Time-Delayed Emergency Stop Relay SR4C

ZANDER AACHEN it works

SR4C is a safety emergency stop relay which combines non-time-delayed and time-delayed contacts in just one compact housing. So the dangerous parts of a machinery can be switched off quickly and safely in case of an emergency situation. At the same time other circuits still can be supplied with power for up to 30 seconds, for example to move a tool into the initial position or to slow down running parts by a brake.



- *STOP category: 0 (non-time-delayed), 1 (time-delayed)*
- *Up to safety category: 4*
- *Control: single or dual-channel*
- *Force guided safety contacts: 4*
- *3 non-time-delayed and 1 time-delayed contact or 2 non-delayed and 2 delayed contacts or 1 non-delayed and 3 delayed contacts*
- *Continuously adjustable delay-time, 1 to 30s*
- *Extremely compact housing, width just 22,5 mm*
- *Redundancy and cyclical monitoring*
- *Short-circuit monitoring and earth fault monitoring*
- *According to EN 60204-1, IEC 60204-1, EN 954-1*

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Application / Installation

In case of danger the **SR4C** can disconnect quickly and safely the moving parts of a machine by switching off the entire main circuits with the non-time-delayed relay contacts. The SR4C provides additional time-delayed contacts. These come into operation if it is safer to supply some parts of a machine with power after pressing the emergency stop button.

The device is designed according to EN 60204-1 (IEC 60204-1) for safety circuits and it may be applied up to safety category 4 according to EN954-1, provided that the start button is not replaced by a link. It is ensured that the occurrence of a single fault does not result in a loss of the safety function and that every fault will be recognized by the cyclical self monitoring at the latest when the device is switched off and shall be switched on again.

The time-delayed contacts are switched on simultaneously with the non-time-delayed contacts, however, when pressing the emergency stop button they will be switched off after the delay-time adjusted at the potentiometer (1 to 30s) has elapsed.

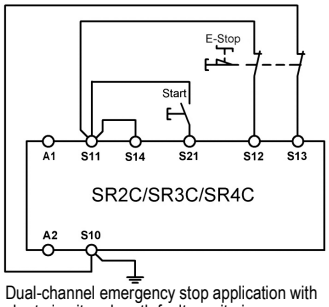
Acc. to EN 60204-1 the unit is designed to be used in switch cabinets with a minimum environment protection of IP54. The mounting is made on a 35 mm DIN-rail. Provided that the system has been installed properly, no maintenance is necessary.

Safety Warnings

- **Installation and operation must be carried out by qualified personnel only.**
- **The electrical installation must be performed after disconnecting the device and the machine from the mains supply.**
- **The wiring must be carried out according to the instructions of this operating manual, or the safety function may be lost.**
- **Opening the device, any manipulation of the device and the avoidance of the safety facilities are not permitted.**
- **All relevant safety regulations and standards must be attended to.**
- **Non-observance of the safety regulations may cause death, severe injuries or substantial damage to property.**

Dual-Channel Emergency Stop with Short-Circuit Monitoring and Earth Fault Monitoring (up to Category 4)

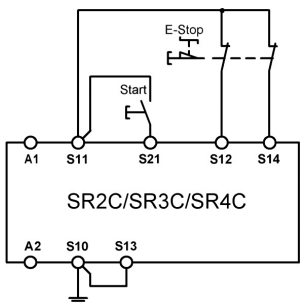
To activate the cross short-circuit monitoring, S11 and S14 must be connected. The emergency stop button has to be looped into the lines S11-S12 and S10-S13. The start button connects S11 with S21. To activate the detection of earth faults, S10 needs to be connected to earth ground. After connecting the power supply to A1 and A2, the safety contacts can be actuated with the start button.



Dual-channel emergency stop application with short-circuit and earth fault monitoring

Dual-Channel Emergency Stop, only with Earth Fault Monitoring, no Short-Circuit Monitoring (up to Category 3)

This application allows to reduce the wiring to the emergency stop button by one line, but the cross short-circuit monitoring is disabled. The terminals S10 and S13 are connected, the emergency stop button is looped into the lines S11-S12 and S11-S14. The start button connects S11 and S21. The earth fault monitoring is enabled by connecting S10 to earth ground.



Dual-channel emergency stop application with earth fault monitoring

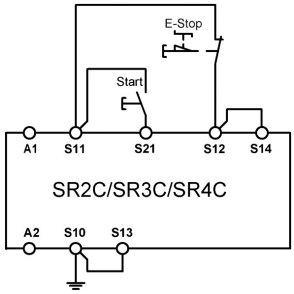
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Time-Delayed Emergency Stop Relay SR4C

Single-Channel Emergency Stop (up to Category 1)

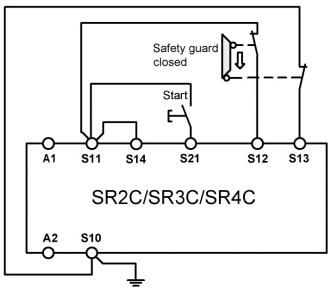
If the risk assessment acc. to EN 954-1 permits, the SR4C may be operated as an emergency stop relay with a single-channel push button. For this purpose S10 and S13 as well as S12 and S14 must be connected. The single-channel emergency stop button is looped into the line S11-S12/S14. The earth fault monitoring is operative if S10 is connected to earth ground.



