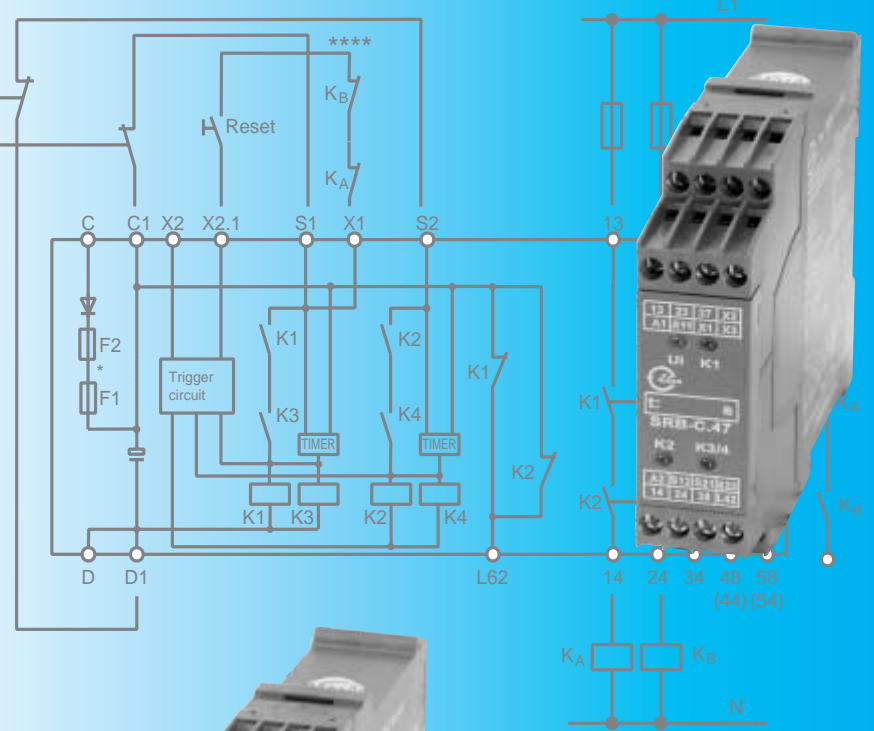


Safety Relay Modules

Catalogue SRB-G

New: Modules SRB-C.44, -45, -46, -47



In the interests of a sustainable use of our world's resources, this catalogue has been printed on 100% recycled paper on the basis of the latest environmental technology.

Safety Relay Modules

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We accept no liability for errors. Technical data subject to change without notice. The data quoted in this list are typical series values which have been carefully checked.

Or as the ancient Greeks already knew: The Gods do not reveal everything to mortals right at the start. But we find out what is better during the course of time by searching.

Xenophanes (*Greek philosopher, born 570/588 BC*)

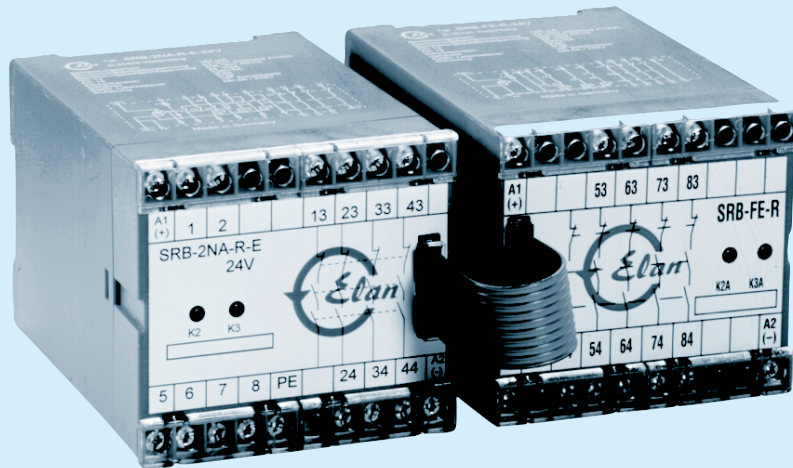
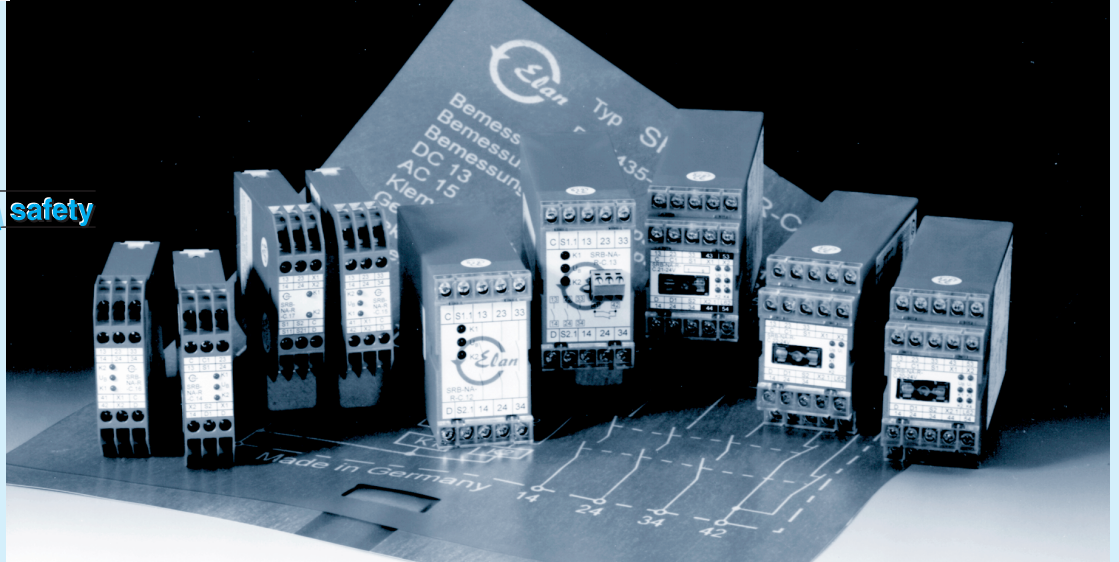
The descriptions, control relationships, data on external actuators, notes on installation and operation etc. are provided on the best of our knowledge. This does not however mean that any warranted characteristics or other claims relevant to liability over and above the "General Terms and Conditions for Supply of Goods and Services from the Electrical Industry" can be deduced from them. The user is not therefore released from the obligation to check our data and recommendations for his own use prior to operation. We trust this will be understood and this note observed.

Safety Relay Modules

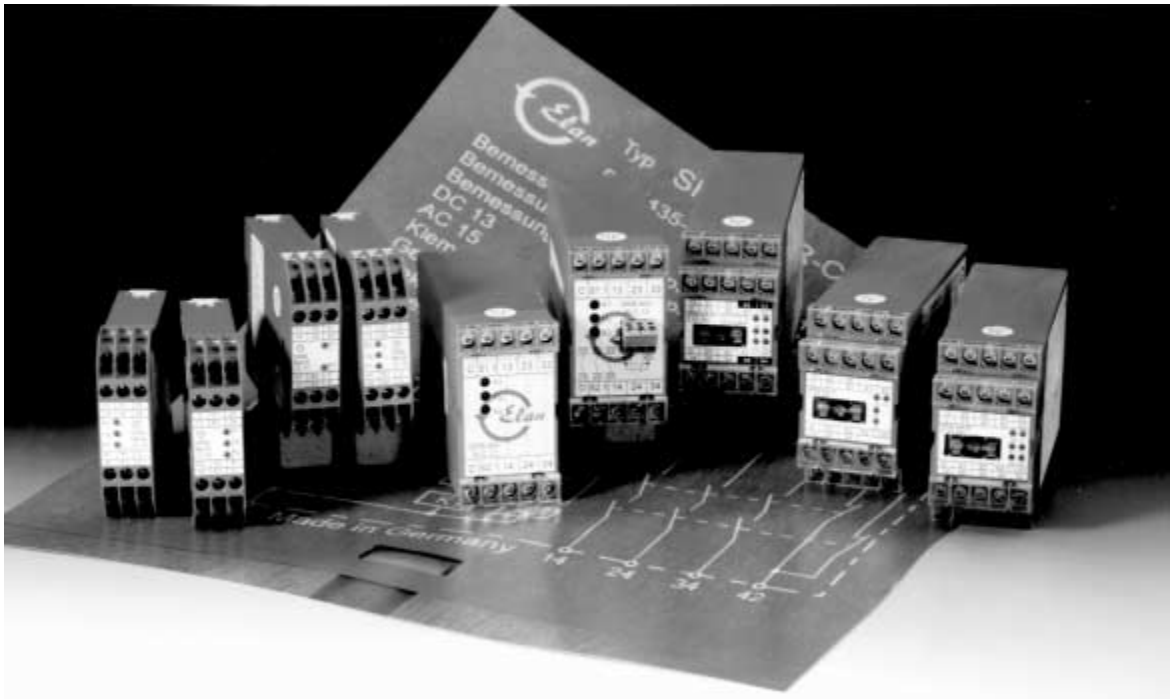
Guide to Products SRB



Switch to  allround safety



A SCHMERSAL company



Compact housings

The significant feature of in this latest issue described Safety Relay Modules (or SRB modules) is highlighting the advantage of increased functionality, but with reduced space consumption.

Standard modules, some with additional technical features are offered in housings, 22.5 mm wide only and 45 mm wide.

Advantages

Safety Relay Modules in ready-to-install compact housings with snap on fixing are containing a fail-safe and error tolerant electric circuit, designed to meet the requirements of control category 3 and/or 4 (EN 954-1), depending on the external wiring.

Furthermore in housings with 45 mm width modules with additional setting and adjustment advantages are available and also modules for some special applications. Some exceptions are realized in 90 mm housings.

Parallel to these standard housings also the product family SRBF – modules in special housings, 36 mm wide – will be continued

Because of the ready-to-install compact housings Safety Relay Modules can be placed directly into the control cabinet very simple and space saving.

Modules which are not listed in this guide, in particular older SRB modules are still on sale. Please ask for extra data sheet.

The use of Safety Relay Modules is saving significantly time for wiring. Furthermore errors in design state and errors during wiring are eliminated and therefore no extra time for trouble shooting and repair needs to be considered.

Approvals



Certifications of all essential SRB basic circuits issued by component test-authorities provide the user with extra security ensuring that this obligations in respect to product liability are fulfilled.

For SRB modules test certificates from the following authorities have been issued (for details see technical data):

- Prüfstelle der BG Feinmechanik und Elektrotechnik, Cologne,

- Berufsgenossenschaftliches Institut für Arbeitssicherheit BIA, St. Augustin,
- Canadian Standard Association CSA,
- Underwriters Laboratories Inc.UL.

Determination

Although all SRB circuits meet the specific requirements related to the protection in case of failures (EN 60 204-1 : 1998-11, part 9.4) the various models differ in some important details.

The scope below shall give assistance in selecting the appropriate module.

For better transparency the following illustration and technical data are filed on the basis of general characteristics and functions, but not following the historic sequential number allocation C.XX.

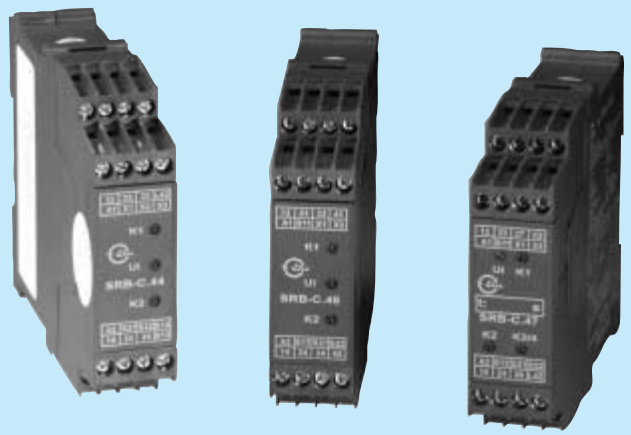
Literature

- EN 60 204-1 : 1998-11: Electrical equipment of machines
- EN 954-1: Safety related parts of control systems – General principles of design
- EN 1050: Risk assessment
- BIA-Report 6/97: Kategorien für sicherheitsbezogene Steuerungen nach EN 954-1
- VDE-Schriftenreihe: Buchveröffentlichung "Absicherung von Maschinen vor gefährbringenden Bewegungen"



New products:

Safety relay modules SRB-C.44, -C.46, -C.47



More versatility with 16 terminals in 22.5 mm housing

Owing to a housing 22.5 mm wide with 16 connecting terminals (instead of 12 so far) the new Safety relay modules Type SRB-C.44, -C.46 and -C.47 are now provided with additional functions which could not be offered till now in such housings.

Please find below major data:

- **SRB-C.44 (data sheet see page 8)**

- 3 safety enabling outputs, 1 monitoring contact
- Dual-channel triggering for non-equivalent inputs
- Suitable for reed switches due to current limitation and voltage limitation at input circuits
- Selectable extras: Trailing edge function, Auto reset, cross-short recognition

- **SRB-C.46 (data sheet see page 16)**

- 3 safety enabling outputs, 1 monitoring contact
- Single- or dual-channel triggering
- Suitable for signal processing of externally powered inputs

- **SRB-C.47 (data sheet see page 20)**

- 2 enabling outputs, instantaneous, 1 monitoring contact
- 1 enabling output, drop-out-delayed 1 ... 30 sec.
- Single- or dual-channel triggering
- Suitable for signal processing of externally powered inputs
- Selectable extras: Trailing edge function, Auto reset, cross-short recognition

- **Safety relay modules SRB-C.46 and -C.47 with hybrid fuse**

As a further significant feature the modules SRB-C.46 and -C.47 are fitted with a so called hybrid fuse. In contrast to a fusible cut-out (glass tube type) the function will be restored automatically after a short circuit. As distinct from commercially standard electronic fuses, the hybrid fuse has a latch function and resets only after power down – power up. This kind of reset prevents the danger of an unintended restart in mode "Automatic start" after repairing a short circuit.

New products:



Safety relay module SRB-C.45 (data sheet see page 12)

With "long-life" feature provided by a complementary electronic circuit

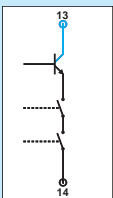
As the result of a complementary electronic circuit comprising photo MOS relays connected upstream of the safety releases, this new C.45 SRB component possesses the special feature that the mechanical and the electrical service life of the safety-orientated relay contacts have become approximately equal. With usual safety relay components, in contrast, a much shorter electrical service life compared to the mechanical service life arises from the switch load. This can be a particular technological disadvantage with applications with a large number of switching cycles, e.g. for the control of the working cycle of a machine.

The complementary electronic circuit in the C.45 SRB component ensures that during the switching on or off of the safety releases, the electrical load is exclusively switched by the photos MOS relay, and that the relay contacts which switch at the same time remain free of the switch load, i.e. their electrical service life remains unaffected. The C.45 SRB component is suitable for 1 or 2 channel activation, either trailing edge, automatic start or cross fault monitoring, it has 2 safety queries available and one floating contact and one electronic feedback contact. The width of the component is 45 mm.

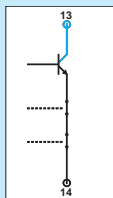
Functional sequence

Closing release:

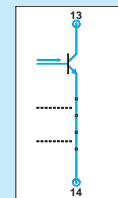
1. Release is open



2. Relay contacts close voltage-free

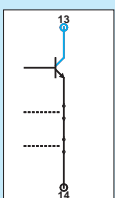


3. Semi-conductor switches => release is closed

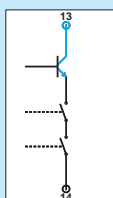


Opening release:

1. Release is kept open by the semi-conductor



2. Relay contacts are opened voltage-free



SRB-C.44

Safety relay array for emergency stop devices, interlocking devices and others

- ☞ 2-channel triggering
- ☞ Non-equivalent inputs
- ☞ Current limitation at input circuits
- ☞ Voltage limitation at input circuits
- ☞ Selectable extras:
 - Trailing edge function
 - Auto reset
- ☞ Cross-short recognition
- ☞ 22.5 mm housing

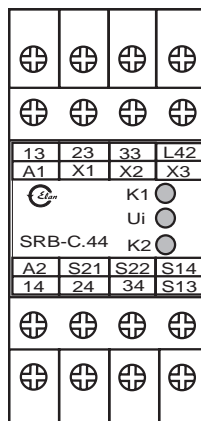
Features

- Relay output: 3 NO, 1 NC (Auxiliary NC for monitoring must not be used in safety enabling circuits!)
- Input for reset
- Feedback loop
- Input for emergency stop or door monitoring
- LED's for K1, K2, U_i
- Housing 45 mm, made of thermoplastic in accordance with UL-94-V-0, red RAL 3000
- DIN rail mounting
DIN EN 50 022

Approvals



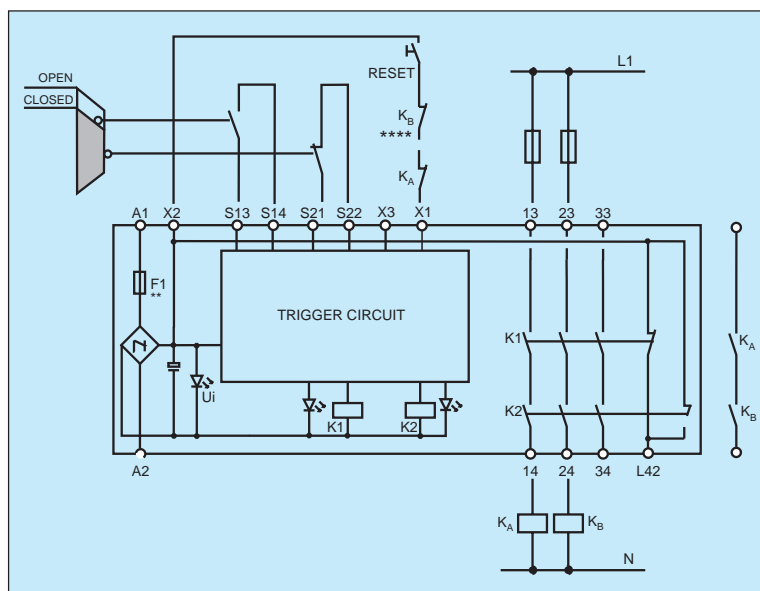
Front view



Product range

Type	Enabling outputs	Operating voltage	Part no.
SRB-C.44	3 NO/1 NC	24 VAC/VDC	600 0101

Wiring diagram



Example for dual-channel door monitoring and external reset button.

Dual-channel output, suitable for contact reinforcement or with positively guided contacts.

**** = Feedback loop

Wire breakage and earth leakage in the monitoring circuits are detected.

** Electronic fuse (an external leading fuse T 0.5 A is recommended)

For further examples refer to page 10/11

Model specific Technical data

(refer to page 157 for general data)

Operating voltage	24VDC -15%/+20%, residual ripple max. 10% 24 VAC -15%/+10%
Frequency	50/60 Hz (for AC operating)
Fuse (power supply)	T 0.5 A/250 V (internal electronic fuse, triggering current > 0.6 A, reset after 1 second)
Power consumption	max. 1.8 W; 2.4 VA, plus auxiliary output L42
Switching capacity (enabling contacts)	230 VAC, 4 A ohmic (inductive with suitable suppression)
Fuse (enabling contacts)	4 A slow blowing
Switching capacity (monitoring contacts)	24 VDC, 100 mA
Current and voltage limitation of input circuits	26 VDC/100 mA
Application category	AC 15/DC 13, DIN VDE 0660 Part 200
Pick-up delay	≤ 120 ms/≤ 30 ms (Auto start, reset button)
Drop-out delay	≤ 20 ms
Contact material / contacts	AgSnO, self cleaning, positively driven
Contact resistance	max. 100 mOhm when new
Air and creeping distances	DIN VDE 0110-1 (04.97), 4 kV/2
Connections	Self lifting screw terminals min. 0.6 qmm, max. 2.5 qmm
Dimensions	H/W/D 90 mm/22.5 mm/121 mm
Weight	235 g
Ambient operating temperature	-25 °C ... +45 °C (derating curve available)
Mechanical life	10 ⁷ switching cycles
Terminal labeling	DIN EN 50 005/DIN 50 013

SRB-C.44 (continued)

Wiring example: Input level

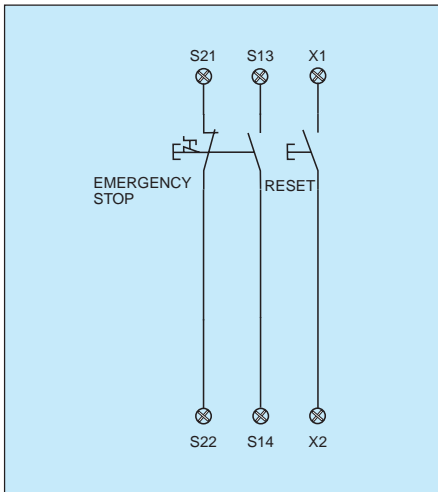
Dual-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

Cross-shorts in the emergency stop circuits are detected.

With external reset button.

Safety category 3 or 4 in accordance with EN 954-1.



Wiring example: Input level

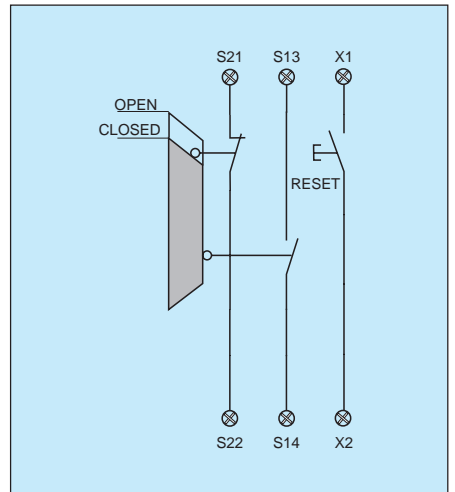
Dual-channel door monitoring according to EN 1088, one limit switch with positive opening contact.

Wire breakage and earth leakage in the door monitoring circuits are detected.

Cross-shorts in the door monitoring circuits are detected.

With external reset button for increased safety requirements.

Safety category 3 or 4 in accordance with EN 954-1.



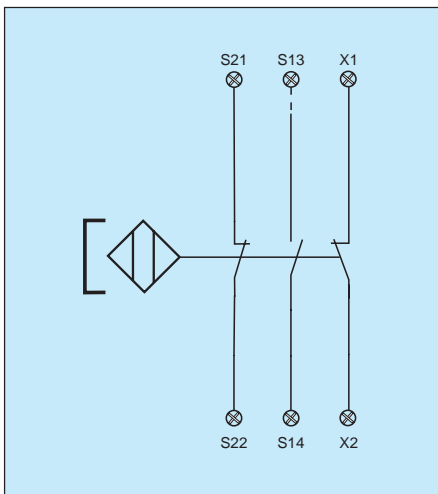
Wiring example: Input level

Dual-channel door monitoring with reed switch.

Wire breakage and earth leakage in the door monitoring circuits are detected.

Cross-shorts in the door monitoring circuits are detected.

Safety category 3 in accordance with EN 954-1.



Wiring example: Input level

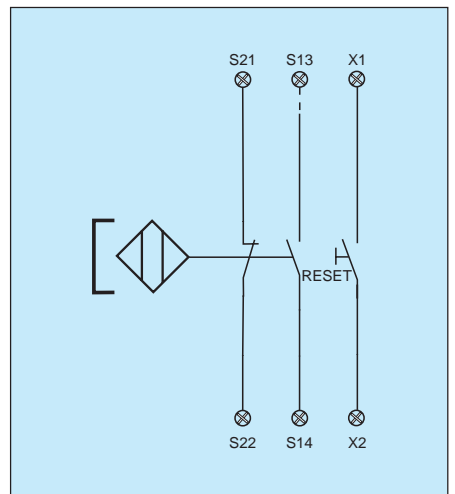
Dual-channel door monitoring with reed switch.

Wire breakage and earth leakage in the door monitoring circuits are detected.

Cross-shorts in the door monitoring circuits are detected.

With external reset button for increased safety requirements.

Safety category 3 in accordance with EN 954-1.



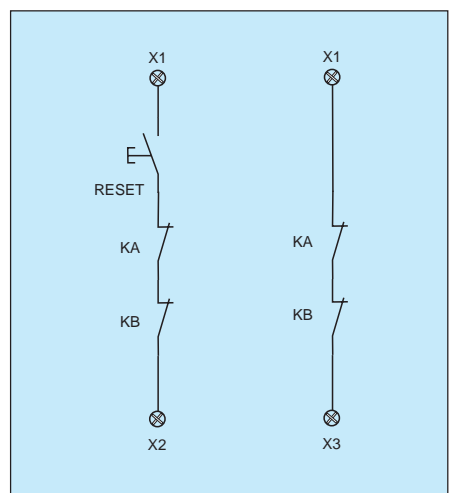
Advice:

For "Automatic Reset" connect feed back loop to X1-X3 or apply jumper X1-X3 if no feed back loop is used.

When using external reset button (feed back loop connected to X1-X2), unit is triggered by trailing edge function.

Trailing edge function with "fail-safe" function only by a DC power supply.

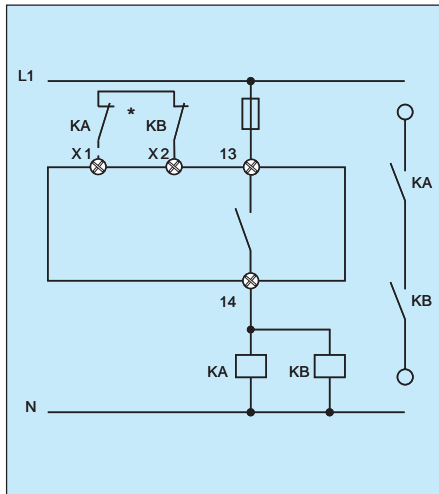
After a performed "Emergency Shut Down" an automatic restart of the system must be prevented by the higher ranking electric circuitry when the relay module SRB-C.44/e is set into mode "Auto-matic Start" (refer to EN 60204-1, part 9.2.5.4.2 and part 10.8.3).



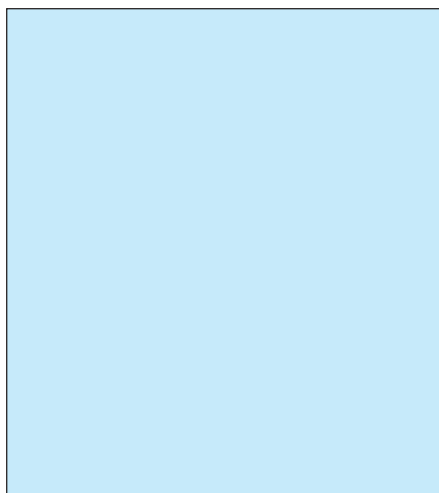
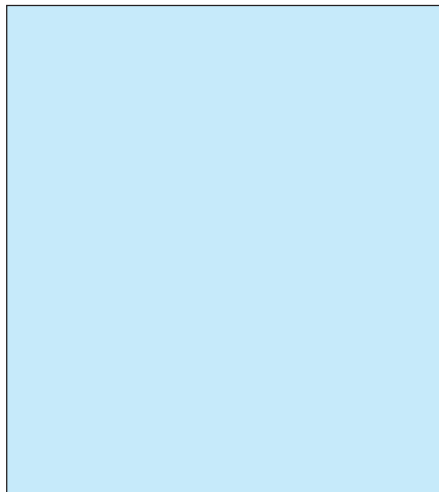
**Wiring example:
Power level**

Single-channel output

Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.



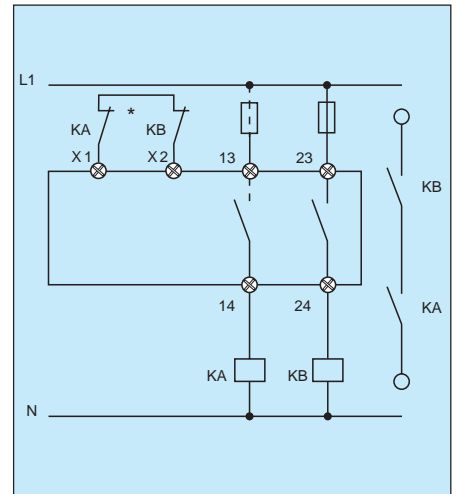
* Reset button wired in series to feedback loop.



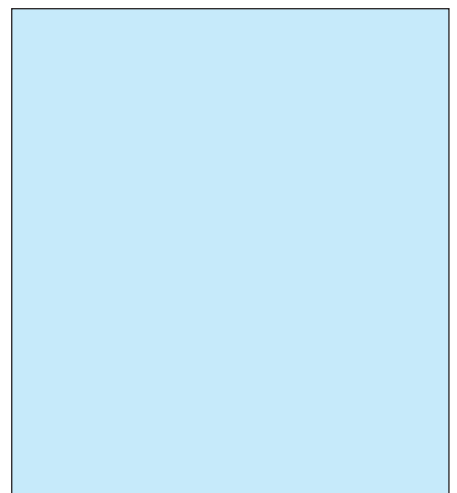
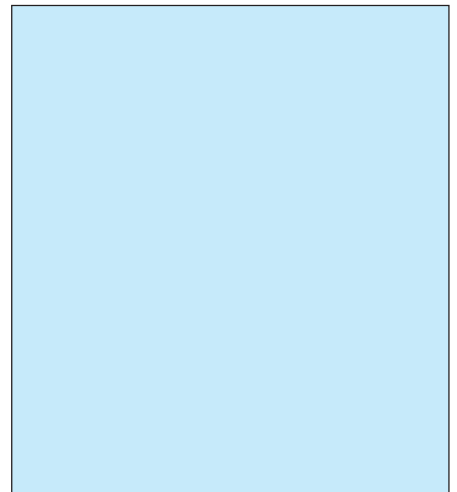
**Wiring example:
Power level**

Dual-channel output

Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.



* Reset button wired in series to feedback loop.



SRB-C.45

Safety relay array for emergency stop devices, interlocking devices and others

- ☞ "Long life" module
- ☞ 1- or 2-channel triggering
- ☞ 3 enabling outputs and 1 monitoring output
- ☞ with integrated selective fuse
- ☞ suitable for signal processing of externally powered inputs
- ☞ 45 mm housing
- ☞ 1 semiconductor output
- ☞ Selectable extras:
 - Trailing edge function
 - Auto reset
 - Cross-short recognition

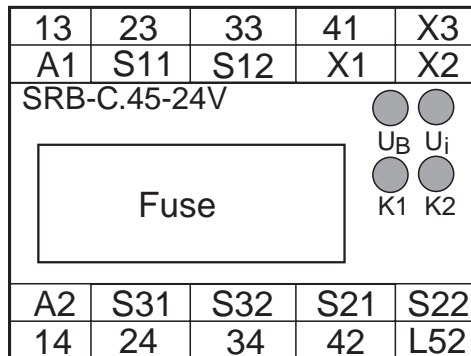
Features

- Relay output: 3 NO, 1 NC with non-equivalence. (Auxiliary NC for monitoring must not be used in safety enabling circuits!)
- Long life module for application with high switching frequency. Electrical life approximate to mechanical life.
- Input for reset
- Feedback loop
- Input for emergency stop or door monitoring
- LED's for K1, K2, U_B and U_i
- Housing 45 mm, made of thermoplastic in accordance with UL-94-V-0, red RAL 3000
- DIN rail mounting
DIN EN 50 022-35

Approvals



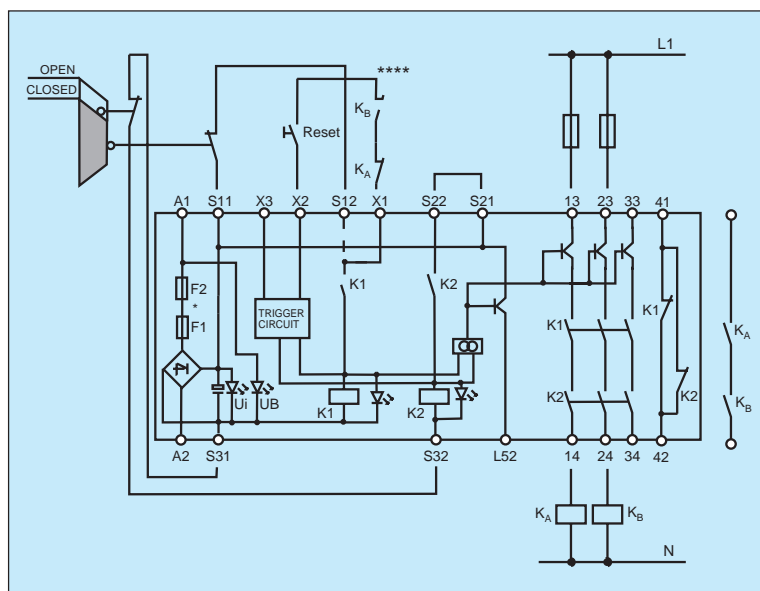
Front view



Product range

Type	Enabling outputs	Operating voltage	Part no.
SRB-C.45	3 NO/1 NC	24 VAC/VDC	600 0102

Wiring diagram



Example for dual-channel door monitoring and external reset button.

Dual-channel output, suitable for contact reinforcement or with positively guided contacts.

**** = Feedback loop

Wire breakage and earth leakage in the monitoring circuits are detected.

* Fuse F2 (located in housing lid) 1 A, Fuse F1 (internal) 1.25 A

For further examples refer to page 14/15

Model specific Technical data

(refer to page 157 for general data)

Operating voltage	24 VDC -15%/+20%, residual ripple max. 10% 24 VAC -15%/+10%
Frequency	50/60 Hz (for AC operating)
Fuse (power supply)	F2: T 1.0 A/250 V (internal F1: T 1.25 A/250 V)
Power consumption	max. 3.4 W; 4.4 VA, plus auxiliary output L52
Switching capacity (enabling contacts)	60 VAC/VDC, 3 A ohmic (inductive with suitable suppression)
Fuse (enabling contacts)	3 A slow blowing
Switching capacity (monitoring contacts)	41/42: 24 V/2 A; L52: max. 100 mA
Fuse (monitoring contacts)	41/42: 2 A slow blowing
Application category	AC 15/DC 13, DIN VDE 0660 Part 200
Pick-up delay	≤ 120 ms
Drop-out delay	≤ 20 ms
Contact material / contacts	AgSnO, self cleaning, positively driven
Contact resistance	max. 100 mOhm when new
Air and creeping distances	DIN VDE 0110-1 (04.97), 4 kV/2
Connections	Self lifting screw terminals min. 0.5 qmm, max. 2.5 qmm
Dimensions	H/W/D 83 mm/45 mm/140 mm
Weight	460 g
Ambient operating temperature	0 °C ... +45 °C (derating curve available)
Mechanical life	10 ⁷ switching cycles
Terminal labeling	DIN EN 50 005/DIN 50 013

SRB-C.45 (continued)

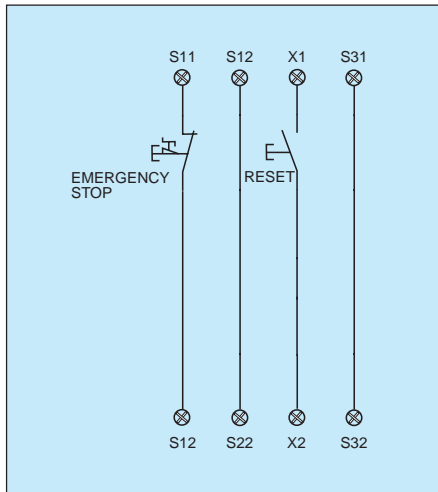
Wiring example: Input level

Single-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

With external reset button.

Safety category 2 in accordance with EN 954-1.



Wiring example: Input level

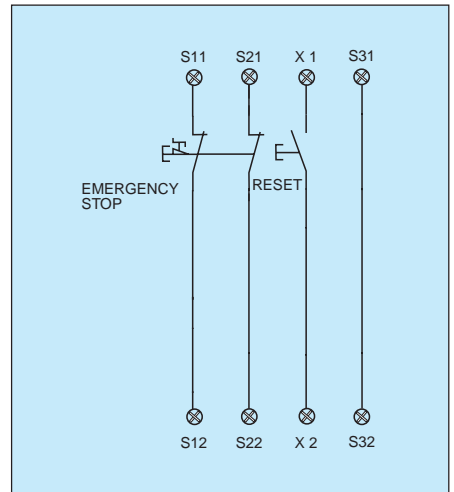
Dual-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

Cross-shorts in the emergency stop circuits are **not detected**.

With external reset button.

Safety category 3 or 4 in accordance with EN 954-1.



Wiring example: Input level

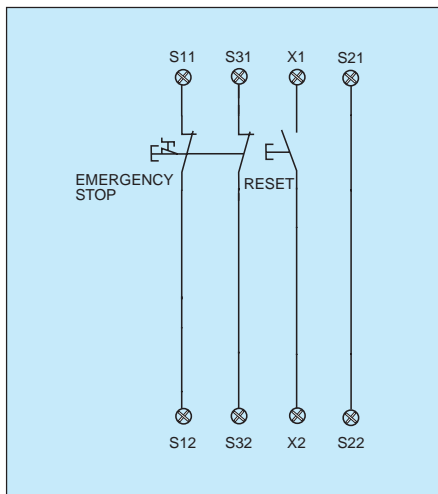
Dual-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

Cross-shorts in the emergency stop circuits are detected.

With external reset button.

Safety category 3 or 4 in accordance with EN 954-1.



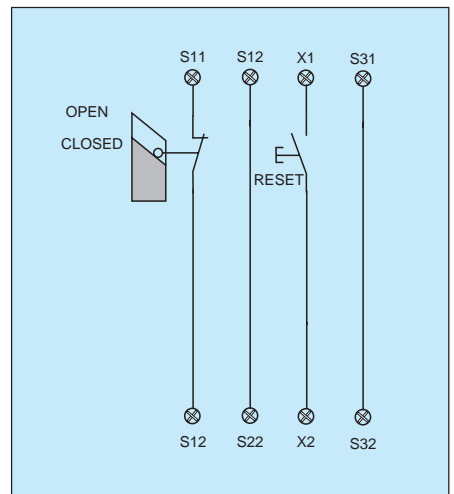
Wiring example: Input level

Single-channel door monitoring according to EN 1088 limit switch with positive opening contact.

Wire breakage and earth leakage in the emergency stop circuits are detected.

With external reset button.

Safety category 2 in accordance with EN 954-1.



Wiring example: Input level

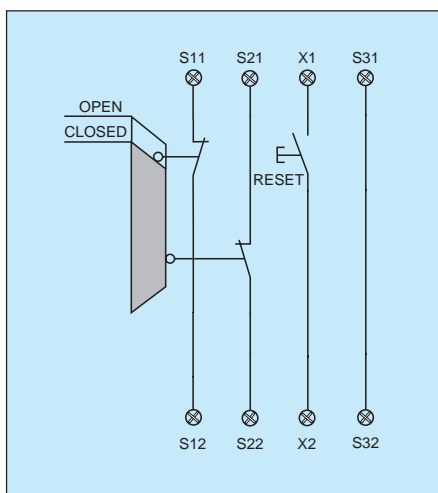
Dual-channel door monitoring according to EN 1088, one limit switch with positive opening contact.

Wire breakage and earth leakage in the door monitoring circuits are detected.

Cross-shorts in the door monitoring circuits are **not detected**.

With external reset button.

Safety category 3 or 4 in accordance with EN 954-1.



Wiring example: Input level

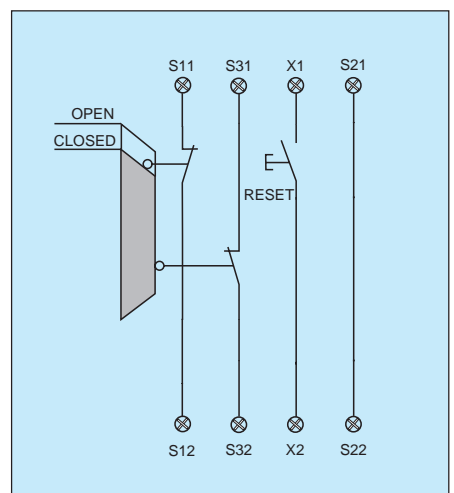
Dual-channel door monitoring according to EN 1088, one limit switch with positive opening contact.

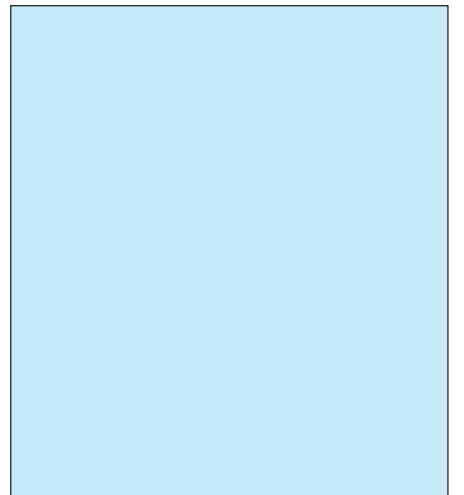
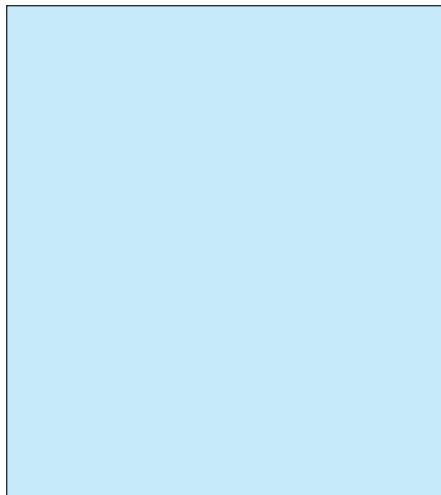
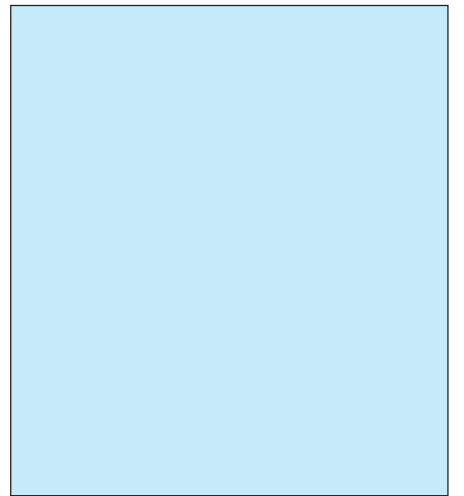
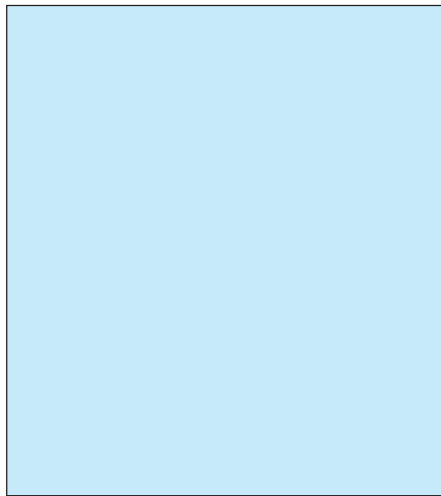
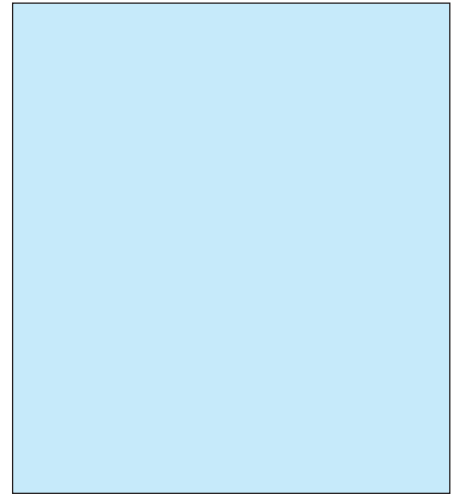
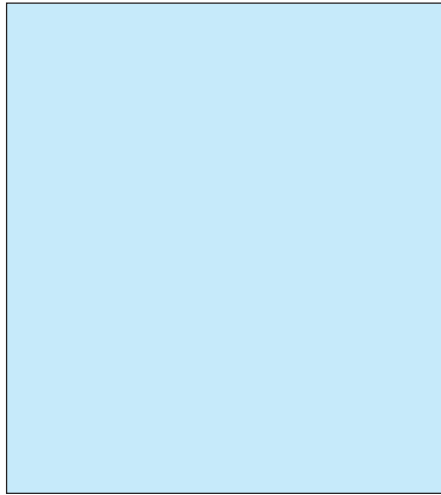
Wire breakage and earth leakage in the door monitoring circuits are detected.

