

## SIPROTEC 7UT512/513 Transformer Differential Protection Relay



Fig. 8/31 SIPROTEC  
7UT512/513 transformer differential protection relay

### Description

The 7UT512/7UT513 differential protection relays are used for fast and selective isolation of short-circuits in transformers of all voltage levels and also in rotating electric machines and short lines. The particular application can be chosen by setting. In this way an optimal adaptation of the relay to the protected object can be achieved. The protection relay can be parameterized for use with three-phase and single-phase transformers. In addition to this, a thermal replica is integrated for the supervision of the thermal losses in the plant. Two variants of the differential relay can be supplied: The 7UT512 relay with a compact design is suited for two-winding transformers as well as for motors or generators and short lines.

A backup overcurrent-time protection and two thermal monitoring functions are also integrated. The larger 7UT513 unit is used for two-winding and three-winding transformers, generators/motors and short two-end and three-end lines.

Two thermal monitoring functions are integrated as additional functions. Moreover, as an alternative, a standby definite-time/inverse-time overcurrent or a restricted earth-fault (REF) or a tank protection function is available for one winding.

The 7UT513 can also be used where the starpoint current of the transformer must be acquired or more inputs and outputs are required than are provided by the 7UT512. The device can interface with conventional control systems or alternatively be integrated in the modern substation control system.

### Function overview

#### Protection functions

- Short-circuit protection for two and three-winding transformers with integrated vector group and ratio adaption
- Restraint against inrush of transformers overexcitation and CT-saturation
- Short-circuit protection for generators and motors with high setting sensitivity
- Short-circuit protection for short lines and busbars up to 3 feeders
- Overload protection with a thermal characteristic for 2 windings/2 terminations
- Two-stage overcurrent backup protection for one winding. On the basis of the 7UT513 hardware, a restricted earth-fault protection or a sensitive, definite-time overcurrent for one star point (tank protection) is available as an alternative

#### Features

- Restraint during inrush, overexcitation and CT-saturation
- Commissioning aid

#### Monitoring functions

- Self-supervision of the relay
- Event logging
- Fault logging
- Oscillographic fault recording

#### Communication protocols

- System interface:  
– IEC 60870-5-103 protocol

#### Hardware

- Digital inputs: 3/5 binary inputs
- Digital outputs: 2/5 trip relays;  
5/11 alarm relays

#### Front design

- PC front port for convenient relay setting
- 8/16 LEDs for local indication

## Selection and ordering data

| Description   | Order No.                 |
|---|---------------------------|
| <b>7UT512/513 differential protection relay</b>   | <b>7UT51□□-□□B□1-□□A0</b> |
| <i>Application for</i>  |                           |
| Two-winding transformer or machine or short line (two ends)   | 2                         |
| Two-winding /three-winding transformer or machine or short line (2/3 ends)  | 3                         |
| <i>Rated current at 50/60 Hz AC, 16.7</i>   |                           |
| 1 A   | 1                         |
| 5 A   | 5                         |
| <i>Rated auxiliary voltage</i>  |                           |
| 24, 48 V DC   | 2                         |
| 60, 110, 125 V DC   | 4                         |
| 220, 250 V DC   | 5                         |
| <i>Unit version / Language</i>  |                           |
| Language: German / English (GB), 50 Hz  |                           |
| For panel flush mounting or cubicle mounting  | C 0                       |
| For panel surface mounting  | D 0                       |
| For panel flush mounting or cubicle mounting, without glass cover   | E 0                       |
| Language: English (US) / German, 60 Hz  |                           |
| For panel flush mounting / cubicle mounting with cable ring lugs and US-foil for front panel  | G 1                       |
| <i>Additional functions</i>   |                           |
| Overcurrent-time protection, two overload functions (standard on 7UT512)  | 0                         |
| Overcurrent-time protection or restricted earth-fault protection, two overload functions (standard on 7UT513)   | 1                         |
| Overcurrent-time protection (phase) or normal/sensitive overcurrent (earth), two times overload protection (one sensitive measuring input for 7UT513) | 2                         |
| <i>Serial system interface</i>  |                           |
| Without   | A                         |
| Electrical, RS232   | B                         |
| Fiber-optic interface (820 nm)  | C                         |

## Accessories

**DIGSI 4**

Software for configuration and operation of Siemens protection units running under MS Windows (version Windows 95 and higher) device templates, Comtrade Viewer, electronic manual included as well as "Getting started" manual on paper, connecting cables (copper)

## Basis

Full version with license for 10 computers, on CD-ROM (authorization by serial number)

7XS5400-0AA00

## Demo

Demo version on CD-ROM

7XS5401-0AA00

## Professional

## Complete version:

DIGSI 4 Basis and additionally SIGRA (fault record analysis), CFC Editor (logic editor), Display Editor (editor for default and control displays) and DIGSI 4 Remote (remote operation)

7XS5402-0AA00

*Connecting cable*

Cable between PC (9-pin connector) and protection unit (25-pin connector)

