

Test Equipment and Accessories

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7XV75 Test Switch



Fig. 14/1 7XV75 test switch

Description

The 7XV75 test switch serves for testing protection relays including CT circuits and command contacts. With the help of the switches located on the front side, the current and voltage inputs as well as the circuits of the protection relay to be tested are interrupted and applied to the front side. Via this plug-in connector, currents and voltages can be fed by an injection test set and the different commands and indications can be tested.

Function overview

The following versions are available in a flush-mounting housing:

- For feeder protection without an open star point
- For feeder protection without an open star point and with additional contacts
- For feeder protection without an open star point for two CT cores or separate earth-fault CT
- For feeder protection with an open star point
- For feeder protection with an open star point and independently switchable trip and CT circuits
- For a 3-winding transformer differential protection
- For feeder protection without an open star point with 4th CT and 4th VT input (three-stage test switch)

Technical data

Test switch	
Rated operating voltage V_n	400 V AC
Rated operating current I_n	6 A
Test current capacity	for 1 s 150 A for 10 s 60 A
Unit design	
Metal housing	7XP20
Dimension	1/6 of 19" wide
Weight	Approx. 3.4 kg

Selection and ordering data

Description	Order No.
7XV75 test switch	7XV750□-□CA00
Without open star point for feeder protection	0
With open star point for feeder protection	1
For 3-winding transformer differential protection	2
Without open star point for two CT cores or separate earth-fault CT	3
Without open star point for feeder protection with 4 th CT and 4 th VT input (three-stage test switch)	6
Without open star point for feeder protection and with additional contacts	7
With open star point and independently switchable trip and CT circuits for feeder protection	8
Front test plug connection	
With 16-pin Harting connector	0
With 16 banana connectors (not available for 7XV7506)	1
Connecting cable 7XV6201 for 7XV75 test switch with 2 meter cable	
with 16-pin Harting connector and 17 isolated banana connectors 4 mm with cable marks	7XV6201-5
with 16-pin Harting connector and 17 cable end sleeves with cable marks	7XV6201-6

7PA22/23 Auxiliary Relays for Various Applications



Fig. 14/2 7PA2 auxiliary relays

Description

Due to their quality, reliability and design, these relays are optimal for applications requiring high reliability and availability such as power stations, substations, railway and industrial plants. Typical examples include petrochemical industry, chemical industry, cement industry, rolling mills etc.

The relays comply with the IEC, EN, IEEE standards (type and routine test) and bear the CE mark.

The robust switch contacts are characterized by high make/break capacity, overload capability and continuous current intensity capacity; thus perfect insulation is obtained. Direct control of high-voltage and medium-voltage switchgear is possible.

Their high degree of protection and the transparent cover ensure reliable operation in tropical and/or salty sea air ambient conditions.

Technical data for 7PA22 and 7PA23

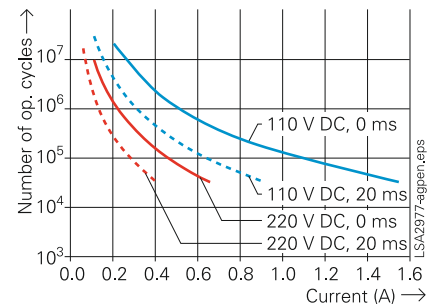
Switching contacts
 Continuous current 10 A
 Overload capability 80 A/200 ms
 150 A/10 ms
 Switching current/voltage 40 A/0.5 s/110 V DC

Breaking capacity for 10^5 operating cycles

	Non-inductive		Inductive, 20 ms	
	1 contact	2 contacts in series	1 contact	2 contacts in series
V DC	A	A	A	A
24	6.6	12.7	3.2	6.0
60	2.6	4.9	1.4	2.7
125	1.2	2.2	0.6	1.1
220	0.6	1.1	0.3	0.6

For details see characteristics

V_{max} , open contact 250 V DC/400 V AC
 Mechanical service life 10^7 operating cycles
 Operating temperature -10 °C to +55 °C
 14 °F to 131 °F
 Max. permissible humidity 93 % at 40 °C/104 °F
 Seismic stress class according to IEEE 501
 Degree of ZPA 3 g acceleration at 33 Hz



Standards

Electrical tests performed according to IEC 60255
 - Dielectric test 2 kV/50 Hz/ 1 min
 - Surge withstand 5 kV/1.2/50 μ s test
 - Insulation > 2000 M Ω /
 500 V_{peak-to-peak}

Flammability tests according to IEC 60692-2-1
 Plastic materials UL 94: VO,
 IEC 60695: 850 °C/30 s
 1562 °F/30 s

Degree of protection Relay: IP 40
 acc. to IEC 60529 With socket cover:
 IP 50

Climatic stress test according to
 - IEC 60255-7 Non-dissipating unit
 dry heat +70 °C/96 h 158 °F/96 h
 Dissipating unit
 +55 °C/96 h 131 °F/96 h

- IEC 60068-2-30 +55 °C/12 h
 cyclic humid heat 131 °F/12 h

- IEC 60068-2-1 100 cycles
 cold Non-dissipating unit
 -10 °C/2 h 14 °F/2 h

- IEC 60255-7 At rated voltage V_N
 thermal aging test +55 °C/1440 h
 131 °F/1440 h

7PA22

Fast-acting lockout relay

Description

The bistable 7PA22 is a fast-acting lockout relay with eight changeover contacts and is plugged into a mounting frame equipped with a plug-in socket (type 7XP9010) with screw-type terminals at the rear.

Functions

No continuous power consumption. Position indication on the front side. Mechanical reset pushbutton.

Position memory with two positions (e.g. for yes/no, open/close, auto/manual, local/remote etc.).

Technical data

While the auxiliary voltage is being supplied to the SET coil, the reset pushbutton must not remain pushed longer than 20 s.