Cross-shorts in the emergency stop circuits are detected.

With external reset button.

Safety category 3 or 4 in accordance with EN 954-1.





SRB-C.46

Safety relay array for emergency stop devices, interlocking devices and others

- ➔ 1- or 2-channel triggering
- ➔ 3 enabling outputs and 1 monitoring output
- ➔ with electronic short circuit protection "Hybrid fuse"
- ➔ suitable for signal processing of externally powered inputs
- ➔ 22.5 mm housing
- ➔ Selectable extras:
 - Trailing edge function
 - Auto reset
 - Cross-short recognition

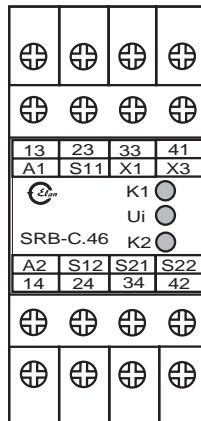
Features

- Relay output: 3 NO, 1 NC (Auxiliary NC for monitoring must not be used in safety enabling circuits!)
- Input for reset
- Feedback loop
- Input for emergency stop or door monitoring
- LED's for K1, K2, U_i
- Housing 22.5 mm, made of thermoplastic in accordance with UL-94-V-0, red RAL 3000
- DIN rail mounting DIN EN 50 022

Approvals



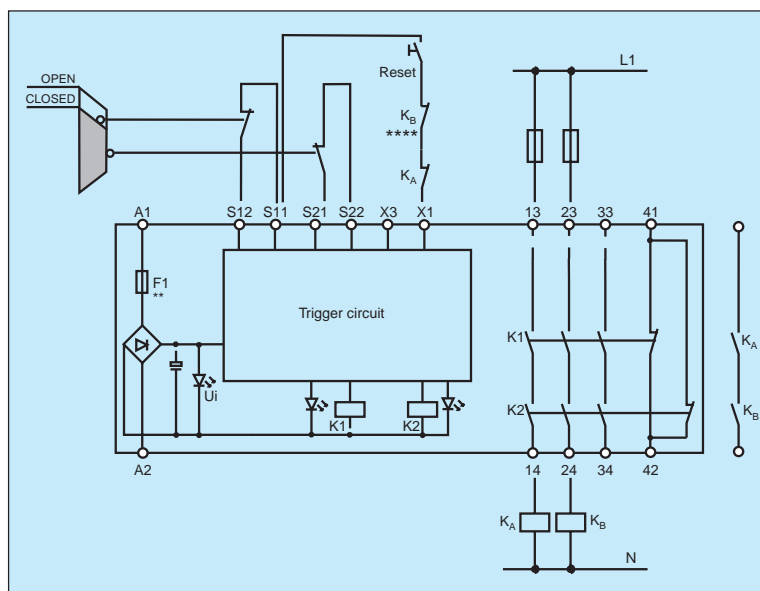
Front view



Product range

Type	Enabling outputs	Operating voltage	Part no.
SRB-C.46	3 NO/1 NC	24 VAC/VDC	600 0103

Wiring diagram



Example for dual-channel door monitoring and external reset button.

Dual-channel output, suitable for contact reinforcement with positively guided contacts.

**** = Feedback loop

Wire breakage and earth leakage in the monitoring circuits are detected.

** Hybrid fuse

For further examples refer to page 18/19

Model specific Technical data

(refer to page 157 for general data)

Operating voltage	24 VDC -15%/+20%, residual ripple max. 10% 24 VAC -15%/+10%
Frequency	50/60 Hz (for AC operating)
Fuse (power supply)	Internal electronic fuse, triggering current > 0.6 A, reset after power down
Power consumption	max. 2.4 W; 3.3 VA
Switching capacity (enabling contacts)	230 VAC, 4 A ohmic (inductive with suitable suppression)
Fuse (enabling contacts)	4 A slow blowing
Switching capacity (monitoring contacts)	24 VDC, 2 A
Fuse (monitoring contacts)	2 A slow blowing
Application category	AC 15/DC 13, DIN VDE 0660 Part 200
Pick-up delay	≤ 200 ms/≤ 30 ms (Auto start, reset button)
Drop-out delay	≤ 20 ms
Contact material / contacts	AgSnO, self cleaning, positively driven
Contact resistance	max. 100 mOhm when new
Air and creeping distances	DIN VDE 0110-1 (04.97), 4 kV/2
Connections	Self lifting screw terminals min. 0.6 qmm, max. 2.5 qmm
Dimensions	H/W/D 90 mm/22.5 mm/121 mm
Weight	235 g
Ambient operating temperature	-25 °C ... +45 °C (derating curve available)
Mechanical life	10 ⁷ switching cycles
Terminal labeling	DIN EN 50 005/DIN 50 013

SRB-C.46 (continued)

Wiring example: Input level

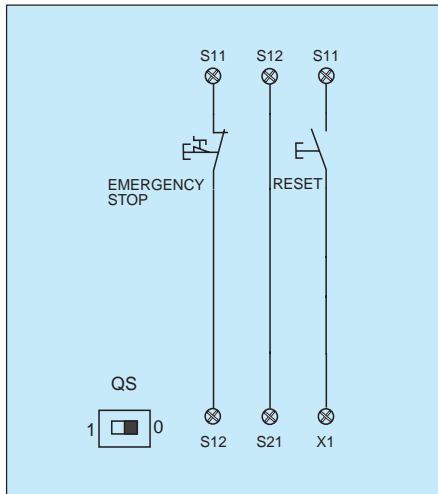
Single-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

To deactivate cross-short monitoring: Set switch "QS" (bottom of housing) to "0".

With external reset button.

Safety category 2 in accordance with EN 954-1.



Wiring example: Input level

Dual-channel emergency stop switch according to EN 60 204-1.

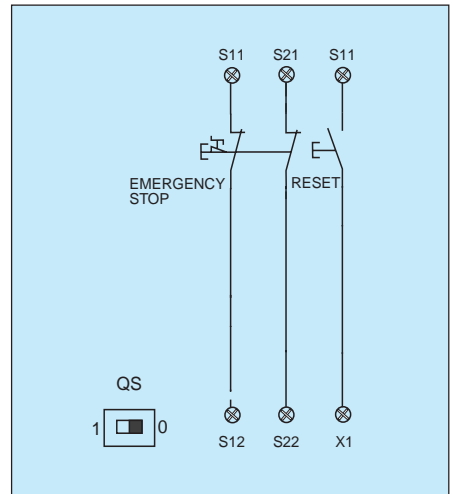
Wire breakage and earth leakage in the Emergency stop circuits are detected.

Cross-shorts in the emergency stop circuits are **not detected**.

To deactivate cross-short monitoring: Set switch "QS" (bottom of housing) to "0".

With external reset button.

Safety category 3 or 4 in accordance with EN 954-1.



Wiring example: Input level

Dual-channel emergency stop switch according to EN 60 204-1.

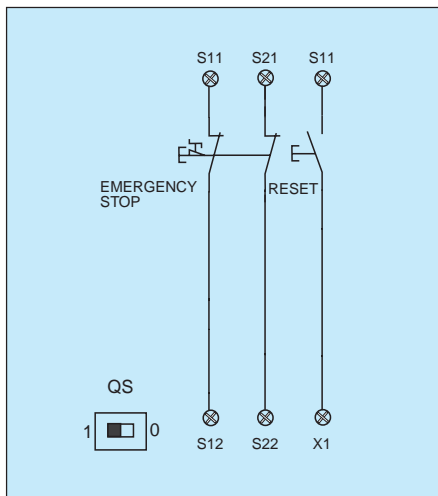
Wire breakage and earth leakage in the emergency stop circuits are detected.

Cross-shorts in the emergency stop circuits are detected.

Activating cross-short monitoring: Set switch "QS" (bottom of housing) to "1".

With external reset button.

Safety category 3 or 4 in accordance with EN 954-1.



Wiring example: Input level

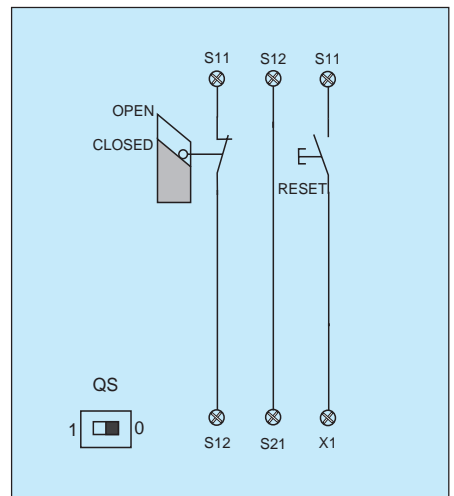
Single-channel door monitoring according to EN 1088 limit switch with positive opening contact.

Wire breakage and earth leakage in the emergency stop circuits are detected.

To deactivate cross-short monitoring: Set switch "QS" (bottom of housing) to "0".

With external reset button for increased safety requirements.

Safety category 2 in accordance with EN 954-1.



Wiring example: Input level

Dual-channel door monitoring according to EN 1088, one limit switch with positive opening contact.

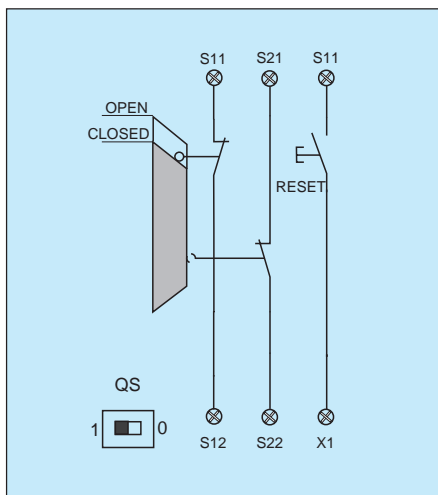
Wire breakage and earth leakage in the door monitoring circuits are detected.

Cross-shorts in the door monitoring circuits are detected.

Activating cross-short monitoring: Set switch "QS" (bottom of housing) to "1".

With external reset button for increased safety requirements.

Safety category 3 or 4 in accordance with EN 954-1.



Wiring example: Input level

Dual-channel triggering using P-switching semiconductors.

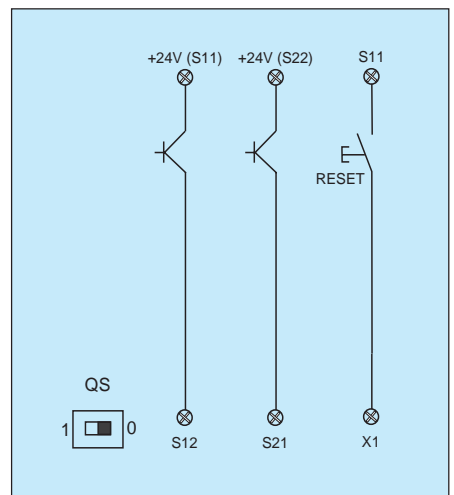
Wire breakage and earth leakage in the door monitoring circuits are detected.

With external reset button.

Attention: QS-switch must be set in position "0".

WARNING: Ignoring may destroy the device.

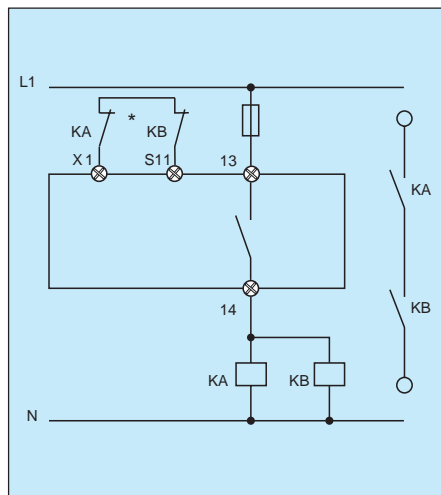
Safety category 3 or 4 in accordance with EN 954-1.



**Wiring example:
Power level**

Single-channel output

Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.

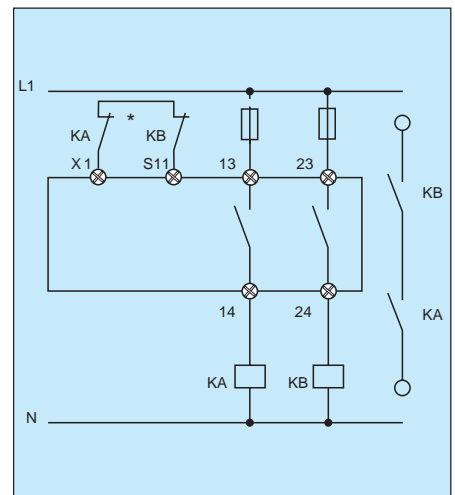


* Reset button wired in series to feedback loop.

**Wiring example:
Power level**

Dual-channel output

Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.



* Reset button wired in series to feedback loop.

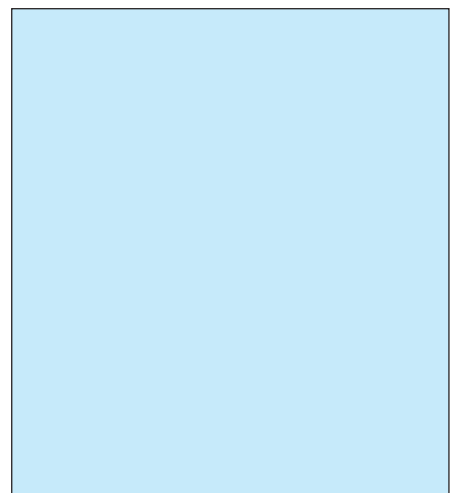
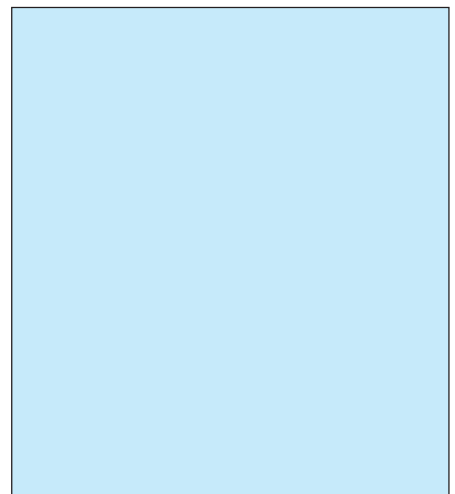
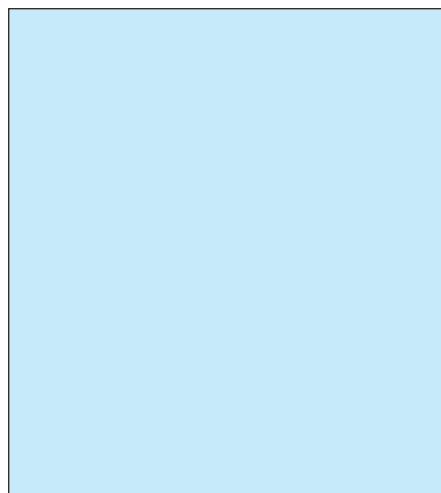
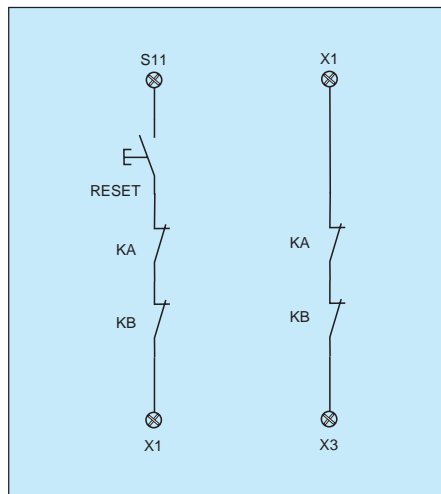
Advice

For "Automatic Reset" connect feed back loop to X1-X3 or apply jumper X1-X3 if no feed back loop is used.

When using external reset button (feed back loop connected to S11-X1), unit is triggered by trailing edge function.

Trailing edge function with "fail-safe" function only by a DC power supply.

After a performed "Emergency Shut Down" an automatic restart of the system must be prevented by the higher ranking electric circuitry when the relay module SRB-C.46/e is been set into mode "Automatic Start" (refer to EN 60204-1, part 9.2.5.4.2 and part 10.8.3).



SRB-C.47

Safety relay array for emergency stop devices, interlocking devices and others

- ➡ 1- or 2-channel triggering
- ➡ 22.5 mm housing
- ➡ 3 enabling outputs, instant and 1 enabling output, drop-out delayed
- ➡ Selectable extras:
 - Trailing edge function
 - Auto reset
 - Cross-short recognition
- ➡ with "Hybrid fuse"
- ➡ suitable for processing of externally powered input signals

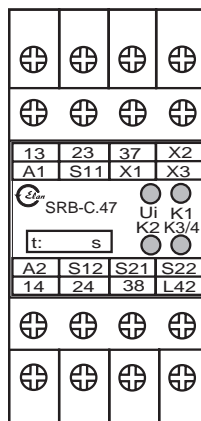
Features

- Relay output:
 - 2 NO, instantaneous;
 - 1 NO, drop-out delayed
- 1 semi-conductor output
- Input for reset
- Feedback loop
- Input for emergency stop or door monitoring
- LED's for K1, K2, K3/k4 and U_i
- Housing 22.5 mm, made of thermoplastic in accordance with UL-94-V-0, red RAL 3000
- DIN rail mounting
DIN EN 50 022

Approvals



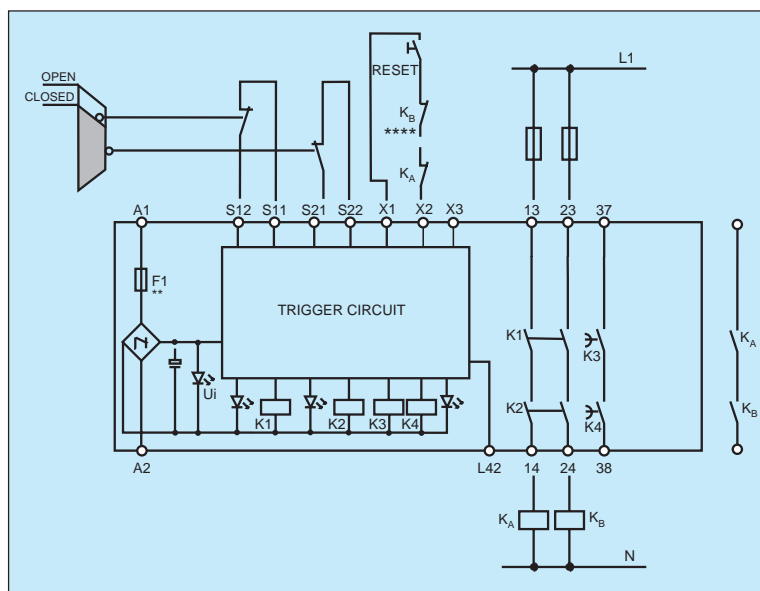
Front view



Product range

Type	Enabling outputs	Operating voltage	Part no.
SRB-C.47	2 NO/1 NO \curvearrowright -/1 NC	24 VAC/VDC	600 0104

Wiring diagram



Example for dual-channel door monitoring and external reset button.

Dual-channel output, suitable for contact reinforcement with positively guided contacts.

**** = Feedback loop

Wire breakage and earth leakage in the monitoring circuits are detected.

** Hybrid fuse

For further examples refer to page 22/23

Model specific Technical data

(refer to page 157 for general data)

Operating voltage	24 VDC -15%/+20%, residual ripple max. 10% 24 VAC -15%/+6%
Frequency	50/60 Hz (for AC operating)
Fuse (power supply)	Internal electronic fuse, triggering current < 0.6 A, reset after power down
Power consumption	max. 4 W; 5.5 VA, plus auxiliary output L42
Switching capacity (enabling contacts)	230 VAC, 4 A ohmic (inductive with suitable suppression)
Fuse (enabling contacts)	4 A slow blowing
Switching capacity (monitoring contacts)	L42: 24 VDC, 100 mA
Application category	AC 15/DC 13, DIN VDE 0660 Part 200 13/14, 23/24: AC 15: 250 V/1.5 A; DC 13: 24 V/1.2 A 37/38: AC 15: 250 V/3 A; DC 13: 24 V/2 A
Pick-up delay	≤ 120 ms/≤ 30 ms (Auto start, reset button)
Drop-out delay	≤ 20 ms
Contact material / contacts	AgSnO, self cleaning, positively driven
Contact resistance	max. 100 mOhm when new
Air and creeping distances	DIN VDE 0110-1 (04.97), 4 kV/2
Connections	Self lifting screw terminals min. 0.5 qmm, max. 2.5 qmm
Dimensions	H/W/D 90 mm/22.5 mm/121 mm
Weight	235 g
Ambient operating temperature	-25 °C ... +45 °C (derating curve available)
Mechanical life	10 ⁷ switching cycles
Terminal labeling	DIN EN 50 005/DIN 50 013

SRB-C.47 (continued)

Wiring example: Input level

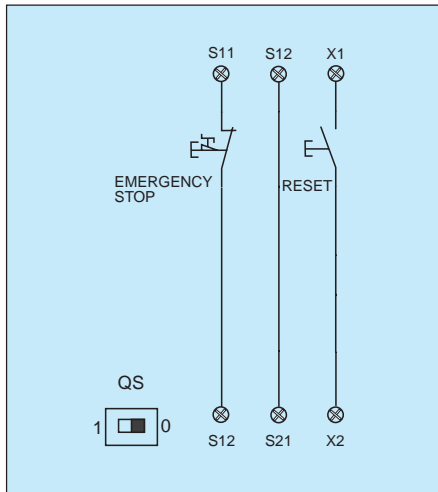
Single-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

To deactivate Cross-short monitoring: Set switch "QS" (bottom of housing) to "0".

With external reset button.

Safety category 2 in accordance with EN 954-1.



Wiring example: Input level

Dual-channel emergency stop switch according to EN 60 204-1.

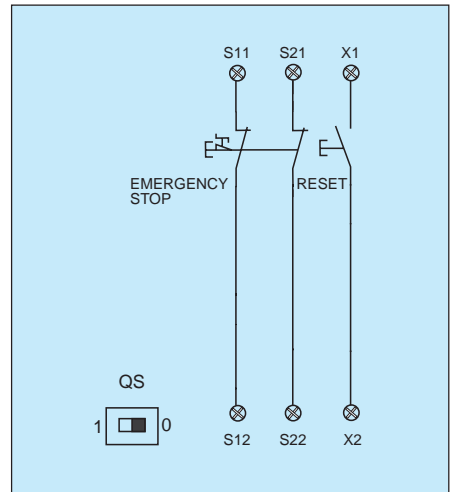
Wire breakage and earth leakage in the emergency stop circuits are detected.

Cross-shorts in the emergency stop circuits are **not detected**.

To deactivate cross-short monitoring: set switch "QS" (bottom of housing) to "0".

With external reset button.

Safety category 3 or 4 in accordance with EN 954-1.



Wiring example: Input level

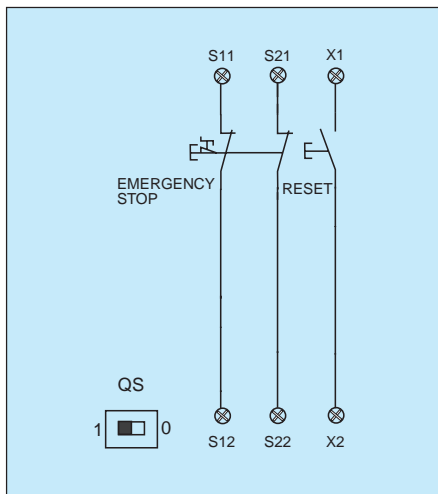
Dual-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

Activating cross-short monitoring: Set switch "QS" (bottom of housing) to "1".

With external reset button.

Safety category 3 or 4 in accordance with EN 954-1.



Wiring example: Input level

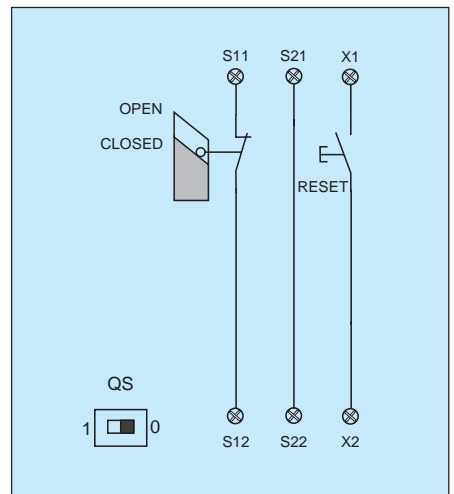
Single-channel door monitoring according to EN 1088 limit switch with positive opening contact.

Wire breakage and earth leakage in the door monitoring circuits are detected.

To deactivate cross-short monitoring: set switch "QS" (bottom of housing) to "0".

With external reset button for increased safety requirements.

Safety category 2 in accordance with EN 954-1.



Wiring example: Input level

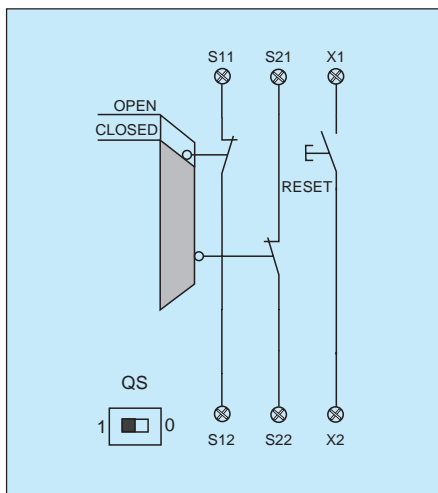
Dual-channel door monitoring according to EN 1088, one limit switch with positive opening contact.

Wire breakage and earth leakage in the door monitoring circuits are detected.

Activating cross-short monitoring: Set switch "QS" (bottom of housing) to "1".

With external reset button.

Safety category 3 or 4 in accordance with EN 954-1.



Wiring example: Input level

Dual-channel triggering using P-switching semi-conductors.

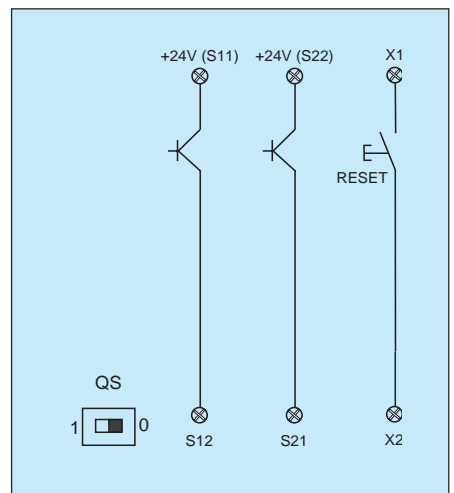
Wire breakage and earth leakage in the door monitoring circuits are detected.

With external reset button.

Attention: QS-switch must be set in position "0".

WARNING: Ignoring may destroy the device.

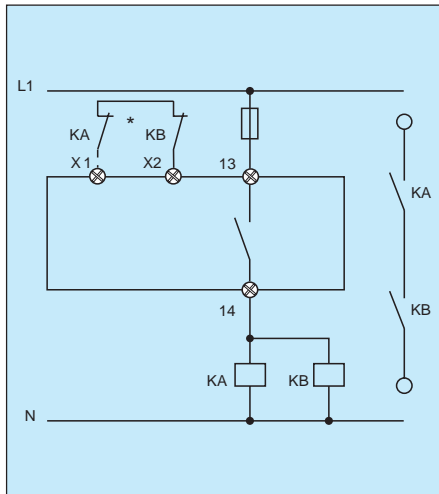
Safety category 3 or 4 in accordance with EN 954-1.



**Wiring example:
Power level**

Single-channel output

Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.

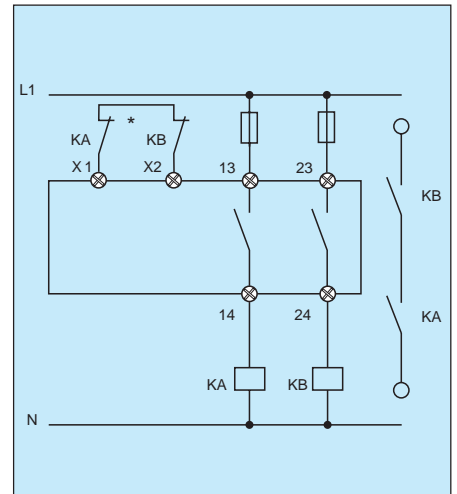


* Reset button wired in series to feedback loop.

**Wiring example:
Power level**

Dual-channel output

Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.



* Reset button wired in series to feedback loop.

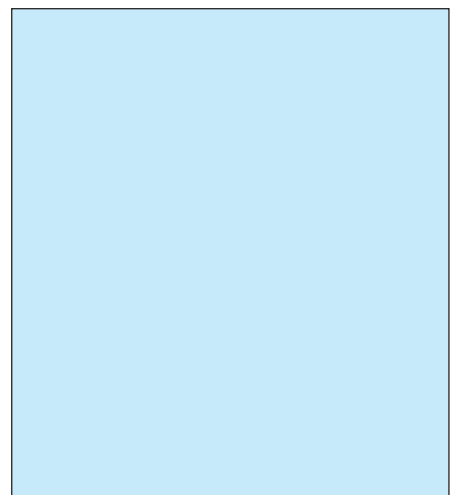
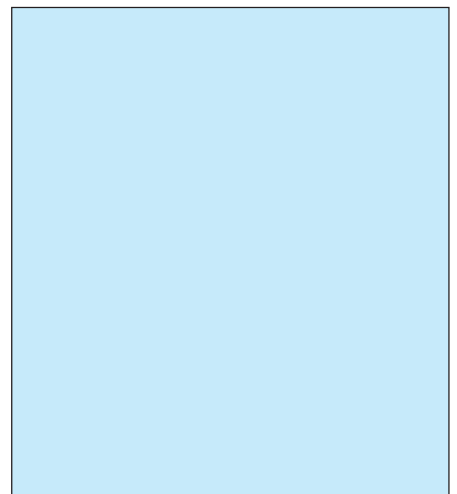
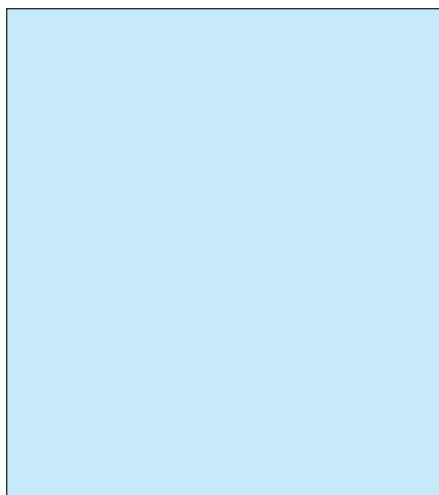
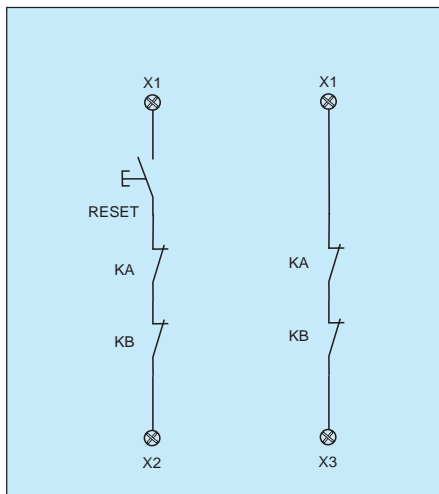
Advice

For "Automatic Reset" connect feed back loop to X1-X3 or apply jumper X1-X3 if no feed back loop is used.

When using external reset button (feed back loop connected to X1-X2), unit is triggered by trailing edge function.

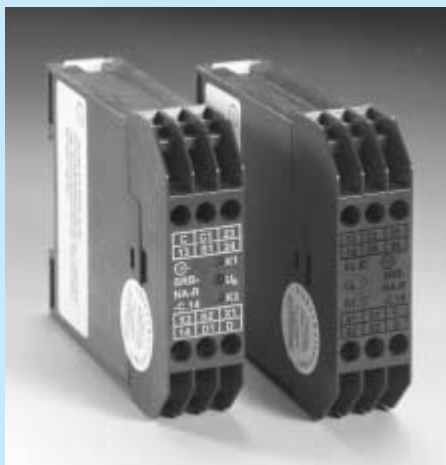
Trailing edge function with "fail-safe" function only by a DC power supply.

After a performed "Emergency Shut Down" an automatic restart of the system must be prevented by the higher ranking electric circuitry when the relay module SRB-C.46/e is been set into mode "Automatic Start" (refer to EN 60204-1, part 9.2.5.4.2 and part 10.8.3).



SRB modules 22.5 mm wide, STOP category 0

- max. 3 enabling outputs and 1 monitoring output
- max. load current: 6 Ampere
- max. safety category: 4
- 1- or 2-channel triggering
- Trailing edge function selectable
- Cross-short recognition selectable
- Semiconductor monitoring outputs selectable
- 24 VDC/VAC-version
- Approvals: BG, CSA, UL



Type	Options													refer to page				
	Enabling outputs STOP cat. 0	Enabling outputs STOP cat. 1	=> max. load current (A)	Auxiliary NC outputs	=> max. load current (A)	Time-window ∞ channel 1/2	Cross-short recognition	Single-channel triggering	Trailing edge function	External powered inputs	Initial start test	24 VDC/VAC	48 VAC		115 VAC	230 VAC	BG approval	CSA approval
SRB-NA-R-C.14	2	6		4	+	+	●				●				✓	✓	✓	refer to page 26
SRB-NA-R-C.15	3	6	1 2	3	+	+	●				●				✓	✓	✓	refer to page 30
SRB-NA-R-C.17	2	4		4	+	+	●	●			●*				✓	✓	✓	refer to page 34
SRB-NA-R-C.18	2	6		4	+		●		●		●				✓	✓	✓	refer to page 38
SRB-NA-R-C.36	2	6		4	+		●	●	●		●*				✓	✓	✓	refer to page 42

➤ = fixed; ● = selectable; ● = selectable feature; * = available in 24 VDC only; ✓ = approved

SRB-NA-R-C.14

Safety relay array for emergency stop devices, interlocking devices and others

- ➡ 2 enabling outputs
- ➡ Cross-short recognition

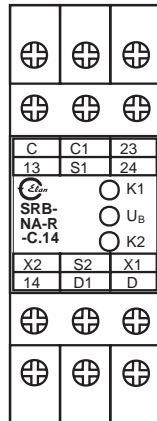
Features

- Relay output: 2 NO
- Reset, feedback loop
- Input for emergency stop or door monitoring
- LED's for K1, K2, U_i
- Housing 22.5 mm, made of thermoplastic in accordance with UL-94-V-0, red RAL 3000
- DIN rail mounting
DIN EN 50 022

Approvals



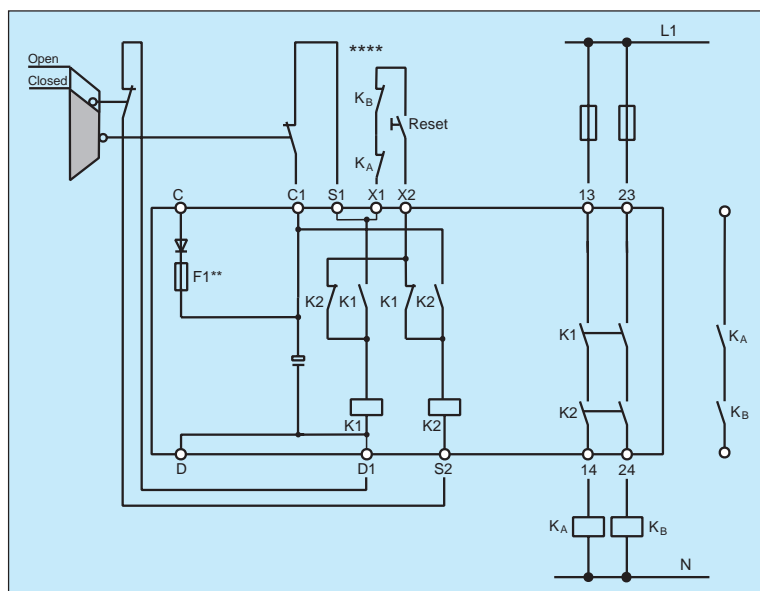
Front view



Product range

Type	Enabling outputs	Operating voltage	Part no.
SRB-NA-R-C.14-24VDC	2 NO	24 VDC	600 0025
SRB-NA-R-C.14-24VAC	2 NO	24 VAC	600 0047
SRB-NA-R-C.14/UC	2 NO	24 VDC/VAC	On request

Wiring diagram



Example for dual-channel door monitoring using two limit switches (one with positive opening contacts) and external reset button.

Dual-channel output, suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.

**** = Feedback loop

Wire breakage and earth leakage in the Monitoring circuits are detected.

** Fuse M 0.5 A (an external leading fuse M 0.25 A is recommended)

For further examples refer to page 28/29

Model specific Technical data

(refer to page 157 for general data)

Operating voltage	24VDC -15%/+20%, residual ripple max. 10% 24 VAC -15%/+6%
Frequency	50/60 Hz (for AC operating)
Fuse (power supply)	M 0.25 A/250 V (internal M 0.5 A/250 V)
Power consumption	max. 2.5 VA
Switching capacity (enabling contacts)	230 VAC, 6 A ohmic (inductive with suitable suppression)
Fuse (enabling contacts)	6 A slow blowing
Application category	AC 15/DC 13, DIN VDE 0660 Part 200
Pick-up delay	≤ 10 ms
Drop-out delay	≤ 30 ms
Contact material / contacts	AgSnO, self cleaning, positively driven
Contact resistance	max. 100 mOhm when new
Air and creeping distances	DIN VDE 0110-1 (04.97), 4 kV/2
Connections	Self lifting screw terminals min. 0.6 qmm, max. 2.5 qmm
Dimensions	H/W/D 82 mm/22.5 mm/98.8 mm
Weight	190 g
Ambient operating temperature	-25 °C ... +45 °C (derating curve page 157)
Mechanical life	10 ⁷ switching cycles
Terminal labeling	DIN EN 60 445/DIN 40 719 Part 2

SRB-NA-R-C.14 (continued)

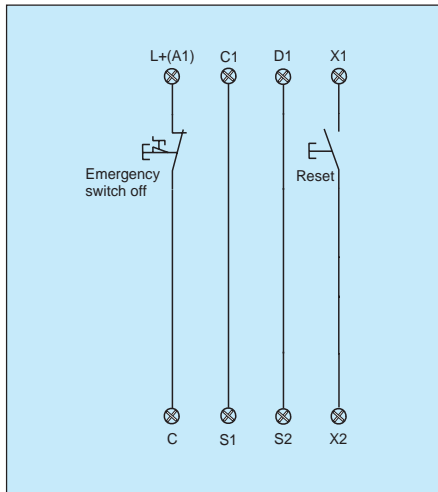
Wiring example: Input level

Single-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

With external reset button.

Safety category 2 in accordance with EN 954-1.



Wiring example: Input level

Dual-channel emergency stop switch according to EN 60 204-1.

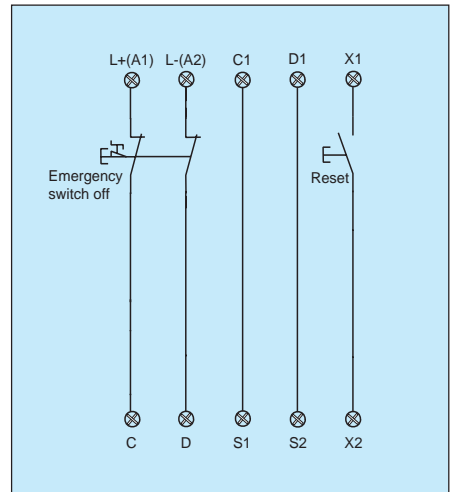
Wire breakage and earth leakage in the emergency stop circuits **are detected**.

Earth leakage at input A2 is detected in non grounded mains only!

Cross-shorts in the emergency stop circuits are detected.

With external reset button.

Safety category 3 in accordance with EN 954-1.



Wiring example: Input level

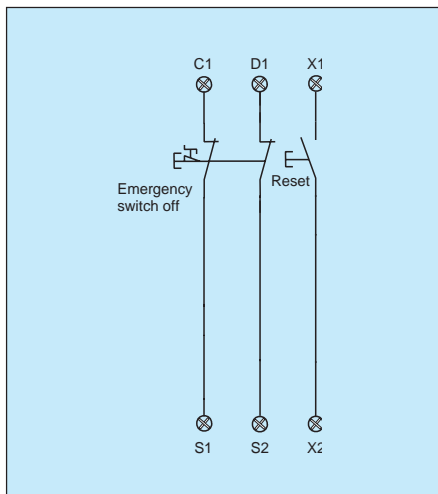
Dual-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

Cross-shorts in the emergency stop circuits are detected.

With external reset button.

Safety category 3 or 4 in accordance with EN 954-1.



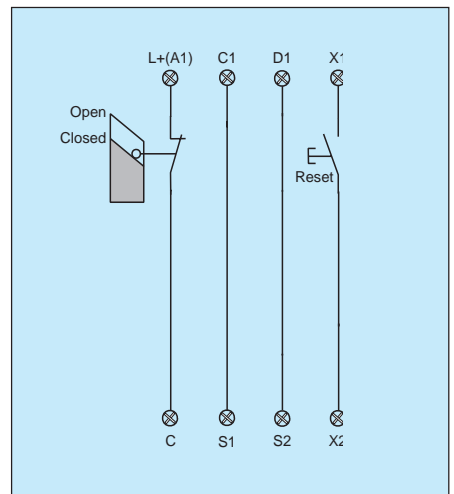
Wiring example: Input level

Single-channel door monitoring according to EN 1088 limit switch with positive opening contact.

Wire breakage and earth leakage in the door monitoring circuits are detected.

With external reset button for increased safety requirements.

Safety category 2 in accordance with EN 954-1.



Wiring example: Input level

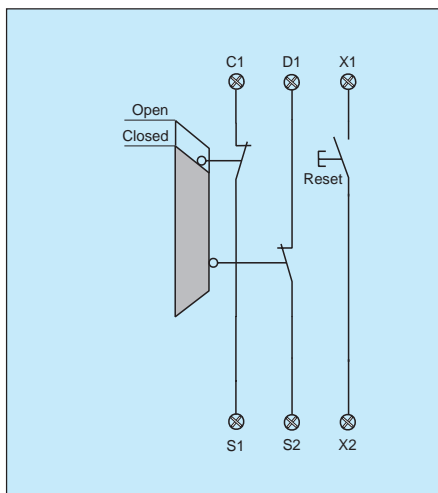
Dual-channel door monitoring according to EN 1088, one limit switch with positive opening contact.

Wire breakage and earth leakage in the door monitoring circuits are detected.

Cross-shorts in the emergency stop circuits are detected.

With external reset button for increased safety requirements.

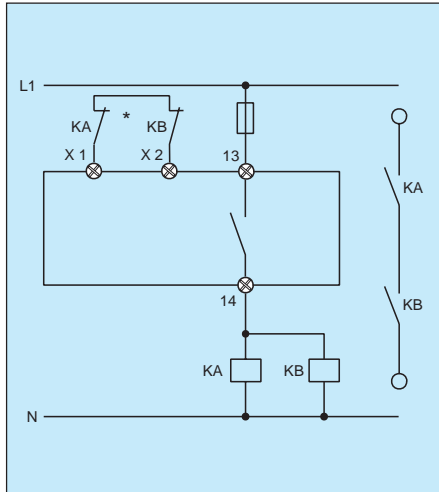
Safety category 3 or 4 in accordance with EN 954-1.