7XV5100-2

or

Cable between PC (9-pin connector) and protection unit (9-pin connector)  
Adaptor 9/25-pin for 7XV5100-4 cable for protec. unit w. 25-pin connector  
(cable 7XV5100-4 and adaptor contained in DIGSI 4)

7XV5100-4

7XV5100-8H

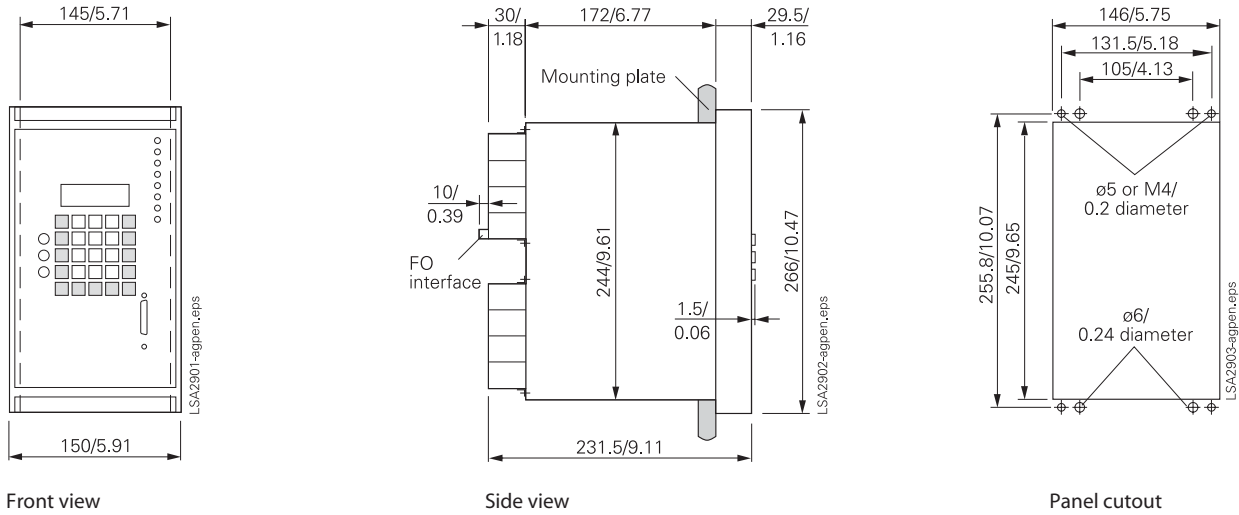
*Manual for 7UT512/513*

English

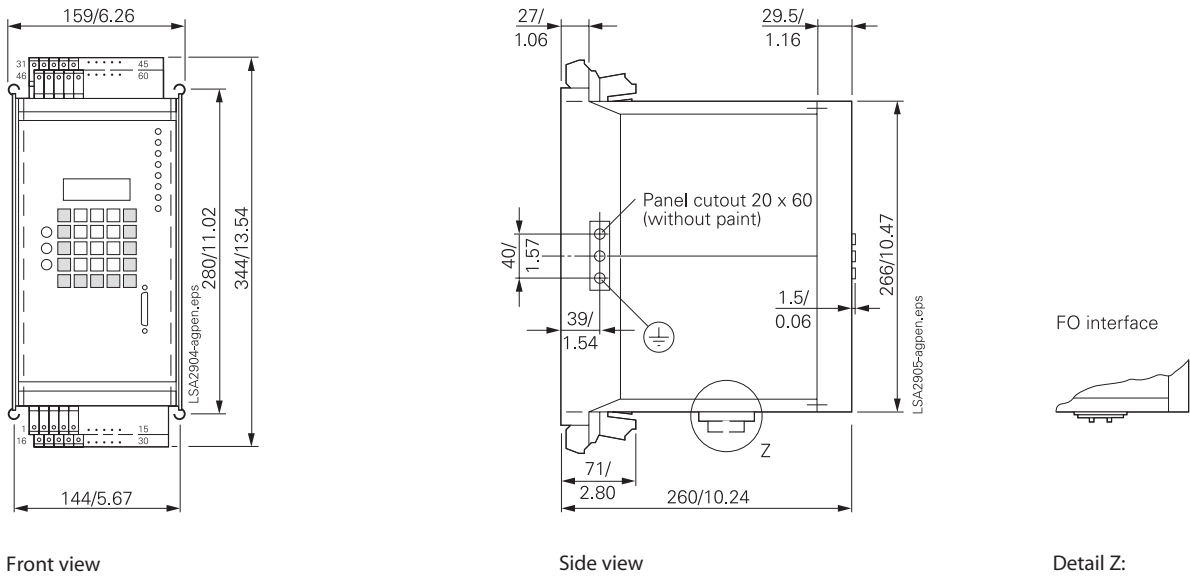
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Dimension drawings in mm / inch