Rated voltages and consumption

V_N	Voltage range	Consumption while switching
V DC	V DC	
24	19 – 26	
30	24 – 33	
60	48 – 66	≤ 48 W
110	88 – 121	
125	100 – 137	
220	176 – 242	

Pick-up time: < 10 ms

General description see page 14/5.

Refer to part 15 for dimension drawings.

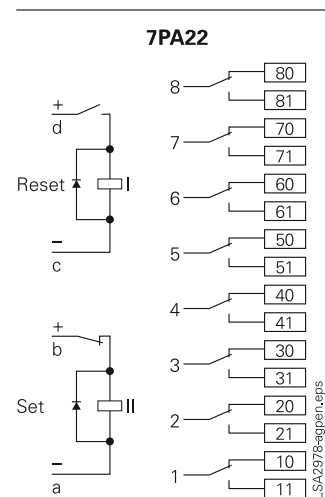


Fig. 14/3 Connection diagram

Selection and ordering data

Description	Order No.
7PA22 fast-acting lockout relay	7PA22□1-□
<i>Auxiliary voltage</i>	
24 V DC	1
60 V DC	2
110 V DC	3
220 V DC	4
125 V DC	5
30 V DC	6
<i>Socket</i>	
without socket	0
with flush-mounting socket 7XP9010-1	1

Accessories

Description	Order No.
<i>Socket as spare part</i>	
Flush mounting	7XP9010-1
Surface mounting	7XP9012-0

7PA23

Fast-acting lockout relay

Description

The bistable 7PA23 is a fast-acting lockout relay with four changeover contacts and is plugged into a mounting frame equipped with a plug-in socket (type 7XP9011) with screw-type terminals at the rear.

Functions

No continuous power consumption. Position indication on the front side. Mechanical reset pushbutton. Position memory with two positions (e.g. for yes/no, open/close, auto/manual, local/remote etc.).

Technical data

While the auxiliary voltage is being supplied to the SET coil, the reset pushbutton must not remain pushed longer than 20 s.

Rated voltages and consumption

V_N	Voltage range	Consumption while switching
V DC	V DC	
24	19 – 26	
30	24 – 33	
60	48 – 66	≤ 24 W
110	88 – 121	
125	100 – 137	
220	176 – 242	

Pick-up time: < 8 ms
 General description see page 14/5.
 Refer to part 15 for dimension drawings.

7PA23

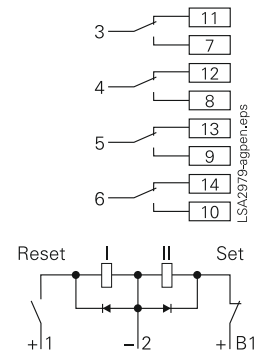


Fig. 14/4 Connection diagram
 Contacts represented in position RESET

Selection and ordering data

Description	Order No.
7PA23 fast-acting lockout relay	7PA23□1-□
<i>Auxiliary voltage</i>	
24 V DC	1
60 V DC	2
110 V DC	3
220 V DC	4
125 V DC	5
30 V DC	6
<i>Socket</i>	
without socket	0
with flush-mounting socket 7XP9011-1	1

Accessories

Description	Order No.
<i>Socket as spare part</i>	
Flush mounting	7XP9011-1
Surface mounting	7XP9013-0

7PA26/27/30 Auxiliary Relays for Various Applications/Trip Circuit Supervision

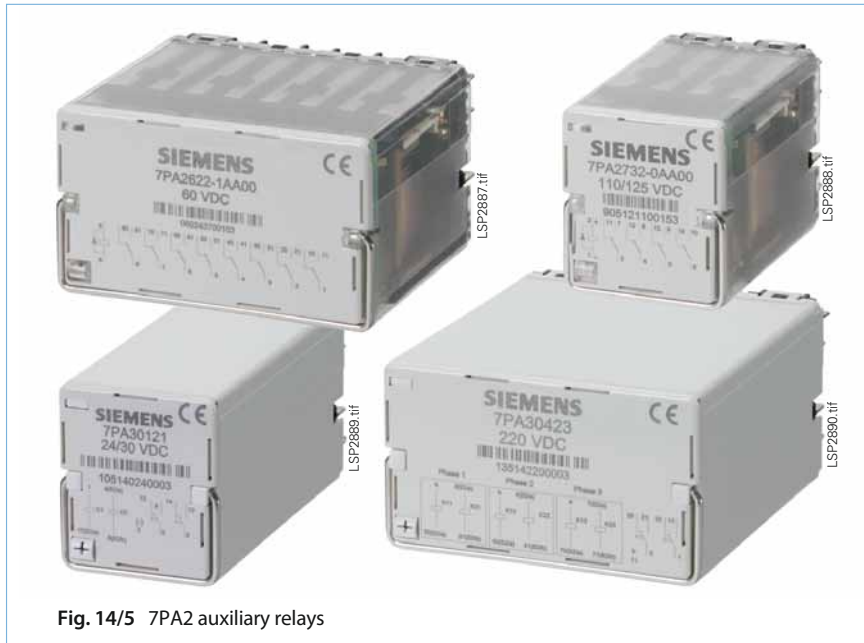


Fig. 14/5 7PA2 auxiliary relays

Description

Due to their quality, reliability and design, these relays are optimal for applications requiring high reliability and availability such as power stations, substations, railway and industrial plants. Typical examples include petrochemical industry, chemical industry, cement industry, rolling mills etc.

The relays comply with the IEC, EN, IEEE standards (type and routine test) and bear the CE mark.

The robust switch contacts are characterized by high make/break capacity, overload capability and continuous current intensity capacity; thus perfect insulation is obtained. Direct control of high-voltage and medium-voltage switchgear is possible.