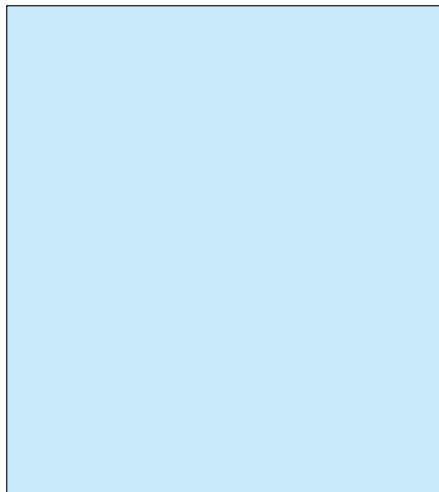
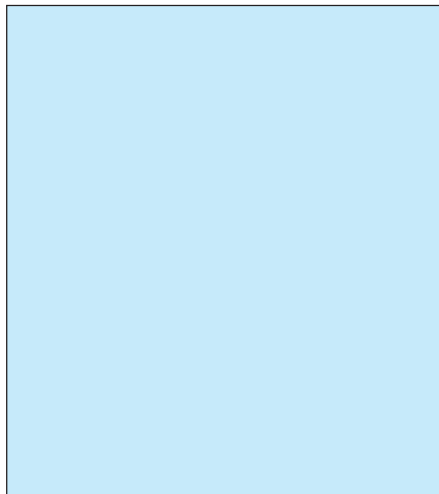
**Wiring example:
Power level**

Single-channel output

Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.



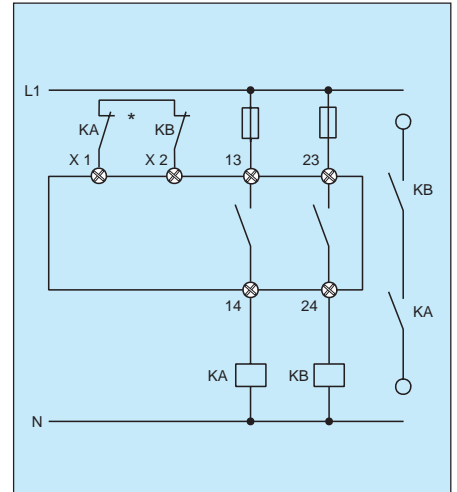
* Reset button wired in series to feedback loop.



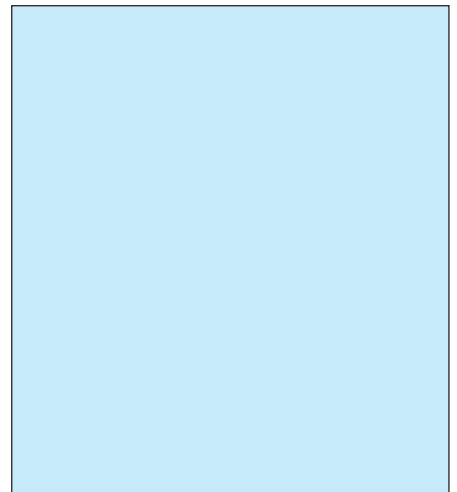
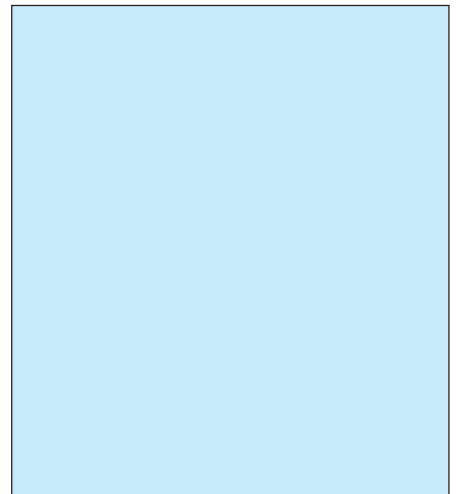
**Wiring example:
Power level**

Dual-channel output

Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.



* Reset button wired in series to feedback loop.



SRB-NA-R-C.15, ...-C.15/1

Safety relay array for emergency stop devices, interlocking devices and others

- ➡ 3 enabling outputs and 1 monitoring output
- ➡ Cross-short recognition

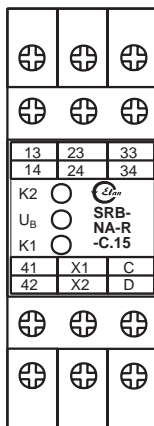
Features

- Relay output: 3 NO, 1 NC (Auxiliary NC for monitoring must not be used in Safety Enabling Circuits!)
- Reset, feedback loop
- NC contacts for monitoring (SRB-NA-R-C.15/1: in series) (SRB-NA-R-C.15: in parallel)
- Input for emergency stop or door monitoring
- LED's for K1, K2, U_i
- Housing 22.5 mm, made of thermoplastic in accordance with UL-94-V-0, red RAL 3000
- DIN rail mounting DIN EN 50 022

Approvals (SRB-NA-R-C.15)



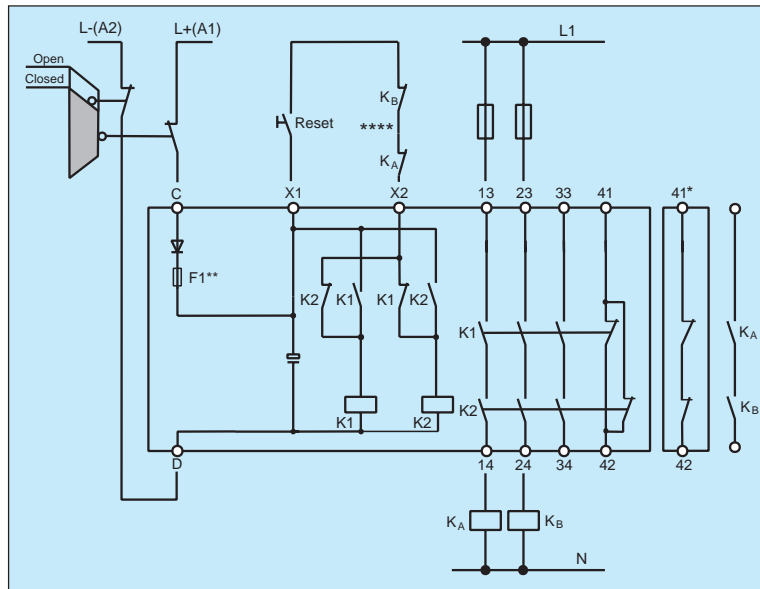
Front view



Product range

Type	Enabling outputs	Operating voltage	Part no.
SRB-NA-R-C.15-24VDC	3 NO/1 NC	24 VDC	600 0032
SRB-NA-R-C.15-24VAC	3 NO/1 NC	24 VAC	600 0044
SRB-NA-R-C.15/1-24VDC	3 NO/1 NC	24 VDC	600 0046
SRB-NA-R-C.15/UC	3 NO/1 NC	24 VDC/VAC	On request

Wiring diagram



Example for dual-channel door monitoring using two limit switches (one with positive opening contacts) and external reset button.

Dual-channel output, suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.

**** = Feedback loop

Wire breakage and earth leakage in the Monitoring circuits are detected.

Earth leakage at input D is detected only in mains with insulation leakage monitoring.

* Monitoring contacts in series at SRB-NA-R-C.15/1

** Fuse M 0.5 A (an external leading fuse M 0.25 A is recommended)

For further examples refer to page 32/33

Model specific Technical data

(refer to page 157 for general data)

Operating voltage	24 VDC $-15\%/+20\%$, residual ripple max. 10% 24 VAC $-15\%/+6\%$
Frequency	50/60 Hz (for AC operating)
Fuse (power supply)	M 0.25 A/250 V (internal M 0.5 A/250 V)
Power consumption	max. 2.5 VA
Switching capacity (enabling contacts)	230 VAC, 6 A ohmic (inductive with suitable suppression)
Fuse (enabling contacts)	6 A slow blowing
Switching capacity (monitoring contacts)	24 V, 2 A ohmic (inductive with suitable suppression)
Fuse (monitoring contacts)	2 A slow blowing
Application category	AC 15/DC 13, DIN VDE 0660 Part 200
Pick-up delay	≤ 10 ms
Drop-out delay	≤ 30 ms
Contact material / contacts	AgSnO, self cleaning, positively driven
Contact resistance	max. 100 mOhm when new
Air and creeping distances	DIN VDE 0110-1 (04.97), 4 kV/2
Connections	Self lifting screw terminals min. 0.6 qmm, max. 2.5 qmm
Dimensions	H/W/D 82 mm/22.5 mm/98.8 mm
Weight	190 g
Ambient operating temperature	-25 °C ... $+45$ °C (derating curve page 157)
Mechanical life	10^7 switching cycles
Terminal labeling	DIN EN 60 445/DIN 40 719 Part 2

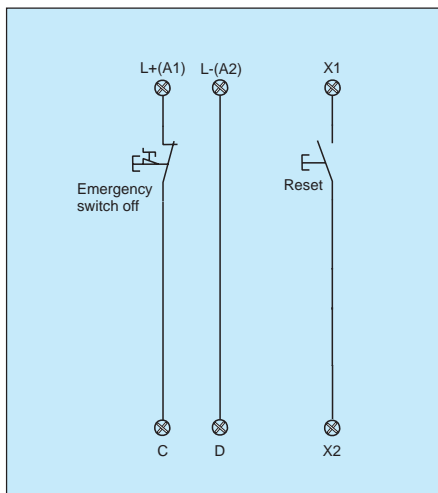
Wiring example: Input level

Single-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

With external reset button.

Safety category 2
in accordance with
EN 954-1.



Wiring example: Input level

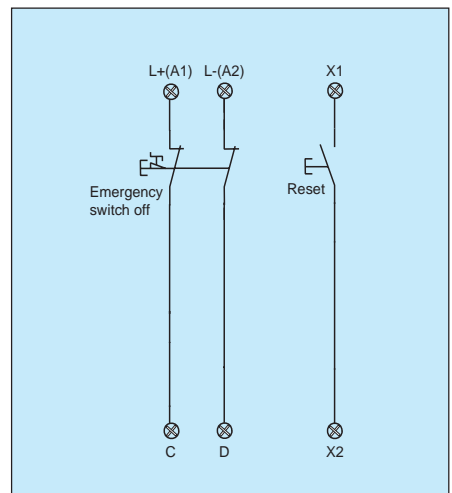
Dual-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

Cross-shorts in the emergency stop circuits are detected.

With external reset button.

Safety category 3
in accordance with
EN 954-1.



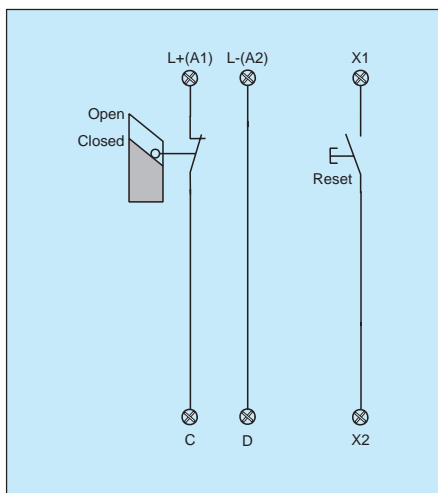
Wiring example: Input level

Single-channel door monitoring according to EN 1088 limit switch with positive opening contact.

Wire breakage and earth leakage in the door monitoring circuits are detected.

With external reset button
for increased safety
requirements.

Safety category 2
in accordance with
EN 954-1.



Wiring example: Input level

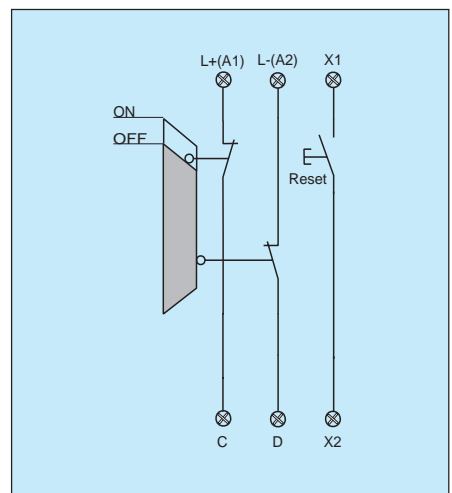
Dual-channel door monitoring according to EN 1088, one limit switch with positive opening contact.

Wire breakage and earth leakage in the door monitoring circuits are detected.

Cross-shorts in the emergency stop circuits are detected.

With external reset button
for increased safety
requirements.

Safety category 3
in accordance with
EN 954-1.



SRB-NA-R-C.17

Safety relay array for emergency stop devices, interlocking devices and others

- ➔ 2 enabling outputs
- ➔ Selectable extras:
 - Trailing edge function
 - Auto reset
- ➔ Cross-short recognition

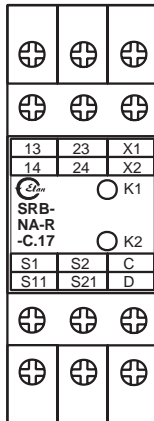
Features

- Relay output: 2 NO
- Input for emergency stop or door monitoring
- Reset, feedback loop
- LED's for K1, K2
- Housing 22.5 mm, made of thermoplastic in accordance with UL-94-V-0, red RAL 3000
- DIN rail mounting
DIN EN 50 022

Approvals



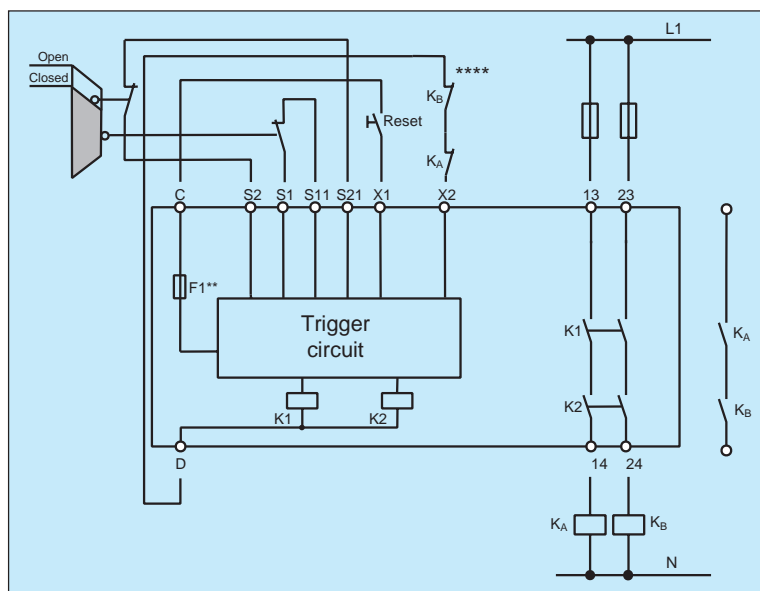
Front view



Product range

Type	Enabling outputs	Operating voltage	Part no.
SRB-NA-R-C.17-24VDC	2 NO	24 VDC	600 0045

Wiring diagram



Example for dual-channel door monitoring using two limit switches (one with positive opening contacts) and external reset button.

Dual-channel output, suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.

**** = Feedback loop

Wire breakage and earth leakage in the monitoring circuits are detected.

** Internal electronic fuse

For further examples refer to page 36/37

Model specific Technical data

(refer to page 157 for general data)

Operating voltage	24 VDC -15%/+20%, residual ripple max. 10%
Fuse (power supply)	internal electronic fuse, breaking current > 0.6 A, reset time approx. 1 sec.
Power consumption	max. 2.5 W
Switching capacity (enabling contacts)	230 VAC, 4 A ohmic (inductive with suitable suppression)
Fuse (enabling contacts)	4 A slow blowing
Application category	AC 15/DC 13, DIN VDE 0660 Part 200
Pick-up delay	≤ 50 ms
Drop-out delay	≤ 20 ms
Contact material / contacts	AgSnO, self cleaning, positively driven
Contact resistance	max. 100 mOhm when new
Air and creeping distances	DIN VDE 0110-1 (04.97), 4 kV/2
Connections	Self lifting screw terminals min. 0.6 qmm, max. 2.5 qmm
Dimensions	H/W/D 82 mm/22.5 mm/98.8 mm
Weight	190 g
Ambient operating temperature	0 °C ... +45 °C (derating curve page 157)
Mechanical life	10 ⁷ switching cycles
Terminal labeling	DIN EN 60 445/DIN 40 719 Part 2

SRB-NA-R-C.17 (continued)

Wiring example: Input level

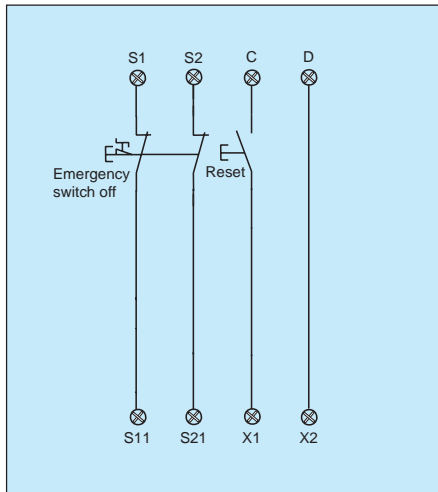
Dual-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

Cross-shorts in the emergency stop circuits are detected.

With external reset button.

Safety category 3 or 4 in accordance with EN 954-1.



Wiring example: Input level

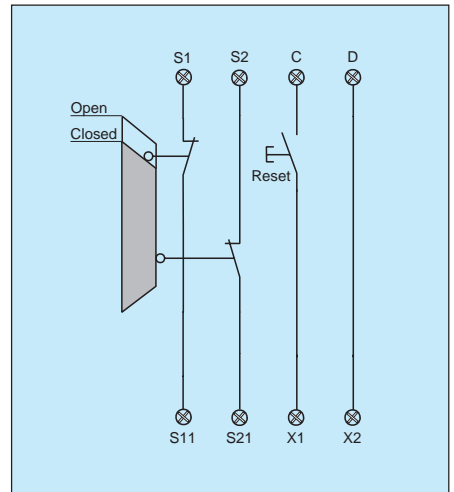
Dual-channel door monitoring according to EN 1088, one limit switch with positive opening contact.

Wire breakage and earth leakage in the door monitoring circuits are detected.

Cross-shorts in the emergency stop circuits are detected.

With external reset button for increased safety requirements.

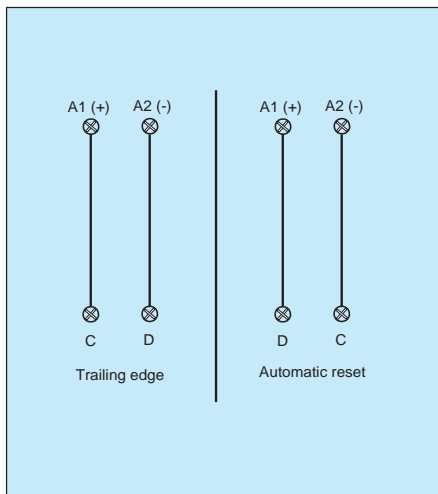
Safety category 3 or 4 in accordance with EN 954-1.



Advice:

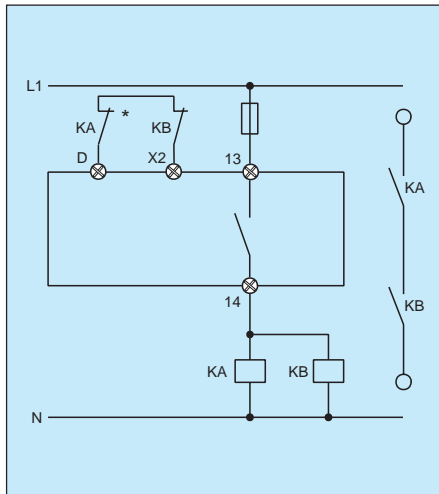
Change over from mode "External reset with trailing edge" to mode "Automatic reset" is achieved by altering the polarity of the supply voltage.

In "Automatic reset" the reset button is eliminated.

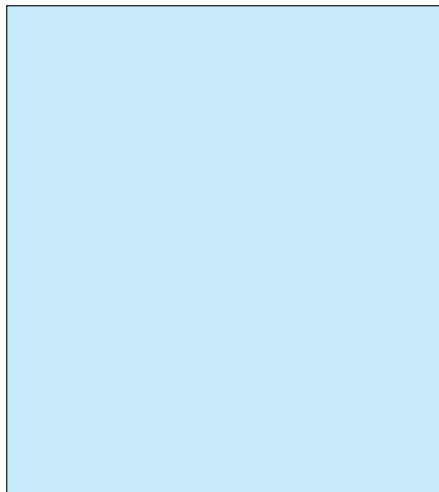
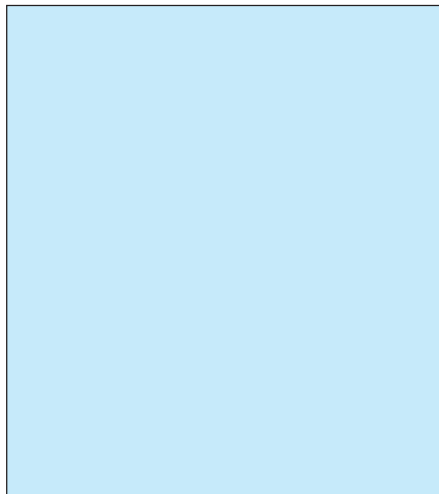


**Wiring example:
Power level**

Single-channel output.
Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.

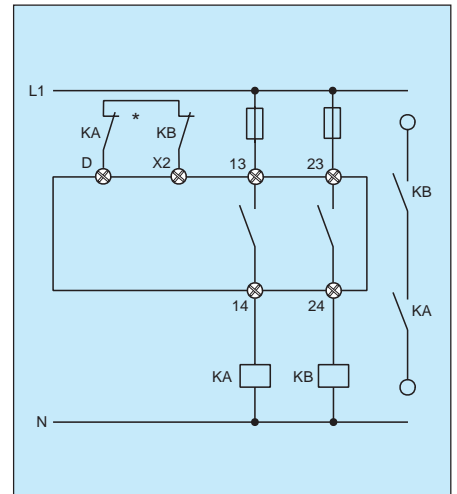


* Reset button wired in series to feedback loop.

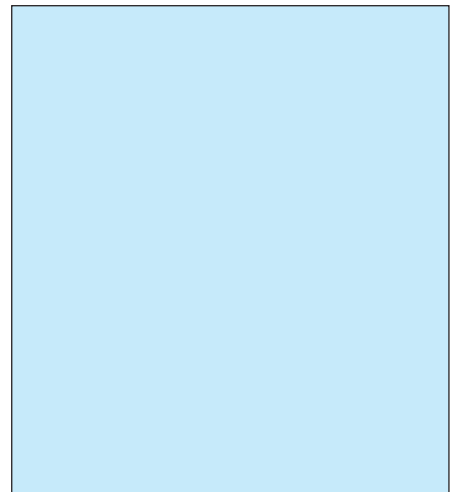
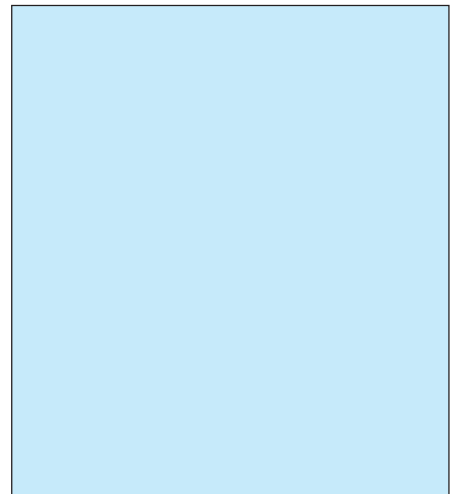


**Wiring example:
Power level**

Dual-channel output.
Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.



* Reset button wired in series to feedback loop.



SRB-NA-R-C.18

Safety relay array for emergency stop devices, interlocking devices and others

- ➡ 2 enabling outputs
- ➡ Suitable for semiconductor monitoring outputs

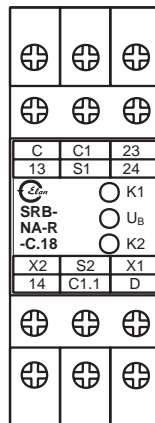
Features

- Relay output: 2 NO
- Reset, feedback loop
- No cross-short recognition
- Input for emergency stop or door monitoring
- LED's for K1, K2, U_B
- Housing 22.5 mm, made of thermoplastic in accordance with UL-94-V-0, red RAL 3000
- DIN rail mounting
DIN EN 50 022

Approvals



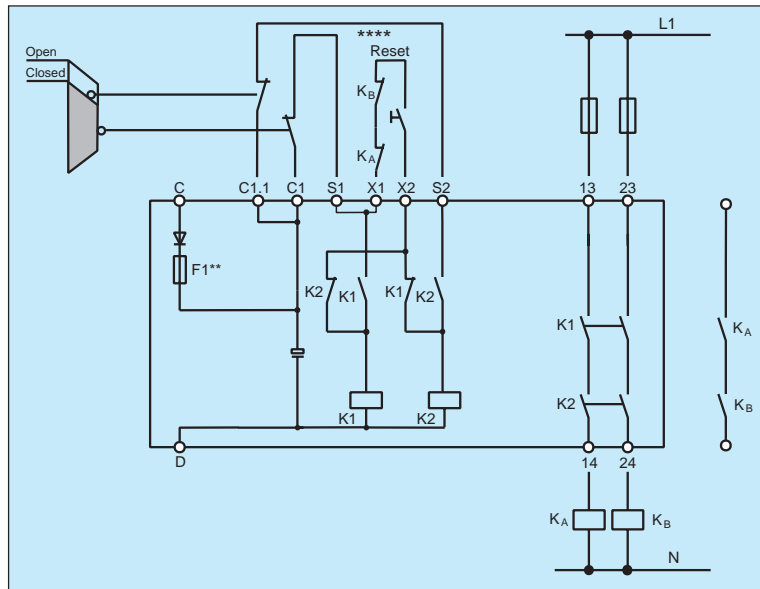
Front view



Product range

Type	Enabling outputs	Operating voltage	Part no.
SRB-NA-R-C.18-24VDC	2 NO	24 VDC	600 0090
SRB-NA-R-C.18-24VAC	2 NO	24 VAC	On request

Wiring diagram



Example for dual-channel door monitoring using two limit switches (one with positive opening contacts) and external reset button.

Dual-channel output, suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.

**** = Feedback loop

Wire breakage and earth leakage in the monitoring circuits are detected.

** Fuse M 0.5 A
(an external leading fuse M 0.25 A is recommended)

For further examples refer to page 40/41

Model specific Technical data

(refer to page 157 for general data)

Operating voltage	24 VDC -15%/+20%, residual ripple max. 10% 24 VAC -15%/+6%
Frequency	50/60 Hz (for AC operating)
Fuse (power supply)	M 0.25 A/250 V (internal M 0.5 A/250 V)
Power consumption	max. 2.5 VA
Switching capacity (enabling contacts)	230 VAC, 6 A ohmic (inductive with suitable suppression)
Fuse (enabling contacts)	6 A slow blowing
Application category	AC 15/DC 13, DIN VDE 0660 Part 200
Pick-up delay	≤ 10 ms
Drop-out delay	≤ 30 ms
Contact material / contacts	AgSnO, self cleaning, positively driven
Contact resistance	max. 100 mOhm when new
Air and creeping distances	DIN VDE 0110-1 (04.97), 4 kV/2
Connections	Self lifting screw terminals min. 0.6 qmm, max. 2.5 qmm
Dimensions	H/W/D 82 mm/22.5 mm/98.8 mm
Weight	190 g
Ambient operating temperature	-25 °C ... +45 °C (derating curve page 157)
Mechanical life	10 ⁷ switching cycles
Terminal labeling	DIN EN 60 445/DIN 40 719 Part 2

SRB-NA-R-C.18 (continued)

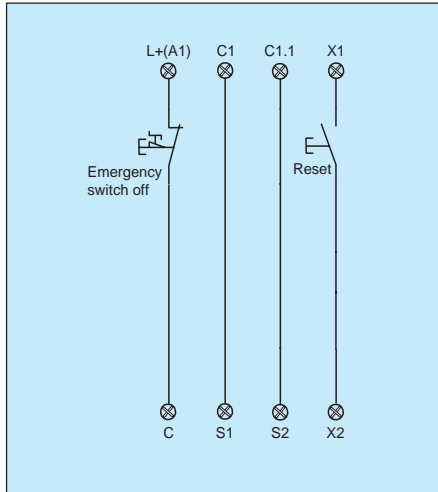
Wiring example: Input level

Single-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

With external reset button.

Safety category 2 in accordance with EN 954-1.



Wiring example: Input level

Dual-channel emergency stop switch according to EN 60 204-1.

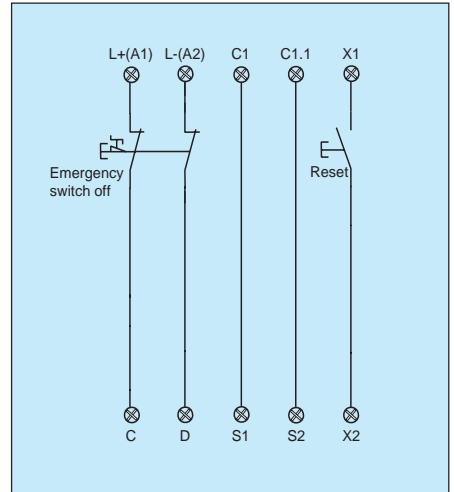
Wire breakage and earth leakage in the emergency stop circuits are detected.

Earth leakage at input A2 is detected in non grounded mains only.

Cross-shorts in the emergency stop circuits are detected.

With external reset button.

Safety category 3 in accordance with EN 954-1.



Wiring example: Input level

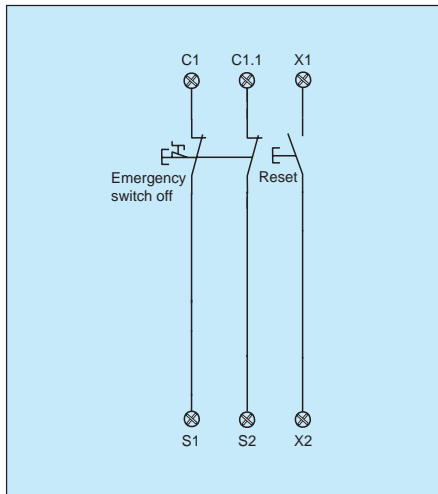
Dual-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

Cross-shorts in the emergency stop circuits are **not detected**.

With external reset button.

Safety category 3 or 4 in accordance with EN 954-1.



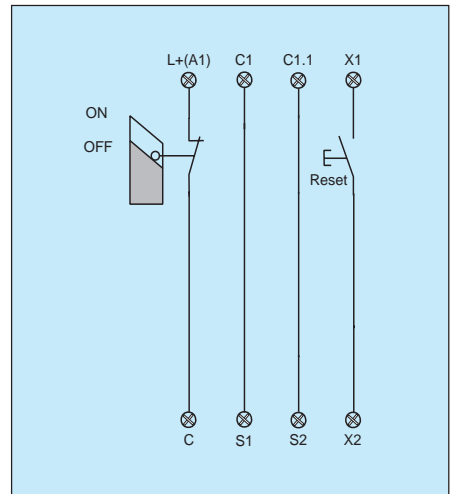
Wiring example: Input level

Single-channel door monitoring according to EN 1088 limit switch with positive opening contact.

Wire breakage and earth leakage in the door monitoring circuits are detected.

With external reset button for increased safety requirements.

Safety category 2 in accordance with EN 954-1.



Wiring example: Input level

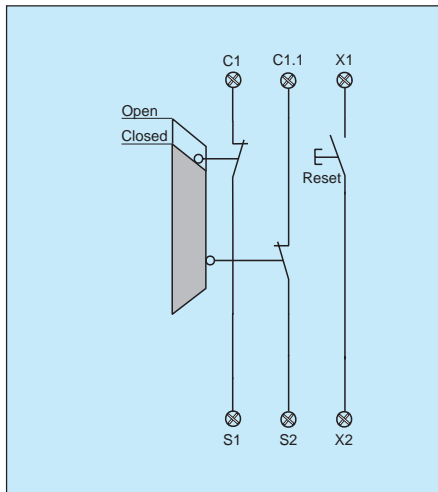
Dual-channel door monitoring according to EN 1088, one limit switch with positive opening contact.

Wire breakage and earth leakage in the door monitoring circuits are detected.

Cross-shorts in the emergency stop circuits are **not detected**.

With external reset button for increased safety requirements.

Safety category 3 or 4 in accordance with EN 954-1.



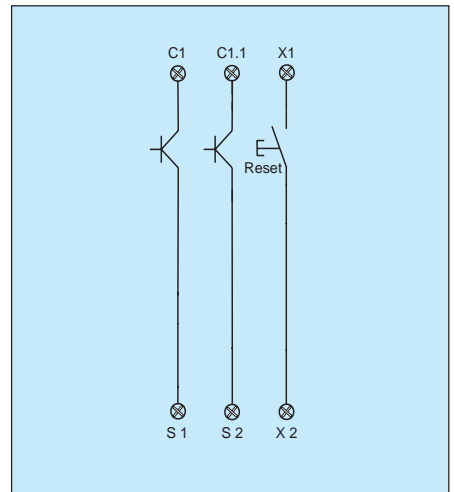
Wiring example: Input level

Dual-channel triggering using P-switching semiconductors.

Wire breakage and earth leakage in the monitoring circuits are detected.

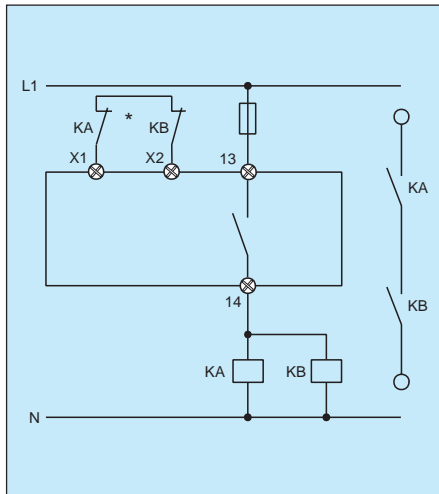
With external reset button.

Safety category 3 or 4 in accordance with EN 954-1.

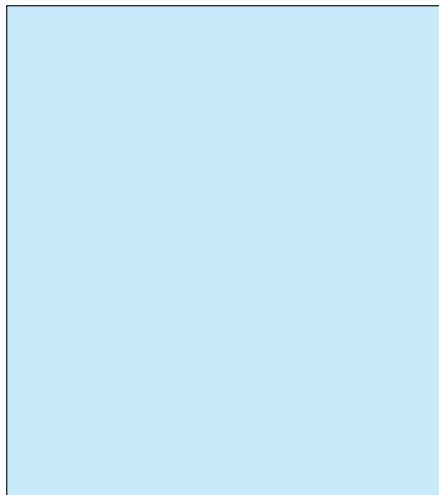
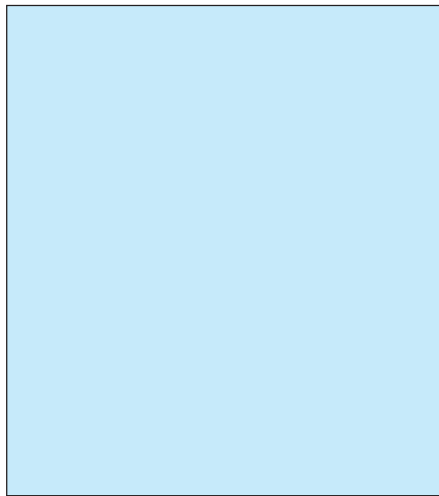


**Wiring example:
Power level**

Single-channel output
Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.

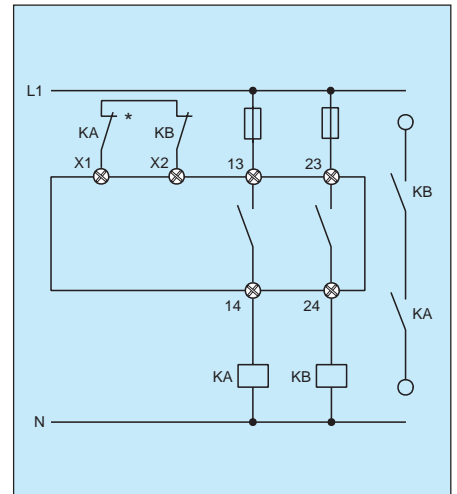


* Reset button wired in series to feedback loop.

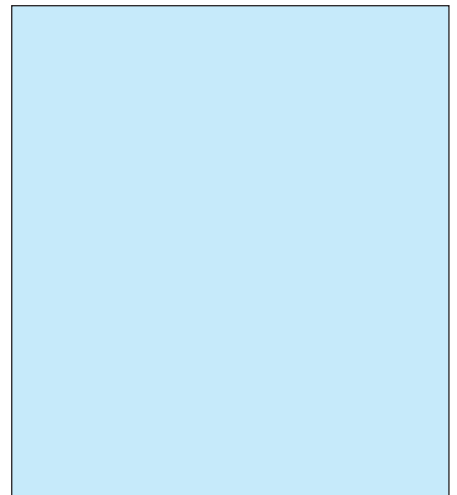
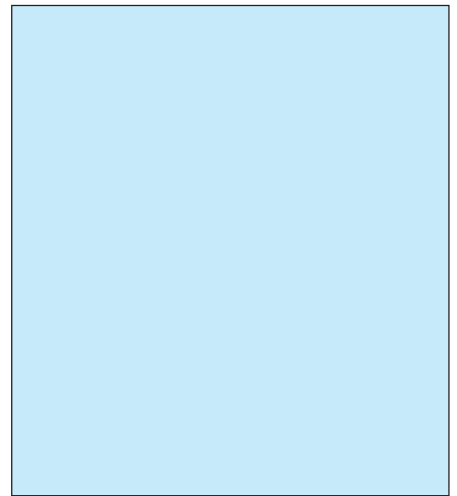


**Wiring example:
Power level**

Dual-channel output
Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.



* Reset button wired in series to feedback loop.



SRB-NA-R-C.36

Safety relay array for emergency stop devices, interlocking devices and others

- ☞ **2 enabling outputs**
- ☞ **Selectable extras:**
 - Trailing edge function
 - Auto reset
- ☞ **Suitable for semiconductor monitoring outputs**

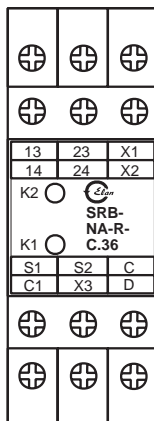
Features

- Relay output: 2 NO
- Reset, feedback loop
- No cross-short recognition
- Input for emergency stop or door monitoring
- LED's for K1, K2
- Housing 22.5 mm, made of thermoplastic in accordance with UL-94-V-0, red RAL 3000
- DIN rail mounting
DIN EN 50 022

Approvals



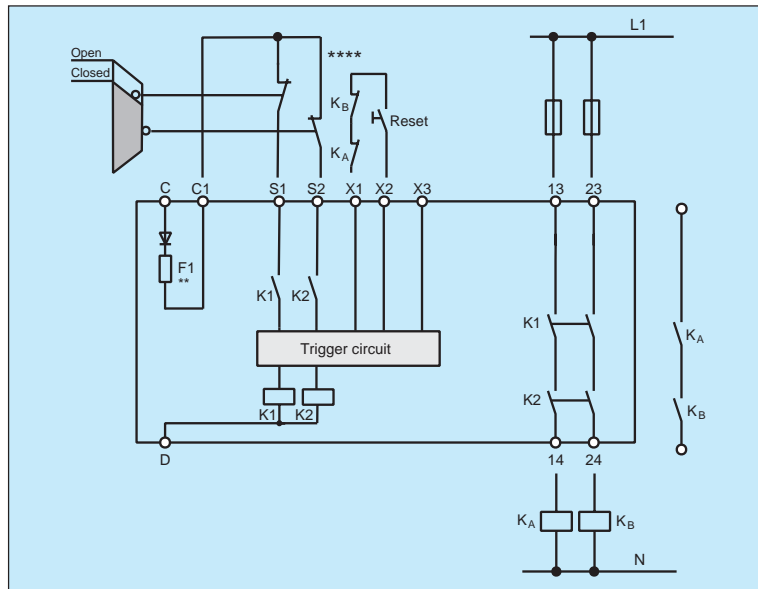
Front view



Product range

Type	Enabling outputs	Operating voltage	Part no.
SRB-NA-R-C.36-24VDC	2 NO	24 VDC	600 0067

Wiring diagram



Example for dual-channel door monitoring using two limit switches (one with positive opening contacts) and external reset button.

Dual-channel output, suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.

**** = Feedback loop

Wire breakage and earth leakage in the monitoring circuits are detected.

** Internal electronic fuse

For further examples refer to page 44/45

Model specific Technical data

(refer to page 157 for general data)

Operating voltage	24 VDC -15%/+20%, residual ripple max. 10%
Fuse (power supply)	internal electronic fuse, breaking current > 0.6 A, reset time approx. 1 sec.
Power consumption	max. 2.5 W
Switching capacity (enabling contacts)	230 VAC, 6 A ohmic (inductive with suitable suppression)
Fuse (enabling contacts)	6 A slow blowing
Application category	AC 15/DC 13, DIN VDE 0660 Part 200
Pick-up delay	≤ 330 ms/720 ms (Reset /Auto Reset)
Drop-out delay	≤ 20 ms
Contact material / contacts	AgSnO, self cleaning, positively driven
Contact resistance	max. 100 mOhm when new
Air and creeping distances	DIN VDE 0110-1 (04.97), 4 kV/2
Connections	Self lifting screw terminals min. 0.6 qmm, max. 2.5 qmm
Dimensions	H/W/D 82 mm/22.5 mm/98.8 mm
Weight	190 g
Ambient operating temperature	0 °C ... +45 °C (derating curve page 157)
Mechanical life	10 ⁷ switching cycles
Terminal labeling	DIN EN 60 445/DIN 40 719 Part 2

SRB-NA-R-C.36 (continued)

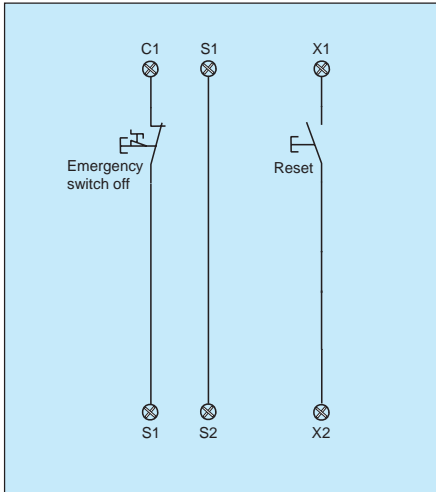
Wiring example: Input level

Single-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

With external reset button.

Safety category 2 in accordance with EN 954-1.



Wiring example: Input level

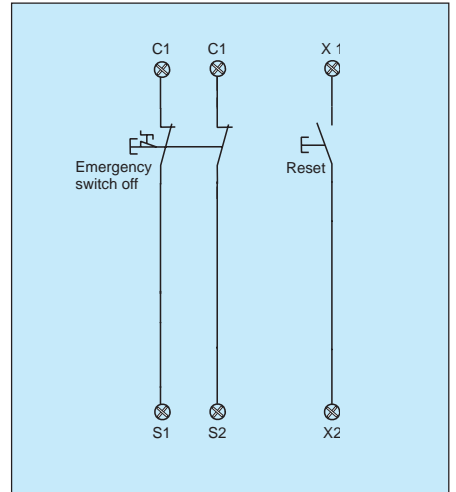
Dual-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

Cross-shorts in the emergency stop circuits are **not detected**.

With external reset button.

Safety category 3 or 4 in accordance with EN 954-1.



