

# Модули расширения безопасности с задержкой по времени SRTC

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# Time-Delayed Safety Expansion Module SRTC

## Operating Instructions

### Correct Use



The SRTC is an expansion module that can be operated with any basic device from the ZANDER SR series, e.g. SR2C or SR3C, in order to permit delayed switch-off of machine parts. This could be the case if it is safer to return a tool to its initial position first instead of stopping operation immediately. The SRTC was developed as a component for a modular system. Any combination of SRTC units and non-time-delayed SREC expansion blocks can be interconnected with just a few lines, permitting realization of an overall system with different times and the specific number of safety contacts required.

- 3 safe, redundant, time-delayed relay outputs
- 1 auxiliary contact (fault monitoring)
- Activation via basic device from the ZANDER SR series
- Continuously adjustable delay, 1 to 30 s
- Corresponds to STOP category 1
- Fault monitoring by basic device
- Indication of the switching state via LED
- Up to PL d, category 3, SIL 2



### Function

The time-delayed emergency stop safety switching device SRTC in combination with a basic device from the ZANDER SR series is designed for safe isolation of safety circuits according to EN 60204-1 and can be used up to safety category 3, PL d according to EN ISO 13849-1.

The SRTC provides a control voltage of DC 24 V at terminal S11. In order for the SRTC to switch together with the connected basic device, the control voltage at S11 is connected to terminals S15 and S16 of the SRTC via one of the safety contacts of the basic device (see *Wiring* section on page 2).

The safety contacts of the basic device close when the basic device is activated, and the control voltage at terminal S11 is then connected with terminals S15 and S16 of the SRTC. The safety contacts of the SRTC switch immediately.

The basic device disconnects the control voltage when the safety switch is operated, and the safety contacts of the SRTC open after the time set on the SRTC elapses (the power supply must be present during the time sequence).

If a fault occurs in the SRTC, this is detected by the basic device via terminals S25 and S26.

**Independent operation without basic device is not possible.**

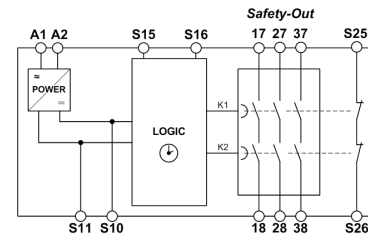


Fig. 1 Block diagram SRTC

### Installation

As per EN 60204-1, the device is intended for installation in control cabinets with a minimum degree of protection of IP54. The following should be noted:

- Mounting on 35 mm rail according to EN 60715 TH35
- Ensure sufficient heat dissipation in the control cabinet
- With the AC 115 V / 230 V version, a minimum distance of 10 mm to adjacent devices must be maintained

**Note:** Spacer from ZANDER AACHEN (Art. No. 472596) for defined distances - See section Accessories.

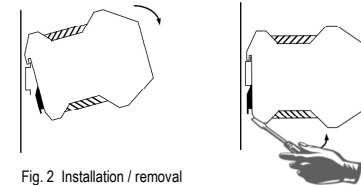


Fig. 2 Installation / removal

### Safety Precautions

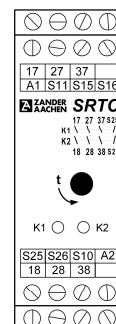


- Installation and commissioning of the device must be performed **only by authorized personnel**.
- Observe the country-specific regulations when installing the device.
- The electrical connection of the device is only allowed to be made with the device isolated.
- The wiring of the device must comply with the instructions in this user information, otherwise there is a risk that the safety function will be lost.
- It is not allowed to open the device, tamper with the device or bypass the safety devices.

- All relevant safety regulations and standards are to be observed.
- The overall concept of the control system in which the device is incorporated must be validated by the user.
- Failure to observe the safety regulations can result in death, serious injury and serious damage.
- Note down the version of the product (see label "Ver: x") and check it prior to every commissioning of a new device. If the version has changed, the overall concept of the control system in which the device is incorporated must be validated again by the user.