Technical data for 7PA26 and 7PA27

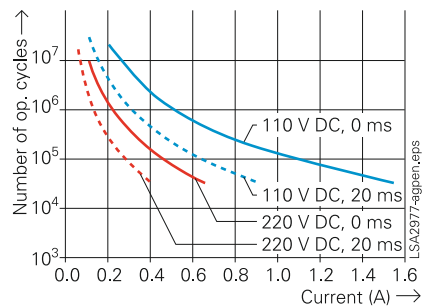
Switching contacts
 Continuous current 10 A
 Overload capability 80 A/200 ms
 150 A/10 ms
 Switching current/voltage 40 A/0.5 s/110 V DC

Breaking capacity for 10^5 operating cycles

V DC	Non-inductive		Inductive, 20 ms	
	1 contact	2 contacts in series	1 contact	2 contacts in series
24	6.6	12.7	3.2	6.0
60	2.6	4.9	1.4	2.7
125	1.2	2.2	0.6	1.1
220	0.6	1.1	0.3	0.6

For details see characteristics

V_{max} , open contact 250 V DC/400 V AC
 Mechanical service life 10^7 operating cycles
 Operating temperature -10 °C to +55 °C
 14 °F to 131 °F
 Max. permissible humidity 93 % at 40 °C/104 °F



Technical data for 7PA30

Contacts
 Permanent current 8 A
 Instantaneous current 15 A
 Making capacity 15 A/4 s/110 V DC
 Breaking capacity 0.3 A/110 V DC
 U_{max} opened contact 250 V DC/400 V AC
 Mechanical life 10^7 operations
 Operating temperature -10 °C +55 °C
 Storage temperature -30 °C +70 °C
 Operating humidity 93 %/40 °C

Standards

Electrical test performed acc. to IEC 60255-5
 Dielectric test 2 kV / 50 Hz / 1 min
 Surge withstand test 5 kV / 1.2 / 50 μ s
 Insulation >100 M Ω / 500 V DC
 Inflammability tests UL94: VO
 Plastic materials
 Degree of protection Relay: IP40
 acc. to IEC 60529
 Climatic stress test acc. to IEC 60068-2
 Dry cold, operation -10 °C
 Dry heat, operation +55 °C
 Storage and transport -25 °C +70 °C

Constructions standards (Cont'd)

Immunity test EMC

- EN 60255-22-1 High frequency 1 MHz burst disturbance test:
Test level: 1 MHz, 400 imp/s, 2 s
Common mode: 2,5 kV
Differential mode: 1 kV
- EN 61000-4-4 Electrical Fast transient burst:
Test level 4 kV, 2,5 kHz,
1 min · 2 kV, 5 kHz, 1 min
- EN 61000-4-5 Surge 8/20 μs (current)
1.2/50 μs (voltage)
Common mode: 2 kV-
Differential mode: 1 kV
- EN 61000-4-3 Radiated electromagnetic field:
Test level: 80-1000 MHz,
10 V/m, 80 % AM (1 kHz)
- EN 61000-4-3 Digital telephones radiated electromagnetic field: Test level:
900 ± 5 MHz, 10 V/m, 50 %
(200 Hz) 1.89 GHz ± 10 MHz,
10 V/m, 50 % (200 Hz)
- EN 61000-4-6 Conducted disturbances induced by radio frequency fields.
Test level: 0.15-80 MHz, 10 V,
80 % AM (1kHz)
- EN 61000-4-2 Electrostatic discharges: Test level: Contact ± 15 kV;
Air mode ± 15 kV
- EN 61000-4-8 Power frequency magnetic field:
Test level: 100 A/m
1 min · 1000 A/m 1 s
- EN 55011 Class A Emission test: Test level: Cover:
30-230 MHz, 40 dB(μV/m)
(quasi peak)-10 m
230-1000 MHz, 47 dB(μV/m)
(quasi peak)-10 m
Power supply:
0.15-0.5 MHz, 79 dB(μV)
(quasi peak)/ 66 dB average val.
0.5-5 MHz, 73 dB(μV)
(quasi peak)/ 60 dB average val.
5-30 MHz, 73 dB(μV)
(quasi peak)/ 60 dB average val.

7PA26 Monostable fast-acting relay

Description

The monostable 7PA26 has eight change-over contacts.

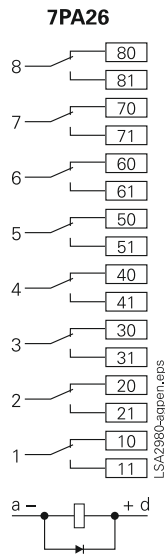


Fig. 14/6 Connection diagram

Technical data

Rated voltages and consumption

V _N	Voltage range	Consumption	
V DC	V DC	mA	
7PA26□20			
24/30	20 – 33	278	
60	48 – 66	100	
110/125	88 – 138	55	
220	176 – 242	28	
7PA26□21			
		Consumption	
		Normal Peak	
24/30	19 – 36	50	0.8 A 20 ms
60	42 – 72	20	
110/125	77 – 150	14	0.3 A 20 ms
220	154 – 264	7	

- Pick-up time: 7PA26□20 < 20 ms
7PA26□21 < 10 ms
- Drop-out time: < 40 ms

General description see page 14/5.
Refer to part 15 for dimension drawings.

Selection and ordering data

Description	Order No.
7PA26 monostable relay with 8 changeover contacts	7PA26□2-□AA00-□
Auxiliary voltage	
24 /30 V DC	1
60 V DC	2
110/125 V DC	3
220 V DC	4
Standard, 20 ms	0
Fast, 10 ms	1
Socket	
without socket	0
with flush-mounting socket 7XP9010-3	1
with surface-mounting socket 7XP9012-0	2

Accessories

Description	Order No.
Socket as spare part	
Flush mounting	7XP9010-3
Surface mounting	7XP9012-0

7PA27 Monostable fast-acting relay

Description

The monostable 7PA27 is a fast-acting relay with four changeover contacts.

Technical data

Rated voltages and consumption

V_N	Voltage range	Consumption	
		Normal	Peak
V DC	V DC	mA	
24/30	19 – 36	28	1 A/20 ms
60	42 – 72	12	1 A/20 ms
110/125	77 – 150	8	0,3 A/20 ms
220	154 – 264	6	0,3 A/20 ms

- Pick-up time: < 8 ms
- Drop-out time: < 40 ms

General description see page 14/5.

