can also be used as backup protection for protected downstream objects (such as cables or lines). With its modular structure, flexibility and the powerful DIGSI 5 engineering tool, SIPROTEC 7UT87 offers future-oriented system solutions with high investment security and low operating costs.

Main function Up to 3 differential protection functions with additional stabilization (in different transformer function groups); up to 5 ground fault differential protection functions.

For auto transformer applications, two differential protection functions can be processed in an auto transformer function group.

Usable measuring points	9 x 3-phase current measuring points, 5 x 1-phase current measuring points, 5 x 3-phase voltage measuring points
Inputs and outputs	2 predefined standard variants with 20 current transformers, 4 voltage transformers, 15 to 27 binary inputs, 22 to 38 binary outputs
Hardware flexibility	Flexibly adjustable and expandable I/O quantity structure within the scope of the SIPROTEC 5 modular system.
Housing width	2/3 x 19" - 2/1 x 19"



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Functions

DIGSI 5 permits all functions to be configured and combined as required. In SIPROTEC 7UT87, two transformer function groups can be used.

- Transformer differential protection for multi-winding transformers with versatile, additional protection functions (multi-winding transformers are typical in power converter applications (such as HVDC))
- Transformer differential protection for phase-angle regulating transformers of the single core and two core types, and special transformers
- Transformer protection applications with up to seven 3-phase current measuring points
- Simultaneous differential protection for two parallel transformers (such as two 2-winding transformers)
- Universal usability of the permissible measuring points

Modular and flexible

- Applicable from average up to extra-high voltage
- Protection of standard power transformers, auto transformers and motors
- Typical properties of a transformer differential protection such as flexible adaptation to the transformer vector group, control of inrush and overexcitation processes, safe behavior in case of current-transformer saturation with different degrees of saturation
- Arc protection
- Voltage controller function ANSI 90V for two-winding transformers, three-winding transformers and grid coupling transformers with parallel control (master/follower, circuit reactive current minimization)
- Adaptive adaptation of the operate curve to the transformer tap position
- Increased sensitivity with near-neutral-point ground faults through a separate restricted ground-fault protection
- Additional current and voltage inputs can be supplements for standard protection functions, such as overcurrent, voltage frequency and others
- Graphical logic editor to create powerful automation functions in the device
- Up to 4 pluggable communication modules, usable for different and redundant protocols (IEC 61850, IEC 60870-5-103, IEC 60870-5-104, DNP3 serial and TCP, Modbus TCP, PROFINET IO)
- Redundancy protocols PRP and HSR
- Cyber security to NERC CIP and BDWE Whitepaper requirements
- Secure serial protection data communication, even over great distances and all available physical media (fiber-optic cable, 2-wire connections and communication networks)
- Capturing operational measured variables and protection function measured values to evaluate the plant state, to support commissioning, and to analyze faults
- Phasor measurement unit (PMU) for synchrophasor measured values and IEEE C37.118 protocol
- 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

- High-performance protection features guarantee safety
- Data security and transparency throughout the entire life cycle of the system save time and reduce costs
- Clear and easy-to-use devices and software thanks to user-friendly design
- Increased quality and reliability of the engineering process
- High-performance communications components guarantee safe and effective solutions
- Full compatibility with IEC 61850 Edition 1 and 2
- High available Ethernet communication through integrated Ethernet Redundancy Protocols PRP and HSR



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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.