Модули расширения безопасности SREC
Технические характеристики

По вопросам продаж и поддержки обращайтесь:
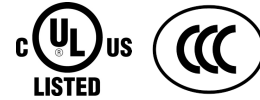
Safety Expansion Module SREC

Operating Instructions

Correct Use

The SREC contact block in combination with any basic device from the ZANDER SR series can be used to produce up to three additional safety contact paths per device. An existing system can thus be expanded practically indefinitely in a modular manner. Activation takes place via a safety contact of the basic device, the SREC provides signaling contacts for fault monitoring. The devices can be used in machines and systems up to safety category 4, PL e according to EN ISO 13849-1.

- *3 safe, redundant relay outputs*
  1 auxiliary contact (fault monitoring)
- *Activation via basic device from the ZANDER SR series*
- *Modular, freely configurable safety system*
- *Fault monitoring by basic device*
- *Earth fault monitoring*
- *Indication of the switching state via LED*
- *Up to category 4, PL e, SIL 3*

Function

The safety expansion module SREC 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 4, PL e according to EN ISO 13849-1.

Terminal S11 (DC 24 control voltage) is connected with terminals S15 and S16 via the safety contacts of the basic device. Starting the basic device also activates the SREC. The basic device disconnects the control voltage when the safety switch is operated, and the safety contacts of the SREC open immediately.

If a fault occurs in the SREC, this is detected by the basic device via terminals S23 and S24.

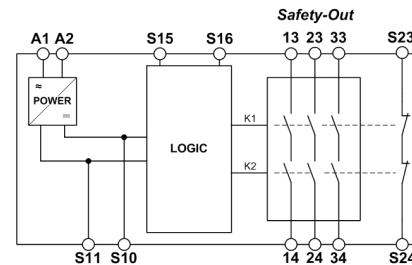***Independent operation without basic device is not possible***.

Fig. 1 Block diagram SREC

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.
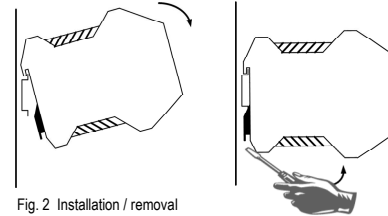

Fig. 2 Installation / removal

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 safety transformer according to DIN 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)
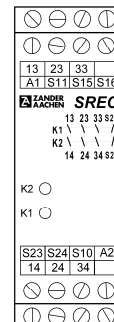
A1:	Power supply
A2 :	Power supply
S11:	DC 24 V control voltage
S10:	Control line
S15:	Control line
S16:	Control line
S23:	Fault monitoring
S24:	Fault monitoring
13-14:	Safety contact 1
23-24:	Safety contact 2
33-34:	Safety contact 3

Fig. 3 Connections

Safety Expansion Module SREC

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Applications

Depending on the application, the device must be wired with a ZANDER basic device as shown in Fig. 1 to Fig. 2. If the devices are wired inside a control cabinet (minimum degree of protection IP54), the fault involving a short circuit between the activation lines can be ruled out (protected wiring space). Category 4, PL e according to EN ISO 13849-1 is thereby possible.
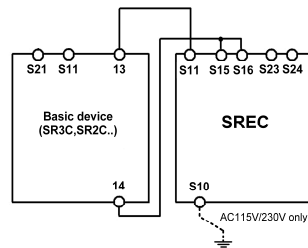If this fault cannot be ruled out, category 3, PL e is achieved.

Wiring

Fig. 1: Connection of SREC to basic device
Wiring of the SREC via only 4 lines:
A safety contact of the basic devices (e.g. 13-14) activates the relays of the SREC (S11 and S15/S16).
Two lines on S23 and S24 are required for feedback/fault monitoring. A fault in the SREC thereby prevents the entire safety chain from restarting. According to the application, they have to be wired according to Fig. 3 respective Fig. 4.
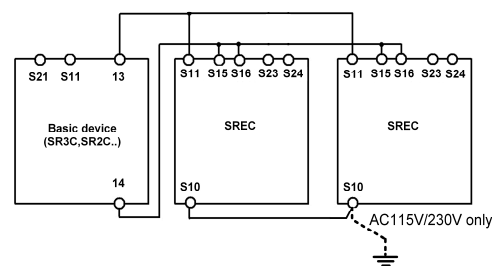*Earth faults in the control lines are detected in addition to internal faults.*

Fig. 2: Connection of several SREC units to basic device
If further SREC units are to be integrated into the system, terminals S11 must be connected in parallel on all SREC units. This also applies to terminals S10 and terminals S15/S16.
The feedback-loops (S23-S24) 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.
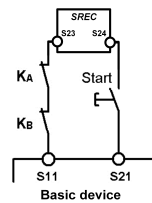
Feedback Loop

Fig. 3: Feedback Loop
Contactors connected to the SREC or the basic devices are monitored via the feedback loop of the basic device. K_A and K_B are the positively driven contacts of the connected contactor or expansion module.
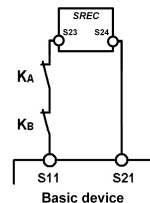

Fig. 4: Feedback Loop with Auto-Start
Contactors connected to the SREC or the basic devices are monitored via the feedback loop of the basic device. K_A and K_B are the positively driven contacts of the connected contactor or expansion module.
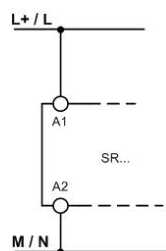
Power supply and Safety contacts

Fig. 5:
Power supply A1 and A2.