Refer to part 15 for dimension drawings.

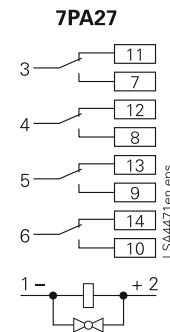


Fig. 14/7 Connection diagram

Selection and ordering data

Description	Order No.
7PA27 monostable fast-acting relay	7PA27□2-0AA00-□
<i>Auxiliary voltage</i>	
24 / 30 V DC	1
60 V DC	2
110 / 125 V DC	3
220 V DC	4
<i>Socket</i>	
without socket	0
with flush-mounting socket 7XP9011-2	1
with surface-mounting socket 7XP9013-0	2

Accessories

Description	Order No.
<i>Socket as spare part</i>	
Flush mounting	7XP9011-2
Surface mounting	7XP9013-0

7PA30 Three-phase Trip circuit supervision

Description

The relay is for supervision of the trip circuit of a circuit breaker with three selective trip coils. The trip circuit wiring is supervised from the positive supply to the negative supply whilst the circuit breaker is open or closed.

Functions

The design, quality and rugged construction of the relay make it suitable for applications requiring high levels of reliability/dependability. The high degree of protection guarantees reliable operation over a wide temperature range, even under extreme environmental conditions.

The relay has been tested in accordance with IEC, EN and IEEE standards. The relay is CE marked. The supervision current is always less than 1.4 mA thus avoiding unwanted operation of the trip coil. Correct operation is shown via a green LED.

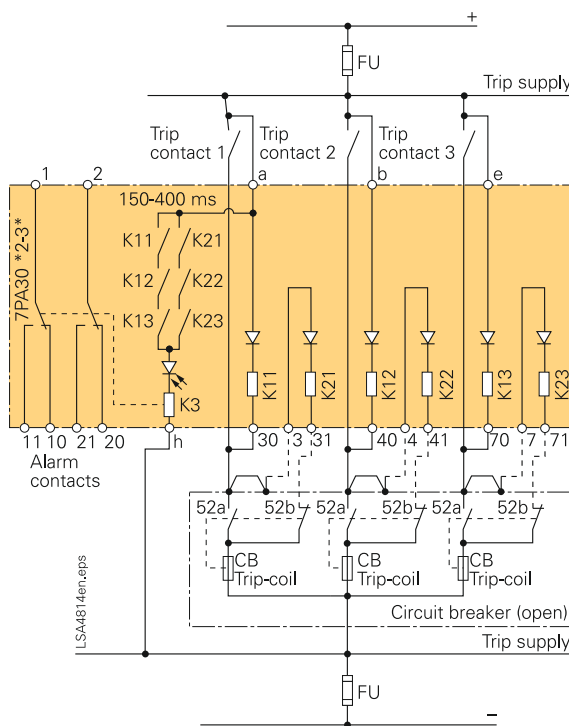


Fig. 14/8 Connection diagram for 3-phase relay

Standard voltages and consumption

V_N	Voltage range	Consumption	Impedance per phase	Pickup Drop out Voltage
V DC	V DC	mA	$k\Omega/s$	V DC
24/30	18 - 33	35	20	between 12 and 18
60	42 - 66	20	44	36 and 42
110/125	77 - 138	20	94	66 and 77
220	154 - 275	15	200	132 and 154

Drop-out time: between 150 ms and 400 ms

Selection and ordering data

Description	Order No.
7PA30 trip circuit supervision (three-phase)	7PA30□2-3AA00-□
<i>Auxiliary voltage</i>	
24/30 V DC	1
60 V DC	2
110/125 V DC	3
220 V DC	4
<i>Socket</i>	
without socket	0
with flush-mounting socket 7XP9010-4	1
with surface-mounting socket 7XP9012-0	2

Accessories

Description	Order No.
<i>Socket as spare part</i>	
Flush mounting	7XP9010-4
Surface mounting	7XP9012-0

7PA30 Single-phase Trip circuit supervision

Description

The relay is for supervision of the trip circuit of a circuit breaker with one trip coil. The trip circuit wiring is supervised from the positive supply to the negative supply whilst the circuit breaker is open or closed.

Functions

The design, quality and rugged construction of the relay make it suitable for applications requiring high levels of reliability/dependability. The high degree of protection guarantees reliable operation over a wide temperature range, even under extreme environmental conditions.

The relay has been tested in accordance with IEC, EN and IEEE standards. The relay is CE marked. The supervision current is always less than 1.4 mA thus avoiding unwanted operation of the trip coil. Correct operation is shown via a green LED.

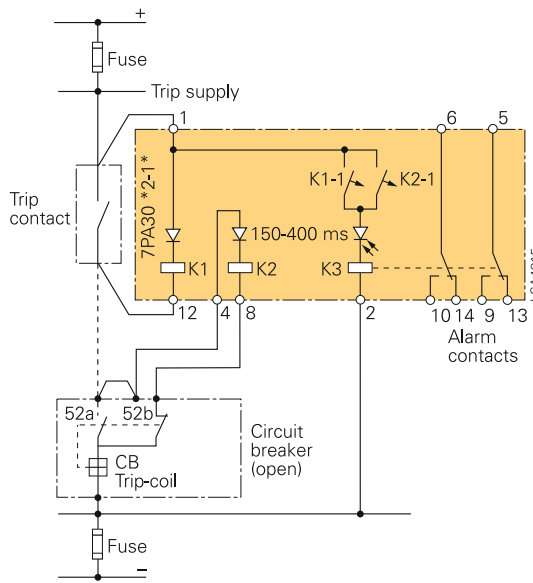


Fig. 14/9 Connection diagram for 1-phase relay

Standard voltages and consumption

V_N	Voltage range	Consumption	Impedance per phase	Pickup Drop out Voltage
V DC	V DC	mA	kΩ/s	V DC
14/30	18 - 33	32	20	between 12 and 18
60	42 - 66	18	44	36 and 42
110/125	77 - 138	18	94	66 and 77
220	154 - 275	13	200	132 and 154

