

Line Differential Protection

SIPROTEC 7SD87

Line Differential protection, 1-/3-pole tripping – 7SD87

Housing: expandable, 1/3 x 19" to 2/1 x 19"

Base function with hardware standard variant ¹⁾³⁾

- F1: 1/3, 7 BI, 14 BO (5S, 1 Life contact, 8F), 4CT, 4VT
- F2: 1/3, 11 BI, 9 BO (2S, 1 Life contact, 6F), 4CT, 4VT
- F3: 1/2, 13 BI, 21BO (12S, 1 Life contact, 8F), 4CT, 4VT
- F4: 1/2, 19 BI, 30 BO (21S, 1 Life contact, 8F), 4CT, 4VT
- F5: 1/2, 21 BI, 17 BO (6S, 1 Life contact, 6F, 4P), 4CT, 4VT
- F6: 1/2, 15 BI, 18 BO (5S, 1 Life contact, 8F, 4HS), 4CT, 4VT
- F7: 1/2, 15 BI, 20 BO (5S, 1 Life contact, 14F), 8CT, 8VT
- F8: 2/3, 31 BI, 46 BO (37S, 1 Life contact, 8F), 4CT, 4VT
- F9: 2/3, 31 BI, 25 BO (10S, 1 Life contact, 6F, 8P), 4CT, 4VT
- F10: 2/3, 27 BI, 34 BO (21S, 1 Life contact, 8F, 4HS), 4CT, 4VT
- F11: 2/3, 27 BI, 36 BO (21S, 1 Life contact, 14F), 8CT, 8VT
- F12: 5/6, 27 BI, 33 BO (8S, 1 Life contact, 16F, 8HS), 8CT, 8VT

Line differential protection application

- Two line ends
- Three line ends
- Four to six line ends

Application templates/ Function points ²⁾

- DIFF Basic (0 function points)
 - DIFF overhead line (175 function points)
 - DIFF overhead line with transformer (275 function points)
 - DIFF overhead line, 1.5 CB (350 function points)
- (The application templates for 1.5 CB applications require 8CTs + 8VTs, e.g. standard variant Type 7, 11 or 12)

Warranty extension

- Price per extra year of warranty

Communication

- Integrated Ethernet interface RJ45 for DIGSI
- Integrated Ethernet interface RJ45 for DIGSI and IEC 61850
- SIPROTEC 5 Plug-In Modules

Display, Housing, Key switch, LEDs etc.

- General price relevant options

1) Abbreviations:

Housing width in 19" fragments, with small display, with 16 LEDs

BI: Binary inputs

BO: Binary outputs

S: Standard relays, F: Fast relays

HS: High-speed relays, P: Power relays.

2) Available function scope acc. to catalog or function points calculator in the order configurator.

3) Note: Price does NOT include any communication plug-in module; a plug-in module for the protection interface must be added separately.

General Ordering Options for Complete Devices

SIPROTEC 5 General

General ordering options for complete devices - General

Display type

Without display and without keypad
Small display
Large display

Key switch

Without
With

Number of LEDs

16
32
48
64
80

Housing type

Flush mounting
Surface mounting
Surface-mounting with detached operation panel and 2,5 m cable
Surface-mounting with detached operation panel and 5,0 m cable

Expansion modules for further expansion of hardware standard variants ¹⁾

IO201: 4I, 8BI, 6 BO (6F)
IO202: 4I, 4U, 8BI, 6 BO (6F)
IO203: 8I, 4BI, 4 BO (4F)
IO204: 10BI, 6 BO (4S, 2P)
IO205: 12BI, 16 BO (16S)
IO206: 6BI, 7 BO (7S)
IO207: 16BI, 8BO (8S)
IO208: 4I, 4U, 4BI, 11BO (3S, 8F)
IO209: 8BI, 4BO (4HS)
IO211: 8 BI, 8VT
IO214: 4I, 4U, 2BI, 5BO (5F)
IO215: 4I, 4U, 8BI, 6BO (6F) Special module for RC-divider with 10 V voltage inputs
IO230: 48 BI
IO231: 24 BI, 24 BA
CB202: Communication board with ports M, N, P for plug-in modules
PB201: Process bus (in preparation)
PS203: Power supply for second row, contains connecting cable to 1st row

1) Abbreviations:

Housing width in 19" fragments, with large display, with 16 LEDs

BI: Binary inputs

BO: Binary outputs

S: Standard relays, F: Fast relays.

General Ordering Options for Complete Devices SIPROTEC 5 General

General ordering options for complete devices – General

Extra function points

Basis
Basis + 10 function points
Basis + 20 function points
Basis + 30 function points
Basis + 40 function points
Basis + 50 function points
Basis + 75 function points
Basis + 100 function points
Basis + 125 function points
Basis + 150 function points
Basis + 175 function points
Basis + 200 function points
Basis + 225 function points
Basis + 250 function points
Basis + 275 function points
Basis + 300 function points
Basis + 325 function points
Basis + 350 function points
Basis + 375 function points
Basis + 400 function points
Basis + 425 function points
Basis + 450 function points
Basis + 475 function points
Basis + 500 function points
Basis + 600 function points
Basis + 700 function points
Basis + 800 function points
Basis + 900 function points
Basis + 1 000 function points
Basis + 1 100 function points
Basis + 1 200 function points
Basis + 1 300 function points
Basis + 1 400 function points

SIPROTEC 5 - Arc Protection

Product description	Order No.
Arc Protection	(Short Product Code)
Arc Protection Plugin Module (ARC-CD-3FO)	P1Z1966
Point Sensor 3 m	P1X19
Point Sensor 4 m	P1X28
Point Sensor 5 m	P1X37
Point Sensor 10 m	P1X46
Point Sensor 15 m	P1X55
Point Sensor 20 m	P1X64
Point Sensor 35 m	P1X82