Dimension drawings for SIPROTEC 3  
1/3 x 19" housing



**Fig. 16/29**  
1/3 x 19" housing  
for flush mounting or  
cubicle mounting



**Fig. 16/30**  
1/3 x 19" housing  
for panel surface mounting

Dimension drawings in mm / inch

Dimension drawings for SIPROTEC 3  
1/2 x 19" housing

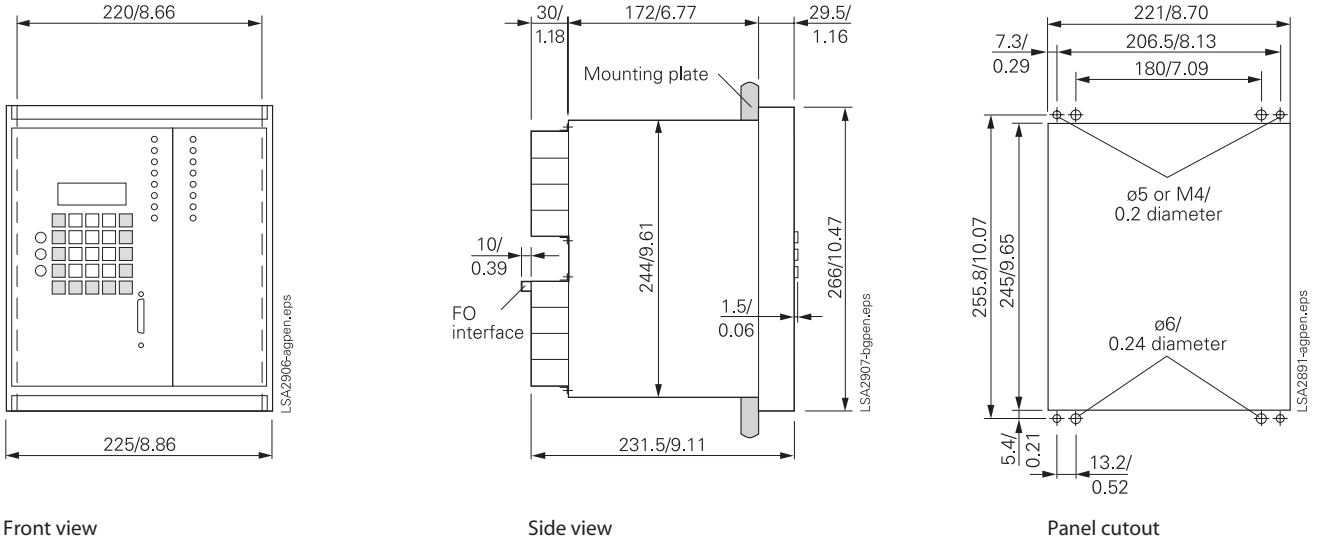


Fig. 16/31

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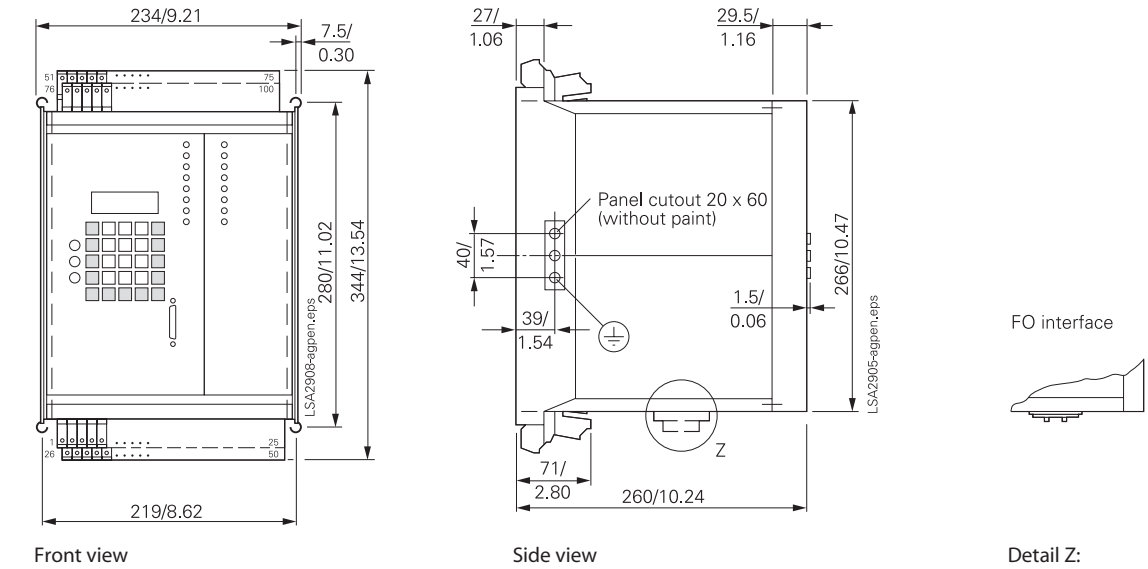


Fig. 16/32  
1/2 x 19" housing  
for panel surface mounting