Single-channel emergency stop application with earth fault monitoring

Dual-Channel Safety Guard Monitoring with Short-Circuit Monitoring and Earth Fault Monitoring (up to Category 4)

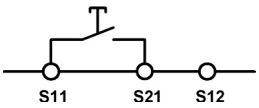
This application conforms to the dual-channel emergency stop, however, the emergency stop button is replaced by two limit switches which monitor the guard door. The limit switches must have positive opening NC contacts, i.e. in case of need they must cut off the electric connection by forcibly opening the switching contacts.



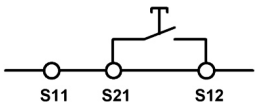
Dual-channel safety guard application with short-circuit monitoring and earth fault monitoring

Start Performance

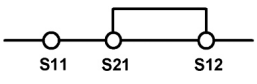
SR4C provides an input for a start push-button. When the start button is pressed the safety contacts are closed. Depending on the application and the demanded safety category it can be wired as follows:



Monitored manual start.
It is monitored that the start button has been opened before the emergency button is closed.



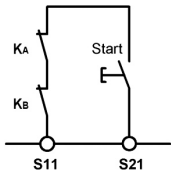
Manual start without monitoring



Automatic start (e.g. for safety gate application).
Maximum allowable time difference when closing the safety switches at S12 and S13:
S12 prior to S13: 50ms;
S13 prior to S12: any time (infinite)

Feedback Circuit

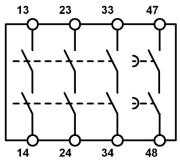
The feedback circuit monitors contactors or the extension modules SREC or SRTC which are connected to the emergency stop relay. K_A, K_B are force guided contacts of the connected contactor or extension module, up to category 3.



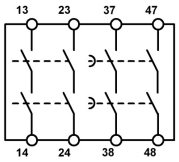
Safety Contacts

SR4C is available in three variants:
- 3 non-time-delayed and 1 time-delayed safety contact
- 2 non-time-delayed and 2 time-delayed safety contacts
- 1 non-time-delayed and 3 time-delayed safety contacts

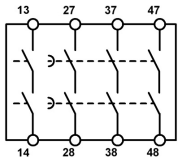
The terminal diagram can be seen in the following picture.



SR4C with 3 non-time-delayed and 1 time-delayed contact
(Order No. 472212)

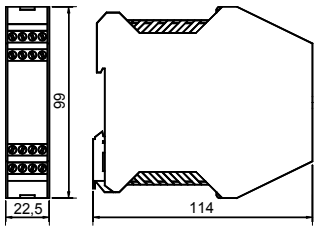


SR4C with 2 non-time-delayed and 2 time-delayed contacts
(Order No. 472222)



SR4C with 1 non-time-delayed and 3 time-delayed contacts
(Order No. 472232)

Technical Data	
Conforms to standards	VDE0113 part 1: 1998-11, EN60204-1:1997, IEC 60204-1, EN954-1:1996
Operating voltage	AC/DC24V An insulating transformer acc. to EN 60742 must be used.
Allowable tolerance	+/-10%
Power consumption	approx. 4.6W
Control voltage at S11	DC24V
Control current	approx. 190mA
Safety contacts	4 NO (2n/d, 1d; 2n/d, 2d; 1n/d, 3d)
Switching voltage max.	AC250V
Contact rating of safety contacts (13-14, 23-24, 33-34, 43-44) Cumulative current	AC: 250V, 2000VA, 8A for AC-12 250V, 3A for AC-15 DC: 24V, 48W, 2A for DC-12 and DC-13 (con. 13-14 + 23-24 + 33-34 + 33-44): max. 15A
Delay-time	1 to 30s, continuously adjustable
Minimum current	24V/20mA
External fuses for safety cont.	6A slow-blow or 8A quick-blow
Wire width	max. 2,5mm2
Length of control lines	max. 1000m at 0,75mm2
Contact material	AgNi
Service life	mech. approx. 1x107, elec. 1x105 switching cycles
Rated impulse withstand voltage	2,5kV (control voltage/contacts)
Dielectric strength	4kV acc. to DIN VDE 0110-1:1997-04
Protection	IP20
Temperature range	-15°C to +40°C
Weight	approx. 230g
Mounting	DIN-rail acc. to EN 50022-35



Order No.	Type
472212	SR4C, AC/DC 24V, 3 non-delayed / 1 delayed 1-30s
472222	SR4C, AC/DC 24V, 2 non-delayed / 2 delayed 1-30s
472232	SR4C, AC/DC 24V, 1 non-delayed / 3 delayed 1-30s

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