Drop-out time: between 150 ms and 400 ms

Selection and ordering data

Description	Order No.
7PA30 trip circuit supervision (single-phase)	7PA30□2-1AA00-□
<i>Auxiliary voltage</i>	
24/30 V DC	1
60 V DC	2
110/125 V DC	3
220 V DC	4
<i>Socket</i>	
without socket	0
with flush-mounting socket 7XP9011-0	1
with surface-mounting socket 7XP9013-0	2

Accessories

Description	Order No.
<i>Socket as spare part</i>	
Flush mounting	7XP9011-0
Surface mounting	7XP9013-0

7TS16 Annunciation Relay



Fig. 14/10 7TS16 annunciation relay

Description

The 7TS16 relay features auxiliary trip indication for local and remote signaling. It has four independent output contacts and LED indication. The relay complies with the IEC and EN standards and bears the CE mark.

The 7TS16 is a reliable and versatile high-speed relay with four signal inputs. It has four local LEDs and auto-resetting output contacts, used in SCADA controls. Additionally, it features two diode tripping circuits.

Reset is possible via remote input and via local reset push button.

The reset should not be permanently switched on.

Function overview

- Indications: Four LEDs, latching type, signaling until reset.
- Inputs: Four alarm/trip inputs
 - Input for remote reset
 - Push button for local reset
- Outputs: For each alarm/trip input:
 - One diode 2.5 A
 - One potential free changeover contact
 - One potential free NO contact
 - One common tripping output through diode (2.5 A; V_{max} 220 V DC)
- Contacts:
 - Permanent current 8 A
 - Instantaneous current 15 A
 - Making capacity 15 A /4 s /110 V DC
 - Breaking capacity 0.3 A /110 V DC

Technical data

- Rated voltages (V_N):
24/30, 110/125, 220 V DC
- Voltage range +10 % – 30 %
 V_N
- Operating temperature -10 to +55 °C
- Operating humidity 93 %/40 °C
- Pickup time < 5 ms
- Consumption

For one trip

V_N	
24/30 V DC	1 A/3 ms
110/125 V DC	3 A/3 ms
220 V DC	4 A/3 ms

For a permanent trip

V_N	mA
24/30 V DC	21
110/125 V DC	8
220 V DC	6.5

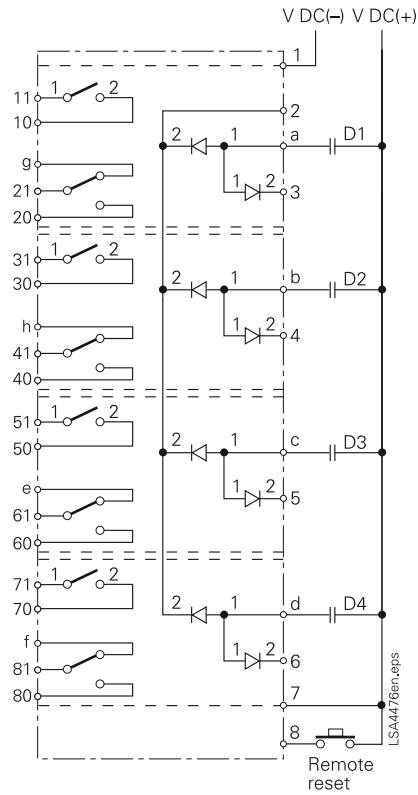
For a latched LED

V_N	mA
24/30 V DC	1
110/125 V DC	3
220 V DC	5

Standards

- Electrical tests performed acc. to IEC 60255-5
- Dielectric test 2 kV/50 Hz/ 1 min
 - Surge withstand test 5 kV/1.2/50 μ s
- High-frequency test acc. to IEC 60255-22-1
- Common mode 2.5 kV / 1 MHz
 - Differential mode 1 kV / 1 MHz
- Inflammability tests UL94: VO
Plastic materials
- Degree of protection Relay: IP40
acc. to IEC 60529
- Climatic stress test acc. to IEC 60068-2
- Dry cold, operation - 10 °C
 - Dry heat, operation + 55 °C
 - Storage and transport - 30 °C + 70 °C

Connection diagram



- 2 Direct common trip output
- 3, 4, 5, 6 Direct trip output
- 1(-), 7(+) Auxiliary supply
- D External relay contact

Fig. 14/11 Connection diagram
Contacts represented without auxiliary supply in the relay

Selection and ordering data

Description	Order No.
7TS16 annunciation relay with 4 LEDs	7TS16□2-0AA00-□
<i>Rated auxiliary voltage</i>	
24/30 V DC	1
110/125 V DC	3
220 V DC	4
<i>Socket</i>	
Without socket	0
With flush-mounting socket 7XP9010-2	1
With surface-mounting socket 7XP9012-0	2

Accessories

<i>Socket as spare part</i>	
Flush mounting	7XP9010-2
Surface mounting	7XP9012-0

3RV16 Voltage Transformer Circuit-Breaker



Fig. 14/12
3RV16 voltage transformer circuit-breaker

Description

The voltage transformer circuit-breaker protects the secondary side of voltage transformers used to connect protection relays with voltage-dependent starting. The switch is used for distance protection with low-impedance starting. Special auxiliary contacts reliably prevent low-impedance starting from triggering distance protection if only one error has occurred in the converter line.

The voltage transformer circuit-breaker can also be used to safely disconnect the distance protection relay from the voltage transformer. In this case the special auxiliary contacts also prevent erratic triggering of the distance protection.

Additional fuses are not required. A “Fuse Failure Monitor” (FFM) is also not required.

The circuit-breakers are snap-mounted on a 35-mm mounting rail to EN 50022. Push-in lugs are available for screw-type connection of the circuit-breakers.