### Electrical Connection

- Consider the information in the section "Techn. data"
- When the 24 V version is used, a safe transformer according to EN 61558-2-6 or a power supply unit with electrical isolation from the mains must be connected
- External fusing of the safety contacts must be provided
- If the device does not function after commissioning, it must be returned to the manufacturer unopened. Opening the device will void the warranty
- Use adequate protective circuit for inductive loads (e.g. free-wheeling diode)



A1:	Power supply
A2:	Power supply
S11:	DC 24V control voltage
S10:	Control line
S15:	Control line
S16:	Control line
S25:	Fault monitoring
S26:	Fault monitoring
17-18:	Time-delayed safety contact 1
27-28:	Time-delayed safety contact 2
37-38:	Time-delayed safety contact 3

Fig. 3 Connections

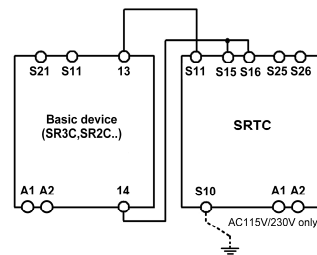
# Time-Delayed Safety Expansion Module SRTC

## Operating Instructions

### Applications

Depending on the application, the device must be wired with a ZANDER basic device as shown in Fig. 4 to Fig. 9.

### Wiring



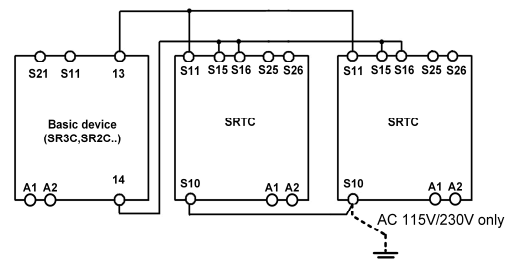
**Fig. 4: Connection of SRTC to basic device**

Wiring of the SRTC via only 4 lines:

A safety contact of the basic device (e.g. 13-14) activates the relays of the SRTC (S11 and S15/S16).

Two lines on S25 and S26 are required for feedback/fault monitoring. According to the application, they have to be wired according to Fig. 3 respective Fig. 4.

A fault in the SRTC thereby prevents the entire safety chain from restarting. Earth faults in the control lines are detected in addition to internal faults.



**Fig. 5: Connection of several SRTC units to basic device**

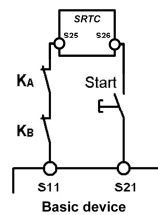
If further SRTC units are to be integrated into the system, terminals S11 must be connected in parallel on all SRTC units. This also applies to terminals S10 and terminals S15/S16.

The feedback-loops (S25-S26) of the several expansion devices have to be wired in series to the start of the basic device (see Fig. 3 respective Fig. 4).

#### Notice:

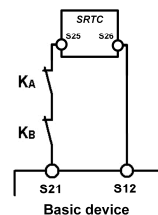
In order to activate earth fault monitoring, S10 must be connected to PE (protective earth) on the AC115/230V devices. With AC/DC 24 V, connect PE only to the power supply unit according to EN60204-1.

### Feedback Loop



**Fig. 6: Feedback loop**

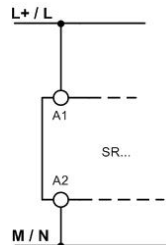
Contactors connected to the SRTC or the basic devices are monitored via the feedback loop of the basic device. KA and KB are the positively driven contacts of the connected contactor or expansion module.



**Fig. 7: Feedback Loop with Auto-Start**

Contactors connected to the SRTC or the basic devices are monitored via the feedback loop of the basic device. KA and KB are the positively driven contacts of the connected contactor or expansion module.

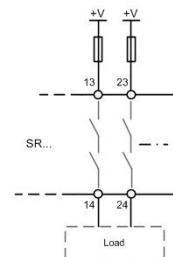
### Power supply and Safety contacts



**Fig. 8:**

Power supply A1 and A2.

(Power supply according to techn. Data)



**Fig. 9:**

Connecting load to safety contacts.

