

## SIPROTEC 7SA513 Distance Protection Relay for Transmission Lines



Fig. 6/81  
SIPROTEC 7SA513 distance protection relay

### Description

The 7SA513 numerical distance protection relay provides selective and fast clearance of faults on overhead lines and cables with single and multiple end infeed in high and extra high voltage networks with any type of meshing. The neutral point can be earthed, compensated or isolated. The main function is a fast non-switched distance protection with a polygon fault detection and tripping characteristic.

A fault detection program with a  $V/I/\varphi$  characteristic is also available instead of the polygon fault detection characteristic. The unit also incorporates all functions usually required for line protection. It can also be used as backup distance protection for all types of differential protection equipment. The unit can be integrated both into conventional installations and into SICAM substation control and protection systems.

The serial system interface protocol used conforms to IEC 60870-5-103.

### Function overview

#### Protection functions

- Non-switched distance protection with 6 measurement systems
- Fault locator
- Sensitive earth-fault protection for high-resistance earth faults in earthed networks
- Backup overcurrent-time protection
- Overvoltage protection
- Auto-reclosure
- Teleprotection (pilot protection)
- Synchro-check
- Breaker failure protection
- Power swing blocking/tripping
- Switch-onto-fault protection
- Weak-infeed protection

#### Features

- Tripping time 18 ms at 50 Hz
- Adaptive measurement algorithms with reliable fault loop selection
- Dynamically unlimited directional sensitivity
- Suitable for lines with series capacitors
- Compensation for the influence of a parallel line in case of earth faults
- Non-volatile storage of events

#### Monitoring functions

- Self-supervision of the relay
- Measured-value supervision
- Event logging
- Fault logging
- Oscillographic fault records

#### Front design

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

#### Communication interfaces

- Front interface for connecting a PC
- System interface for connecting to a control system via IEC 60870-5-103 or DIN 19244 protocol

#### Hardware

- Analog inputs:
  - 5 current transformers
  - 7 voltage transformers
- Binary inputs: 16/24
- Binary outputs: 22/33

## Selection and ordering data

Description	Order No.
<b>7SA513 distance protection relay, version V3</b>	<b>7SA513□-□□A2□-0C□□</b>
<i>Rated current for 50/60 Hz AC</i>	
1 A	1
5 A	5
<i>Rated auxiliary voltage</i>	
48 to 60 V DC	2
110 to 125 V DC	4
220 to 250 V DC	5
<i>Unit design</i>	
For panel surface mounting	B
For panel flush mounting or cubicle flush mounting	C
For panel flush mounting or cubicle flush mounting without glass cover	E
<i>Input/output modules (EAH)<sup>1)</sup></i>	
2 EAH: 18 SR, 4 CR, 16 BI	0
3 EAH: 27 SR, 6 CR, 24 BI	1
2 EAH: 12 SR, 2 RR, 4 CR, 16 BI	2
3 EAH: 18 SR, 3 RR, 6 CR, 24 BI	3
<i>Options A</i>	
Without auto-reclosure, without synchro-check	E
With auto-reclosure 1/3-pole, without synchro-check	G
With auto-reclosure 1/3-pole, with synchro-check	H
<i>Options B</i>	
Without earth-fault backup protection for earthed networks	0
With earth-fault backup protection for earthed networks	1

- 1) SR Signal/Alarm relay, switching power 20 W, 1 A  
 RR Reed relay, switching power 15 W, 0.3 A  
 CR Command relay, switching power 1000 W, 5 A  
 BI Binary input, voltage range 24 to 250 V DC settable.

## 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>	<a href="#">7XS5400-0AA00</a>
<p>Demo</p> <p>Demo version on CD-ROM</p>	<a href="#">7XS5401-0AA00</a>
<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>	<a href="#">7XS5402-0AA00</a>
<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>	<a href="#">7XS5410-0AA00</a>
<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>	<p><a href="#">7XV5100-2</a></p> <p><a href="#">7XV5100-4</a></p> <p><a href="#">7XV5100-8H</a></p>
<p><b>Manual for 7SA513</b></p> <p>English</p>	<a href="#">C53000-G1176-C103</a>