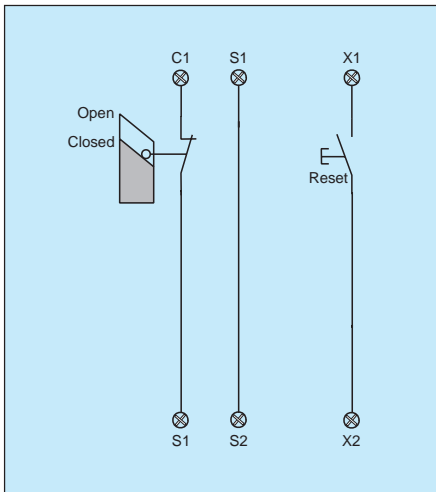
Wiring example: Input level

Single-channel door monitoring according to EN 1088 one limit switch with positive opening contact.

Wire breakage and earth leakage in the door monitoring circuits are detected.

With external reset button for increased safety requirements.

Safety category 2 in accordance with EN 954-1.



Wiring example: Input level

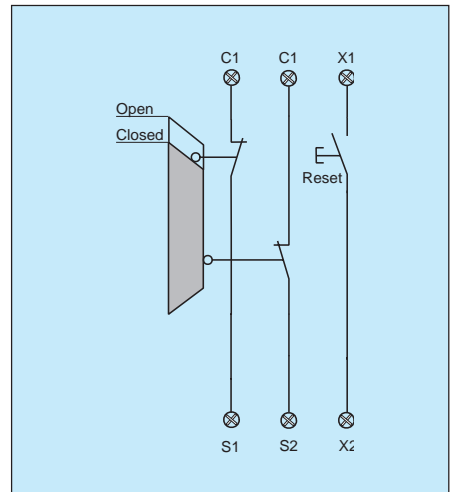
Dual-channel door monitoring according to EN 1088 one limit switch with positive opening contact.

Wire breakage and earth leakage in the door monitoring circuits are detected.

Cross-shorts in the door monitoring circuits are **not detected**.

With external reset button for increased safety requirements.

Safety category 3 or 4 in accordance with EN 954-1.



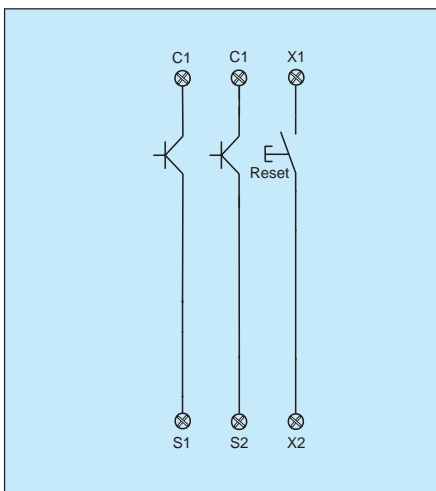
Wiring example: Input level

Dual-channel triggering using P-switching semiconductors.

Wire breakage and earth leakage in the door monitoring circuits are detected.

With external reset.

Safety category 3 or 4 in accordance with EN 954-1.

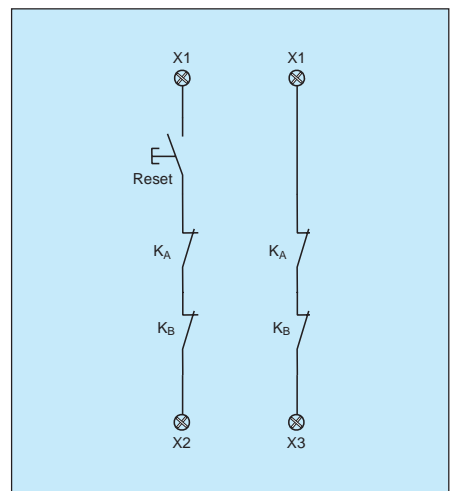


Advice:

For "Automatic Reset" apply jumper X1-X3.

When using external reset button (connected to X1-X2), unit is triggered by trailing edge function.

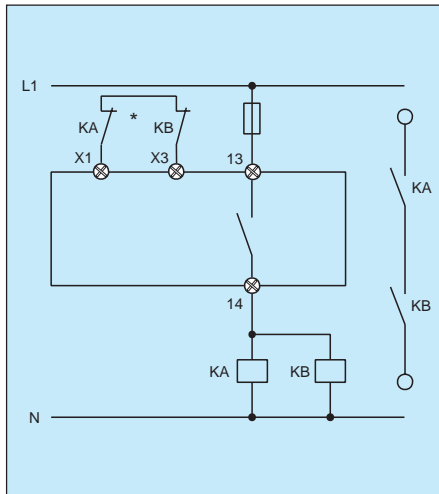
Reset button wired in series to feedback loop.



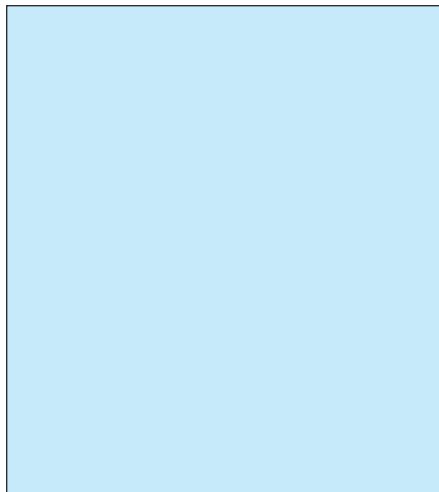
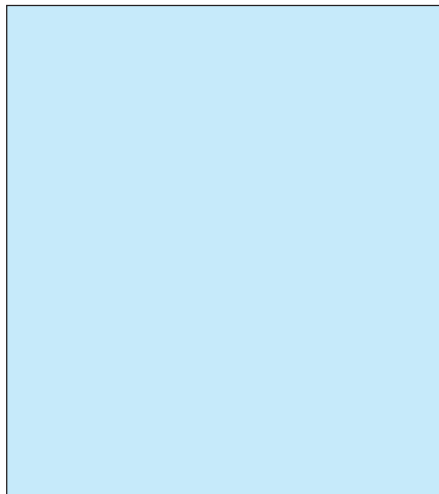
**Wiring example:
Power level**

Single-channel output

Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.



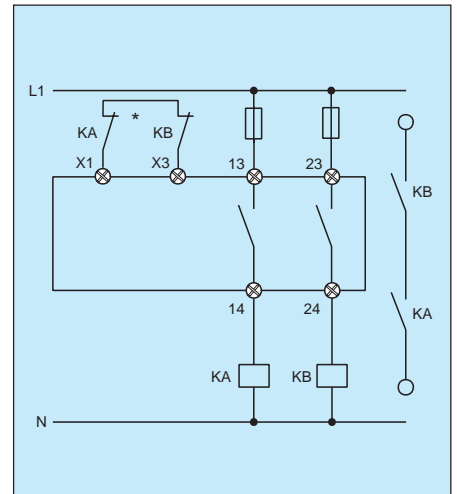
* Reset button wired in series to feedback loop.



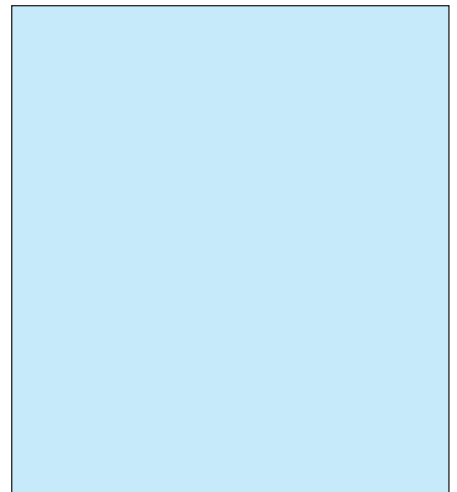
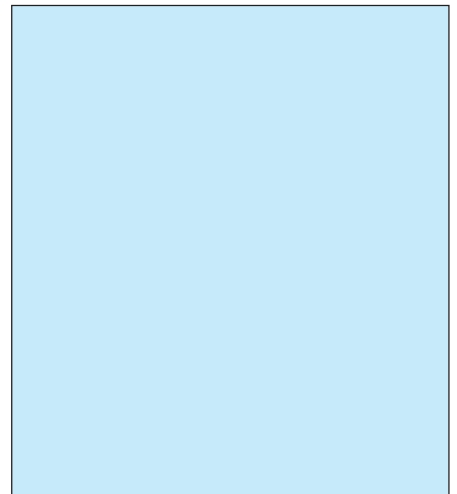
**Wiring example:
Power level**

Dual-channel output

Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.

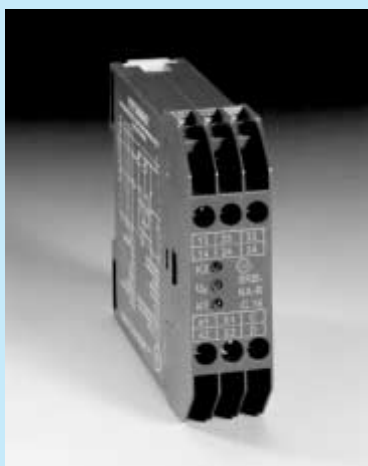


* Reset button wired in series to feedback loop.



SRB modules 22.5 wide, STOP category 1

- ☛ Enabling outputs drop-out delayed: 1 sec.
- ☛ 3 enabling outputs and 1 monitoring output
- ☛ max. load current: 6 Ampere
- ☛ max. safety category: 4
- ☛ 1- or 2-channel triggering
- ☛ Cross-short recognition
- ☛ 24 VDC/VAC-Version
- ☛ Approvals: BG, CSA, UL



Type	Options																		
	Enabling outputs STOP cat. 0	Enabling outputs STOP cat. 1*	⇒ max. load current (A)	Auxiliary NC outputs	⇒ max. load current (A)	Time window	max. safety category	Cross-short recognition	Single-channel 1/2	Trailing edge triggering	External powered function	Initial start test	24 VDC/VAC	48 VAC	115 VAC	230 VAC	BG approval	CSA approval	UL approval
SRB-NA-R-C.16	3	6	1	2	3	+	+	●				●				✓	✓	✓	refer to page 48

* = drop-out delay: 1 sec.; + = fixed; ● = selectable; ✓ = approved

SRB-NA-R-C.16, ...-C.16/1

Safety relay array for emergency stop devices, interlocking devices and others

- ➡ 3 enabling outputs and 1 monitoring output
- ➡ Drop-out delayed (1 sec.) enabling outputs
- ➡ STOP category 1
- ➡ Cross-short recognition

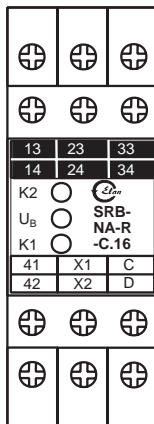
Features

- Relay output: 3 NO, 1NC (Auxiliary NC for monitoring must not be used in safety enabling circuits!)
- Reset, feedback loop
- NC contacts for monitoring (SRB-NA-R-C.16/1: in series) (SRB-NA-R-C.16: in parallel)
- Input for emergency stop or door monitoring
- LED's for K1, K2, U_B
- Housing 22.5 mm, made of thermoplastic in accordance with UL-94-V-0, red RAL 3000
- DIN rail mounting
DIN EN 50 022

Approvals



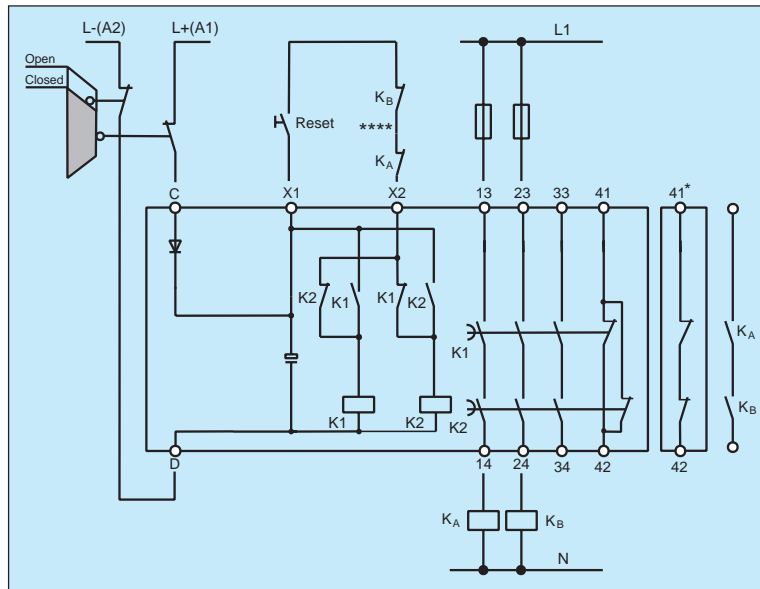
Front view



Product range

Type	Enabling outputs	Operating voltage	Part no.
SRB-NA-R-C.16-24VDC	3 NC ÷/1 NC	24 VDC	600 0035
SRB-NA-R-C.16/1-24VDC	3 NC ÷/1 NC	24 VDC	600 0034
SRB-NA-R-C.16-24VAC	3 NC ÷/1 NC	24 VAC	On request

Wiring diagram



For further examples refer to page 50/51

Model specific Technical data

(refer to page 157 for general data)

Operating voltage	24 VDC $-15\%/+20\%$, residual ripple max. 10% 24 VAC $-15\%/+6\%$
Frequency	50/60 Hz (for AC operating)
Fuse (power supply)	M 0.5 A/250 V
Power consumption	max. 2.5 VA
Switching capacity (enabling contacts)	230 VAC, 6 A ohmic (inductive with suitable suppression)
Fuse (enabling contacts)	6 A slow blowing
Switching capacity (monitoring contacts)	24 V, 2 A ohmic (inductive with suitable suppression)
Fuse (monitoring contacts)	2 A slow blowing
Application category	AC 15/DC 13, DIN VDE 0660 Part 200
Pick-up delay	≤ 50 ms
Drop-out delay	1.1 s $-20\%/+20\%$ (for $U_B = 24$ VDC)
Contact material / contacts	AgSnO, self cleaning, positively driven
Contact resistance	max. 100 mOhm when new
Air and creeping distances	DIN VDE 0110-1 (04.97), 4 kV/2
Connections	Self lifting screw terminals min. 0.6 qmm, max. 2.5 qmm
Dimensions	H/W/D 82 mm/22.5 mm/98.8 mm
Weight	190 g
Ambient operating temperature	-25 °C ... $+45$ °C (derating curve page 157)
Mechanical life	10^7 switching cycles
Terminal labeling	DIN EN 60 445/DIN 40 719 Part 2

Example for dual-channel door monitoring using two limit switches (one with positive opening contacts) and external reset button.

Dual-channel output, suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.

**** = Feedback loop

Wire breakage and earth leakage in the monitoring circuits are detected.

Earth leakage at input D is detected only in mains with insulation leakage monitoring.

An external leading fuse 0.5 A is recommended.

* Monitoring contacts in series at SRB-NA-R-C.16/1

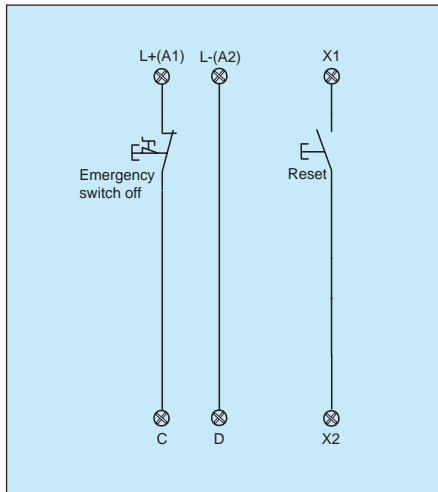
Wiring example: Input level

Single-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

With external reset button.

Safety category 2 in accordance with EN 954-1.



Wiring example: Input level

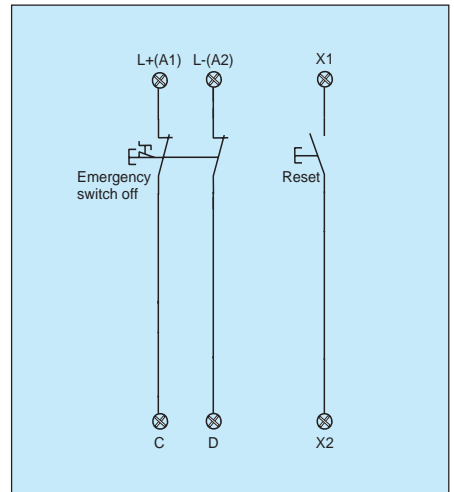
Dual-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

Cross-shorts in the emergency stop circuits are detected.

With external reset button.

Safety category 3 in accordance with EN 954-1.



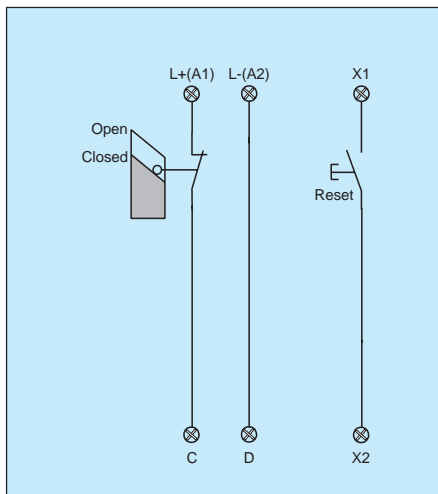
Wiring example: Input level

Single-channel door monitoring according to EN 1088 limit switch with positive opening contact.

Wire breakage and earth leakage in the door monitoring circuits are detected.

With external reset button for increased safety requirements.

Safety category 2 in accordance with EN 954-1.



Wiring example: Input level

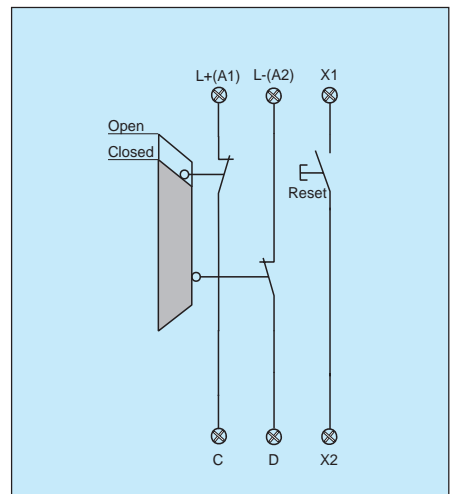
Dual-channel door monitoring according to EN 1088, one limit switch with positive opening contact.

Wire breakage and earth leakage in the door monitoring circuits are detected.

Cross-shorts in the door monitoring circuits are detected.

With external reset button for increased safety requirements.

Safety category 3 in accordance with EN 954-1.



Safety relevant advice!

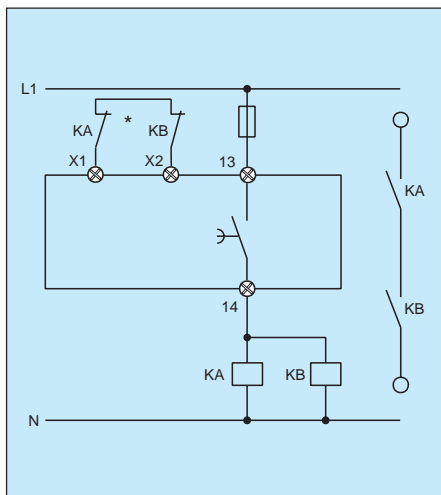
The drop-out delay features in the SRB-NA-R-C.16 24 VDC refers to control category 1 "tried and tested components and principles" according to EN 954-1.

**Wiring example:
Power level**

Single-channel output

Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.

Drop-out delay:
Safety category 1 in accordance with EN 954-1.



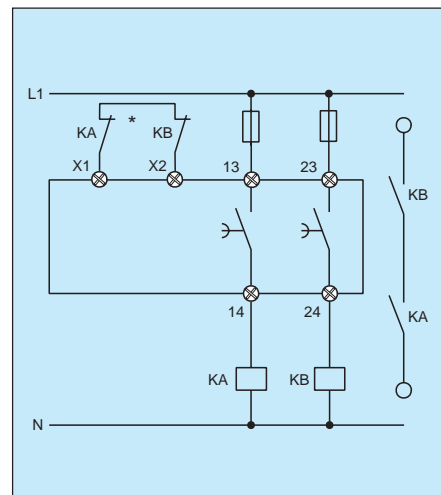
* Reset button wired in series to feedback loop.

**Wiring example:
Power level**

Dual-channel output

Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.

Drop-out delay:
Safety category 1 in accordance with EN 954-1.



* Reset button wired in series to feedback loop.

SRB modules 45 mm wide, standard version, STOP category 0

- ✦ max. 3 enabling outputs and 2 monitoring outputs
- ✦ max. load current: 6 Ampere
- ✦ max. safety category: 4
- ✦ 1- or 2-channel triggering
- ✦ Trailing edge function selectable
- ✦ Cross-short recognition selectable
- ✦ Semiconductor monitoring outputs selectable
- ✦ 24 VDC/VAC, 48 VAC, 115 VAC and 230 VAC versions
- ✦ Approvals: BG, CSA, UL



Type	Options																		
	Enabling outputs STOP cat. 0	Enabling outputs STOP cat. 1	⇒ max. load current (A)	Auxiliary NC/NO outputs	⇒ max. load current (A)	max. safety category	Time window ∞	Cross-short recognition	Single-channel triggering	Trailing edge function	External powered inputs	Initial start test	24 VDC/VAC	48 VAC	115 VAC		230 VAC	BG approval	CSA approval
SRB-NA-R-C.12	3		6			3	+	+	●			●	+	+	+	✓	✓	✓	refer to page 54
SRB-NA-R-C.33	3		6	1	2	4	+		●		●	+	+	+	✓	✓	✓	refer to page 58	
SRB-NA-R-C.34	3		6	1/1	2	4	+		●	●	●				✓	✓	✓	refer to page 62	

✦ = fixed; ● = selectable; ● = selectable feature; ✓ = approved; ✓ = in preparation

SRB-NA-R-C.12

Safety relay array for emergency stop devices, interlocking devices and others

- ☛ 3 enabling outputs
- ☛ 3-channel triggering
- ☛ Different operating voltage
- ☛ Cross-short recognition

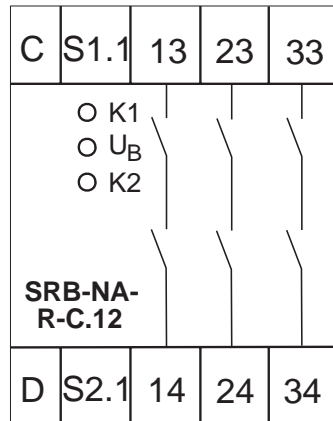
Features

- Relay output: 3 NO
- LED's for K1, K2, U_B
- DIN rail mounting DIN EN 50 022
- Reset, feedback loop
- Housing 45 mm, made of thermoplastic in accordance with UL-94-V-0, red RAL 3000
- Input for emergency stop or door monitoring

Approvals



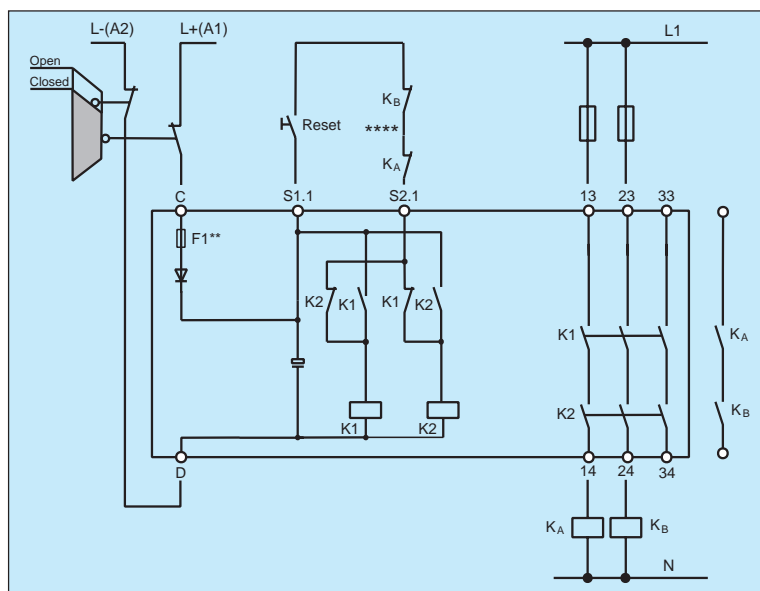
Front view



Product range

Type	Enabling outputs	Operating voltage	Part no.
SRB-NA-R-C.12-24VDC	3 NO	24 VDC	600 0023
SRB-NA-R-C.12-48VAC	3 NO	48 VAC	600 0059
SRB-NA-R-C.12-115VAC	3 NO	115 VAC	600 0052
SRB-NA-R-C.12-230VAC	3 NO	230 VAC	600 0050

Wiring diagram



Example for dual-channel door monitoring using two limit switches (one with positive opening contacts) and external reset button.

Dual-channel output, suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.

**** = Feedback loop

Wire breakage and earth leakage in the monitoring circuits are detected.

Earth leakage at input D is detected only in mains with insulation leakage monitoring.

** Fuse M 0.5 A (an external leading fuse M 0.25 A is recommended)

For further examples refer to page 56/57

Model specific Technical data

(refer to page 157 for general data)

Operating voltage	24 VDC -15%/+20%, residual ripple max. 10% 48 VAC, 115 VAC, 230 VAC -15%/+6%
Frequency	50/60 Hz (for AC operating)
Fuse (power supply)	M 0.25 A/250 V (internal M 0.5 A/250 V)
Power consumption	max. 2.5 VA
Switching capacity (enabling contacts)	230 VAC, 6 A ohmic (inductive with suitable suppression)
Fuse (enabling contacts)	6 A slow blowing
Application category	AC 15/DC 13, DIN VDE 0660 Part 200
Pick-up delay	≤ 30 ms
Drop-out delay	≤ 50 ms
Contact material / contacts	AgSnO, self cleaning, positively driven
Contact resistance	max. 100 mOhm when new
Air and creeping distances	DIN VDE 0110-1 (04.97), 4 kV/2
Connections	Self lifting screw terminals min. 0.6 qmm, max. 2.5 qmm
Dimensions	H/W/D 83 mm/45 mm/127 mm
Weight	280 g (360 g at 48 VAC, 115 VAC and 230 VAC versions)
Ambient operating temperature	-25 °C ... +45 °C (derating curve page 157)
Mechanical life	10 ⁷ switching cycles
Terminal labeling	DIN EN 60 445/DIN 40 719 Part 2

SRB-NA-R-C.12 (continued)

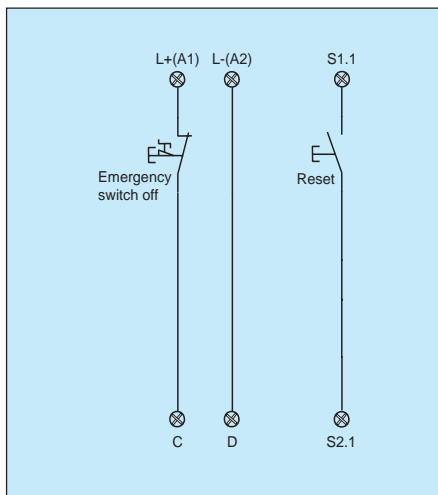
Wiring example: Input level

Single-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

With external reset button.

Safety category 2 in accordance with EN 954-1.



Wiring example: Input level

Dual-channel emergency stop switch according to EN 60 204-1.

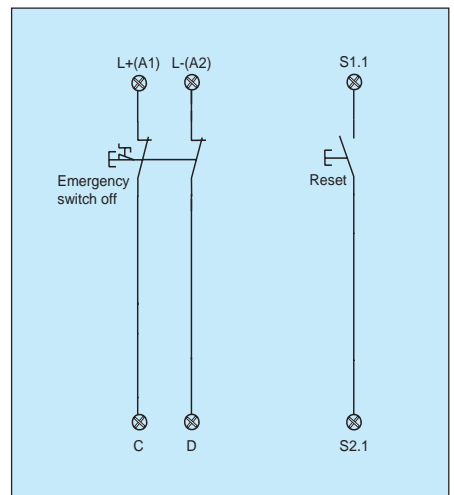
Wire breakage and earth leakage in the emergency stop circuits are detected.

Earth leakage at input A2 is detected in non grounded mains only!

Cross-shorts in the emergency stop circuits are detected.

With external reset button.

Safety category 3 in accordance with EN 954-1.



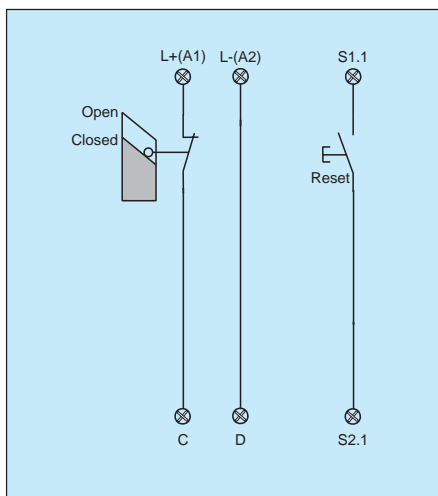
Wiring example: Input level

Single-channel door monitoring according to EN 1088 limit switch with positive opening contact.

Wire breakage and earth leakage in the door monitoring circuits are detected.

With external reset button for increased safety requirements.

Safety category 2 in accordance with EN 954-1.



Wiring example: Input level

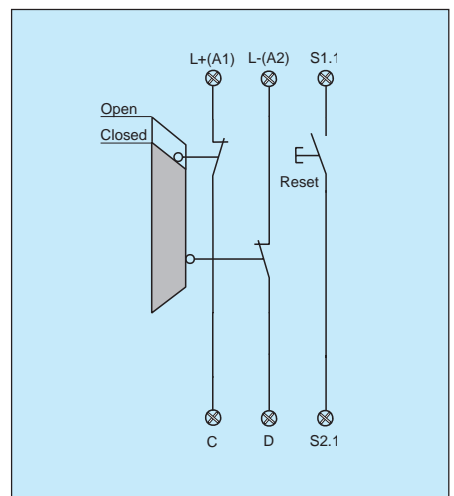
Dual-channel door monitoring according to EN 1088, one limit switch with positive opening contact.

Wire breakage and earth leakage in the door monitoring circuits are detected.

Cross-shorts in the door monitoring circuits are detected.

With external reset button for increased safety requirements.

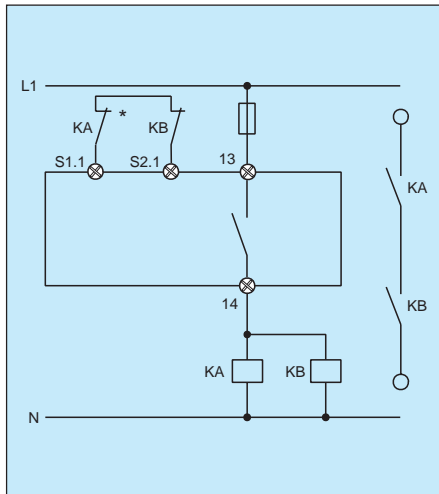
Safety category 3 in accordance with EN 954-1.



**Wiring example:
Power level**

Single-channel output

Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.

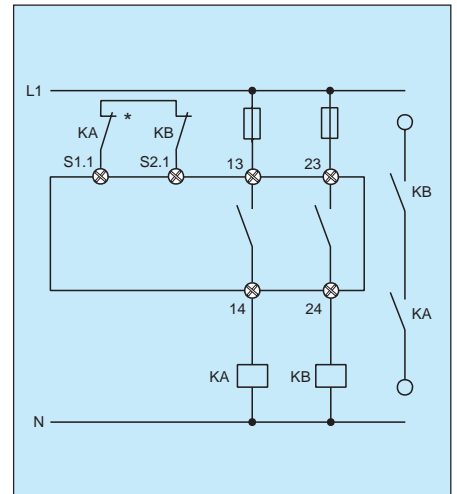


* Reset button wired in series to feedback loop.

**Wiring example:
Power level**

Dual-channel output

Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.



* Reset button wired in series to feedback loop.

SRB-NA-R-C.33

Safety relay array for emergency stop devices, interlocking devices and others

- ➡ 2 enabling outputs and 1 monitoring output
- ➡ Different operating voltage

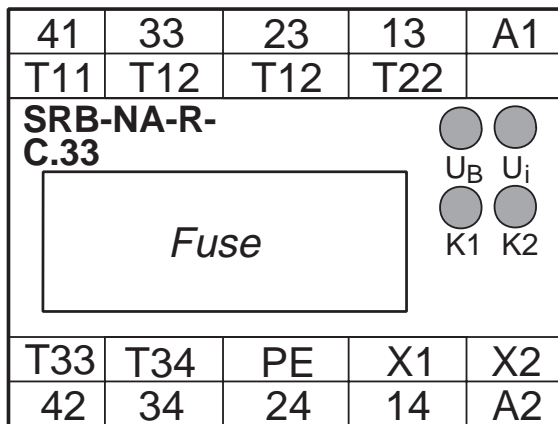
Features

- Relay output: 3 NO, 1 NC (Auxiliary NC for monitoring must not be used in safety enabling circuits!)
- Reset, feedback loop
- Input for emergency stop or door monitoring
- LED's for K1, K2, U_B, U_I
- Housing 45 mm, made of thermoplastic in accordance with UL-94-V-0, red RAL 3000
- DIN rail mounting DIN EN 50 022

Approvals



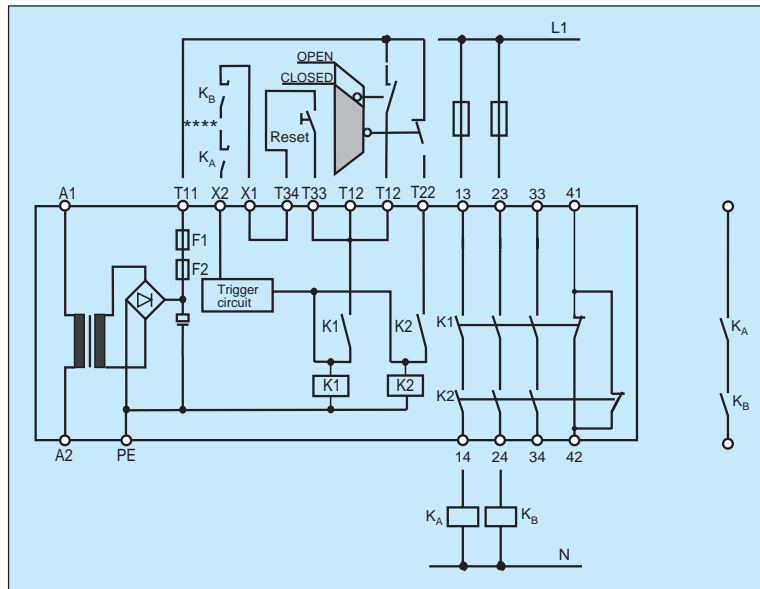
Front view



Product range

Type	Enabling outputs	Operating voltage	Part no.
SRB-NA-R-C.33-24V	3 NO/1 NC	24 VDC/VAC	600 0001
SRB-NA-R-C.33-48VAC	3 NO/1 NC	48 VAC	On request
SRB-NA-R-C.33-115VAC	3 NO/1 NC	115 VAC	600 0006
SRB-NA-R-C.33-230VAC	3 NO/1 NC	230 VAC	600 0002

Wiring diagram



Example for dual-channel door monitoring using two limit switches (one with positive opening contacts) and external reset button.

Dual-channel output, suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.

**** = Feedback loop

Wire breakage and earth leakage in the monitoring circuits are detected.

For further examples refer to page 60/61

Model specific Technical data

(refer to page 157 for general data)

Operating voltage	24 VDC $-15\%/+20\%$, residual ripple max. 10% 24 VAC, 48 VAC, 115 VAC, 230 VAC $-15\%/+6\%$
Frequency	50/60 Hz (for AC operating)
Fuse (power supply)	F2: T 0.125 A/250 V (internal F1: TM 0.25 A/250 V)
Power consumption	max. 2.5 VA
Switching capacity (enabling contacts)	230 VAC, 6 A ohmic (inductive with suitable suppression)
Fuse (enabling contacts)	6 A slow blowing
Switching capacity (monitoring contacts)	24 V, 2 A ohmic (inductive with suitable suppression)
Fuse (monitoring contacts)	2 A slow blowing
Application category	AC 15/DC 13, DIN VDE 0660 Part 200
Pick-up delay	≤ 20 ms
Drop-out delay	≤ 50 ms
Contact material / contacts	AgSnO, self cleaning, positively driven
Contact resistance	max. 100 mOhm when new
Air and creeping distances	DIN VDE 0110-1 (04.97), 4 kV/2
Connections	Self lifting screw terminals min. 0.5 qmm, max. 2.5 qmm
Dimensions	H/B/T 83 mm/45 mm/140 mm
Weight	190 g (280 g at 48 VAC, 115 VAC and 230 VAC versions)
Ambient operating temperature	-25 °C ... $+45$ °C (derating curve page 157)
Mechanical life	10^7 switching cycles
Terminal labeling	DIN EN 50 005/DIN 50 013

SRB-NA-R-C.33 (continued)

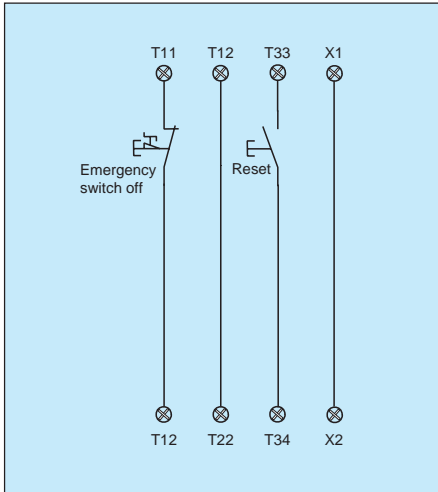
Wiring example: Input level

Single-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

With external reset button.

Safety category 2 in accordance with EN 954-1.



Wiring example: Input level

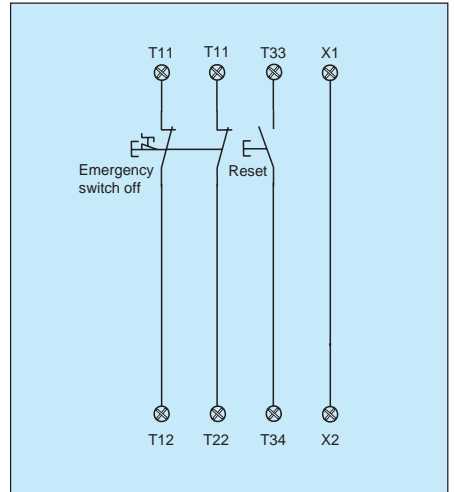
Dual-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

Cross-shorts in the emergency stop circuits are **not detected**.

With external reset button.

Safety category 3 or 4 in accordance with EN 954-1.



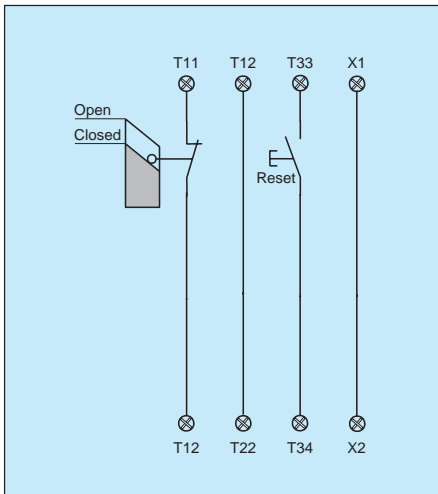
Wiring example: Input level

Single-channel door monitoring according to EN 1088 limit switch with positive opening contact.

Wire breakage and earth leakage in the door monitoring circuits are detected.

With external reset button for increased safety requirements.

Safety category 2 in accordance with EN 954-1.



Wiring example: Input level

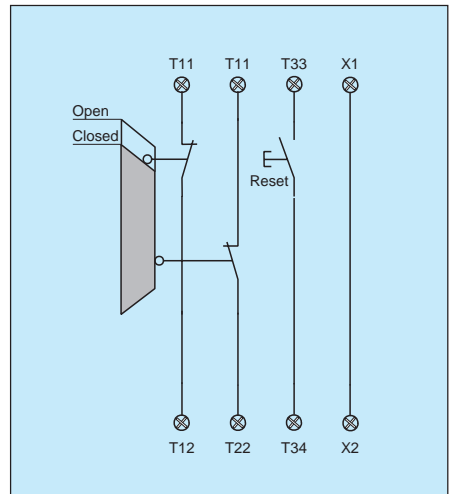
Dual-channel door monitoring according to EN 1088, one limit switch with positive opening contact.

Wire breakage and earth leakage in the door monitoring circuits are detected.

Cross-shorts in the door monitoring circuits are **not detected**.

With external reset button for increased safety requirements.

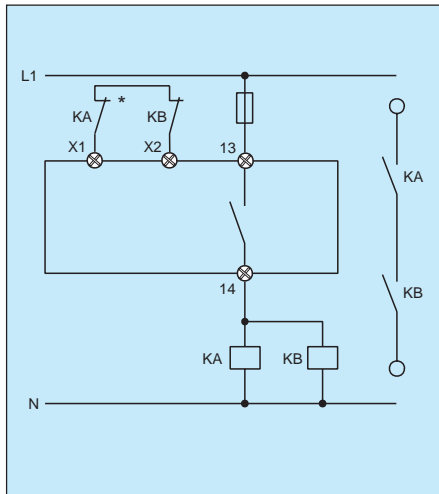
Safety category 3 or 4 in accordance with EN 954-1.



**Wiring example:
Power level**

Single-channel output

Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.

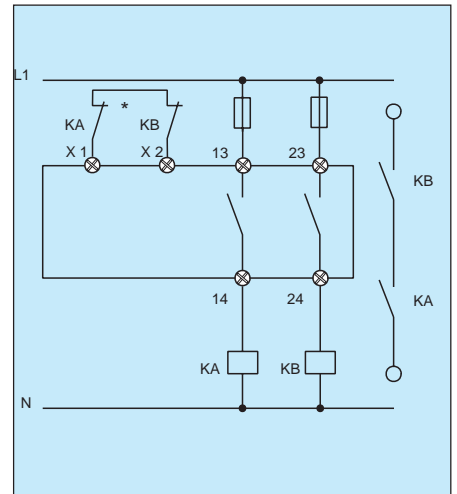


* Feedback loop

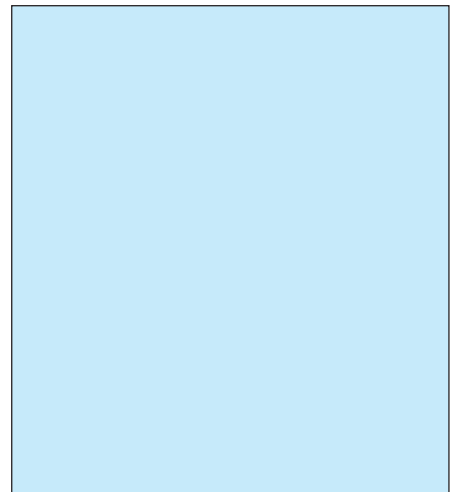
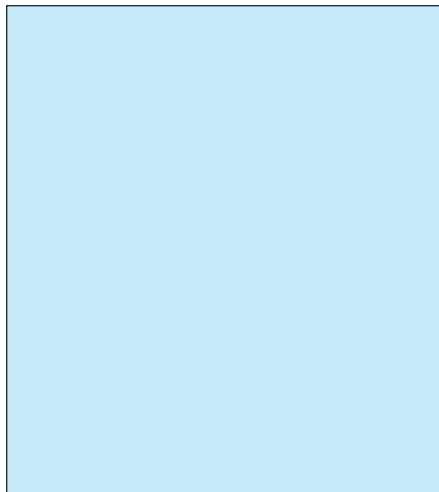
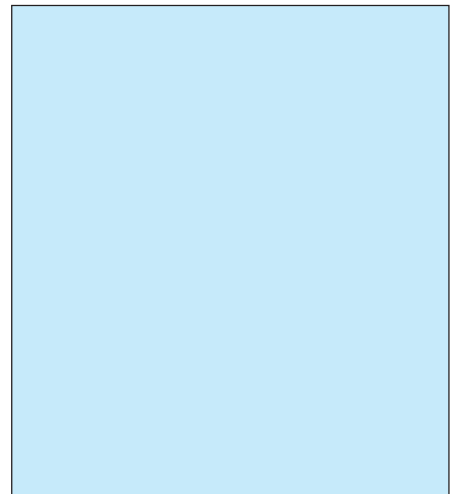
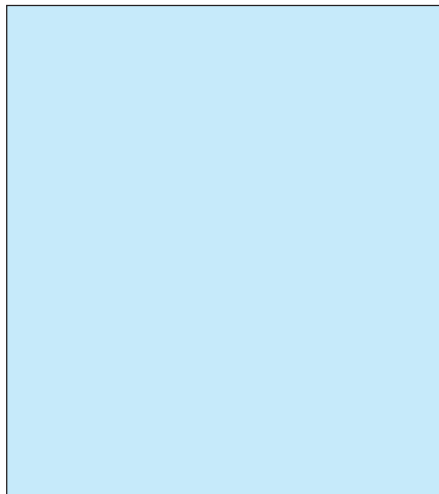
**Wiring example:
Power level**

Dual-channel output

Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.