The circuit-breaker for voltage transformers also incorporates 2 auxiliary contacts (normally 1 NO + 1 NC). During the closing operation, contact making via the NO contact of the control switch takes place later than via the main contacts, whereas during the opening operation the auxiliary circuits are interrupted at the

same time as the main circuits, if not before. This adjustment has the effect of preventing the opening of the circuit-breaker from producing a tripping command via the underimpedance starting of the distance protection relay.

The auxiliary voltage for blocking voltage-dependent starting (underimpedance) must always be routed via the NO contact 11-14.

Function overview

Application

- Protection of voltage-transformer secondary circuits for the connection of protection relays with voltage-dependent starting element

Functions

- Auxiliary contact of 3RV16 prevents the distance protection tripping via the underimpedance starting in case of a fault in the voltage transformer circuits
- Tripping time of instantaneous element in few milliseconds

Construction

- Snap-on mounting on 35-mm mounting rail, or screw mounting

Functions

The voltage transformer circuit-breaker largely corresponds with the circuit-breaker 3RV1, SIRIUS, size S00. Two special characteristics are taken into account for safe prevention of faulty triggering of the distance protection relay.

Auxiliary switch for blocking the distance protection

The main contacts of the circuit-breaker open if the voltage transformer circuit-breaker is tripped or switched off. The distance protection would falsely interpret low impedance as a fault, which results in immediate power cut-out within only a few milliseconds.

To prevent this fault response, special auxiliary contacts with a time-dependent assignment to the circuit-breaker's main contacts (see Technical data) must be provided. The distance protection is blocked with the help of these auxiliary contacts, and thus prevents faulty triggering.

An auxiliary switch for blocking the distance protection relay is available, equipped with 1 changeover contact fitted permanently in the voltage transformer circuit-breaker. This changeover contact can be used as 1 NO (11-14) or 1 NC (11-12) contact. Due to the high contact stability of these auxiliary contacts at the lowest possible rated operational currents $I_e/AC-15 \geq 0.5 \text{ mA}$ at 230 V, it is also suitable for modern solid-state distance protection relays.

The laterally mountable auxiliary switches of the SIRIUS range can be used for signaling functions. They cannot be used for blocking the distance protection relay.

Impedance across the main contacts

There is only minor current flow across the main contacts of the voltage transformer circuit-breaker. To ensure reliable functioning of the distance protection, main contact resistance must be minimal and nearly constant throughout the service life of the circuit-breaker.

This is realized with suitable contacts and contact materials for the 3RV16 voltage transformer circuit-breaker.

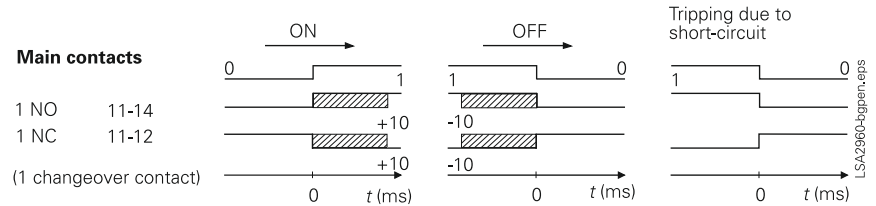
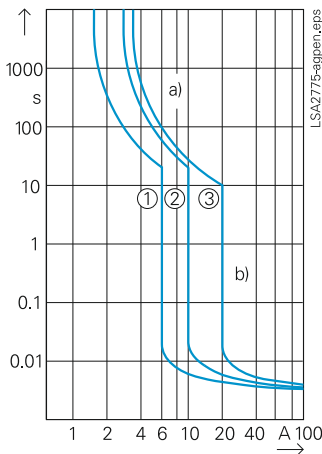


Fig. 14/13 Timing diagram of auxiliary switches for blocking distance protection

Characteristics

The specified tripping characteristics of the thermal overload pickup (a) correspond to the mean value of the leakage bandwidth in cold state; at operating temperature these times are reduced to approx. 25 % of the specified values. The characteristics below are schematic representations. Precise characteristics are available from "Technical Assistance" (E-mail: nst.technical-assistance@siemens.com).



- ① 1.4 A/6 A
- ② 2.5 A/10.5 A
- ③ 3 A/20 A
- a) Thermal overload pickup
- b) Instantaneous electromagnetic surge trip

Fig. 14/14 Characteristics

Connection diagrams

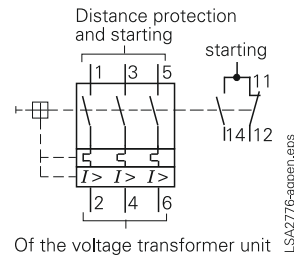


Fig. 14/15 Internal connections

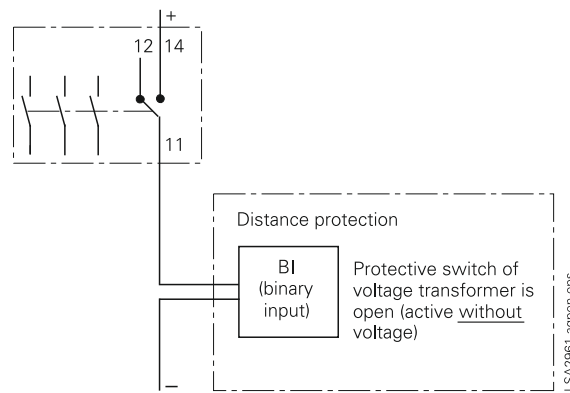


Fig. 14/16 Typical connections

Note:
When using the NC contact to connect the voltage transformer circuit-breaker, the binary input of the distance protection device (Siemens 7SA xxx) should be set to "active without voltage". This type of connection is used for additional monitoring of correct wiring.