SIPROTEC 5 - Interfaces

Product description	Order No. ¹⁾
<u>Plug-in modules for System Interface</u>	(Short Product Code)
USART-AB-1EL: 1 x electric 1 x electrical RS485, applicable for serial protocols, e.g. IEC60870-5-103, DNP3, RTD-unit and 20 mA unit	P1Z79
USART-AC-2EL: 2 x electric 2 x electrical RS485, applicable for serial protocols, e.g. IEC60870-5-103, DNP3, RTD-unit and 20 mA unit	P1Z437
USART-AD-1FO: 1 x opt. 1.5 km 1 x optic serial, 820 nm, ST-connector, 1.5 km over 62,5/125 µm multimode - fiber applicable for IEC 60870-5-103 (extended), DNP 3 serial and Protection interface (Sync. HDLC, IEEE C37.94)	P1Z62
USART-AE-2FO: 2 x opt. 1.5 km 2 x optic serial, 820 nm, ST-connector, 1.5 km over 62,5/125 µm multimode - fiber applicable for IEC 60870-5-103 (extended), DNP 3 serial and Protection interface (Sync. HDLC, IEEE C37.94)	P1Z48
ETH-BA-2EL: 2 x electrical Ethernet interfaces RJ45 plug, 100 Mbit/s integrated switch (for RSTP, PRP, HSR), applicable for IEC 61850, DNP3 TCP, IEC 60870-5-104 and IEEE C37.118 (Syncho-phasor)	P1Z55
ETH-BB-2FO: 2 x optical Ethernet interfaces LC-Duplex connector, 100 Mbit/s, integrated switch (for RSTP, PRP, HSR), applicable for IEC 61850, DNP3 TCP, IEC 60870-5-104 and IEEE C37.118 (Syncho-phasor)	P1Z390
<u>Plug-in module for various applications</u>	
ANAI-CA-4EL: 4x 20 mA ANAI-CA-4EL: 4 Analog inputs 20 mA, screw terminals	P1Z1137

1) The below-mentioned Ordering No. is applicable for a warranty period of 5 years. For extended warranty, please select the appropriate Ordering No. (Short product code) by using the online configurator.

Plug-in modules for Protection InterfaceOrdering No. ⁵⁾
(Short Product Code)

USART-AF-1LDFO: 1 x opt. 24 km (single-mode) / 4 km (multimode) 1 x optic serial, 1300 nm, LC duplex connector, 24 km over 9/125 µm singlemode – fiber, 4 km over 62,5/125 µm multimode - fiber applicable for Protection interface	P1Z758
USART-AW-2LDFO: 2x opt. 24 km (single-mode) / 4 km (multimode) 2 x optic serial, 1300 nm, LC duplex connector, 24 km over 9/125 µm singlemode – fiber, 4 km over 62,5/125 µm multimode - fiber applicable for Protection interface	P1Z772
USART-AG-1LDFO: 1 x opt. 60 km 1 x optic serial, 1300 nm, LC duplex connector, 60 km over 9/125 µm singlemode – fiber applicable for Protection interface	P1Z468
USART-AU-2LDFO: 2 x opt. 60 km 2 x optic serial, 1300 nm, LC duplex connector, 60 km over 9/125 µm singlemode – fiber applicable for Protection interface	P1Z239
USART-AK-1LDFO: 1x opt. 100 km 1 x optic serial, 1550 nm, LC duplex connector, 100 km over 9/125 µm singlemode – fiber applicable for Protection interface	P1Z888
USART-AV-2LDFO: 2 x opt. 100 km 2 x optic serial, 1550 nm, LC duplex connector, 100 km over 9/125 µm singlemode – fiber applicable for Protection interface	P1Z741
USART-AH-1LDFO: 1x opt.,bidir. 1 x optic serial, bidirectional via 1 common fiber, 1300 nm/1550 nm (Tx/Rx), LC simplex connector, 40 km over 9/125 µm singlemode – fiber ¹⁾ applicable for Protection interface	P1Z765
USART-AJ-1LDFO: 1x opt.,bidir. 1 x optic serial, bidirectional via 1 common fiber, 1550 nm/1300 nm (Tx/Rx), LC simplex connector 40 km over 9/125 µm singlemode – fiber ²⁾ applicable for Protection interface	P1Z1007
USART-AX-2LDFO: 2x opt.,bidir. 2 x optic serial, bidirectional via 1 common fiber, 1300 nm/1550 nm (Tx/Rx), 2 x LC simplex connector, 40 km over 9/125 µm singlemode – fiber ³⁾ applicable for Protection interface	P1Z802
USART-AY-2LDFO: 2x opt.,bidir. 2 x optic serial, bidirectional via 1 common fiber, 1550 nm/1300 nm (Tx/Rx), 2x LC simplex connector, 40 km over 9/125 µm singlemode – fiber ⁴⁾ applicable for Protection interface	P1Z789

Warranty extension

price per extra year of warranty (applicable for each plug-in module)

- 1) USART-AH-1LDFO only in conjunction with USART-AJ-1LDFO or USART-AY-2LDFO at the remote end.
- 2) USART-AJ-1LDFO only in conjunction with USART-AH-1LDFO or USART-AX-2LDFO at the remote end.
- 3) USART-AX-2LDFO only in conjunction with USART-AJ-1LDFO or USART-AY-2LDFO at the remote end.
- 4) USART-AY-2LDFO only in conjunction with USART-AH-1LDFO or USART-AX-2LDFO at the remote end.
- 5) The below-mentioned Ordering No. is applicable for a warranty period of 5 years. For extended warranty, please select the appropriate Ordering No. (Short product code) by using the online configurator.