* Feedback loop



SRB-NA-R-C.34

Safety relay array for emergency stop devices, interlocking devices and others

- ☛ 3 enabling outputs and 2 monitoring outputs
- ☛ Selectable extras:
 - Trailing edge function
 - Auto reset

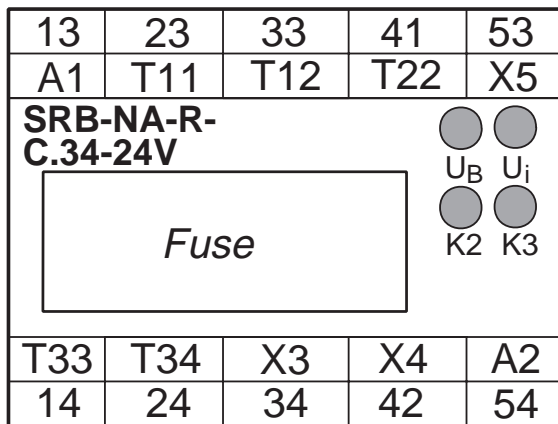
Features

- Relay output: 3 NO, 2 NO/NC (Auxiliary NO/NC for monitoring must not be used in safety enabling circuits!)
- Reset, feedback loop
- Input for emergency stop or door monitoring
- LED's for K1, K2, U_B, U_I
- Housing 90 mm, made of thermoplastic in accordance with UL-94-V-0, red RAL 3000
- DIN rail mounting DIN EN 50 022

Approvals



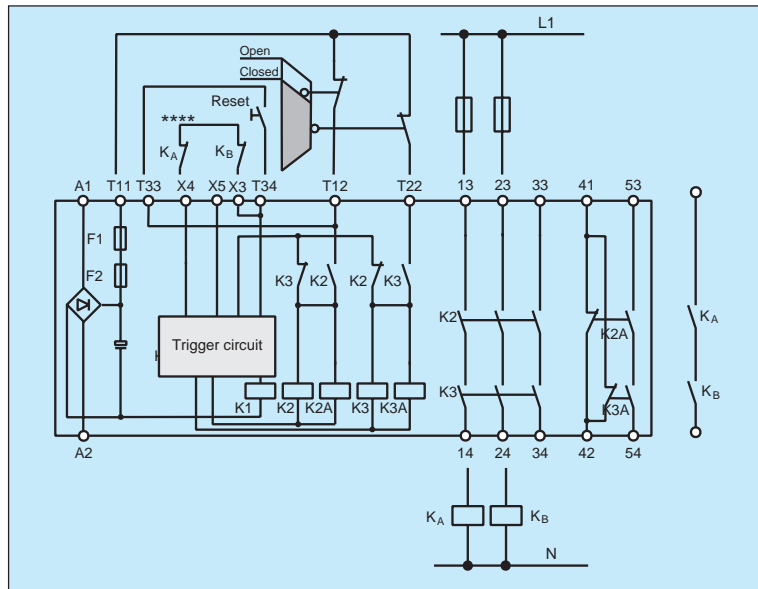
Front view



Product range

Type	Enabling outputs	Operating voltage	Part no.
SRB-NA-R-C.34-24V	3 NO/1 NC/1 NO	24 VDC/VAC	600 0087

Wiring diagram



Example for dual-channel door monitoring using two limit switches (one with positive opening contacts) and external reset button.

Dual-channel output, suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.

**** = Feedback loop

Wire breakage and earth leakage in the monitoring circuits are detected.

For further examples refer to page 64/65

Model specific Technical data

(refer to page 157 for general data)

Operating voltage	24 VDC -15%/+20%, residual ripple max. 10% 24 VAC -15%/+6%
Frequency	50/60 Hz (for AC operating)
Fuse (power supply)	F2: T 0.25 A/250 V (internal F1: T 0.5 A/250 V)
Power consumption	max. 4 W; 4.3 VA
Switching capacity (enabling contacts)	230 VAC, 6 A ohmic (inductive with suitable suppression) DC 13: 24 V/2 A; AC 15: 230 VAC/3 A
Fuse (enabling contacts)	6 A slow blowing
Switching capacity (monitoring contacts)	max. 24 VDC/2 A ohmic (inductive with suitable suppression)
Fuse (monitoring contacts)	2 A slow blowing
Application category	AC 15/DC 13, DIN VDE 0660 Part 200
Pick-up delay	≤ 20 ms
Drop-out delay	≤ 30 ms
Contact material / contacts	AgCdO, self cleaning, positively driven
Contact resistance	max. 100 mOhm when new
Air and creeping distances	DIN VDE 0110-1 (04.97), 4 kV/2
Connections	Self lifting screw terminals min. 0.5 qmm, max. 2.5 qmm
Dimensions	H/W/D 83 mm/45 mm/140 mm
Weight	200 g
Ambient operating temperature	-25 °C ... +45 °C (derating curve page 157)
Mechanical life	10 ⁷ switching cycles
Terminal labeling	DIN EN 50 005/DIN 50 013

SRB-NA-R-C.34 (continued)

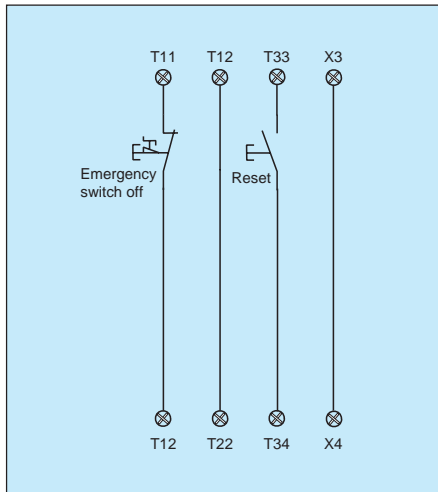
Wiring example: Input level

Single-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

With external reset button.

Safety category 2 in accordance with EN 954-1.



Wiring example: Input level

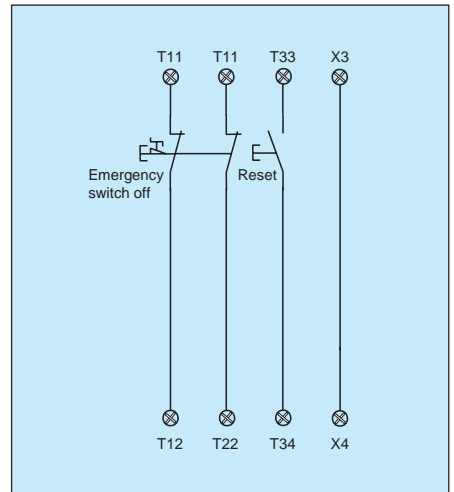
Dual-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

Cross-shorts in the emergency stop circuits are **not detected**.

With external reset button.

Safety category 3 or 4 in accordance with EN 954-1.



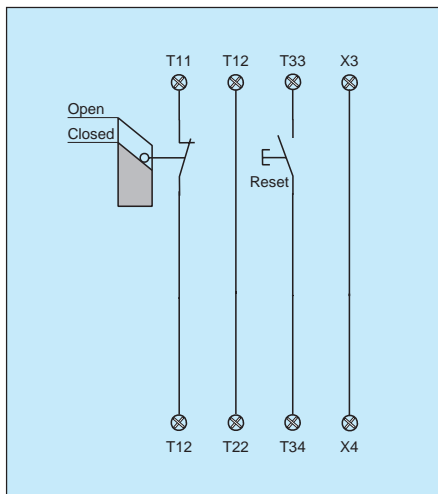
Wiring example: Input level

Single-channel door monitoring according to EN 1088 limit switch with positive opening contact.

Wire breakage and earth leakage in the door monitoring circuits are detected.

With external reset button for increased safety requirements.

Safety category 2 in accordance with EN 954-1.



Wiring example: Input level

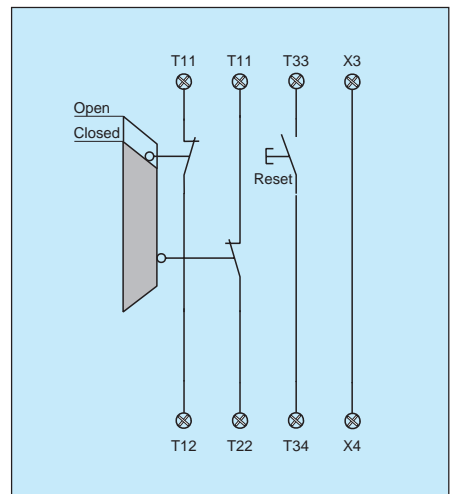
Dual-channel door monitoring according to EN 1088, one limit switch with positive opening contact.

Wire breakage and earth leakage in the door monitoring circuits are detected.

Cross-shorts in the emergency stop circuits are **not detected**.

With external reset button for increased safety requirements.

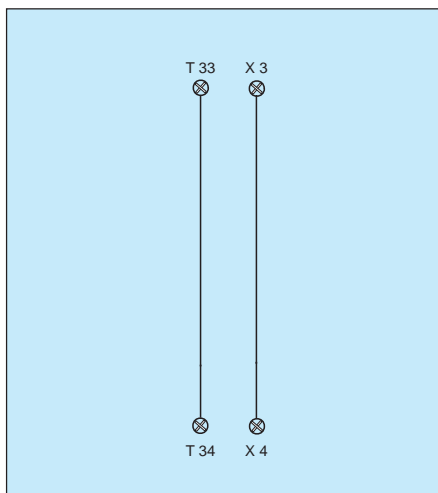
Safety category 3 or 4 in accordance with EN 954-1.



Advice:

Time window infinite channel 1 and channel 2 via cable link between X3/X4 and T33/T34.

For external reset connect reset button to X3/X4.

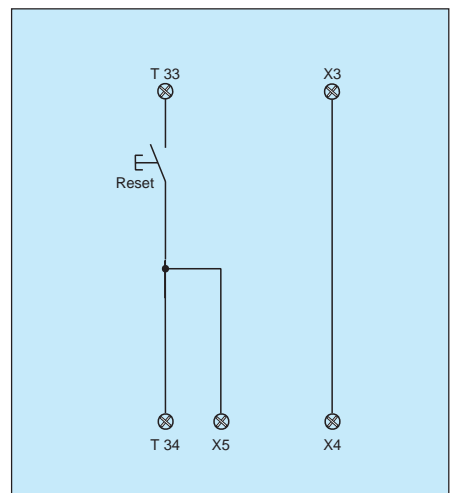


Wiring example: Input level

Start with trailing edge function.

Module is activated after release of the reset button.

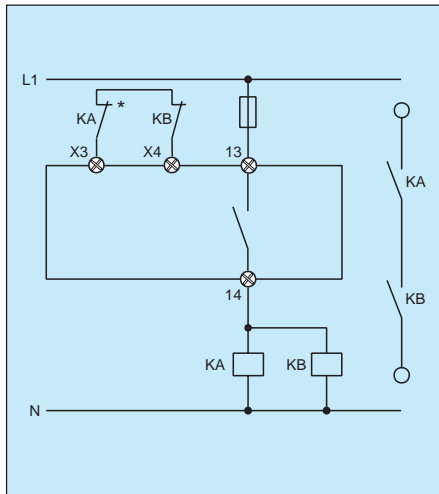
This prevents tampering of the reset button which could lead to an automatic reset.



**Wiring example:
Power level**

Single-channel output

Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.

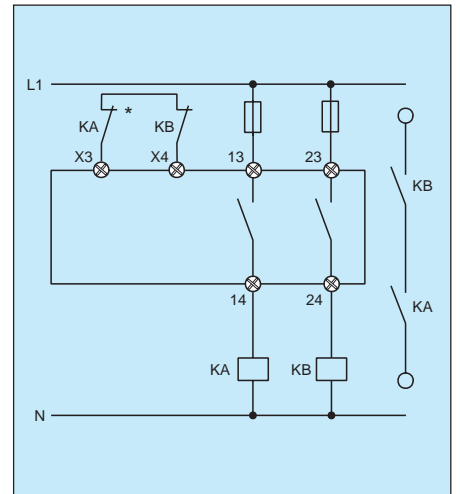


* Feedback loop

**Wiring example:
Power level**

Dual-channel output

Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.



* Feedback loop

SRB modules 45 mm wide, standard versions, STOP category 1

- ✦ 4 enabling outputs and 1 monitoring output
- ✦ 1 enabling output drop-out delayed: 0 ... 30 sec.
- ✦ max. load current: 6 Ampere
- ✦ max. safety category: 4
- ✦ 1- or 2-channel triggering
- ✦ Trailing edge function selectable
- ✦ Cross-short recognition selectable
- ✦ Semiconductor monitoring outputs selectable
- ✦ 24 VDC/VAC version
- ✦ Approvals: BG, CSA, UL



Type														Options				
	Enabling outputs STOP cat. 0	Enabling outputs STOP cat. 1*	⇒ max. load current (A)	Auxiliary NC outputs	⇒ max. load current (A)	Time window	Cross-short recognition	Single-channel triggering	Trailing edge function	External power inputs	Initial start test	24 VDC/VAC	48 VAC	115 VAC	230 VAC	BG approval	CSA approval	
SRB-NA-R-C.35/WE	3	1	6	1	2	4		●	●	●	●				✓	✓	✓	refer to page 68
SRB-NA-R-C.35/KE	3	1	6	1	2	4		●	●	●	●				✓	✓	✓	refer to page 68
SRB-NA-R-C.35/ WE.QS	3	1	6	1	2	4	+		●	●	●				✓	✓	✓	refer to page 68
SRB-NA-R-C.35/ KE.QS	3	1	6	1	2	4	+		●	●	●				✓	✓	✓	refer to page 68

* = drop-out delay: 0 ... 30 sec.: setting by manufacturer (WE)/setting by customer (KE);

+ = fixed; ● = selectable; ● = selectable feature; ✓ = in preparation

SRB-NA-R-C.35

Safety relay array for emergency stop devices, interlocking devices and others

- ☛ 4 enabling outputs and 1 monitoring output
- ☛ 1 enabling output drop-out delayed: 0 ... 30 seconds
- ☛ Selectable extras:
 - Trailing edge function
 - Auto reset

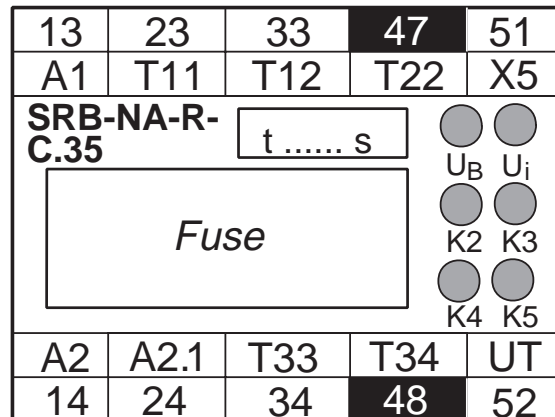
Features

- Relay output: 4 NO, 1 NC
1 NO drop out delayed
(Auxiliary NC for monitoring must not be used in safety enabling circuits!)
- Reset, feedback loop
- Input for emergency stop or door monitoring
- LED's for K2, K3, K4, K5, U_B, U_i
- Housing 45 mm, made of thermoplastic in accordance with UL-94-V-0, red RAL 3000
- DIN rail mounting
DIN EN 50 022

Approvals



Front view

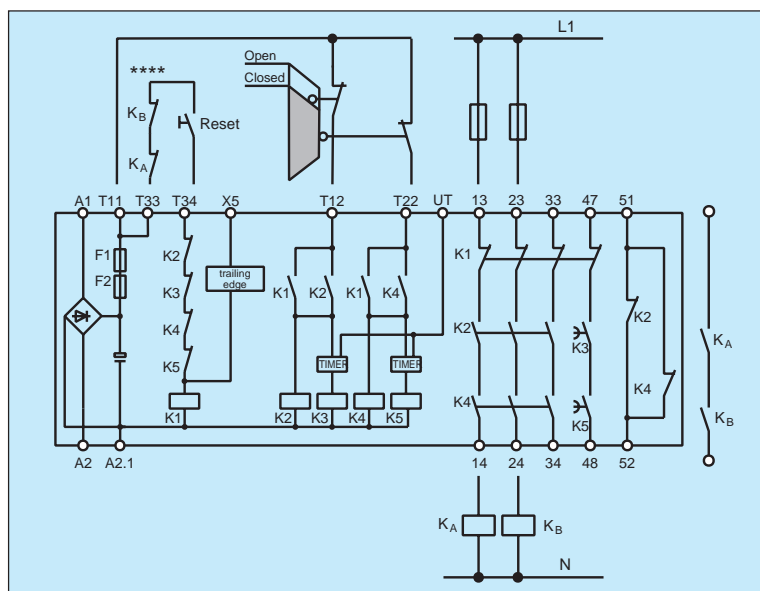


Product range

Type	Enabling outputs	Operating voltage	Part no.
SRB-NA-R-C.35/WE-24V	3 NO/1 NO/1 NC	24 VDC/VAC	600 0763
SRB-NA-R-C.35/KE-24V	3 NO/1 NO/1 NC	24 VDC/VAC	600 0762
SRB-NA-R-C.35/WE-QS-24V	3 NO/1 NO/1 NC	24 VDC/VAC	On request
SRB-NA-R-C.35/KE-QS-24V	3 NO/1 NO/1 NC	24 VDC/VAC	On request

SRB-NA-R-C.35 (continued)

Wiring diagram



Example for dual channel door monitoring using two limit switches (one with positive opening contacts) and external reset button.

Dual-channel output, suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.

**** = Feedback loop

Wire breakage and earth leakage in the monitoring circuits are detected.

For further examples refer to page 70/71

Model specific Technical data

(refer to page 157 for general data)

Operating voltage	24 VDC $-15\%/+20\%$, residual ripple max. 10% 24 VAC $-15\%/+6\%$
Frequency	50/60 Hz (for AC operating)
Fuse (power supply)	F2: T 0.25 A/250 V (internal F1: T 0.5 A/250 V)
Power consumption	max. 3.5 W; 4.7 VA
Switching capacity (enabling contacts)	230 VAC, 6 A ohmic (inductive with suitable suppression) DC 13: 24 V/2 A; AC 15: 230 VAC/3 A
Fuse (enabling contacts)	6 A slow blowing
Switching capacity (monitoring contacts)	max. 24 V/2 A ohmic (inductive with suitable suppression)
Fuse (monitoring contacts)	2 A slow blowing
Application category	AC 15/DC 13, DIN VDE 0660 Part 200
Pick-up delay	≤ 200 ms
Drop-out delay	≤ 30 ms
Contact material / contacts	AgCdO self cleaning, positively driven
Contact resistance	max. 100 mOhm when new
Air and creeping distances	DIN VDE 0110-1 (04.97), 4 kV/2
Connections	Self lifting screw terminals min. 0.5 qmm, max. 2.5 qmm
Dimensions	H/W/D 83 mm/45 mm/140 mm
Weight	280 g
Ambient operating temperature	-25 °C ... $+45$ °C (derating curve page 157)
Mechanical life	10^7 switching cycles
Terminal labeling	DIN EN 50 005/DIN 50 013

SRB-NA-R-C.35 (continued)

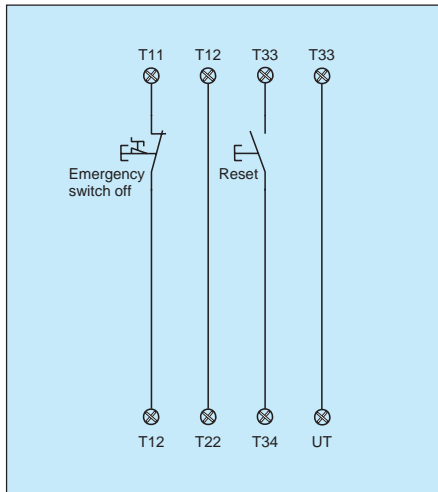
Wiring example: Input level

Single-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

With external reset button.

Safety category 2 in accordance with EN 954-1.



Wiring example: Input level

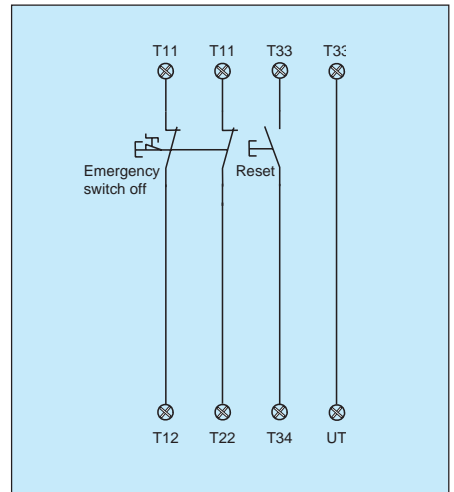
Dual-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

Cross-shorts in the emergency stop circuits are **not detected**.

With external reset button.

Safety category 3 or 4 in accordance with EN 954-1.



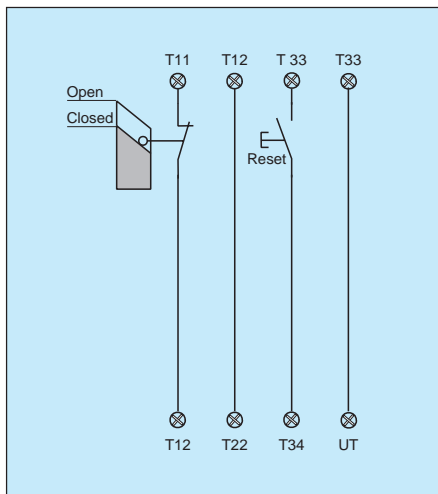
Wiring example: Input level

Single-channel door monitoring according to EN 1088 limit switch with positive opening contact.

Wire breakage and earth leakage in the door monitoring circuits are detected.

With external reset button for increased safety requirements.

Safety category 2 in accordance with EN 954-1.



Wiring example: Input level

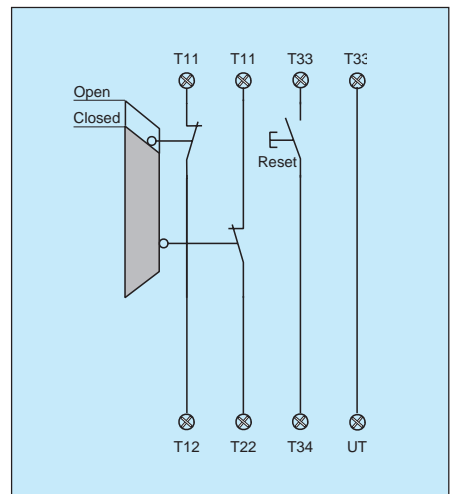
Dual-channel door monitoring according to EN 1088 one limit switch with positive opening contact.

Wire breakage and earth leakage in the door monitoring circuits are detected.

Cross-shorts in the door monitoring circuits are **not detected**.

With external reset button for increased safety requirements.

Safety category 3 or 4 in accordance with EN 954-1.



Wiring example: Input level (Type QS)

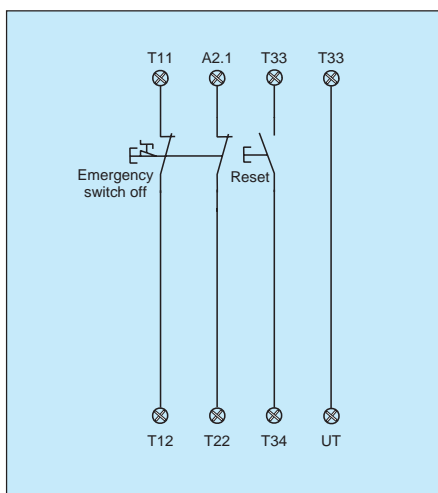
Dual-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

Cross-shorts in the emergency stop circuits are detected.

With external reset button.

Safety category 3 or 4 in accordance with EN 954-1.



Wiring example: Input level (Typ QS)

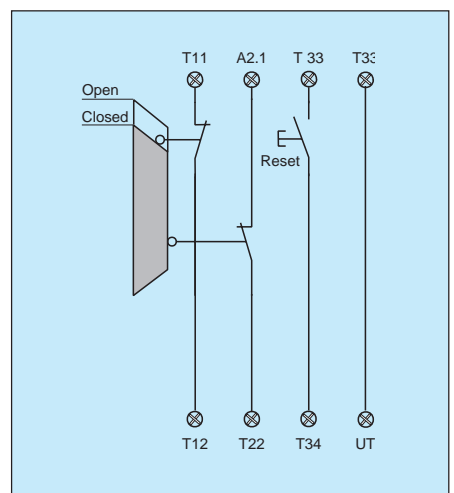
Dual-channel door monitoring according to EN 1088, one limit switch with positive opening contact.

Wire breakage and earth leakage in the door monitoring circuits are detected.

Cross-shorts in the door monitoring circuits are detected.

With external reset button for increased safety requirements.

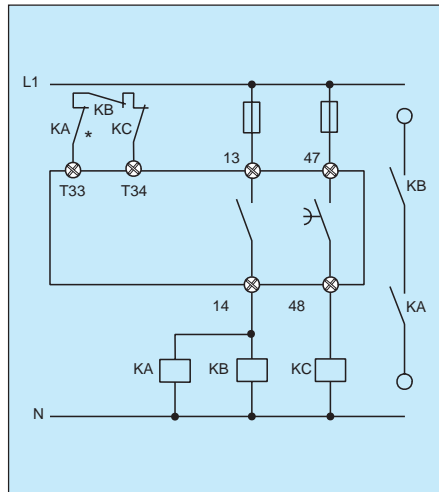
Safety category 3 or 4 in accordance with EN 954-1.



Wiring example: Power level

Single-channel output

Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.

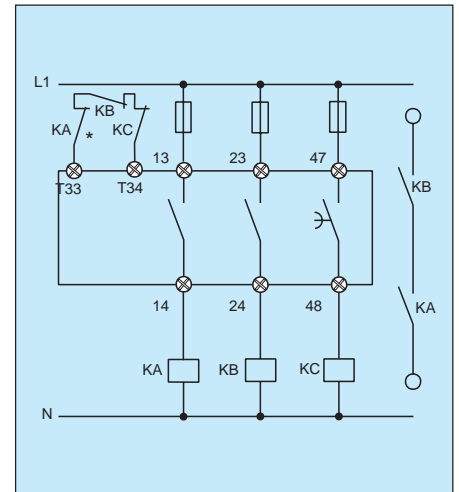


* Reset button wired in series to feedback loop.

Wiring example: Power level

Dual-channel output

Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.



* Reset button wired in series to feedback loop.

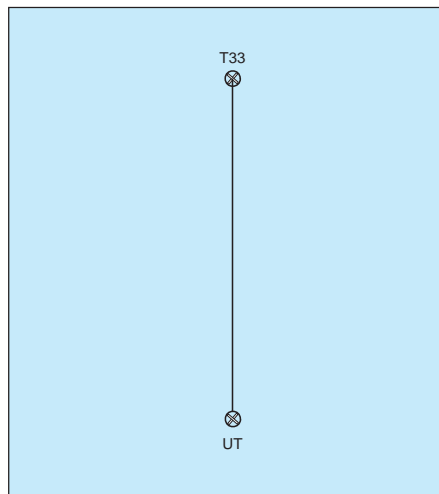
Advice:

The supply for the electronic timers of the delayed enabling output 47/48 is on terminal UT.

For a controlled operation in case of power lost, supply external power to terminal UT.

Warning:

If external voltage (24 VDC, no ripple) is applied on terminal UT, a fuse 0.1 A quick blow shall be provided.

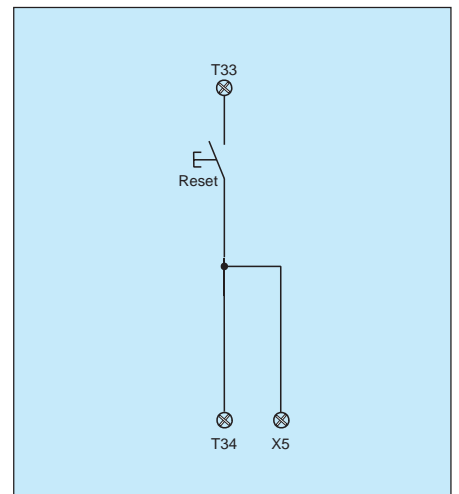


Wiring example: Input level

Start with trailing edge function.

Module is activated after release of the reset button.

This prevents tampering of the reset button which could lead to an automatic reset.

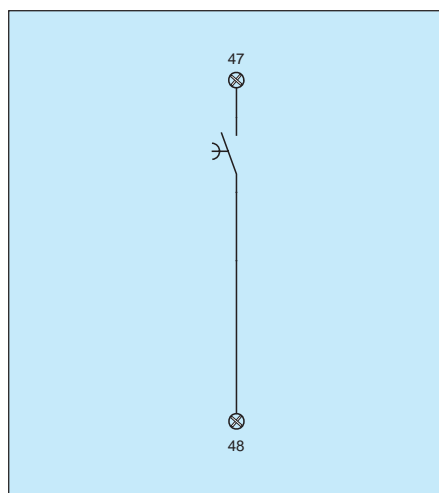


Advice:

Drop-out delay of the enabling output 47/48 adjustable 0 ... 30 sec.

Enabling output 47/48 corresponds to Stop-category 1 in accordance with EN 60 204-1.

Enabling output 13/14, 23/24 and 33/34 corresponds to Stop-category 0 in accordance with EN 60 204-1.



SRB modules 45 mm wide, multifunctional version, STOP category 0

- ✚ max. 5 enabling outputs and 1 monitoring output
- ✚ 2 semiconductor outputs
- ✚ max. load current: 6 Ampere
- ✚ max. safety category: 4
- ✚ 1- or 2-channel triggering
- ✚ Trailing edge function selectable
- ✚ Cross-short recognition selectable
- ✚ Semiconductor monitoring outputs selectable
- ✚ Initial start test selectable
- ✚ 24 VDC/VAC version
- ✚ Approvals: BG, CSA, UL



Type	Options																		
	Enabling outputs STOP cat. 0	Enabling outputs STOP cat. 1	⇒ max. load current (A)	Auxiliary NC/NO outputs	⇒ max. load current (A)	max. safety category	Time window ∞ channel	Cross-short recognition	Single-channel triggering	Trailing edge function	External powered inputs	Initial start test	24 VDC/VAC	48 VAC	115 VAC	230 VAC	BG approval	CSA approval	UL approval
SRB-NA-R-C.20	5	4	1	0,5	4	+	☐	●	●			●				✓	✓	✓	refer to page 74
SRB-NA-R-C.22	3	4	1	0,5	4	+	☐	●	●			●				✓	✓	✓	refer to page 78
SRB-NA-R-C.27	3	6	1/2	2/0,1	4	+	☐	●	●	●	●					✓	✓	✓	refer to page 82

✚ = fixed; ☐ = DIP switch setting; ● = selectable; ● = selectable feature; ✓ = approved; ✓ = in preparation

SRB-NA-R-C.20

Safety relay array for emergency stop devices, interlocking devices and others

☞ 5 enabling outputs and 1 monitoring output

☞ Selectable extras:

- Trailing edge function
- Auto reset
- Cross-short recognition

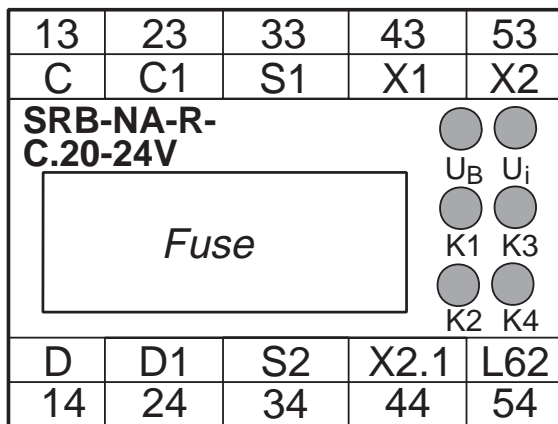
Features

- Relay output: 5 NO, 1 NC (Auxiliary NC for monitoring must not be used in safety enabling circuits!)
- Reset, feedback loop
- Input for emergency stop or door monitoring
- LED's for K1, K2, K3, K4, U_B, U_i
- Housing 45 mm, made of thermoplastic in accordance with UL-94-V-0, red RAL 3000
- DIN rail mounting DIN EN 50 022

Approvals



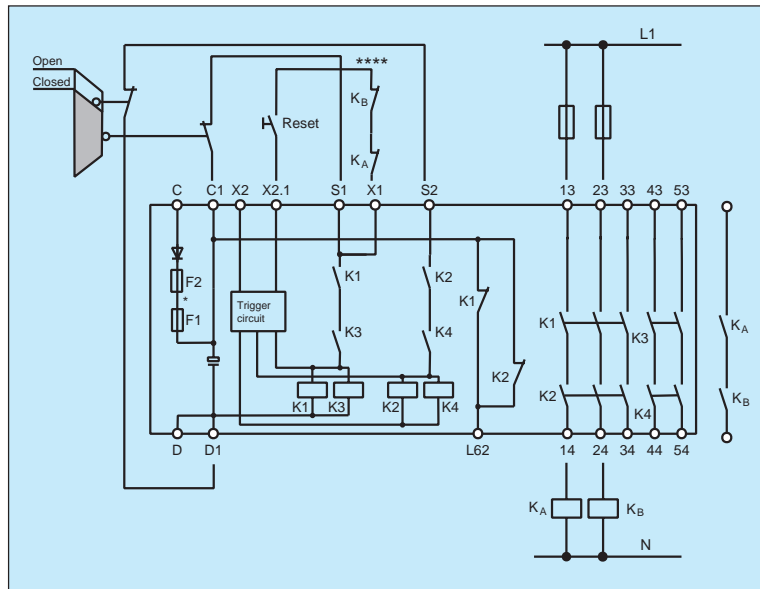
Front view



Product range

Type	Enabling outputs	Operating voltage	Part no.
SRB-NA-R-C.20-24V	5 NO/1 NC	24 VAC/VDC	600 0048

Wiring diagram



Example for dual-channel door monitoring using two limit switches (one with positive opening contacts) and external reset button.

Dual-channel output, suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.

**** = Feedback loop

Wire breakage and earth leakage in the monitoring circuits are detected.

* Fuse F2 (front cover) 1 A, Fuse F1 (internal) 1.25 A

For further examples refer to page 76/77

Model specific Technical Data

(Refer to page 157 for general data)

Operating voltage	24 VDC -15%/+20%, residual ripple max. 10% 24 VAC -15%/+6%
Frequency	50/60 Hz (for AC operating)
Fuse (power supply)	T 1.0 A/250 V (internal T 1.25 A/250 V)
Power consumption	max. 3.6 VA, plus monitoring output L62
Switching capacity (enabling contacts)	230 VAC, 4 A ohmic (inductive with suitable suppression) NO 43/44, 53/54: DC 13: 24 VDC/2 A; AC 15: 230 VAC/3 A
Fuse (enabling contacts)	4 A slow blowing
Switching capacity (monitoring contacts)	L62: max. 500 mA
Application category	AC 15/DC 13, DIN VDE 0660 Part 200
Pick-up delay	≤ 30 ms
Drop-out delay	≤ 60 ms
Contact material / contacts	AgSnO, AgNi self cleaning, positively driven
Contact resistance	max. 100 mOhm when new
Air and creeping distances	DIN VDE 0110-1 (04.97), 4 kV/2
Connections	Self lifting screw terminals min. 0.5 qmm, max. 2.5 qmm
Dimensions	H/W/D 83 mm/45 mm/140 mm
Weight	460 g
Ambient operating temperature	-25 °C ... +45 °C (derating curve page 157)
Mechanical life	10 ⁷ switching cycles
Terminal labeling	DIN EN 60 445/DIN 40 719 Part 2

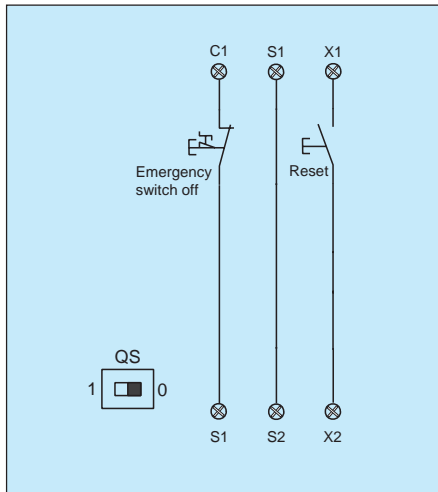
Wiring example: Input level

Single-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

With external reset button.

Safety category 2 in accordance with EN 954-1.



Wiring example: Input level

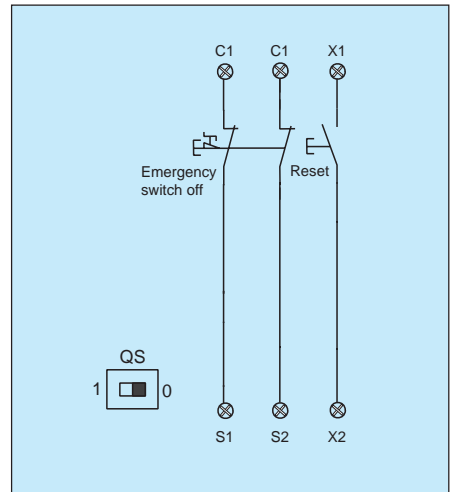
Dual-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

Cross-shorts in the emergency stop circuits are **not detected**.

With external reset button.

Safety category 3 or 4 in accordance with EN 954-1.



Wiring example: Input level

Dual-channel emergency stop switch according to EN 60 204-1.

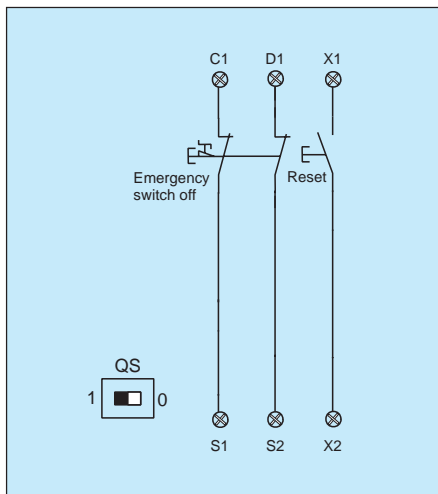
Wire breakage and earth leakage in the emergency stop circuits are detected.

Cross-shorts in the emergency stop circuits are detected.

To enable cross-short monitoring: Set switch QS (bottom of housing) to 1.

With external reset button.

Safety category 3 or 4 in accordance with EN 954-1.



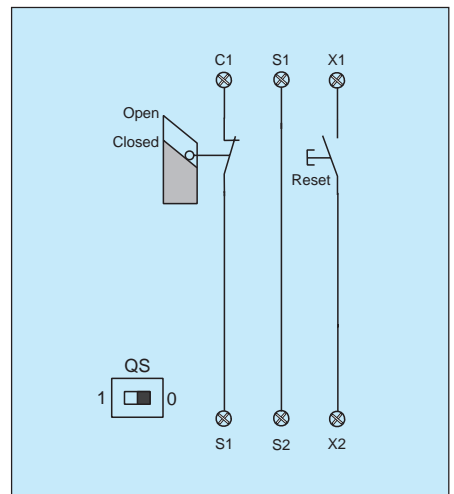
Wiring example: Input level

Single-channel door monitoring according to EN 1088 limit switch with positive opening contact.

Wire breakage and earth leakage in the door monitoring circuits are detected.

With external reset button for increased safety requirements.

Safety category 2 or 4 in accordance with EN 954-1.



Wiring example: Input level

Dual-channel door monitoring according to EN 1088, one limit switch with positive opening contact.

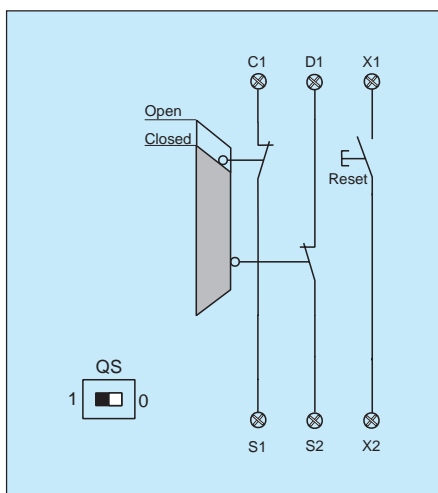
Wire breakage and earth leakage in the door monitoring circuits are detected.

Cross-shorts in the door monitoring circuits are detected.

To enable cross-short monitoring: Set switch QS (bottom of housing) to 1.

With external reset button for increased safety requirements.

Safety category 3 or 4 in accordance with EN 954-1.



Wiring example: Input level

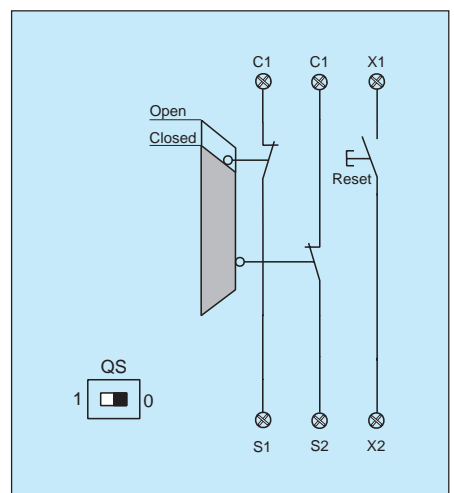
Dual-channel door monitoring according to EN 1088, one limit switch with positive opening contact.

Wire breakage and earth leakage in the door monitoring circuits are detected.

Cross-shorts in the door monitoring circuits are **not detected**.

With external reset button for increased safety requirements.

Safety category 3 or 4 in accordance with EN 954-1.

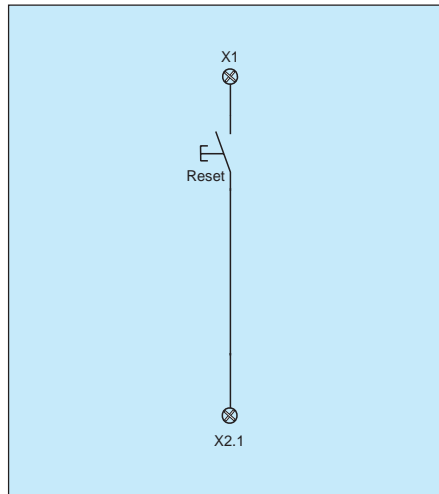


Advice:

For "Automatic Reset" apply jumper X1-X2.

When using external Reset button (connect to X1-X2.1), unit is triggered by trailing edge function.

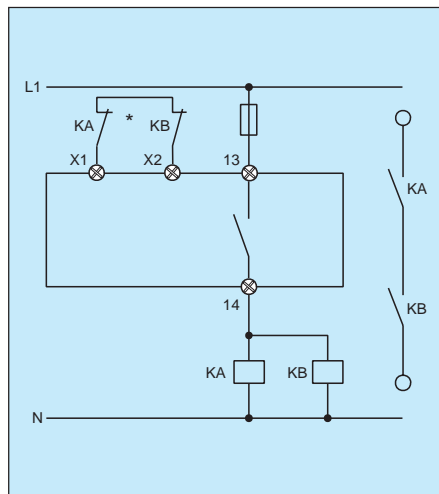
Reset button wired in series to feedback loop.



Wiring example: Power level

Single-channel output

Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.