Technical data

Conductor cross-sections, main circuit, 1 or 2 conductors

Type	3RV1611-1AG14	1CG14	1DG14
Terminal type	Screw connection		
Terminal screw	Prozidriv size 2		
Solid	2 x (0.5 to 1.5 mm ²); 2 x (0.75 to 2.5 mm ²); (max. 4 mm ²);		
Finely stranded with end sleeve	2 x (0.5 to 1.5 mm ²); 2 x (0.75 to 2.5 mm ²)		
Stranded	2 x (0.5 to 1.5 mm ²); 2 x (0.75 to 2.5 mm ²); (max. 4 mm ²)		

Auxiliary switch for blocking the distance protection

With defined time-dependent assignment for blocking distance protection	1 changeover contact, solid-state compatible (usable as 1 NO or 1 NC)		
Rated operational current I_E /rated operational voltage V_E	AC-14	0.5 A/ V_E 250 V	
	AC-14	1 A/ V_E 125 V	
	DC-13	0.27 A/ V_E 250 V	
	DC-13	0.44 A/ V_E 125 V	

Short-circuit protection for auxiliary circuit

Fusible link, gL/gG	max. 10 A
Miniature circuit-breaker, C characteristic	max. 6 A

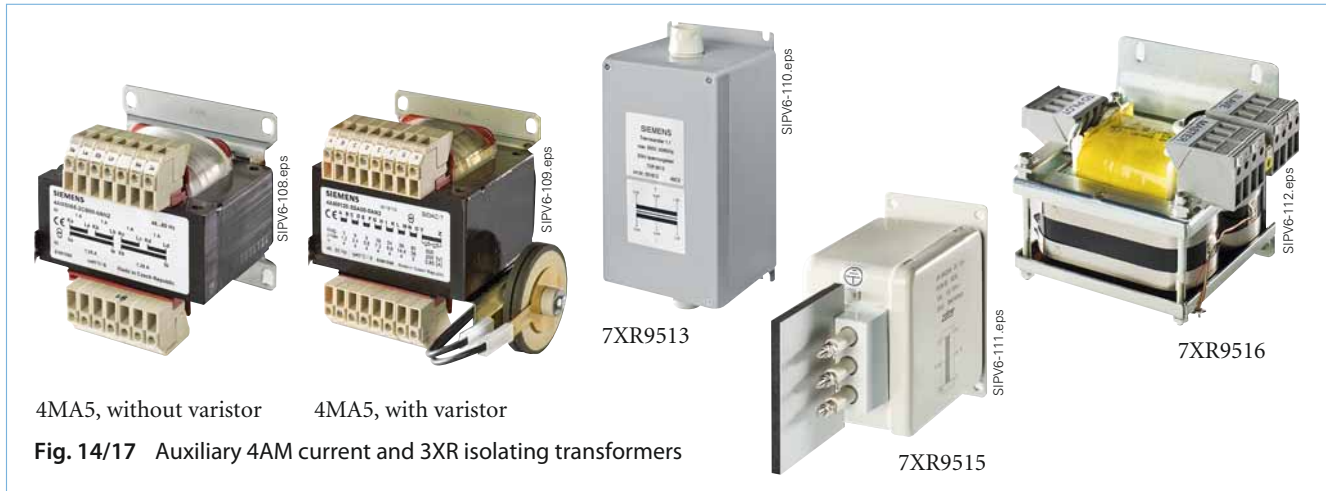
Selection and ordering data

Description	Order No.
3RV16 voltage transformer circuit-breaker	
with 1 auxiliary contact, 1 changeover	
1.4/ 6 A	3RV1611-1AG14
2.5/10.5 A	3RV1611-1CG14
3/20 A	3RV1611-1DG14
Laterally mountable auxiliary switches 1 NO/NC	3RV1901-1A

General technical data

Type	3RV1611-1AG14	1CG14	1DG14
Rated current	1.4	2.5	3
Permissible ambient temperature			
During storage/transport	-50 to +80 °C		
During operation	-20 to +60 °C (up to 70 °C possible with current reduction)		
Rated operational voltage V_E	400 V		
Rated frequency	16.7 to 60 Hz		
Rated insulation voltage V_I	690 V		
Short-circuit breaking capacity at 400 V AC, short-circuit proof up to	50 kA		
Current setting of the thermal overload release	1.4 A	2.5 A	3 A
Operating value of the instantaneous electromagnetic overcurrent release	6 ± 20 %	10.5 ± 20 %	20 ± 20 %
Tripping time of the instantaneous electromagnetic overcurrent release	Approx. 6 ms at 12 A 6 ms at 20 A 6 ms at 40 A		
Disconnection life:			
short-circuit current I_p	Max. short-circuit disconnections		
≤ 0.1 kA	≤ 10		
0.1 to 2 kA	≤ 3		
2 kA to 50 kA	1		
Internal resistance			
in cold state	> 0.25 Ω ± 6.5 %		
in heated state	> 0.30 Ω ± 6.5 %		
Shock resistance	15 g		
acc. to IEC 60068, Part 2-27			
Degree of protection	IP 20		
acc. to IEC 60529			
Touch protection	Safe against finger touch		
acc. to DIN VDE 0106 Part 100			
Service life	Operating cycles		
mechanical	10000		
electrical	10000		
Permissible mounting position	any		