(Figure shows example. Voltage „+V“ according to techn. Data)

### Commissioning Procedure



**Note:** The items listed under “Electrical connection” must be observed during commissioning.

#### 1. Wiring SRTC:

Wire the SRTC with the ZANDER basic device according to your application (see Fig. 4 to Fig. 5).

#### 2. Wiring basic device:

Wire the basic device according to the required Performance Level determined (see user information for the basic device).

#### 3. Wiring feedback loop:

Wire the feedback loop as shown in Fig. 6 or Fig. 7.

#### 4. Wiring power supply:

Connect the power supply to terminals A1 and A2 (Fig. 8).

**Warning:** Wiring only in de-energized state.

#### 5. Setting delay time:

Set the desired time delay on the rotary knob and seal the knob with the supplied sticker.

#### Warning:

Scale division lines should be regarded only as a setting aid. Always make sure to measure the delay time.

#### 6. Starting the device:

Switch the operating voltage on.

#### Warning:

If the “Automatic start” starting behavior is set on the basic device, the safety contacts will close immediately after Power-On. If the “Monitored manual start” starting behavior is set, close the start button on the basic device to close the safety contacts.

The LEDs **K1** and **K2** on the basic device and on the SRTC are lit when the safety contacts are closed.

#### 7. Triggering safety function:

Open the emergency stop circuit by actuating the connected safety switch. The safety contacts of the basic device open immediately, the safety contacts of the SRTC open after expiration of the time set on the rotary knob.

**Warning:** Measure the delay time.

#### 8. Reactivation:

Close the emergency stop circuit. If “Automatic start” is selected on the basic device, the safety contacts will close immediately.

If the “Monitored manual start” starting behavior is set, close the start button on the basic device to close the safety contacts of the basic device and the SRTC.

# Time-Delayed Safety Expansion Module SRTC

## Operating Instructions

### Maintenance

Once per month, the device must be checked for proper function and for signs of tampering and bypassing of the safety function (to do this, check the wiring of the device and activate the emergency stop function. Check the delay time).

The device is otherwise maintenance free, provided that it was installed properly.

### What to Do in Case of a Fault?

#### Device does not switch on:

- Check the wiring of the SRTC and the basic device by comparing it with the wiring diagrams (also see user information for the basic device).
- Check the safety switch used on the basic device for correct function and adjustment.
- Check whether the emergency stop circuit of the basic device is closed.
- Check whether the start button on the basic device (with manual start) is closed.
- Check the operating voltage at A1 and A2 on the basic device and on the SRTC.
- Is the feedback loop closed?

#### Device cannot be switched on again after an emergency stop:

- Check whether the emergency stop circuit was closed again.
  - Was the start button opened before closing of the emergency stop circuit (with manual start)?
  - Is the feedback loop closed?
  - Is the power supply present during the time sequence?
- If the fault still exists, perform the steps listed under "Commissioning Procedure".

If these steps do not remedy the fault either, return the device to the manufacturer for examination.

**Opening the device is impermissible and will void the warranty.**

### Safety Characteristics According to EN ISO 13849-1

The device is certified according to EN ISO 13849-1 up to a Performance Level of PL d.

#### Note:

Additional data can be requested from the manufacturer for applications that deviate from these conditions.

Safety characteristics according to EN ISO 13849-1 for all variants of SRTC			
Load (DC-13; 24 V)	<= 0,1 A	<= 1 A	<= 2 A
T10d [years]	20	20	20
Category	3	3	3
PL	d	d	d
PFHd [1/h]	1,03E-07	1,03E-07	1,03E-07
nop [cycle / year]	<= 400.000	<= 73.000	<= 17.000