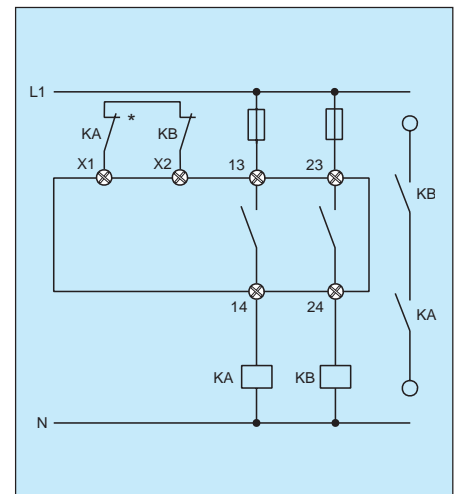


* Reset button wired in series to feedback loop.

Wiring example: Power level

Dual-channel output

Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.



* Reset button wired in series to feedback loop.

SRB-NA-R-C.22

Safety relay array for emergency stop devices, interlocking devices and others

- ☞ 3 enabling outputs and 1 monitoring output
- ☞ Selectable extras:
 - Trailing edge function
 - Auto reset
 - Cross-short recognition

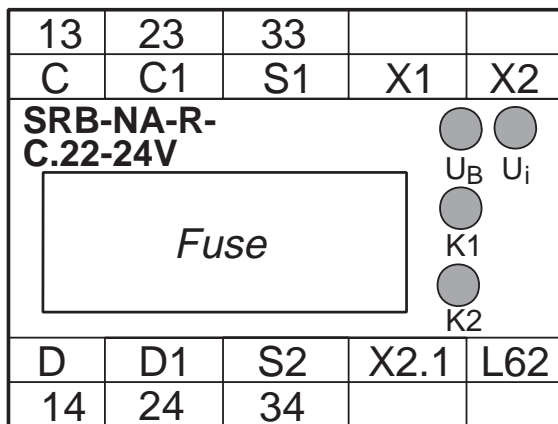
Features

- Relay output: 3 NO, 1 NC (Auxiliary NC for monitoring must not be used in safety enabling circuits!)
- Reset, feedback loop
- Input for emergency stop or door monitoring
- LED's for K1, K2, U_B, U_i
- Housing 45 mm, made of thermoplastic in accordance with UL-94-V-0, red RAL 3000
- DIN rail mounting DIN EN 50 022

Approvals



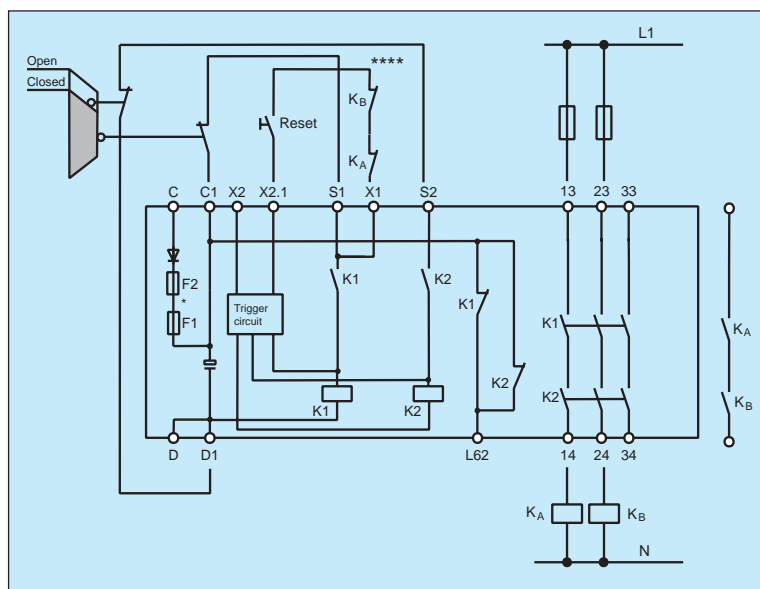
Front view



Product range

Type	Enabling outputs	Operating voltage	Part no.
SRB-NA-R-C.22-24V	3 NO/1 NC	24 VAC/VDC	600 0049

Wiring diagram



Example for dual-channel door monitoring using two limit switches (one with positive opening contacts) and external reset button.

Dual-channel output, suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.

**** = Feedback loop

Wire breakage and earth leakage in the monitoring circuits are detected.

* Fuse F2 (front cover) 1 A, Fuse F1 (internal) 1.25 A

For further examples refer to page 80/81

Model specific Technical data

(refer to page 157 for general data)

Operating voltage	24 VDC $-15\%/+20\%$, residual ripple max. 10% 24 VAC $-15\%/+6\%$
Frequency	50/60 Hz (for AC operating)
Fuse (power supply)	T 1.0 A/250 V (internal T 1.25 A/250 V)
Power consumption	max. 2.0 VA, plus monitoring output L62
Switching capacity (enabling contacts)	230 VAC, 4 A ohmic (inductive with suitable suppression) NO 43/44, 53/54; DC 13: 24 VDC/2 A; AC 15: 230 VAC/3 A
Fuse (enabling contacts)	4 A slow blowing
Switching capacity (monitoring contacts)	L62: max. 500 mA
Application category	AC 15/DC 13, DIN VDE 0660 Part 200
Pick-up delay	≤ 30 ms
Drop-out delay	≤ 60 ms
Contact material / contacts	AgSnO, AgNi self cleaning, positively driven
Contact resistance	max. 100 mOhm when new
Air and creeping distances	DIN VDE 0110-1 (04.97), 4 kV/2
Connections	Self lifting screw terminals min. 0.5 qmm, max. 2.5 qmm
Dimensions	H/W/D 83 mm/45 mm/140 mm
Weight	460 g
Ambient operating temperature	-25 °C ... $+45$ °C (derating curve page 157)
Mechanical life	10^7 switching cycles
Terminal labeling	DIN EN 60 445/DIN 40 719 Part 2

SRB-NA-R-C.22 (continued)

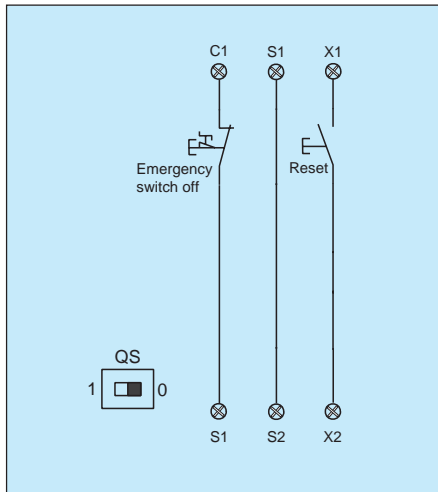
Wiring example: Input level

Single-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

With external reset button.

Safety category 2 in accordance with EN 954-1.



Wiring example: Input level

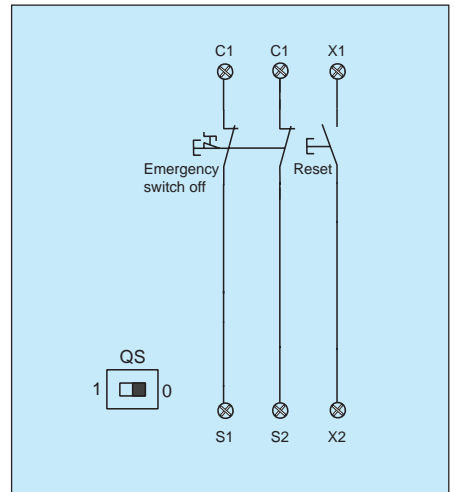
Dual-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

Cross-shorts in the emergency stop circuits are **not detected**.

With external reset button.

Safety category 3 or 4 in accordance with EN 954-1.



Wiring example: Input level

Dual-channel emergency stop switch according to EN 60 204-1.

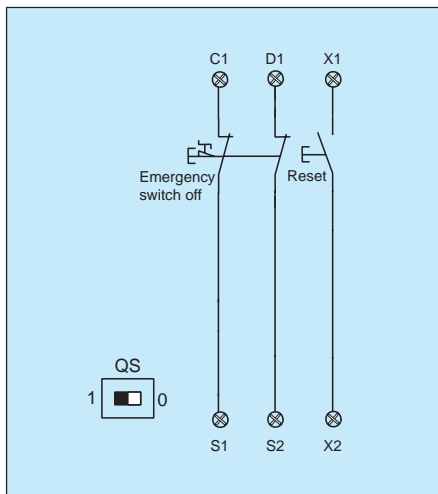
Wire breakage and earth leakage in the emergency stop circuits are detected.

Cross-shorts in the emergency stop circuits are detected.

To enable cross-short monitoring: Set switch QS (bottom of housing) to 1.

With external reset button.

Safety category 3 or 4 in accordance with EN 954-1.



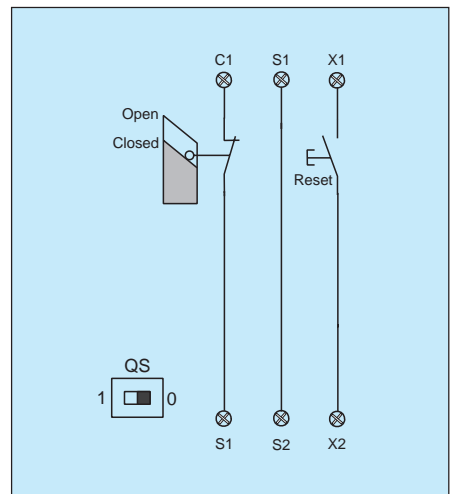
Wiring example: Input level

Single-channel door monitoring according to EN 1088 limit switch with positive opening contact.

Wire breakage and earth leakage in the door monitoring circuits are detected.

With external reset button for increased safety requirements.

Safety category 2 in accordance with EN 954-1.



Wiring example: input level

Dual-channel door monitoring according to EN 1088, one limit switch with positive opening contact.

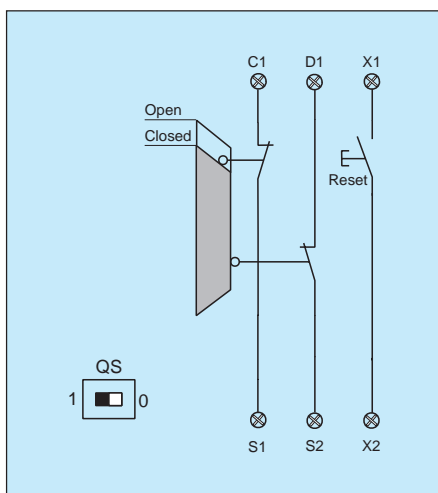
Wire breakage and earth leakage in the door monitoring circuits are detected.

Cross-shorts in the door monitoring circuits are detected.

To enable cross-short monitoring: Set switch QS (bottom of housing) to 1.

With external reset button for increased safety requirements.

Safety category 3 or 4 in accordance with EN 954-1.



Wiring example:- input level

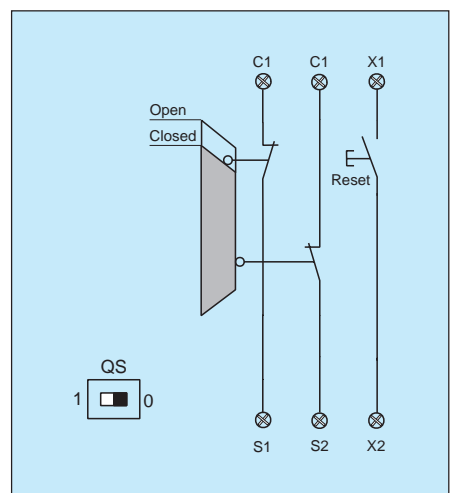
Dual-channel door monitoring according to EN 1088, one limit switch with positive opening contact.

Wire breakage and earth leakage in the door monitoring circuits are detected.

Cross-shorts in the door monitoring circuits are **not detected**.

With external reset button for increased safety requirements.

Safety category 3 or 4 in accordance with EN 954-1.

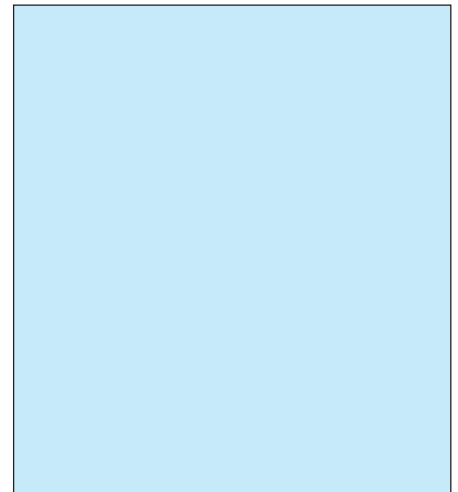
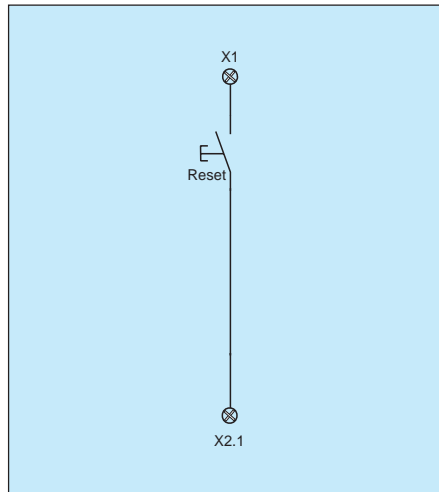


Advice:

For "Automatic reset" apply jumper X1-X2.

When using external reset button (connect to X1-X2.1), unit is triggered by trailing edge function.

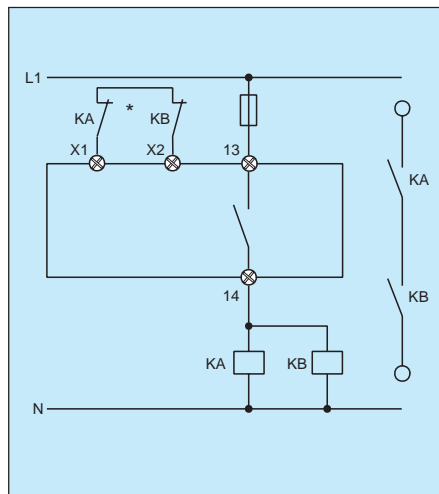
Reset button wired in series to feedback loop.



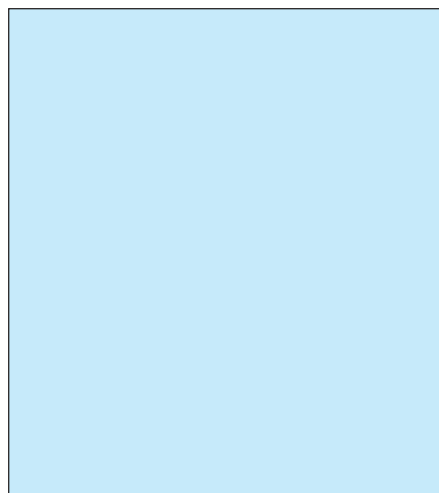
Wiring example: Power level

Single-channel output.

Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.



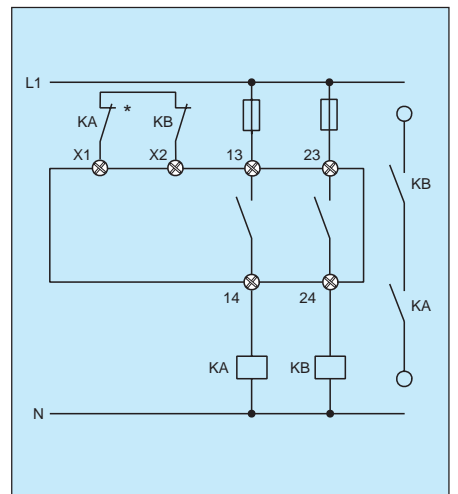
* Reset button wired in series to feedback loop.



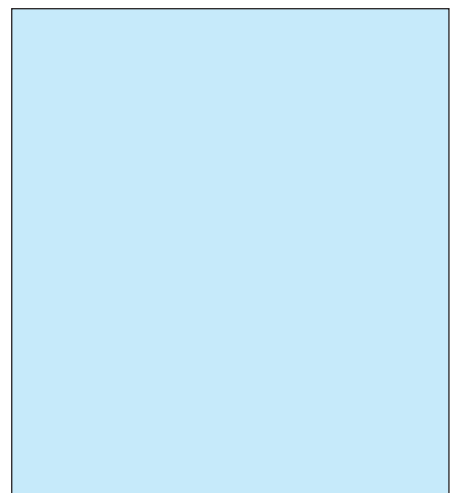
Wiring example: Power level

Dual-channel output.

Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.



* Reset button wired in series to feedback loop.



SRB-NA-R-C.27

Safety relay array for emergency stop devices, interlocking devices and others

- ☛ 3 enabling outputs and 1 monitoring output
- ☛ 2 semiconductor outputs
- ☛ Selectable extras:
 - Auto reset
 - Trailing edge function
 - Initial start test

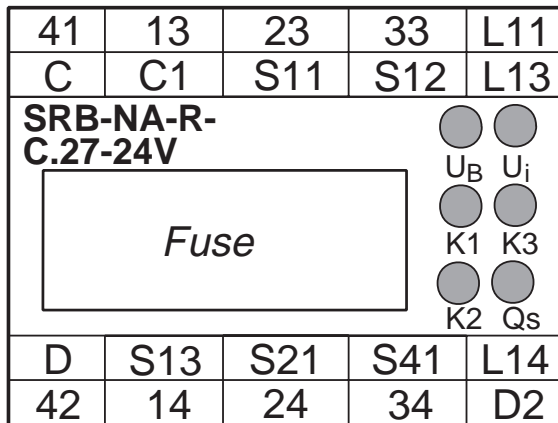
Features

- Relay output: 3 NO, 1 NC (Auxiliary NC for monitoring must not be used in safety enabling circuits!)
- Monitoring outputs for K1, K2/K3
- Reset, feedback loop
- Input for emergency stop or door monitoring
- LED's for K1, K2, K3, Qs, U_B, U_i
- Housing 45 mm, made of thermoplastic in accordance with UL-94-V-0, red RAL 3000
- DIN rail mounting DIN EN 50 022

Approvals



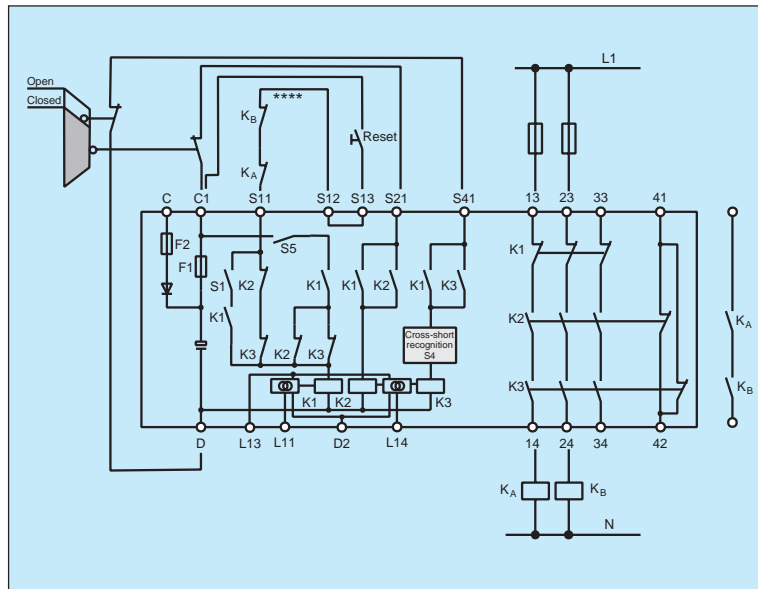
Front view



Product range

Type	Enabling outputs	Operating voltage	Part no.
SRB-NA-R-C.27-24V	3 NO/1 NC	24 VAC/VDC	600 0063

Wiring diagram



Example for dual-channel door monitoring using two limit switches (one with positive opening contacts) and external reset button.

Dual-channel output, suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.

**** = Feedback loop

Wire breakage and earth leakage in the monitoring circuits are detected.

For further examples refer to page 84/85

Model specific Technical data

(refer to page 157 for general data)

Operating voltage	24 VDC $-15\%/+20\%$, residual ripple max. 10% 24 VAC $-15\%/+6\%$
Frequency	50/60 Hz (for AC operating)
Fuse (power supply)	T 1.0 A/250 V (internal T 1.25 A/250 V)
Power consumption	max. 7 VA
Switching capacity (enabling contacts)	230 VAC, 6 A ohmic (inductive with suitable suppression)
Fuse (enabling contacts)	6 A slow blowing
Switching capacity (monitoring contacts)	41/42: 24 VDC, 2 A; L11, L14: max. 100 mA
Fuse (monitoring contacts)	41/42: 2 A slow blowing; L11, L14: 100 mA slow blowing
Application category	AC 15/DC 13, DIN VDE 0660 Part 200
Pick-up delay	≤ 200 ms
Drop-out delay	≤ 30 ms
Contact material / contacts	AgSnO self cleaning, positively driven
Contact resistance	max. 100 mOhm when new
Air and creeping distances	DIN VDE 0110-1 (04,97), 4 kV/2
Connections	Self lifting screw terminals min. 0.5 qmm, max. 2.5 qmm
Dimensions	H/W/D 83 mm/45 mm/140 mm
Weight	460 g
Ambient operating temperature	-25 °C ... $+45$ °C (derating curve page 157)
Mechanical life	10^7 switching cycles
Terminal labeling	DIN EN 60 445/DIN 40 719 Part 2

SRB-NA-R-C.27 (continued)

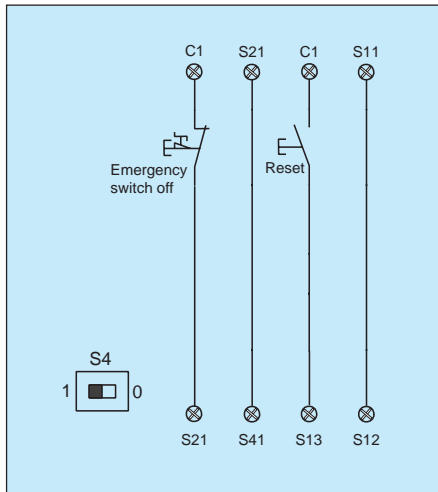
Wiring example: Input level

Single-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

With external reset button.

Safety category 2 in accordance with EN 954-1.



Wiring example: Input level

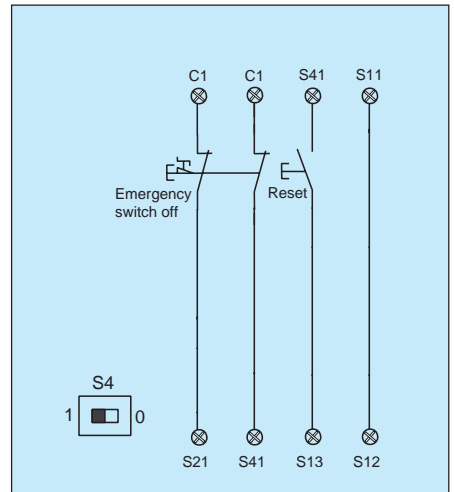
Dual-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

Cross-shorts in the emergency stop circuits are **not detected**.

With external reset button.

Safety category 3 or 4 in accordance with EN 954-1.



Wiring example: Input level

Dual-channel emergency stop switch according to EN 60 204-1.

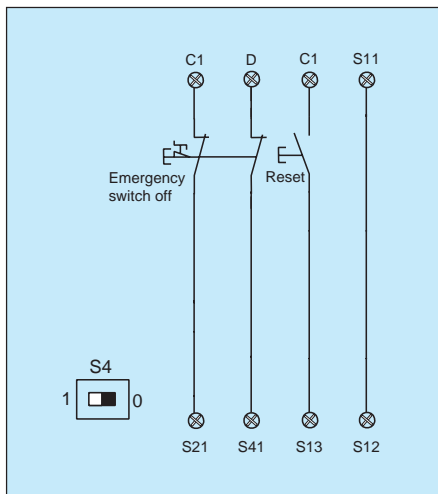
Wire breakage and earth leakage in the emergency stop circuits are detected.

Cross-shorts in the emergency stop circuits are detected.

To enable cross-short monitoring: Set switch QS (bottom of housing) to 0.

With external reset button.

Safety category 3 or 4 in accordance with EN 954-1.



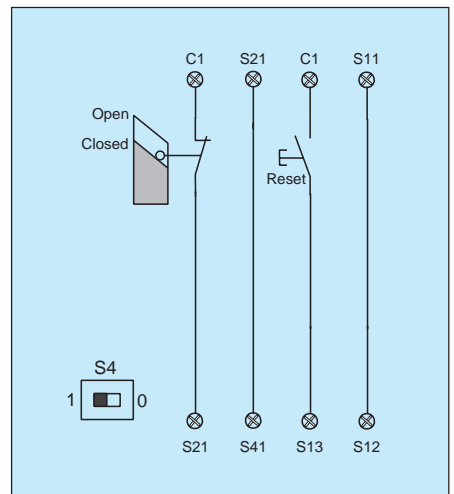
Wiring example: Input level

Single-channel door monitoring according to EN 1088 limit switch with positive opening contact.

Wire breakage and earth leakage in the door monitoring circuits are detected.

With external reset button for increased safety requirements.

Safety category 2 in accordance with EN 954-1.



Wiring example: Input level

Dual-channel door monitoring according to EN 1088, one limit switch with positive opening contact.

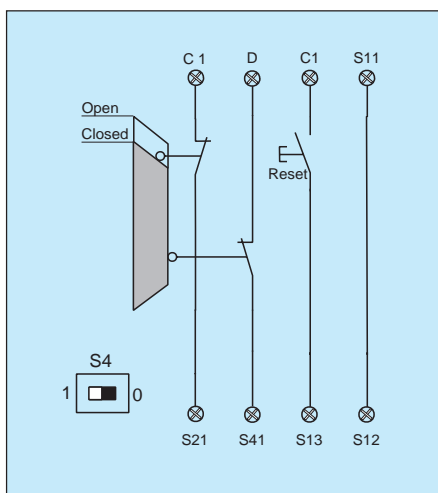
Wire breakage and earth leakage in the door monitoring circuits are detected.

Cross-shorts in the door monitoring circuits are detected.

To enable cross-short monitoring: Set switch QS (bottom of housing) to 0.

With external reset button for increased safety requirements.

Safety category 3 or 4 in accordance with EN 954-1.



Wiring example: Input level

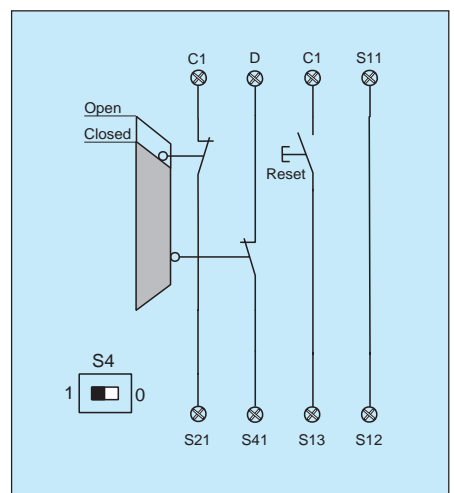
Dual-channel door monitoring according to EN 1088, one limit switch with positive opening contact.

Wire breakage and earth leakage in the door monitoring circuits are detected.

Cross-shorts in the door monitoring circuits are **not detected**.

With external reset button for increased safety requirements.

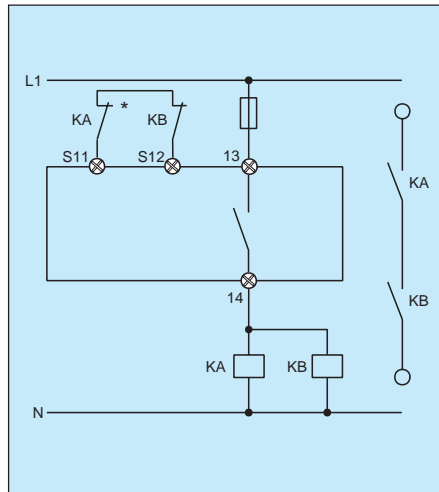
Safety category 3 or 4 in accordance with EN 954-1.



Wiring example: Power level

Single-channel output

Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.

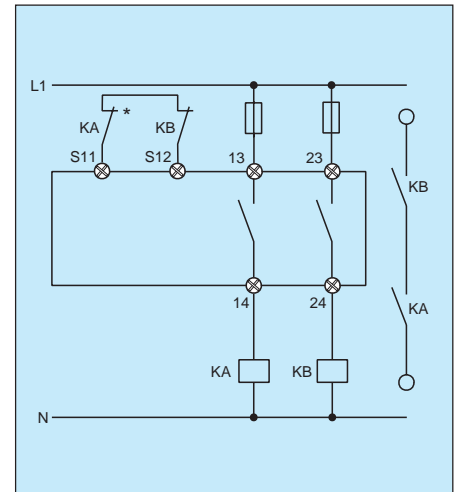


* Feedback loop

Wiring example: Power level

Dual-channel output

Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.



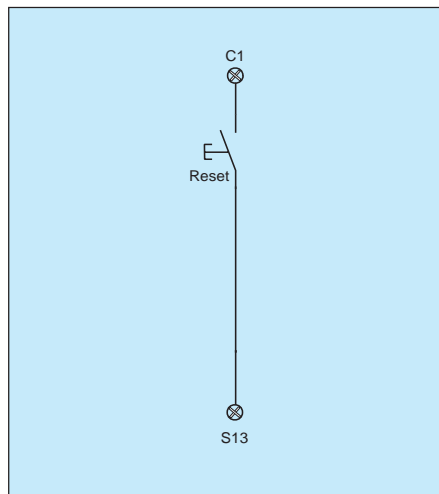
* Feedback loop

Advice:

For "Automatic reset" apply jumper C1-S13.

When using external reset button (switch S1 is set to "1"), unit is triggered by trailing edge function.

If the time difference between input channel 1 and 2 of the safety relay exceeds ca. 100 msec. when connecting a safety limit switch or interlocking device, a self-locking function can be achieved by setting switch S5 to "1". The time difference is then extended to infinite.

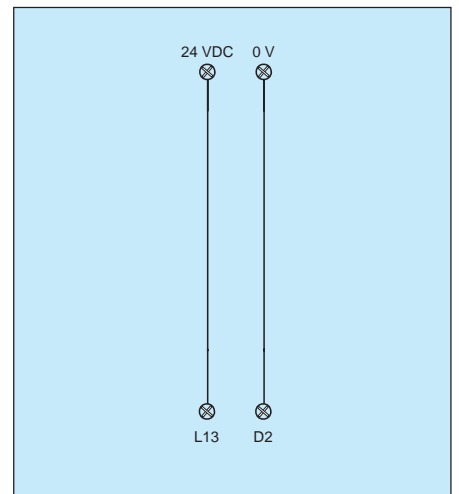


Advice:

Semiconductor outputs L11 and L14 are galvanically separated from the other sections of the SRB-NA-R-C.27.

Provide power supply through inputs L13 and D2.

Semiconductor output L11 is linked to relay K1 (reset), semiconductor output L14 is linked to relays K2 and K3.



Rear view



Setting:

- S1 ON = Trailing edge function on
- S4 ON = Cross-short recognition off
- S5 ON = Time delay between input channel 1 and 2 infinite

- OFF = Trailing edge function off
- OFF = Cross-short recognition on
- OFF = Time delay between input channel 1 and 2 ca. 100 msec.

SRB modules 45 mm wide, multifunctional version, STOP category 1

- max. 5 enabling outputs and 1 monitoring output
- max. 3 enabling outputs drop-out delayed: 0 ... 30 sec.
- max. load current: 4 Ampere
- max. safety category: 4
- 1- or 2-channel triggering
- Trailing edge function selectable
- Cross-short recognition selectable
- Semiconductor monitoring outputs selectable
- 24 VDC/VAC version
- Approvals: BG, CSA, UL



Type	Options																	
	Enabling outputs STOP cat. 0	Enabling outputs STOP cat. 1*	⇒ max. load current (A)	Auxiliary NC outputs	⇒ max. load current (A)	Time window	∞ channel 1/2	Cross-short recognition	Single-channel triggering	Trailing edge function	External powered inputs	24 VDC/VAC	48 VAC		115 VAC	230 VAC	BG approval	CSA approval
SRB-NA-R-C.19		3	4		4	+	●		●						✓	✓	✓	refer to page 88
SRB-NA-R-C.21	3	2	4	1	0,5	4	+	■	●	●					✓	✓	✓	refer to page 92
SRB-NA-R-C.38	3	2	4			4	+	■	●	●					✓	✓	✓	refer to page 96

* = Drop-out delay time 0 ... 30 sec. (0 ... 5.3 sec.) external setting; + = fixed; ■ = DIP switch setting; ● = selectable; ● = selectable feature; ✓ = in preparation; ✓ = approved

SRB-NA-R-C.19

Safety relay array for emergency stop devices, interlocking devices and others

☞ 3 safety enabling outputs drop-out delayed: 0 ... 5.3 sec.

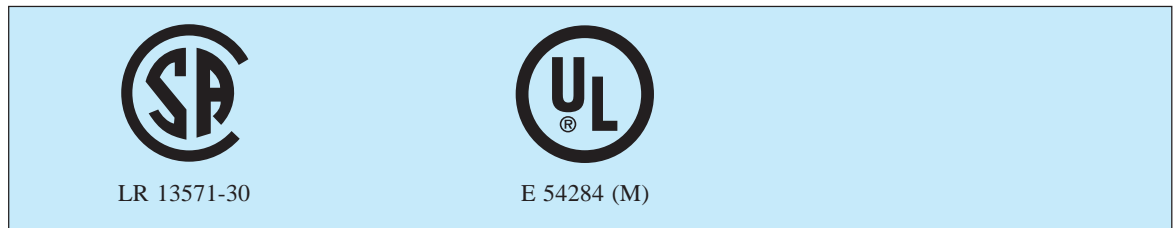
☞ Selectable extras:
 – Trailing edge function
 – Auto reset

☞ Possibility to shorten the drop-out delay

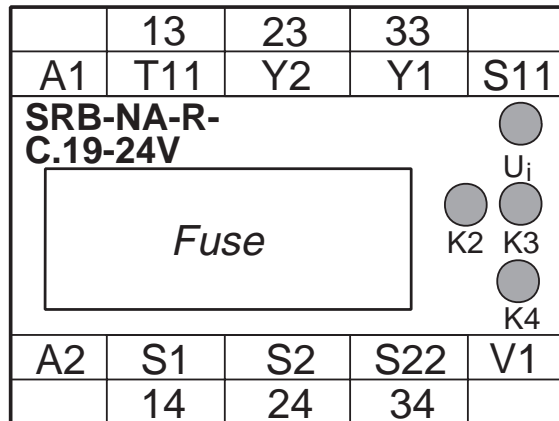
Features

- Relay output: 3 NO
- Reset, feedback loop
- Input for emergency stop or door monitoring
- LED's for K2, K3, K4, U_i
- Housing 45 mm, made of thermoplastic in accordance with UL-94-V-0, red RAL 3000
- DIN rail mounting
DIN EN 50 022

Approvals



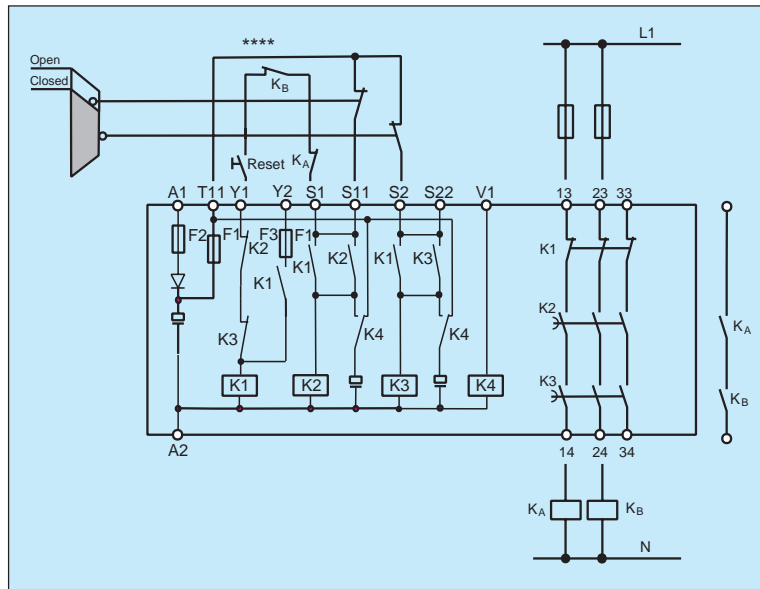
Front view



Product range

Type	Enabling outputs	Operating voltage	Part no.
SRB-NA-R-C.19-24VDC	3 NO ↷	24 VDC	600 0058
SRB-NA-R-C.19-24VAC	3 NO ↷	24 VAC	On request

Wiring diagram



Example for dual-channel door monitoring using two limit switches (one with positive opening contacts) and external reset button.

Dual-channel output, suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.

**** = Feedback loop

Wire breakage and earth leakage in the monitoring circuits are detected.

Cross-shorts in the door monitoring circuits are **not detected**.

With external reset button.

For further examples refer to page 90/91

Model specific Technical data

(refer to page 157 for general data)

Operating voltage	24 VDC -15%/+20%, residual ripple max. 10% 24 VAC -15%/+6%
Frequency	50/60 Hz (for AC operating)
Fuse (power supply)	F2: M 0.25 A/250 V (internal M 0.5 A/250 V; F3: T 0.1 A/250 V)
Power consumption	max. 3 VA
Switching capacity (enabling contacts)	230 VAC, 6 A ohmic (inductive with suitable suppression)
Fuse (enabling contacts)	6 A slow blowing
Application category	AC 15/DC 13, DIN VDE 0660 Part 200
Pick-up delay	≤ 100 ms
Drop-out delay	Refer to page 91
Contact material / contacts	AgSnO, self cleaning, positively driven
Contact resistance	max. 100 mOhm when new
Air and creeping distances	DIN VDE 0110-1 (04.97), 4 kV/2
Connections	Self lifting screw terminals min. 0.5 qmm, max. 2.5 qmm
Dimensions	H/W/D 83 mm/45 mm/140 mm
Weight	390 g
Ambient operating temperature	-25 °C ... +45 °C (derating curve page 157)
Mechanical life	10 ⁷ switching cycles
Terminal labeling	DIN EN 50 005/DIN 50 013

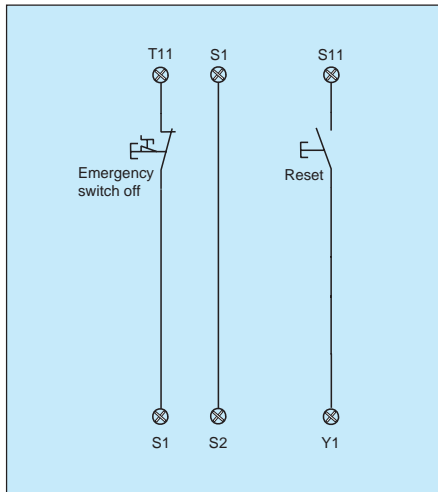
Wiring example: Input level

Single-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

With external reset button.

Safety category 2 in accordance with EN 954-1.



Wiring example: Input level

Dual-channel emergency stop switch according to EN 60 204-1.

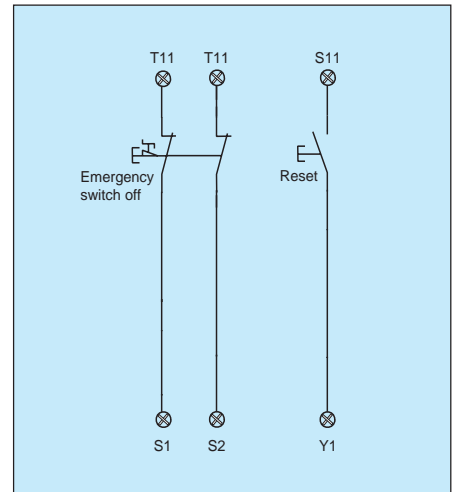
Wire breakage and earth leakage in the emergency stop circuits are detected.

Earth leakage at input A2 is detected in non grounded mains only!

Cross-shorts in the emergency stop circuits are **not detected**.

With external reset button.

Safety category 3 or 4 in accordance with EN 954-1.



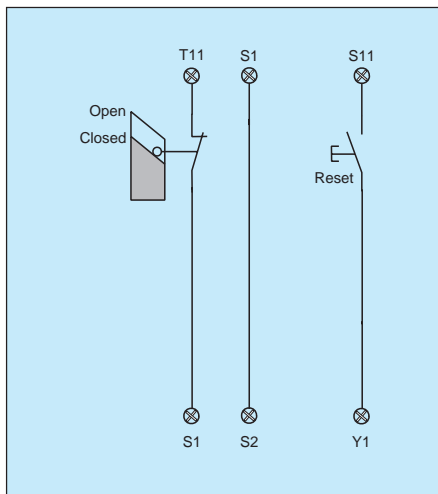
Wiring example: Input level

Single-channel door monitoring according to EN 1088 limit switch with positive opening contact.

Wire breakage and earth leakage in the door monitoring circuits are detected.

With external reset button.

Safety category 2 in accordance with EN 954-1.



Wiring example: Input level

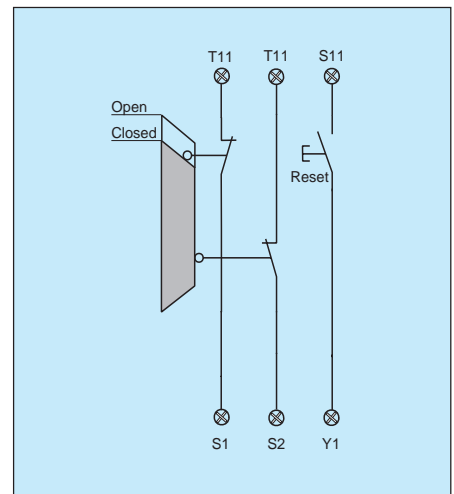
Dual-channel door monitoring according to EN 1088, one limit switch with positive opening contact.

Wire breakage and earth leakage in the door monitoring circuits are detected.

Cross-shorts in the door monitoring circuits are **not detected**.

With external reset button for increased safety requirements.

Safety category 3 or 4 in accordance with EN 954-1.



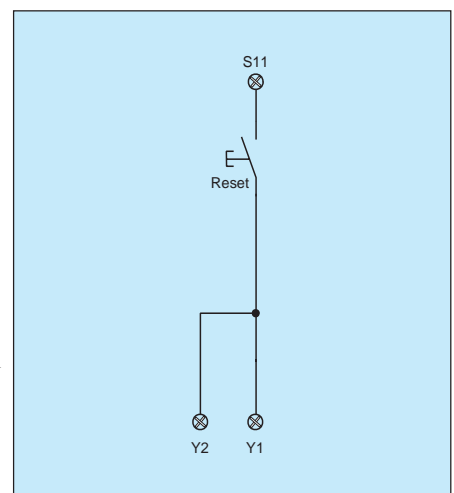
Advice:

For "Automatic reset" apply jumper S11-Y1.

When using external reset button (S11-Y2) and jumper Y1-Y2, unit is triggered by trailing edge function.

Reset button wired in series to feedback loop.

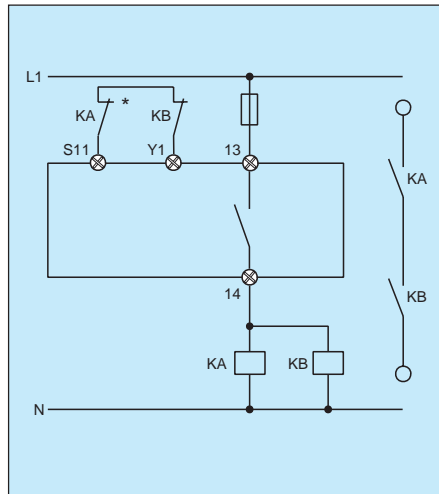
If the time between channel 1 and 2 exceeds ca. 20 msec. when connecting a safety limit switch or interlocking device, a lock function can be achieved by triggering channel 2 (T11-S2) prior to channel 1 (T11-S1). The time difference is then extended to infinite.



Wiring example: Power level

Single-channel output.

Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.

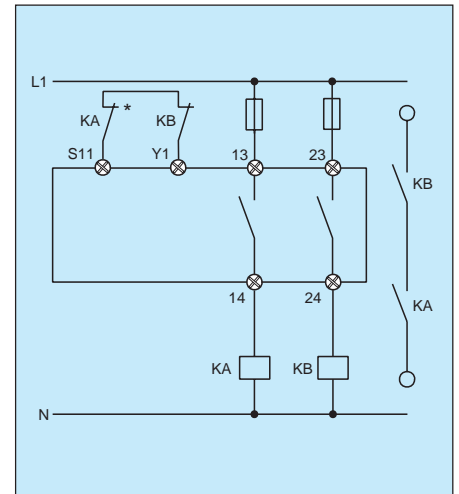


* Reset button wired in series to feedback loop.

Wiring example: Power level

Dual-channel output.

Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.

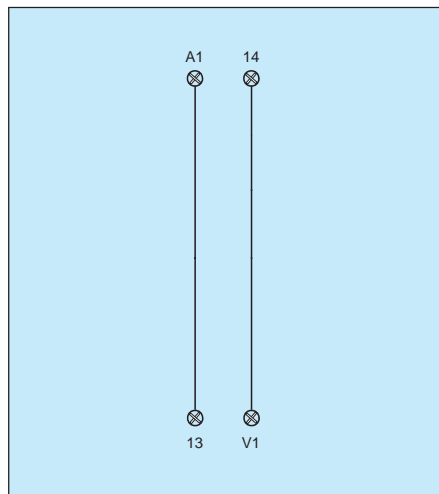


* Reset button wired in series to feedback loop.

Advice:

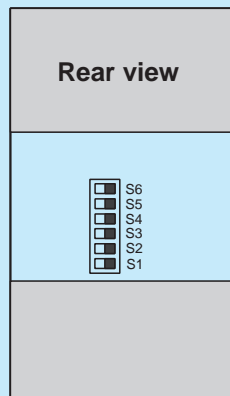
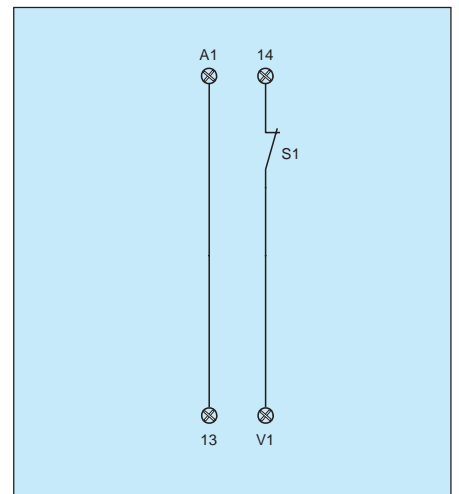
Enabling outputs 23/24 and 33/34 correspond to STOP category 1 in accordance with EN 60 204-1.

The safety relay module has no safety function if connector V1 is triggered external.



Advice:

It is possible to shorten the drop-out delay time via an external NC between terminals 14 and V1.



Set to ON	Time in seconds
S1, S4	ca. 0,7
S2, S5	ca. 1,4
S1, S2, S4, S5	ca. 2,1
S3, S6	ca. 3,2
S1, S3, S4, S6	ca. 3,9
S2, S3, S5, S6	ca. 4,6
S1, S2, S3, S4, S5, S6	ca. 5,3

Tolerance: ± 30%

SRB-NA-R-C.21

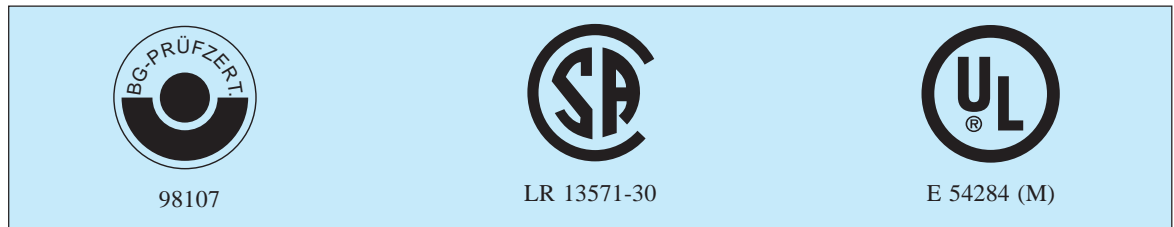
Safety relay array for emergency stop devices, interlocking devices and others

- ☞ 5 enabling outputs and 1 monitoring output
- ☞ 2 enabling outputs drop-out delayed: 0 ... 30 sec.
- ☞ Selectable extras:
 - Trailing edge function
 - Auto reset
 - Cross-short recognition
- ☞ Time set in 24 stages (at bottom of housing)

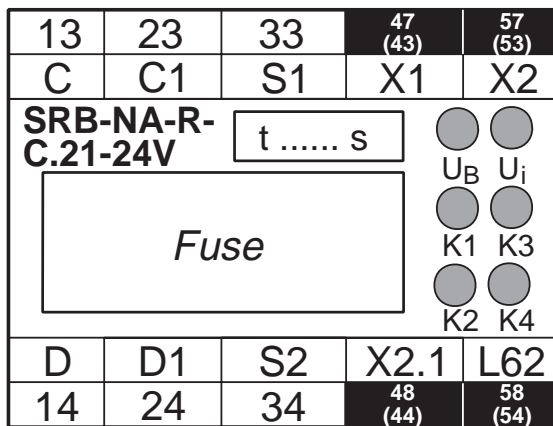
Features

- Relay output: 3 NO, 2 NO time delayed, 1 NC
(Auxiliary NC for monitoring must not be used in safety enabling circuits!)
- Reset, feedback loop
- Input for emergency stop or door monitoring
- LED's for K1, K2, K3, K4, U_B, U_i
- Housing 45 mm, made of thermoplastic in accordance with UL-94-V-0, red RAL 3000
- DIN rail mounting
DIN EN 50 022

Approvals



Front view

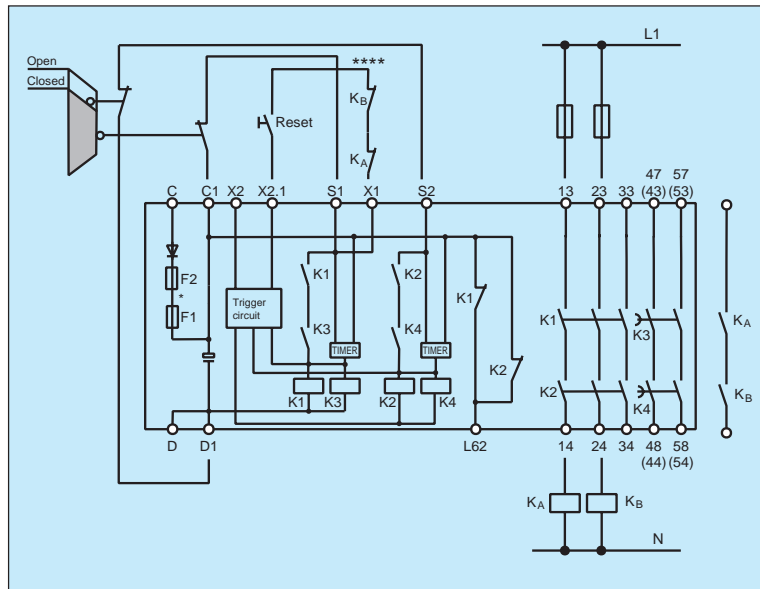


Product range

Type	Enabling outputs	Operating voltage	Part no.
SRB-NA-R-C.21-24V	3 NO/2 NO ÷/1 NC	24 VAC/VDC	600 0790

SRB-NA-R-C.21 (continued)

Wiring diagram



Example for dual-channel door monitoring using two limit switches (one with positive opening contacts) and external reset button.

Dual-channel output, suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.

**** = Feedback loop

Wire breakage and earth leakage in the monitoring circuits are detected.

* Fuse F2 (front cover) 1 A, fuse F1 (internal) 1.25 A

For further examples refer to page 94/95

Model specific Technical data

(refer to page 157 for general data)

Operating voltage	24 VDC $-15\%/+20\%$, residual ripple max. 10% 24 VAC $-15\%/+6\%$
Frequency	50/60 Hz (for AC operating)
Fuse (power supply)	T 1.0 A/250 V (internal T 1.25 A/250 V)
Power consumption	max. 4.0 VA, plus monitoring output L62
Switching capacity (enabling contacts)	230 VAC, 4 A ohmic (inductive with suitable suppression) NO 43/44, 53/54: DC 13: 24 VDC/2 A; AC 15: 230 VAC/3 A
Fuse (enabling contacts)	4 A slow blowing
Switching capacity (monitoring contacts)	L62: max. 500 mA
Application category	AC 15/DC 13, DIN VDE 0660 Part 200
Pick-up delay	≤ 30 ms
Drop-out delay	≤ 60 ms
Contact material / contacts	AgSnO, self cleaning, positively driven
Contact resistance	max. 100 mOhm when new
Air and creeping distances	DIN VDE 0110-1 (04.97), 4 kV/2
Connections	Self lifting screw terminals min. 0.5 qmm, max. 2.5 qmm
Dimensions	H/W/D 83 mm/45 mm/140 mm
Weight	480 g
Ambient operating temperature	-25 °C ... $+45$ °C (derating curve page 157)
Mechanical life	10^7 switching cycles
Terminal labeling	DIN EN 60 445/DIN 40 719 Part 2

SRB-NA-R-C.21 (continued)

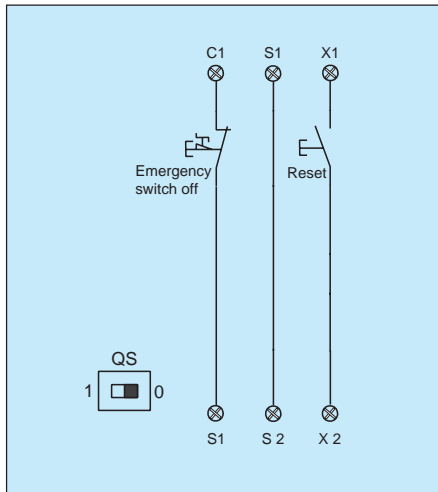
Wiring example: Input level

Single-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

With external reset button.

Safety category 2 in accordance with EN 954-1.



Wiring example: Input level

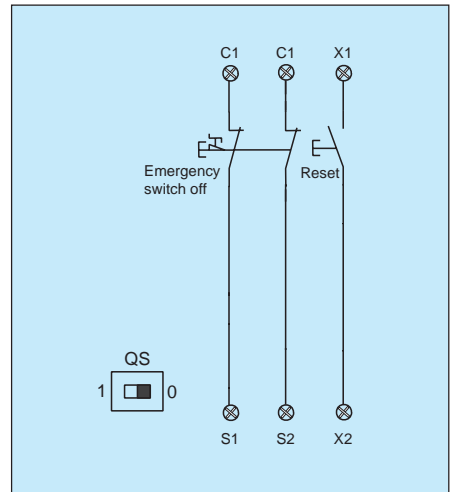
Dual-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

Cross-shorts in the emergency stop circuits are **not detected**.

With external reset button.

Safety category 3 or 4 in accordance with EN 954-1.



Wiring example: Input level

Dual-channel emergency stop switch according to EN 60 204-1.

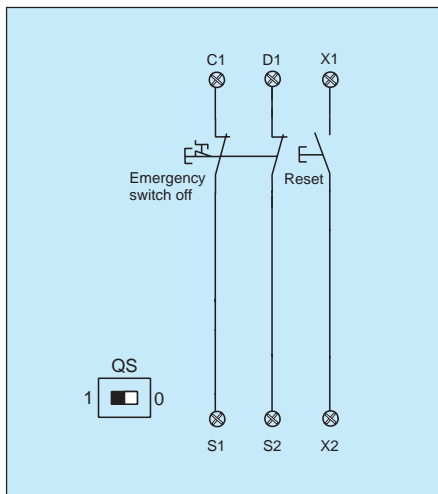
Wire breakage and earth leakage in the emergency stop circuits are detected.

Cross-shorts in the emergency stop circuits are detected.

To enable cross-short monitoring: Set switch "QS" (bottom of housing) to 1.

With external reset button.

Safety category 3 or 4 in accordance with EN 954-1.



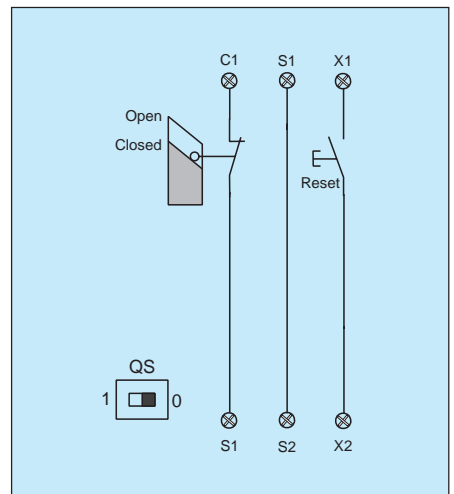
Wiring example: Input level

Single-channel door monitoring according to EN 1088 limit switch with positive opening contact.

Wire breakage and earth leakage in the door monitoring circuits are detected.

With external reset button for increased safety requirements.

Safety category 2 in accordance with EN 954-1.



Wiring example: Input level

Dual-channel door monitoring according to EN 1088, one limit switch with positive opening contact.

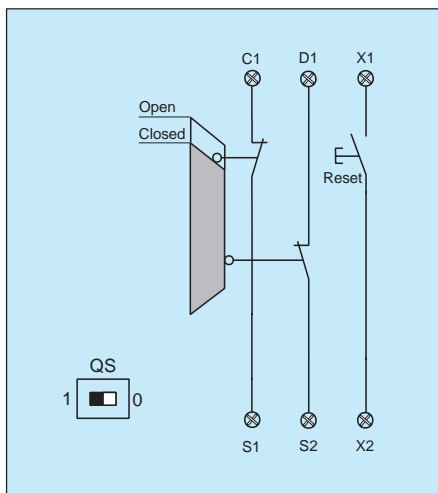
Wire breakage and earth leakage in the door monitoring circuits are detected.

Cross-shorts in the emergency stop circuits are detected.

To enable cross-short monitoring: Set switch "QS" (bottom of housing) to 1.

With external reset button for increased safety requirements.

Safety category 3 or 4 in accordance with EN 954-1.



Wiring example: Input level

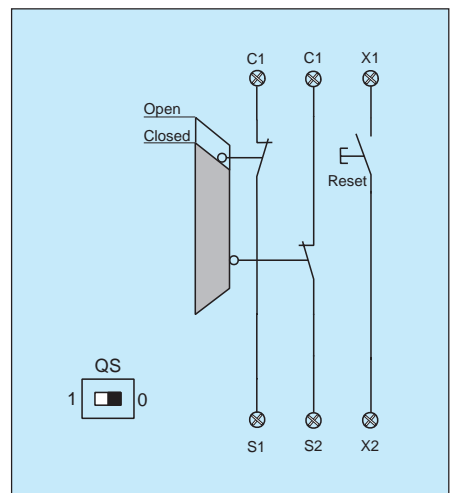
Dual-channel door monitoring according to EN 1088, one limit switch with positive opening contact.

Wire breakage and earth leakage in the door monitoring circuits are detected.

Cross-shorts in the emergency stop circuits are **not detected**.

With external reset button for increased safety requirements.

Safety category 3 or 4 in accordance with EN 954-1.

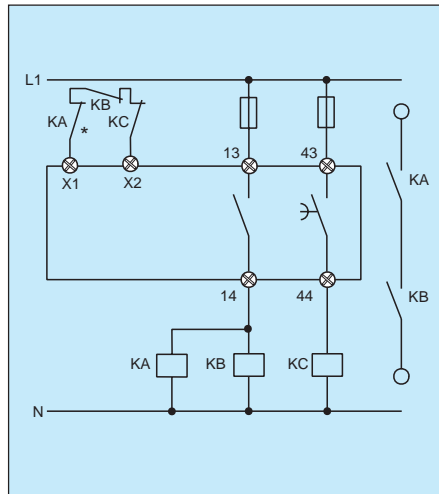


SRB-NA-R-C.21 (continued)

Wiring example: Power level

Single-channel output

Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.



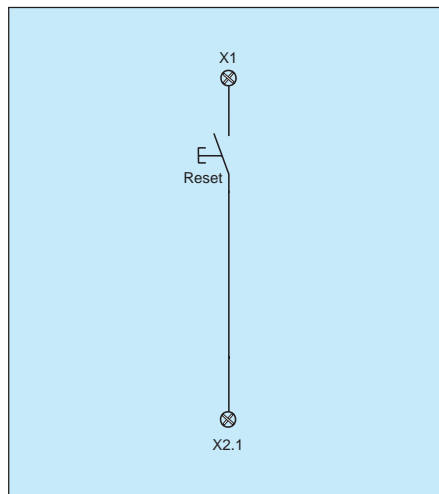
* Reset button wired in series to feedback loop.

Advice:

For "Automatic reset" apply jumper X1-X2.

When using external reset button (X1-X2.1), unit is triggered by trailing edge function.

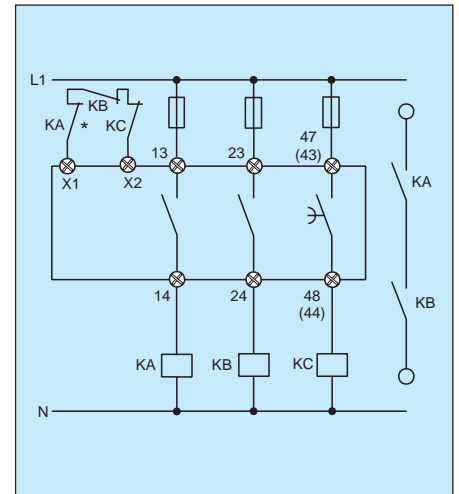
Reset button wired in series to feedback loop.



Wiring example: Power level

Dual-channel output

Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.



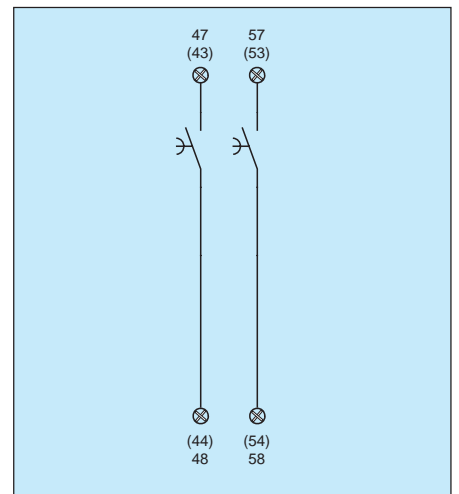
* Reset button wired in series to feedback loop.

Advice:

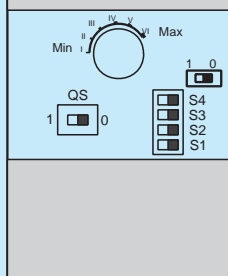
Drop-out delay of the enabling outputs 47/48 and 57/58 adjustable from 0-30 sec.

Enabling outputs 43/44 and 53/54 correspond to STOP category 1 in accordance with EN 60 204-1.

Enabling outputs 47/48 and 57/58 correspond to STOP category 1 in accordance with EN 60 204-1.



Rear view



Time in seconds	S1 = 1, S2 = 1, S3 = 1, S4 = 1	S1 = 0, S2 = 1, S3 = 0, S4 = 1	S1 = 1, S2 = 0, S3 = 1, S4 = 0	S1 = 0, S2 = 0, S3 = 0, S4 = 0
-----------------	--------------------------------	--------------------------------	--------------------------------	--------------------------------

I	0.44	2.30	3.5	18
II	0.62	2.45	5.0	20
III	0.87	2.70	7.0	22
IV	1.05	2.85	8.5	23
V	1.27	3.05	10.2	25
VI	1.77	3.55	14.2	29

Tolerance: ± 5%

SRB-NA-R-C.38

Safety relay array for emergency stop devices, interlocking devices and others

- ➡ 5 enabling outputs
- ➡ 2 enabling outputs drop-out delayed: 0 ... 30 seconds
- ➡ Selectable extras:
 - Trailing edge function, – Auto reset, – Cross-short recognition
- ➡ Time set in 24 stages (at bottom of housing)
- ➡ Possibility to shorten the drop-out delay

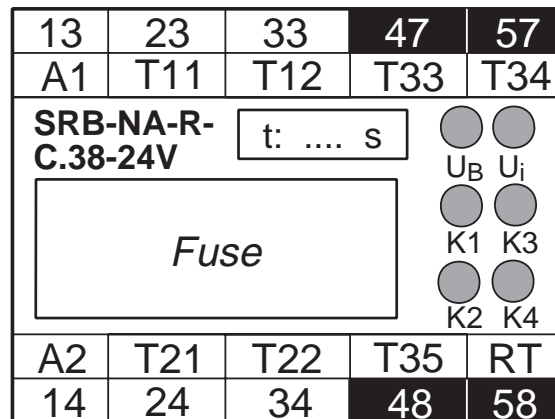
Features

- Relay output: 3 NO, 2 NO drop-out delayed
- LED's for K1, K2, K3, K4, U_B and U_i
- DIN rail mounting DIN EN 50 022
- Reset, feedback loop
- Housing 90 mm, made of thermoplastic in accordance with UL-94-V-0, red RAL 3000
- Input for emergency stop or door monitoring

Approvals



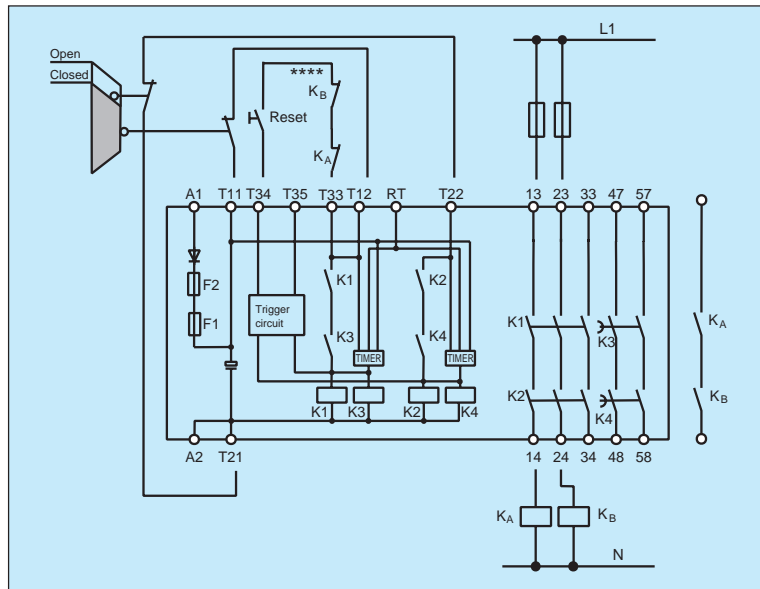
Front view



Product range

Type	Enabling outputs	Operating voltage	Part no.
SRB-NA-R-C.38-24V	3 NO/2 NO ↻	24 VAC/VDC	On request

Wiring diagram



Example for dual-channel door monitoring using two limit switches (one with positive opening contacts) and external reset button.

Dual-channel output, suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.

**** = Feedback loop

Wire breakage and earth leakage in the monitoring circuits are detected.

* Fuse F2 (front cover) 1 A, fuse F1 (internal) 1.25 A

For further examples refer to page 98/99

Model specific Technical data

(refer to page 157 for general data)

Operating voltage	24 VDC -15%/+20%, residual ripple max. 10% 24 VAC -15%/+6%
Frequency	50/60 Hz (for AC operating)
Fuse (power supply)	T 1.0 A/250 V (internal T 1.25 A/250 V)
Power consumption	max. 4.0 VA
Switching capacity (enabling contacts)	230 VAC, 4 A ohmic (inductive with suitable suppression) NO 43/44, 53/54: DC 13: 24 VDC/2 A; AC 15: 230 VAC/3 A
Fuse (enabling contacts)	4 A slow blowing
Application category	AC 15/DC 13, DIN VDE 0660 Part 200
Pick-up delay	≤ 30 ms
Drop-out delay	≤ 60 ms
Contact material / contacts	AgSnO, self cleaning, positively driven
Contact resistance	max. 100 mOhm when new
Air and creeping distances	DIN VDE 0110-1 (04.97), 4 kV/2
Connections	Self lifting screw terminals min. 0.5 qmm, max. 2.5 qmm
Dimensions	H/W/D 83 mm/45 mm/140 mm
Weight	480 g
Ambient operating temperaturer	-25 °C ... +45 °C (derating curve page 157)
Mechanical life	10 ⁷ switching cycles
Terminal labeling	DIN EN 50 005/DIN 50 013

SRB-NA-R-C.38 (continued)

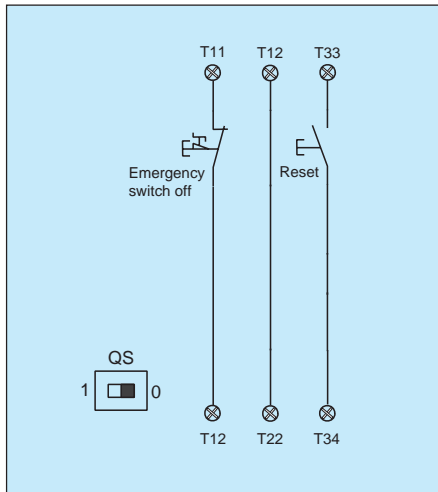
Wiring example: Input level

Single-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

With external reset button.

Safety category 2 in accordance with EN 954-1.



Wiring example: Input level

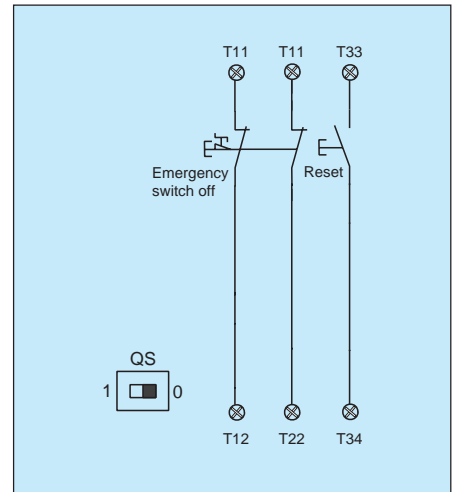
Dual-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

Cross-shorts in the emergency stop circuits are **not detected**.

With external reset button.

Safety category 3 or 4 in accordance with EN 954-1.



Wiring example: Input level

Dual-channel door monitoring according to EN 1088, one limit switch with positive opening contact.

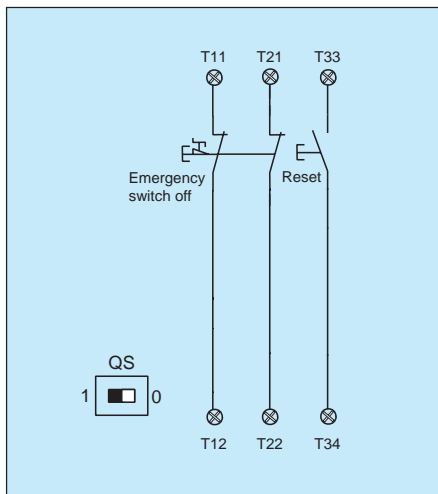
Wire breakage and earth leakage in the door monitoring circuits are detected.

Cross-shorts in the emergency stop circuits are detected.

To enable cross-short monitoring: Set switch "QS" (bottom of housing) to 1.

With external reset button.

Safety category 3 or 4 in accordance with EN 954-1.



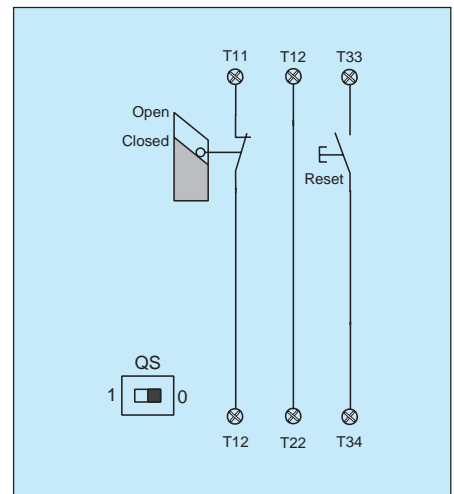
Wiring example: Input level

Single-channel door monitoring according to EN 1088 limit switch with positive opening contact.

Wire breakage and earth leakage in the door monitoring circuits are detected.

With external reset button for increased safety requirements.

Safety category 2 in accordance with EN 954-1.



Wiring example: Input level

Dual-channel door monitoring according to EN 1088, one limit switch with positive opening contact.

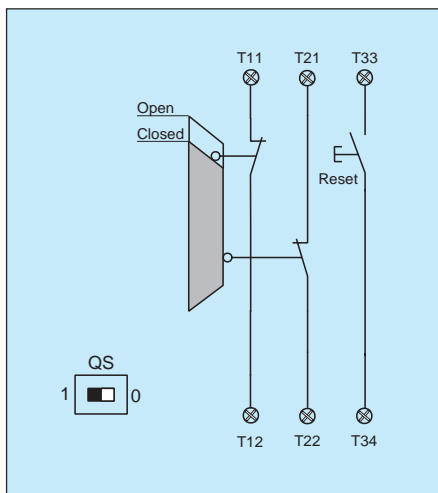
Wire breakage and earth leakage in the door monitoring circuits are detected.

Cross-shorts in the emergency stop circuits are detected.

To enable cross-short monitoring: Set switch "QS" (bottom of housing) to 1.

With external reset button.

Safety category 3 or 4 in accordance with EN 954-1.



Wiring example: Input level

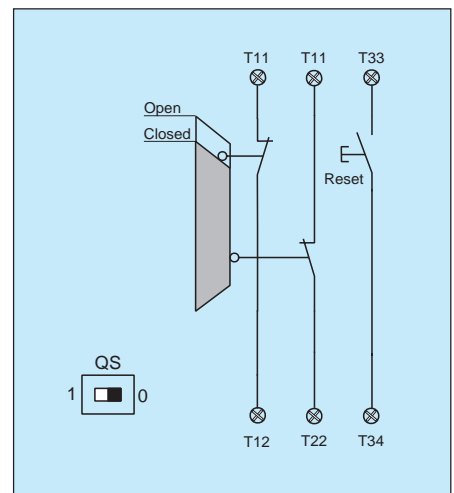
Dual-channel door monitoring according to EN 1088, one limit switch with positive opening contact.

Wire breakage and earth leakage in the door monitoring circuits are detected.

Cross-shorts in the emergency stop circuits are **not detected**.

With external reset button.

Safety category 3 or 4 in accordance with EN 954-1.

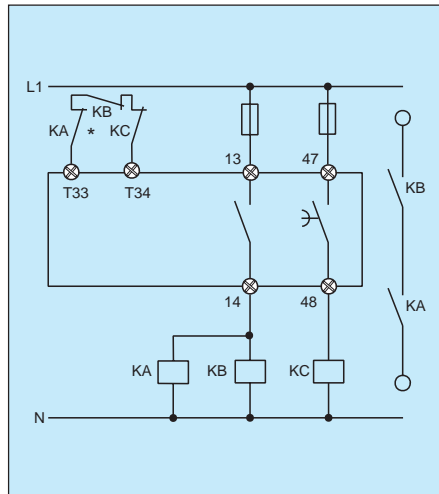


SRB-NA-R-C.38 (continued)

Wiring example: Power level

Single-channel output

Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.



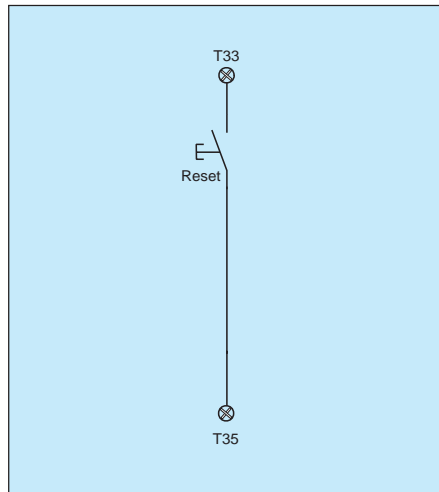
* Reset button wired in series to feedback loop.

Advice:

For "Automatic reset" apply jumper X1-X2.

When using external reset button (X1-X2.1), unit is triggered by trailing edge function.

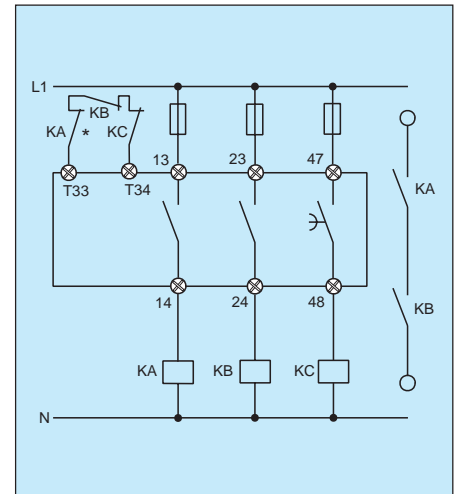
Reset button wired in series to feedback loop.



Wiring example: Power level

Dual-channel output

Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.



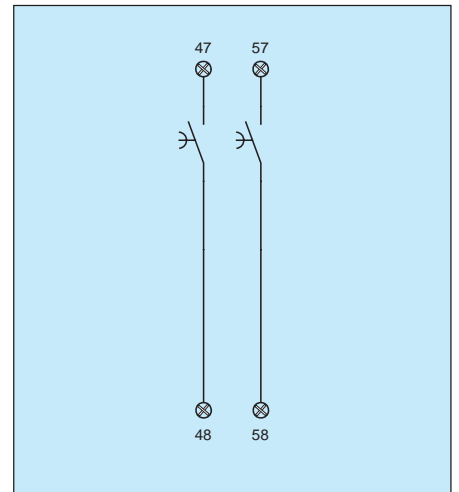
* Reset button wired in series to feedback loop.

Advice:

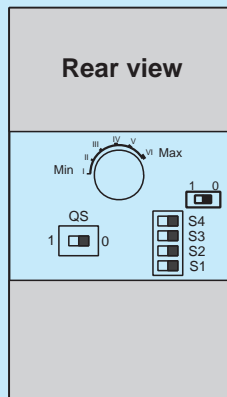
Drop-out delay of the enabling outputs 47/48 and 53/54 adjustable from 0–30 sec.

Enabling outputs 57/58 and 53/54 correspond to STOP category 1 in accordance with EN 60 204-1.

Enabling outputs 47/48 and 57/58 correspond to STOP category 1 in accordance with EN 60 204-1.



Rear view



Time in seconds	S1 = 1, S2 = 1, S3 = 1, S4 = 1	S1 = 0, S2 = 1, S3 = 0, S4 = 1	S1 = 1, S2 = 0, S3 = 1, S4 = 0	S1 = 0, S2 = 0, S3 = 0, S4 = 0
-----------------	--------------------------------	--------------------------------	--------------------------------	--------------------------------

I	0.44	2.30	3.5	18
II	0.62	2.45	5.0	20
III	0.87	2.70	7.0	22
IV	1.05	2.85	8.5	23
V	1.27	3.05	10.2	25
VI	1.77	3.55	14.2	29

Tolerance: ± 5%

SRB modules 45 mm wide, special versions

- ☛ Suitable for battery powered networks
- ☛ Suitable for humid environments, non-equivalent input circuits
- ☛ max. 3 enabling outputs and 1 monitoring output
- ☛ max. load current: 6 Ampere
- ☛ max. safety category: 3
- ☛ 1- or 2-channel triggering
- ☛ Cross-short recognition
- ☛ 12 VDC, 24 VDC/VAC, 48 VAC, 115 VAC and 230 VAC versions
- ☛ Approvals: CSA, UL



Type	Options																	
	Enabling outputs STOP cat. 0	Enabling outputs STOP cat. 1	=> max. load current (A)	Auxiliary NC outputs	=> max. load current (A)	Time window ∞	Cross-short recognition	Single-channel triggering	Trailing edge triggering	External powered inputs	Initial start test	24 VDC/VAC	48 VAC	115 VAC	230 VAC	BG approval	CSA approval	UL approval
SRB-NA-NF	3	6	3	+	+	●				●*								refer to page 102
Special feature(s): operated by battery powered networks, * = voltage 12 VDC, refer to page 159																		
SRB-NA-R-C.26	3	6	1	2	3	+	+				●	+	+	+	✓	✓	✓	refer to page 106
Special feature(s): dual channel non-equivalent input circuits for humid environments, refer to page 159																		

☛ = fixed; ● = selectable; ✓ = in preparation; ✓ = approved

SRB-NA-NF

E-Stop module for vehicles

- ☞ Suitable for battery powered networks
- ☞ 3 safety enabling outputs
- ☞ Cross-short recognition

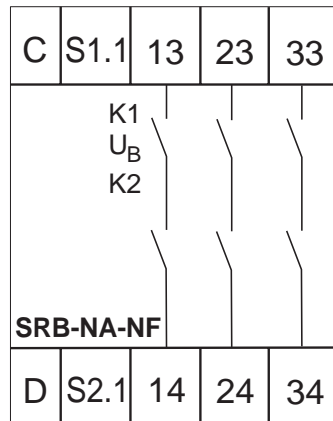
Features

- Relay output: 3 NO
- Reset, feedback loop
- Input for emergency stop or door monitoring
- LED's for K1, K2, U_B
- Housing 45 mm, made of thermoplastic in accordance with UL-94-V-0, red RAL 3000
- DIN rail mounting
DIN EN 50 022

Approvals



Front view

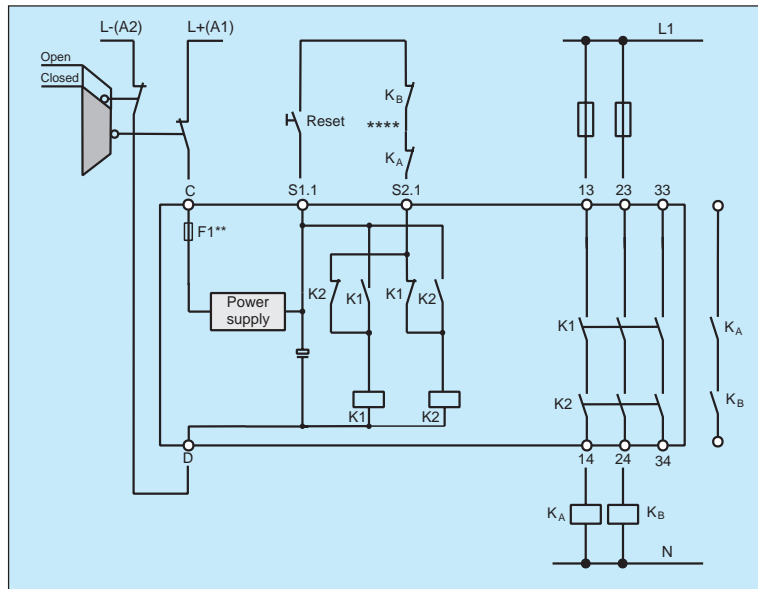


Product range

Type	Enabling outputs	Operating voltage	Part no.
SRB-NA-NF-24V	3 NO	24 VDC	600 0758
SRB-NA-NF-12VDC	3 NO	12 VDC	On request

SRB-NA-NF (continued)

Wiring diagram



Example for dual-channel door monitoring using two limit switches (one with positive opening contacts) and external reset button.

Dual-channel output, suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.

**** = Feedback loop

Wire breakage and earth leakage in the monitoring circuits are detected.

Earth leakage at input D is detected only in mains with insulation leakage monitoring.

** Fuse M 0.5 A
(an external leading fuse
M 0.25 A is recommended)

For further examples
refer to page 104/105

Model specific Technical data

(refer to page 157
for general data)

Operating voltage	24 VDC, 12 VDC -25%/+35%, residual ripple 10%
Fuse (power supply)	M 0.25 A/250 V (internal M 0.5 A/250 V)
Power consumption	max. 2.5 VA
Switching capacity (enabling contacts)	230 VAC, 6 A ohmic (inductive with suitable suppression)
Fuse (enabling contacts)	6 A slow blowing
Application category	AC 15/DC 13, DIN VDE 0660 Part 200
Pick-up delay	≤ 30 ms
Drop-out delay	≤ 50 ms
Contact material / contacts	AgSnO, self cleaning, positively driven
Contact resistance	max. 100 mOhm when new
Air and creeping distances	DIN VDE 0110-1 (04.97), 4 kV/2
Connections	Self lifting screw terminals min. 0.5 qmm, max. 2.5 qmm
Dimensions	H/W/D 83 mm/45 mm/127 mm
Weight	280 g
Ambient operating temperature	-25 °C ... +45 °C (derating curve page 157)
Mechanical life	10 ⁷ switching cycles
Terminal labeling	DIN EN 60 445/DIN 40 719 Part 2

SRB-NA-NF (continued)

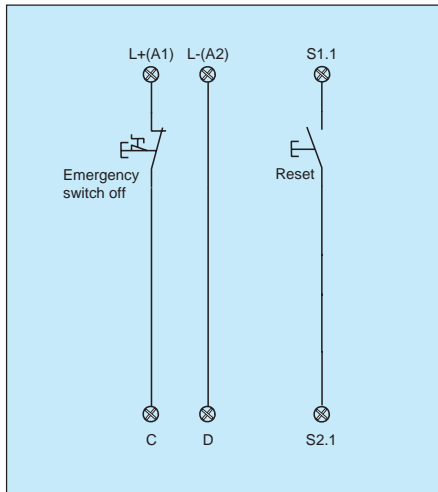
Wiring example: Input level

Single-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

With external reset button.

Safety category 2 in accordance with EN 954-1.



Wiring example: Input level

Dual-channel emergency stop switch according to EN 60 204-1.

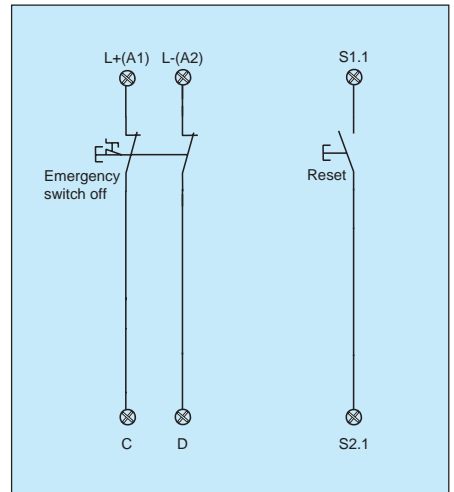
Wire breakage and earth leakage in the emergency stop circuits are detected.

Earth leakage at input A2 is detected in non grounded mains only!

Cross-shorts in the emergency stop circuits are detected.

With external reset button.

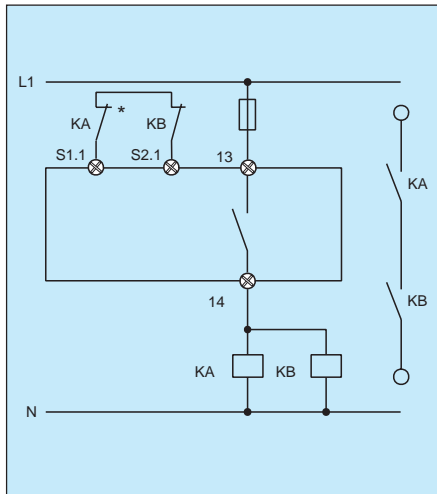
Safety category 3 in accordance with EN 954-1.



Wiring example: Power level

Single-channel output

Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.

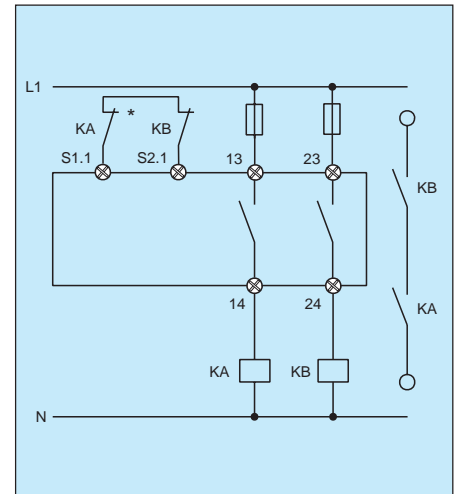


* Reset button wired in series to feedback loop.