4AM□□ Auxiliary Current Transformers 7XR□□ Isolating Transformers



Overview

Application	Comment	Climatic requirements according to former DIN 40040	Features
Matching current transformer	Multi-tap aux. current transformer to match different current transformer ratios. 4AM51 70-7AA: Standard version, primarily for transformer differential protection. 4AM52 72-2AA: Version with double thermal withstand capability, e.g. when connecting to wide-range current transformer (continuous rating $2 \times I_N$). 4AM52 72-3AA: Version with higher saturation factor (mainly for the busbar differential protection). Greater overcurrent factor because of higher voltages	HKG HKG HKG	Numerous ratios can be selected using terminal connections (next page) $f_N = 45$ to 60 Hz
Input and matching current transformer	Input and matching current transformer for phase selective busbar differential protection (a.o. for 7SS60, 7UT6) 4AM51 20-1DA: For 1 A C.T.s 4AM51 20-2DA: For 5 A C.T.s ¹⁾	HKG HKG	$f_N = 45$ to 60 Hz with varistor
3-phase summation input C.T.	Input 3-phase summation current transformer for busbar differential protection (a.o. for 7SS60). 4AM51 20-3DA: For 1 A C.T.s 4AM51 20-4DA: For 5 A C.T.s for line differential protection (a.o. for 7SD600) 4AM49 30-6DA: For 5 A 4AM49 30-7DA: For 1 A	HKG HKG HKG HKG	$f_N = 45$ to 60 Hz with varistor $f_N = 45$ to 60 Hz with varistor
Aux. C.T. for C.T. powered tripping circuits	Auxiliary current transformer for C.T. powered trip coils in stations where no battery supply can be made available. 4AM50 65-2CB: For 1 A C.T.s 4AM50 70-8AB: For 5 A C.T.s Suitable for tripping coils with $I_N \leq 0.5$ A or 1 A, $V_N \leq 40$ V or 20 V, $P \leq 20$ VA.	HKD HKD	Unlike transducers, no defined rated power or class accuracy required. $f_N = 45$ to 60 Hz
Isolating transformer	Isolating transformer for pilot wire differential protection. Provides galvanic isolation between pilot wires and relays. 7XR9 513: For differential protection with 1 pair of pilot wires (a.o. for 7SD600) 7XR9 515: For differential protection with 1 pair of pilot wires (a.o. for 7SD600) 7XR9 516: For communication converter 7XV5662-0AC00 (a.o. for SIPROTEC 4 device 7SA522, 7SA6, 7SD52, 7SD61)	HKG HKG –	20 kV insulation 5 kV insulation 20 kV insulation

Climatic requirements: HKG = -25 °C to $+125$ °C relative humidity max. 75 %; annual average < 65 % on 60 days of the year up to 85 % (equally distributed over the year); condensation not permissible

HKD = -25 °C to $+125$ °C relative humidity max. 90 %; annual average < 80 % on 30 days of the year up to 100 % (equally distributed over the year); condensation permissible

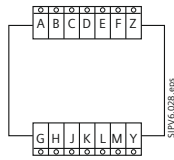
1) If increased thermal withstand is required type 4AM51 20-4DA is recommended.

Order No. and Technical data

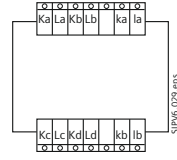
Order No.		Windings of auxiliary current transformers	Weight, approx.
4AM49 30-6DB00-0AN2	Number of windings		1.9 kg
	Max. current, continuously	A 28 28 28 28 6.5	
	Max. voltage	V 0.23 0.46 0.69 1.38 (5.6) 400	
4AM49 30-7DB00-0AN2	Number of windings		2 kg
	Max. current, continuously	A 4.5 4.5 4.5 4.5 1.2	
	Max. voltage	V 1.15 2.3 3.5 7 (20) 400	
4AM51 70-7AA00-0AN2	Number of windings (in relation to each other)		3.6 kg
	Rated current I _N ¹⁾	A 5 5 5 1 5 5 5 1	
4AM52 72-2AA00-0AN2	Rated current I _N ¹⁾	A 10 10 10 2 10 10 10 2	5.4 kg
	Max. voltage	V 2 4 14 32 2 4 14 32	
4AM52 72-3AA00-0AN2	Rated current I _N ¹⁾	A 5 5 5 1 5 5 5 1	5.4 kg
	Max. voltage	V 4 8 28 64 4 8 28 64	
4MA50 65-2CB00-0AN2	Rated current I _N ¹⁾	A 1 1 1 1	2.9 kg
	Number of windings		
	Number of windings	Primary windings	
4MA50 70-8AB00-0AN2	Rated current I _N ¹⁾	A 1.25 1.25	2.9 kg
	Rated current I _N ¹⁾	A 5 5 5 5	
	Number of windings		
4AM51 20-1DA00-0AN2	Number of windings		3.6 kg
	Max. current, continuously	A 6.8 6.8 6.8	
	Max. voltage	V 0.4 0.8 1.6 3.2 6.4 12.5 200	
4AM51 20-2DA00-0AN2	Max. current, continuously	A 26 26 not fitted	3.6 kg
	Max. voltage	V 0.4 0.8 1.6 3.2 200	
4AM51 20-3DA00-0AN2	Number of windings		3.6 kg
	Max. current, continuously	A 4 4 4 4 4 4 2 0.85	
	Max. voltage	V 1.2 2.4 3.6 7.2 9.6 14.4 36 200	
4AM51 20-4DA00-0AN2	Number of windings		3.6 kg
	Max. current, continuously	A 17.5 17.5 17.5 17.5 17.5 17.5 8 0.85	
	Max. voltage	V 0.4 0.8 1.2 1.6 2.4 3.2 4.8 200	
7XR9 513	Isolating transformer for differential protection with 1 pair of pilot wires		5 kg
7XR9 515	Isolating transformer for differential protection with 1 pair of pilot wires		2 kg
7XR9 516	Isolating transformer for communication converter		1.4 kg

1) Thermal withstand with simultaneous loading of all the windings: 1.2 x I_N/continuously; 10 x I_N/10 s; 25 I_N/1 s.

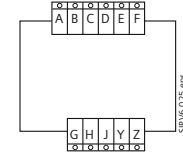
Order No. and Technical data



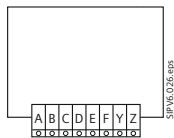
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4AM49 30-7DB



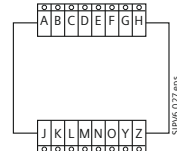
4AM50 65-2CB
4AM50 70-8AB



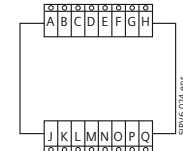
4AM51 20-1DA



4AM51 20-2DA



4AM51 20-3DA
4AM51 20-4DA



4AM51 70-7AA
4AM52 72-2AA
4AM52 72-3AA

Fig. 14/18 Connection of windings