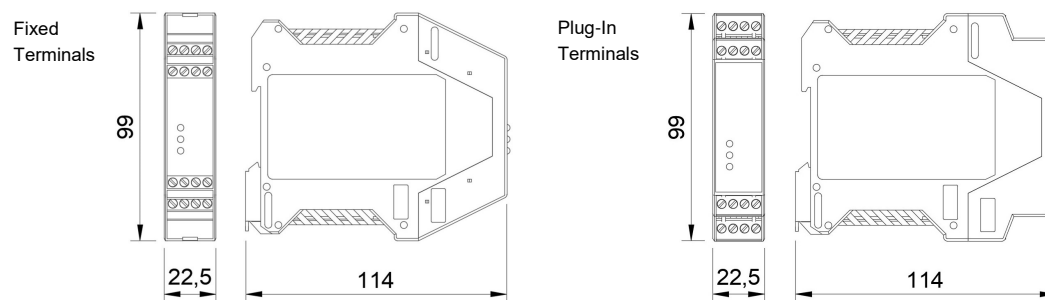
### Techn. Data

Corresponds to the standards	EN 60204-1; EN ISO 13849-1 ; EN 62061
Operating voltage	AC 230 V, AC 115 V, AC/DC 24 V
Rated supply frequency	AC: 50-60 Hz
Permissible deviation	+ / - 10 %
Power consumption	<b>DC 24 V</b> <b>AC 230 V</b> approx. 1.5 W    approx. 4 VA
Delay time	1 to 30 s, continuously adjustable
Control voltage at S11	DC 24 V
Control current S11...S14	max. 40 mA
Safety contacts	3 NO contacts
Auxiliary contacts	1 NC contact; monitoring contact for basic device
Max. switching voltage	AC 250 V
Safety contact breaking capacity	AC:    230 V, 1500 VA, 6 A for ohmic load 230 V, 4 A for AC-15 DC:    24 V, 30 W, 1.25 A for ohmic load 24 V, 30 W, 2 A for DC-13 Max. total current through all 3 contacts: 10.5 A
Minimum contact load	24 V, 20 mA
Contact fuses	6 A gG
Max. line cross section	0.14 - 2.5 mm <sup>2</sup>
Tightening moment (Min. / Max.)	0.5 Nm / 0.6 Nm
Typ. switch-on delay / switch-off delay for NO contacts requested via safety circuit	< 60 ms / < 50 ms
Max. length of control line	1000 m with 0.75 mm <sup>2</sup>
Contact material	AgNi
Contact service life	mech. approx. 1 x 10 <sup>7</sup>
Test voltage	2.5 kV (control voltage/contacts)
Rated impulse withstand voltage, leakage path/air gap	4 kV (EN 60664-1)
Rated insulation voltage	250 V
Degree of protection	IP20
Temperature range	DC 24 V:                    -15 °C to +60 °C AC 230 V/ 115 V/ 24 V: -15 °C to +40 °C
Max. altitude	≤ 2000 m (above sea level)
Degree of contamination	2 (EN 60664-1)
Overvoltage category	3 (EN 60664-1)
Weight	approx. 230 g
Mounting	DIN rail according to EN 60715 TH35

# Time-Delayed Safety Expansion Module SRTC

## Operating Instructions

### Dimension Drawing



Note: Actual number of front LEDs may differ from the number shown in the drawing, depending on the variant.

Variants	Order No. 472190	SRTC, AC 230 V (50-60 Hz),	fixed screw terminals
	Order No. 472191	SRTC, AC 115 V (50-60 Hz),	fixed screw terminals
	Order No. 472192	SRTC, AC/DC 24 V (AC: 50-60 Hz),	fixed screw terminals
	Order No. 474190	SRTC, AC 230 V (50-60 Hz),	incl. plug-in screw terminals
	Order No. 474191	SRTC, AC 115 V (50-60 Hz),	incl. plug-in screw terminals
	Order No. 474192	SRTC, AC/DC 24 V (AC: 50-60 Hz),	incl. plug-in screw terminals
	Order No. 475190	SRTC, AC 230 V (50-60 Hz),	incl. push-in twin spring connector
	Order No. 475191	SRTC, AC 115 V (50-60 Hz),	incl. push-in twin spring connector
	Order No. 475192	SRTC, AC/DC 24 V (AC: 50-60 Hz),	incl. push-in twin spring connector
Accessories	Order No. 472592	EKLS4,	set of plug-in screw terminals
	Order No. 472595	EKLZ4,	set of push-in twin spring connector
	Order No. 472596	Spacer Electric Cabinet	rail spacer 5mm, PU = 12 pcs

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