

## SIPROTEC 7SA510 Distance Protection Relay



Fig. 6/89  
SIPROTEC 7SA510 distance protection relay

### Description

The 7SA510 distance protection relay provides fast, reliable and selective clearance of faults on overhead lines and cables being fed from one or multiple points. The network can be radial, ring or meshed. The system star point may be isolated, resonance-earthed (e.g. Peterson coil), solidly earthed or low-resistance earthed. The relay incorporates all functions normally required for line protection and can also be applied as a time-graded backup protection for all types of differential protection schemes. The 7SA510 can be incorporated in both conventional switchgear systems and SICAM substation control and protection systems. The serial system interface protocol used conforms to IEC 60870-5-103 and can also be connected to the fault monitoring computer DAKON or a star coupler/modem central or remote operation system.

### Function overview

#### Protection functions

- Distance protection for all types of faults
- Fault locator
- Earth-fault detection in isolated/resonant-earthed networks
- Sensitive earth-fault protection for high-resistance faults in earthed networks
- Backup overcurrent-time protection
- Auto-reclosure
- Universal teleprotection interface
- Overload protection
- Power swing blocking/tripping
- Switch-onto-fault protection

#### Features

- Adaptive measurement algorithms
- Dynamically unlimited directional sensitivity
- Non-volatile storage of events

#### Monitoring functions

- Self-supervision of the relay
- Measured value supervision
- Event logging
- Fault logging
- Oscillographic fault recording
- Circuit-breaker operation statistics

#### Communication interfaces

- Front interface for connecting to a PC
- System interface for connecting to a control system via IEC 60870-5-103 protocol

#### Front design

- User-friendly local operation
- LEDs for local alarm
- PC front port for convenient relay setting

#### Hardware

- Analog inputs:
  - 4 current transformers
  - 3 voltage transformers
- Binary inputs: 4
- Binary outputs: 7

## Selection and ordering data

Description	Order No.
<b>7SA510 distance protection relay</b>	<b>7SA510</b> □□□□ <b>A</b> □□□□ - <b>1</b> □□□□
<i>Rated current at 50 / 60 Hz</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</i>	
For panel surface mounting	B
For panel flush mounting/cubicle mounting	C
For panel flush mounting/cubicle mounting without glass cover	E
<i>Relay version</i>	
Version 1: Operating language German, distance protection with overcurrent fault detection ( $I >>$ ), firmware V3	6 1
Version 2: Operating language German, distance protection with overcurrent ( $I >>$ ) and voltage-controlled overcurrent ( $V <, I >$ ) fault detection selectable, firmware V3	6 3
Version 3: Operating language English, distance protection with overcurrent-fault detection ( $I >>$ ), firmware V3	7 1
Version 4: Operating language English, distance protection with overcurrent ( $I >>$ ) and voltage-controlled overcurrent ( $V <, I >$ ) fault detection selectable, firmware V3	7 3
Version 5: Operating language English, distance protection with impedance ( $Z <$ ), voltage-controlled overcurrent ( $V <, I >$ ) and overcurrent-fault detection ( $I >>$ ), selectable, firmware V3	7 2
<i>Serial system interface IEC 60870-5-103</i>	
Without	A
With integrated fiber-optic interface (820 nm)	C
<i>Auto-reclosure</i>	
Without auto-reclosure	D
With auto-reclosure	F
<i>Earth-fault protection functions, power swing detection</i>	
Without	0
Without earth-fault protection functions, with power swing blocking <sup>1)</sup>	1
With sensitive earth-fault detection for compensated/isolated star point and with high-resistance earth-fault protection for solidly or low-resistance earthed star point, selectable; without power swing blocking	2
With sensitive earth-fault detection for compensated/isolated star point and with high-resistance earth-fault protection for solidly or low-resistance earthed star point, selectable; with power swing blocking <sup>1)</sup>	3

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1) The function power swing blocking (16<sup>th</sup> position 1 or 3) is only available for versions with impedance fault detection (12<sup>th</sup> position 2).

## Accessories

Description	Order No.
<p><b>DIGSI 4</b></p> <p>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)</p> <p>Basis</p> <p>Full version with license for 10 computers, on CD-ROM (authorization by serial number)</p>	7XS5400-0AA00
<p>Demo</p> <p>Demo version on CD-ROM</p>	7XS5401-0AA00
<p>Professional</p> <p>Complete version:</p> <p>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)</p>	7XS5402-0AA00
<p><b>SIGRA</b></p> <p>(generally contained in DIGSI Professional, but can be ordered additionally)</p> <p>Software for graphic visualization, analysis and evaluation of fault records. Can also be used for fault records of devices of other manufacturers (Comtrade format). Running under MS Windows 95/98/ME/NT/2000/XP Professional. Incl. templates, electronic manual with license for 10 PCs. Authorization by serial number. On CD-ROM.</p>	7XS5410-0AA00
<p><b>Connecting cable</b></p> <p>Cable between PC/notebook (9-pin connector) and protection unit (25-pin connector)</p> <p>or</p> <p>Cable between PC/notebook (9-pin connector) and protection unit (9-pin connector)</p> <p>Adaptor 9-/25-pin for 7XV5100-4 cable for protec. unit w. 25-pin connector (cable 7XV5100-4 and adaptor contained in DIGSI 4)</p>	7XV5100-2 7XV5100-4 7XV5100-8H
<p><b>Manual for 7SA510</b></p> <p>English</p>	C53000-G1176-C115