(Power supply according to techn. Data)
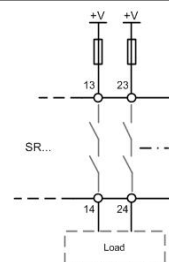
Fig. 6:
Connecting load to safety contacts.

(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 SREC:
Wire the SREC with the ZANDER basic device according to your application (see Fig. 1 to Fig. 2).
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. 3 or Fig. 4.
4. Wiring power supply:
Connect the power supply to terminals A1 and A2 (Fig. 5).
Warning: Wiring only in de-energized state.
5. Starting the device:
Switch on the operating voltage.

Warning:
If the "Automatic start" starting behavior is set 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.

The LEDs *K1* and *K2* on the basic device and on the SREC are lit.

6. Triggering safety function:
Open the emergency stop circuit by actuating the connected safety switch. The safety contacts of the basic device and the SREC open immediately.

7. 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 SREC.

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Operating Instructions

Maintenance	The device must be checked once per month for proper function and for signs of tampering and bypassing of the safety function.	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 SREC 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 SREC.
- 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?

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 e.

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 SREC*			
Load (DC-13; 24 V)	**<= 0,1 A**	**<= 1 A**	**<= 2 A**
T10d [years]	20	20	20
Category	4	4	4
PL	e	e	e
PFHd [1/h]	1.2E-08	1.2E-08	1.2E-08
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, AC: 50-60 Hz
Permissible deviation	+ / - 10 %
Power consumption	**DC 24 V** **AC 230 V** approx. 1.2 W approx. 3.5 VA
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^2
Tightening moment (Min. / Max.)	0.5 Nm / 0.6 Nm
Typ. switch-on delay / switch-off delay for NO contacts requested via safety circuit	< 70 ms / < 20 ms
Max. length of control line	1000m with 0.75 mm^2
Contact material	AgNi
Contact service life	mech. approx. 1 x 10^7
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

Safety Expansion Module SREC

Operating Instructions

Dimension Drawing

Fixed Terminals

66

22,5   114

Plug-In Terminals

66

22,5   114
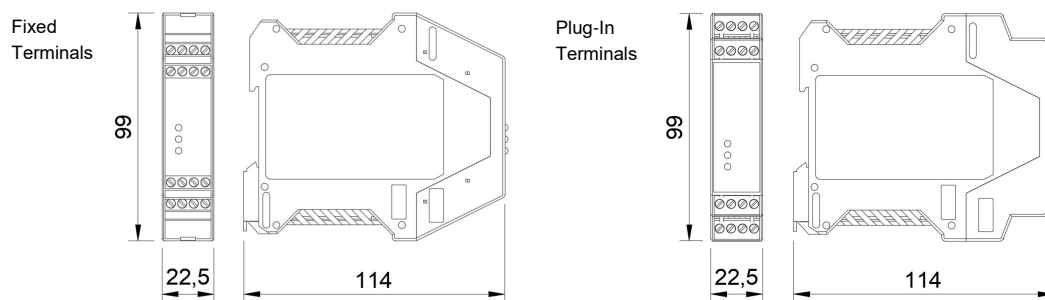
Note: Actual number of front LEDs may differ from the number shown in the drawing, depending on the variant.

Variants

Order No. 472180	SREC, AC 230 V (50-60 Hz),	fixed screw terminals
Order No. 472181	SREC, AC 115 V (50-60 Hz),	fixed screw terminals
Order No. 472182	SREC, AC/DC 24 V (AC: 50-60 Hz),	fixed screw terminals
Order No. 474180	SREC, AC 230 V (50-60 Hz),	incl. plug-in screw terminals
Order No. 474181	SREC, AC 115 V (50-60 Hz),	incl. plug-in screw terminals
Order No. 474182	SREC, AC/DC 24 V (AC: 50-60 Hz),	incl. plug-in screw terminals
Order No. 475180	SREC, AC 230 V (50-60 Hz),	incl. push-in twin spring connector
Order No. 475181	SREC, AC 115 V (50-60 Hz),	incl. push-in twin spring connector
Order No. 475182	SREC, 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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