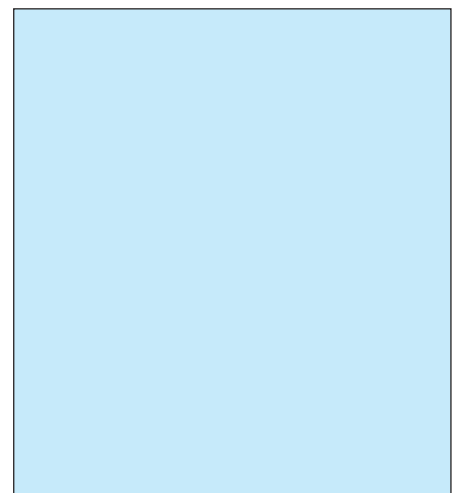
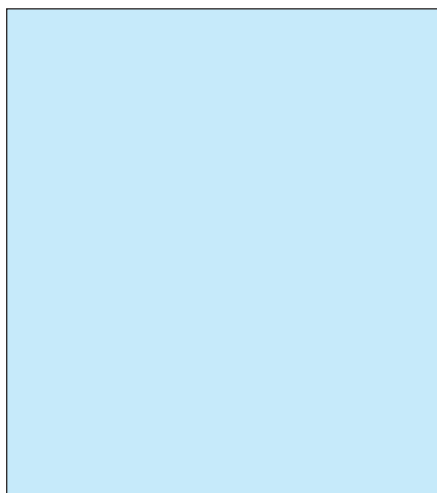
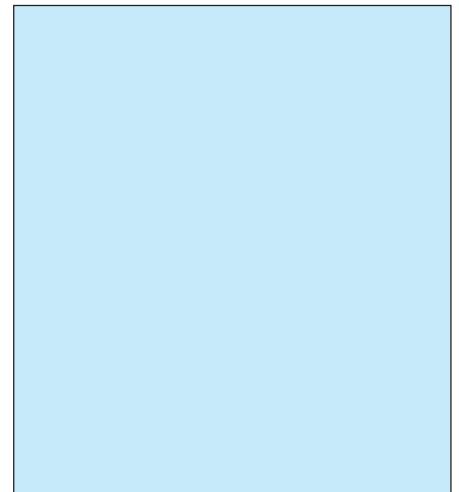
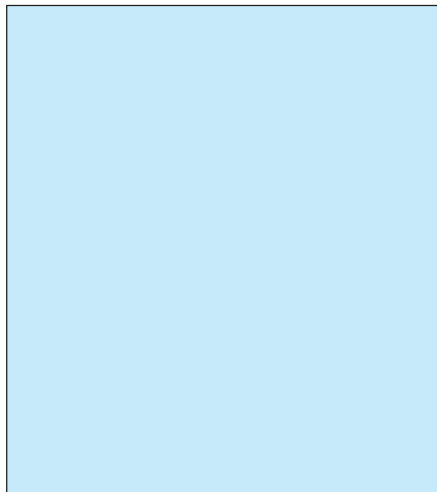
Wiring example: Power level

Dual-channel output

Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.



* Reset button wired in series to feedback loop.



SRB-NA-R-C.26

Safety relay array for emergency stop devices, interlocking devices and others

- ☞ Suitable for humid environments
- ☞ 3 enabling outputs and 1 monitoring output
- ☞ Non-equivalent input
- ☞ Cross-short recognition

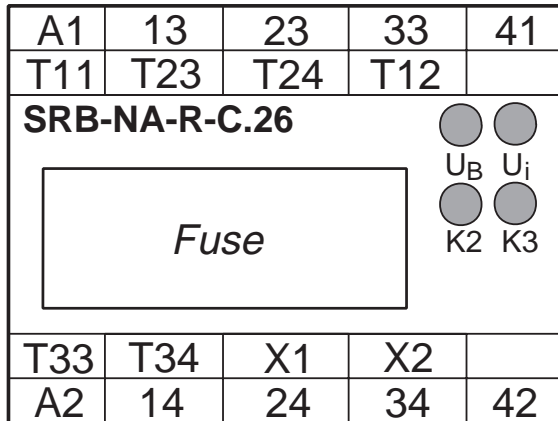
Features

- Relay output: 3 NO, 1 NO time delayed, 1 NC (Auxiliary NC for monitoring must not be used in safety enabling circuits!)
- Reset, feedback loop
- Input for emergency stop or door monitoring
- LED's for K2, K3, U_B, U_i
- Housing 45 mm, made of thermoplastic in accordance with UL-94-V-0, red RAL 3000
- DIN rail mounting DIN EN 50 022

Approvals



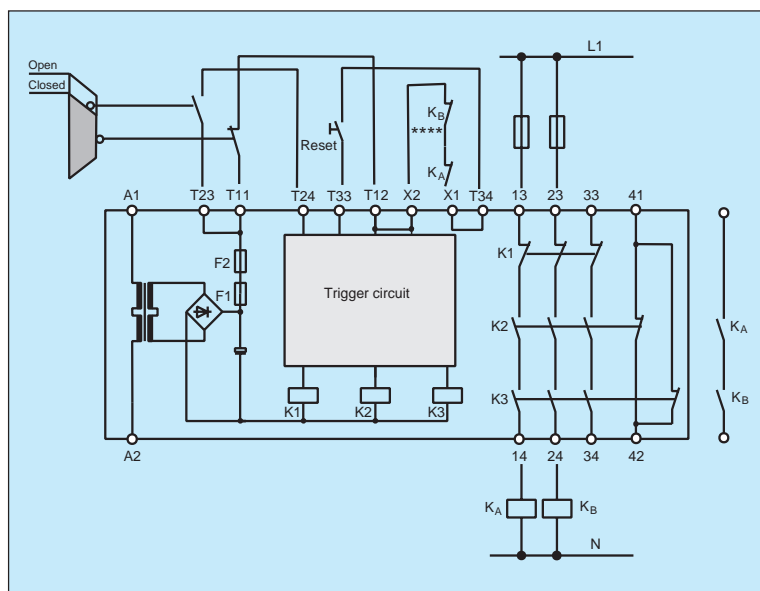
Front view



Product range

Type	Enabling outputs	Operating voltage	Part no.
SRB-NA-R-C.26-24V	3 NO/1 NC	24 VDC/VAC	On request
SRB-NA-R-C.26-115VAC	3 NO/1 NC	115 VAC	600 0091
SRB-NA-R-C.26-230VAC	3 NO/1 NC	230 VAC	On request

Wiring diagram



Example for dual channel door monitoring using two limit switches (one with positive opening contacts) and external reset button.

Dual-channel output, suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.

**** = Feedback loop

Wire breakage and earth leakage in the monitoring circuits are detected.

For further examples refer to page 108/109

Model specific Technical data

(refer to page 157 for general data)

Operating voltage	24 VDC $-15\%/+20\%$, residual ripple max. 10% 24 VAC, 46 VAC, 115 VAC, 230 VAC $-15\%/+6\%$
Frequency	50/60 Hz (for AC operating)
Fuse (power supply)	F2: T 0.125 A/250 V (internal F1: T 0.25 A/250 V)
Power consumption	max. 1.8 W, 5.5 VA
Switching capacity (enabling contacts)	230 VAC, 6 A ohmic (inductive with suitable suppression)
Fuse (enabling contacts)	6 A slow blowing
Switching capacity (monitoring contacts)	24 VDC, 2 A
Fuse (monitoring)	2 A slow blowing
Application category	AC 15/DC 13, DIN VDE 0660 Part 200
Pick-up delay	≤ 50 ms
Drop-out delay	≤ 60 ms
Contact material / contacts	AgSnO, self cleaning, positively driven
Contact resistance	max. 100 mOhm when new
Air and creeping distances	DIN VDE 0110-1 (04.97), 4 kV/2
Connections	Self lifting screw terminals min. 0.5 qmm, max. 2.5 qmm
Dimensions	H/W/D 83 mm/90 mm/127 mm
Weight	460 g (600 g at 230 V and 115 V version)
Ambient operating temperature	-25 °C ... $+45$ °C (derating curve page 157)
Mechanical life	10^7 switching cycles
Terminal labeling	DIN EN 50 005/DIN 50 013

Wiring example: Input level

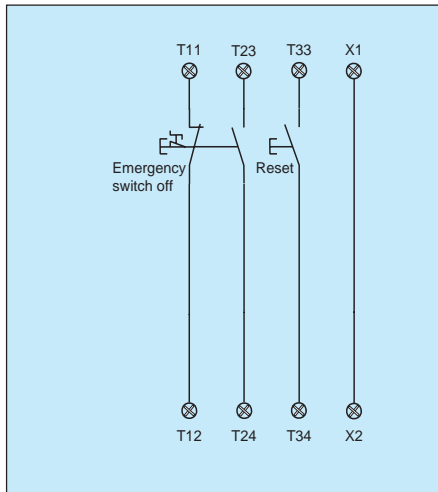
Dual-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

Cross-shorts in the emergency stop circuits are detected.

With external reset button.

Safety category 3 in accordance with EN 954-1.



Wiring example: Input level

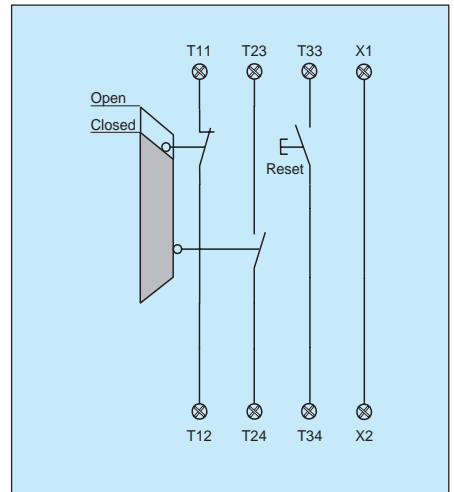
Dual-channel door monitoring according to EN 1088, one limit switch with positive opening contact.

Wire breakage and earth leakage in the door monitoring circuits are detected.

Cross-shorts in the door monitoring circuits are detected.

With external reset button for increased safety requirements.

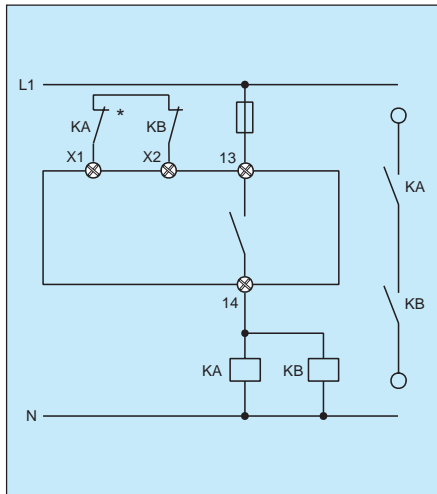
Safety category 3 in accordance with EN 954-1.



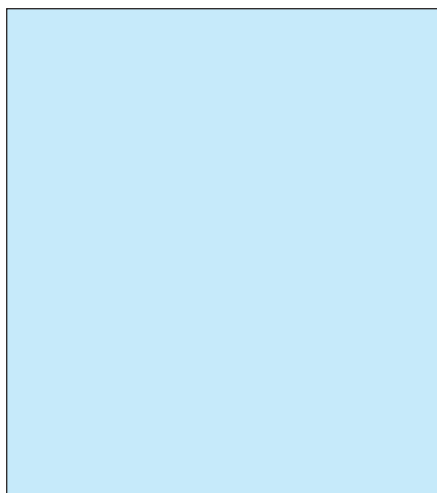
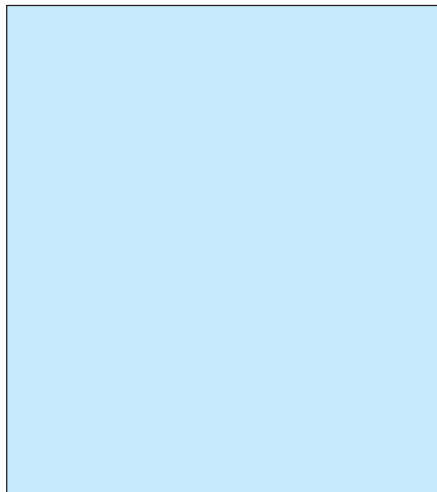
**Wiring example:
Power level**

Single-channel output

Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.



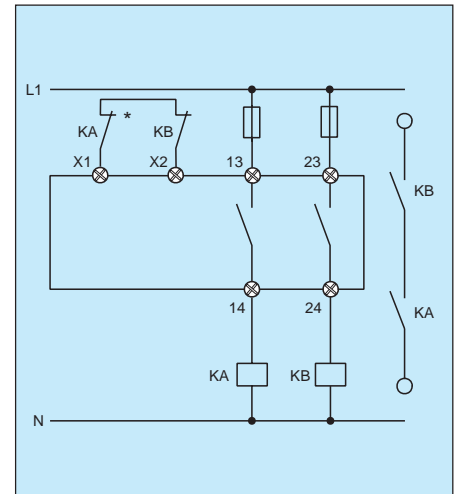
* Feedback loop



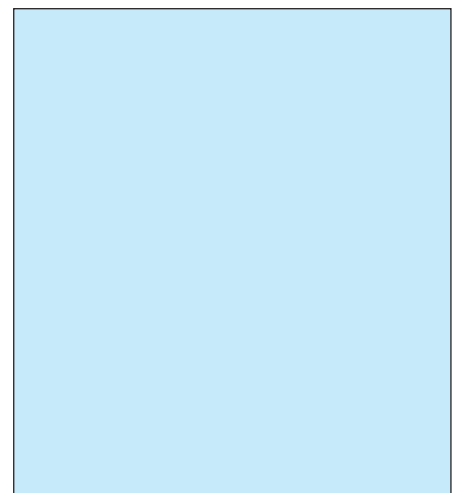
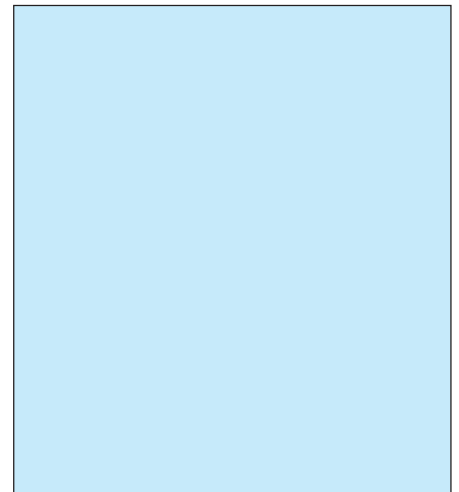
**Wiring example:
Power level**

Dual-channel output

Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.

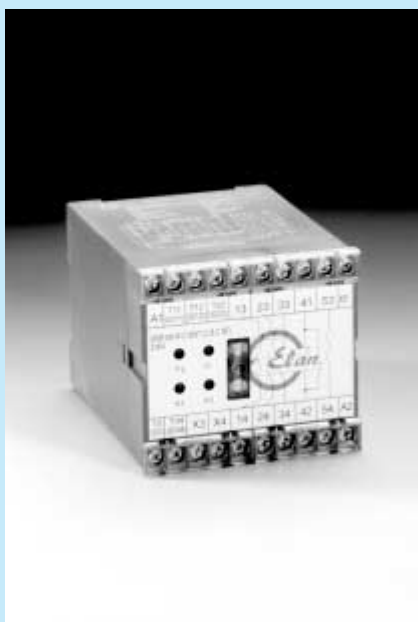


* Feedback loop



SRB modules 90 mm wide, standard version

- ✦ 3 enabling outputs and 1 monitoring output
- ✦ max. load current: 6 Ampere
- ✦ max. safety category: 4
- ✦ 1- or 2-channel triggering
- ✦ Trailing edge function selectable
- ✦ Semiconductor monitoring outputs selectable
- ✦ Initial start test selectable
- ✦ 24 VDC/VAC version
- ✦ Approvals: BG, CSA, UL



Type	Options																		
	Enabling outputs STOP cat. 0	Enabling outputs STOP cat. 1	⇒ max. load current (A)	Auxiliary NC/NO outputs	⇒ max. load current (A)	max. safety category	Time window ∞	Cross-short recognition	Single-channel 1/2	Trailing edge triggering	External powered	Initial start test	24 VDC/VAC	48 VAC	115 VAC	230 VAC	BG approval	CSA approval	UL approval
SRB-NA-R-C.8/97	3	6	1/1	2	4	+	●	●	●	●	●	●	✓	✓	✓	✓	✓	✓	refer to page 112

✦ = fixed; ● = selectable; ● = selectable feature; ✓ = approved

SRB-NA-R-C.8/97

Safety relay array for emergency stop devices, interlocking devices and others

- ☞ 3 enabling outputs and 2 monitoring outputs
- ☞ Selectable extras:
 - Trailing edge function
 - Auto reset

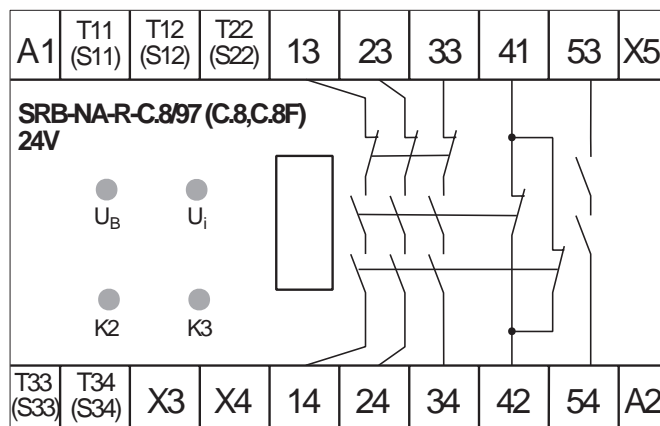
Features

- Relay output: 3 NO, 2 NO/NC (Auxiliary NO/NC for monitoring must not be used in safety enabling circuits!)
- Reset, feedback loop
- Input for emergency stop or door monitoring
- LED's for K1, K2, U_B und U_i
- Housing 90 mm, made of thermoplastic in accordance with UL-94-V-0, red RAL 3000
- DIN rail mounting DIN EN 50 022

Approvals



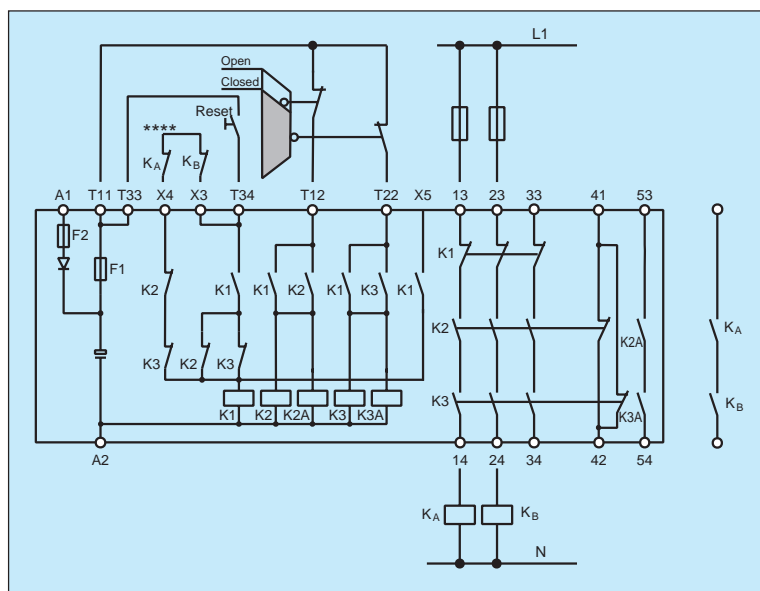
Front view



Product range

Type	Enabling outputs	Operating voltage	Part no.
SRB-NA-R-C.8/97-24V	3 NO/1 NC/1 NO	24 VDC/VAC	600 0040

Wiring diagram



Example for dual channel door monitoring using two limit switches (one with positive opening contacts) and external reset button.

Dual-channel output, suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.

**** = Feedback loop

Wire breakage and earth leakage in the monitoring circuits are detected.

For further examples refer to page 114/115

Model specific Technical data

(refer to page 157 for general data)

Operating voltage	24 VDC -15%/+20%, residual ripple max. 10% 24 VAC -15%/+6%
Frequency	50/60 Hz (for AC operating)
Fuse (power supply)	F2: M 0.25 A/250 V (internal F1: M 0.5 A/250 V)
Power consumption	max. 2.4 W, 4.6 VA
Switching capacity (enabling contacts)	230 VAC, 6 A ohmic (inductive with suitable suppression)
Fuse (enabling contacts)	6 A slow blowing
Switching capacity (monitoring contacts)	max. 24 VDC/2 A ohmic (inductive with suitable suppression)
Fuse (monitoring contacts)	2 A slow blowing
Application category	AC 15/DC 13, DIN VDE 0660 Part 200
Pick-up delay	≤ 200 ms
Drop-out delay	≤ 20 ms
Contact material / contacts	AgSnO, self cleaning, positively driven
Contact resistance	max. 100 mOhm when new
Air and creeping distances	DIN VDE 0110-1 (04.97), 4 kV/2
Connections	Self lifting screw terminals min. 0.6 qmm, max. 2.5 qmm
Dimensions	H/W/D 83 mm/90 mm/127 mm
Weight	500 g
Ambient operating temperature	-25 °C ... +45 °C (derating curve page 157)
Mechanical life	10 ⁷ switching cycles
Terminal labeling	DIN EN 50 005/DIN 50 013

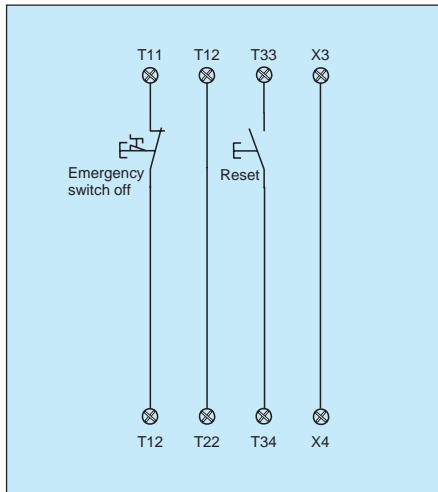
Wiring example: Input level

Single-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

With external reset button.

Safety category 2 in accordance with EN 954-1.



Wiring example: Input level

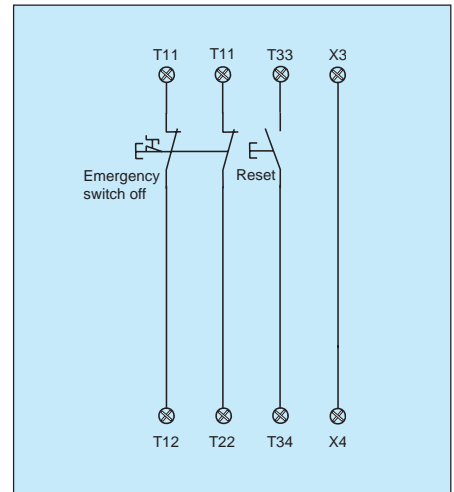
Dual-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

Cross-shorts in the emergency stop circuits are **not detected**.

With external reset button.

Safety category 3 in accordance with EN 954-1.



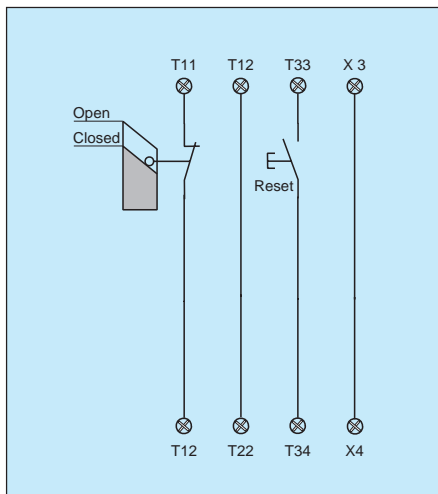
Wiring example: Input level

Single-channel door monitoring according to EN 1088 limit switch with positive opening contact.

Wire breakage and earth leakage in the door monitoring circuits are detected.

With external reset button for increased safety requirements.

Safety category 2 in accordance with EN 954-1.



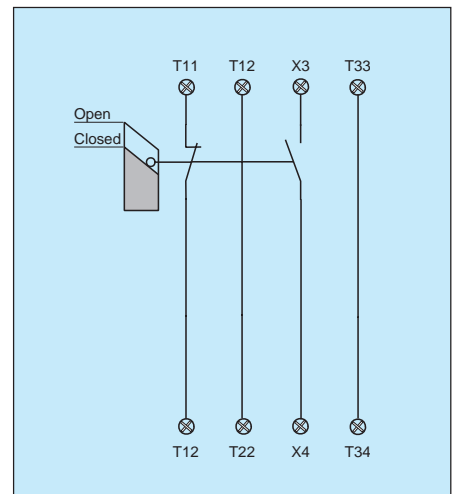
Wiring example: Input level

Dual-channel door monitoring according to EN 1088, one limit switch with positive opening contact.

Wire breakage and earth leakage in the door monitoring circuits are detected.

WARNING: Auto reset after closing door.

Safety category 2 in accordance with EN 954-1.



Wiring example: Input level

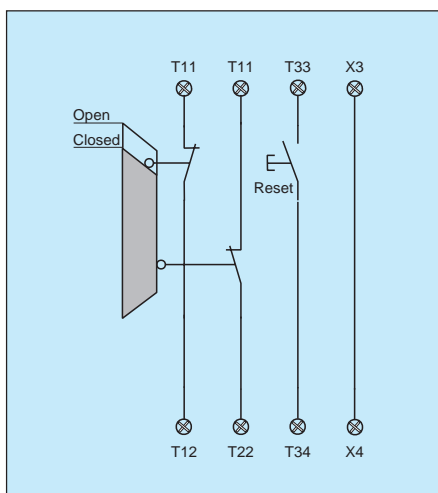
Dual-channel door monitoring according to EN 1088, one limit switch with positive opening contact.

Wire breakage and earth leakage in the door monitoring circuits are detected.

Cross-shorts in the emergency stop circuits are **not detected**.

With external reset button for increased safety requirements.

Safety category 3 or 4 in accordance with EN 954-1.



Wiring example: Input level

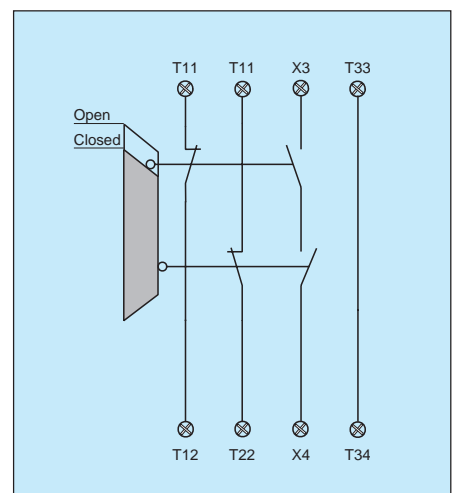
Dual-channel door monitoring according to EN 1088, one limit switch with positive opening contact and automatic initial start test.

Wire breakage and earth leakage in the door monitoring circuits are detected.

Cross-shorts in the emergency stop circuits are **not detected**.

WARNING: Auto reset after closing door.

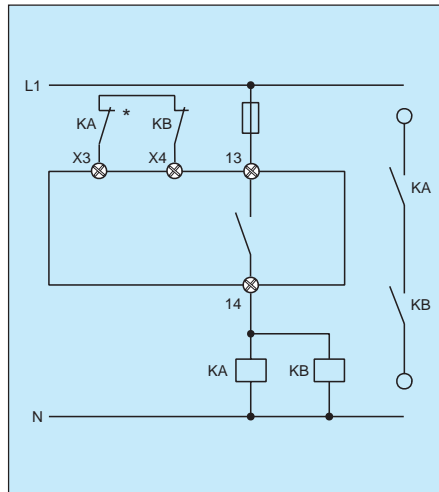
Safety category 3 or 4 in accordance with EN 954-1.



**Wiring example:
Power level**

Single-channel output

Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.

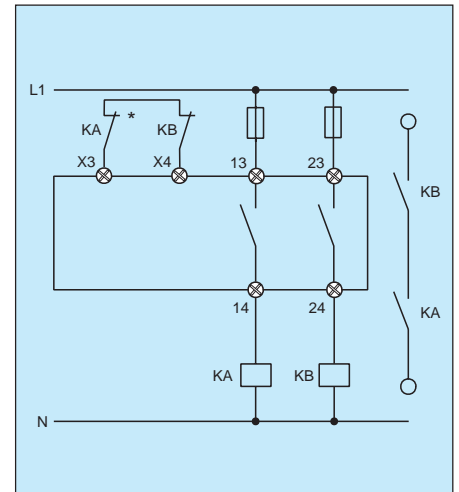


* Feedback loop

**Wiring example:
Power level**

Dual-channel output

Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.

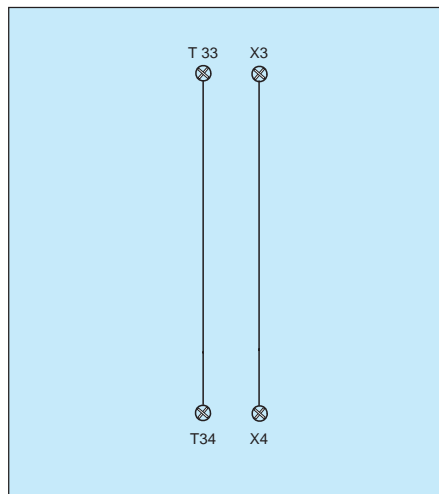


* Feedback loop

Advice:

Time window infinite between channel 1 and channel 2 via jumper between X3/X4 and T33/T34.

For external reset connect reset button to X3/X4.

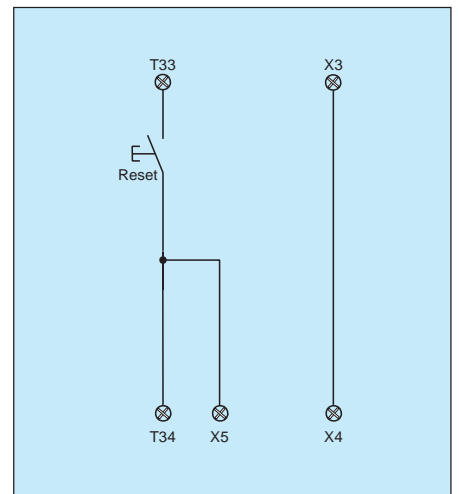


**Wiring example:
Input level**

Start with trailing edge function.

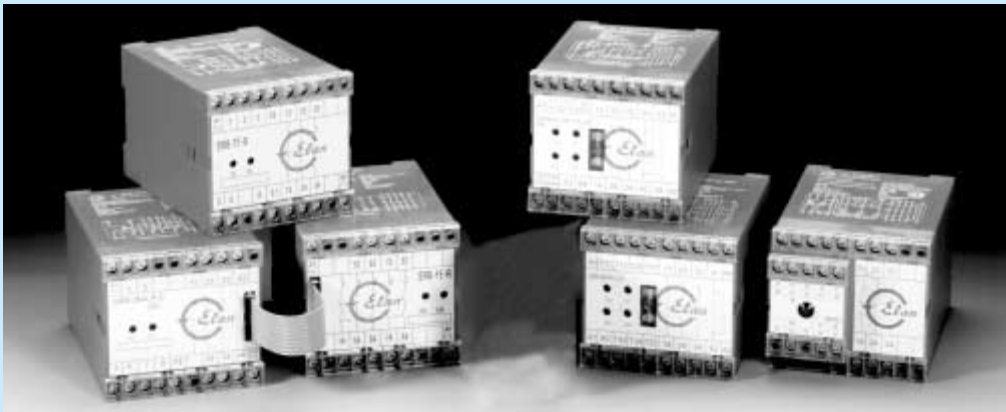
Module is activated after release of the reset button.

This prevents tampering of the reset button which could lead to an automatic reset.



SRB modules 90 mm wide, special versions

- Distinct restart
- Monitored contact multiplication
- 2-voltage version
- With separate output to operate solenoids
- max. 3 enabling outputs and 1 monitoring output
- max. 8 enabling outputs
- max. load current: 6 Ampere
- max. safety category: 4
- 1- or 2-channel triggering
- Trailing edge function selectable
- Semiconductor monitoring outputs selectable
- Initial start test selectable
- 24 VDC/VAC, 48 VAC, 115 VAC and 230 VAC versions
- Approvals: BG, CSA, UL



Type	Options													refer to page						
	3	6	1	2	4	➔ max. load current (A)	➔ max. load current (A)	Time window ∞	Cross-short recognition	Single-channel triggering	Trailing edge function	External powered inputs	Initial start test		24 VDC/VAC	48 VAC	115 VAC	230 VAC	BG approval	CSA approval
SRB-NA-R-C.25	3	6	1	2	4	●	●	+	●	●	●	●	●	●	●	●	✓	✓	✓	refer to page 118
Special feature(s): distinct restart, refer to page 158																				
SRB-2NA-R-E	3	6			4	+	●		●	●	+	+	+	+	+	+	✓		✓	refer to page 122
SRB-FE-R	5	6				+					+	+	+	+	+	+	✓		✓	refer to page 126
Special feature(s): monitored contact multiplication (using ribbon cable) , refer to page 160																				
SRB-QS.1/QS.2	3	6	1/1	2	4	+	+		●	●	●	+		+	+	+	✓	✓	✓	refer to page 130
Special feature(s): 2-voltage-version: selectable 24 VDC/115 VAC or 24 VDC/230 VAC																				
SRB-TF-R	3	6	1		4	+		●	●	●	●	+	+	+	+	+	✓		✓	refer to page 134
SRB-TM-R	3	6	1		4	+		●	●	●	●	+	+	+	+	+	✓	✓	✓	refer to page 138
Special feature(s): With separat output to operate solenoids, refer to page 161																				

➔ = fixed; ● = selectable; ● = selectable feature; ✓ = in preparation; ✓ = approved

SRB-NA-R-C.25

Safety relay array for emergency stop devices, interlocking devices and others

- ☞ Distinct restart
- ☞ 3 safety enabling outputs and 1 monitoring output
- ☞ Selectable extra:
 - Cross-short recognition

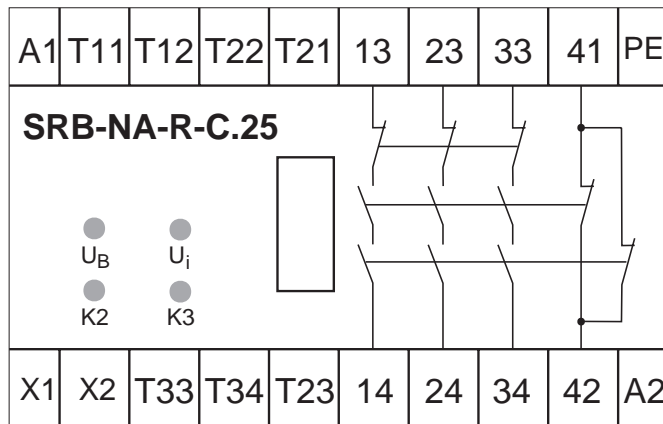
Features

- Relay output: 3 NO, 1 NC (Auxiliary NC for monitoring must not be used in safety enabling circuits!)
- Reset, feedback loop
- Input for emergency stop or door monitoring
- LED's for K2, K3, U_B und U_i
- Housing 90 mm, made of thermoplastic in accordance with UL-94-V-0, red RAL 3000
- DIN rail mounting DIN EN 50 022

Approvals



Front view

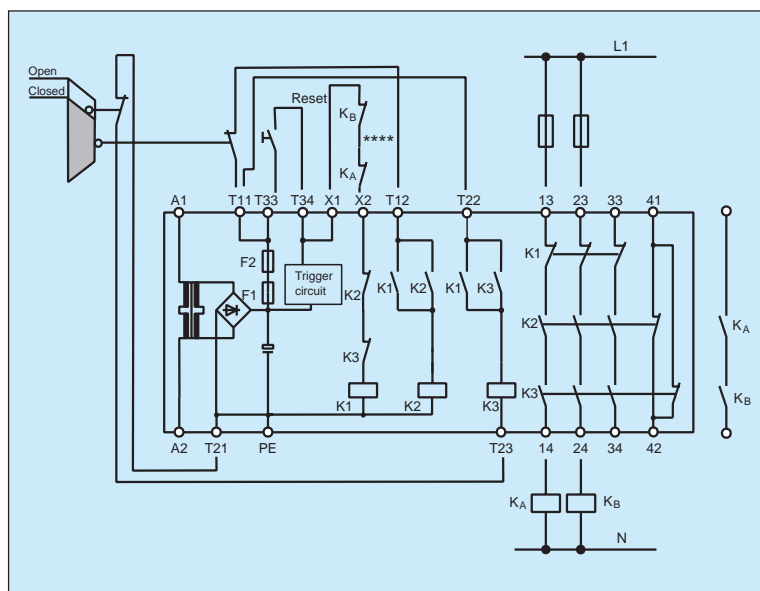


Product range

Type	Enabling outputs	Operating voltage	Part no.
SRB-NA-R-C.25-24V	3 NO/1 NC	24 VDC/VAC	600 0092
SRB-NA-R-C.25-115VAC	3 NO/1 NC	115 VAC	On request
SRB-NA-R-C.25-230VAC	3 NO/1 NC	230 VAC	On request

SRB-NA-R-C.25 (continued)

Wiring diagram



Example for dual-channel door monitoring using two limit switches (one with positive opening contacts) and external reset button.

Dual-channel output, suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.

**** = Feedback loop

Wire breakage and earth leakage in the monitoring circuits are detected.

For further examples refer to page 120/121

Model specific Technical data

(refer to page 157 for general data)

Operating voltage	24 VDC $-15\%/+20\%$, residual ripple max. 10% 24 VAC, 115 VAC, 230 VAC $-15\%/+6\%$
Frequency	50/60 Hz (for AC operating)
Fuse (power supply)	F2: T 0.25 A/250 V (internal F1: T 0.5 A/250 V)
Power consumption	max. 2.4 W, 4.6 VA
Switching capacity (enabling contacts)	230 VAC, 6 A ohmic (inductive with suitable suppression)
Fuse (enabling contacts)	6 A slow blowing
Switching capacity (monitoring contacts)	24 VDC, 2 A
Fuse (monitoring contacts)	2 A slow blowing
Application category	AC 15/DC 13, DIN VDE 0660 Part 200
Pick-up delay	≤ 200 ms (Start button), < 450 ms (Auto-Start)
Drop-out delay	≤ 20 ms
Contact material / contacts	AgSnO, self cleaning, positively driven
Contact resistance	max. 100 mOhm when new
Air and creeping distances	DIN VDE 0110-1 (04.97), 4 kV/2
Connections	Self lifting screw terminals min. 0.5 qmm, max. 2.5 qmm
Dimensions	H/W/D 83 mm/90 mm/127 mm
Weight	450 g (600 g at 230 V and 115 V version)
Ambient operating temperature	-25 °C ... $+45$ °C (derating curve page 157)
Mechanical life	10^7 switching cycles
Terminal labeling	DIN EN 50 005/DIN 50 013

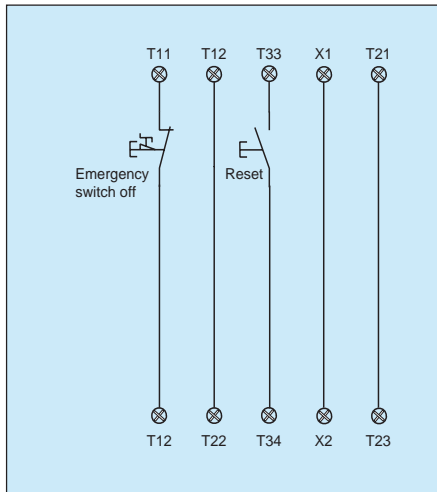
Wiring example: Input level

Single-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

With external reset button.

Safety category 2 in accordance with EN 954-1.



Wiring example: Input level

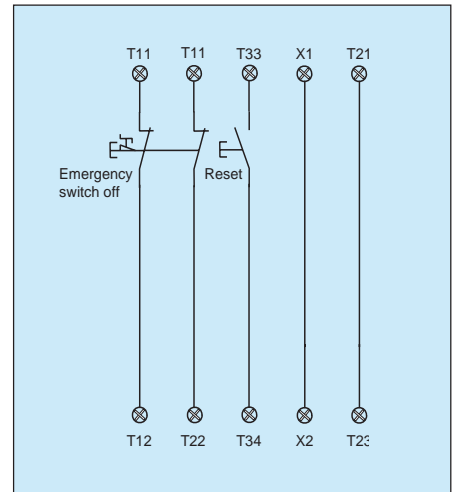
Dual-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

Cross-shorts in the emergency stop circuits are **not detected**.

With external reset button.

Safety category 3 or 4 in accordance with EN 954-1.



Wiring example: Input level

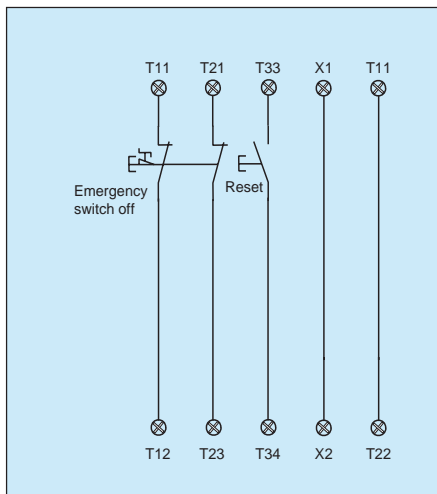
Dual-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

Cross-shorts in the emergency stop circuits are detected.

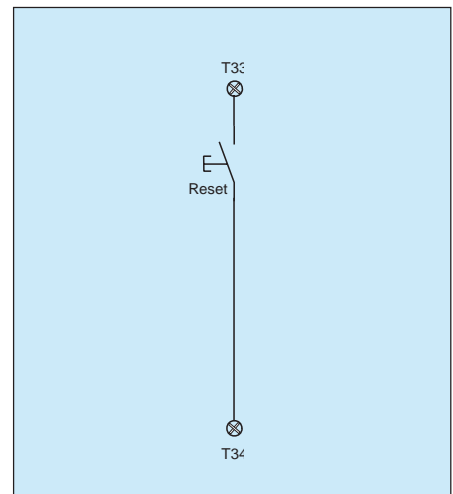
With external reset button.

Safety category 3 or 4 in accordance with EN 954-1.



Advice:

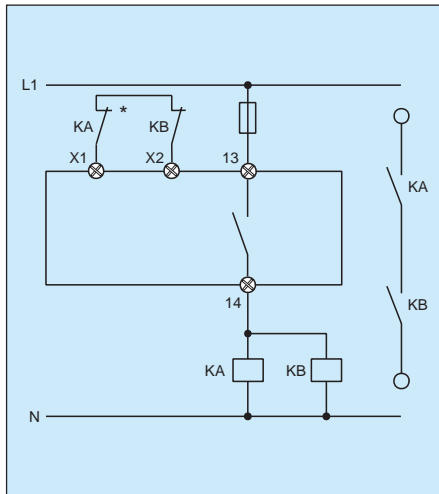
This module is equipped with a particular restart circuit. Automatic restart is provided after a previous power down situation, whilst a restart after operating a protective device needs an extra restart signal.



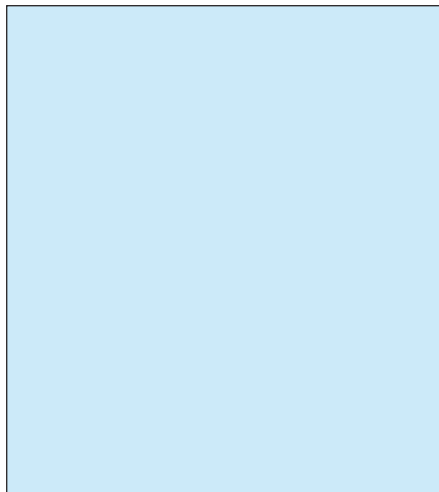
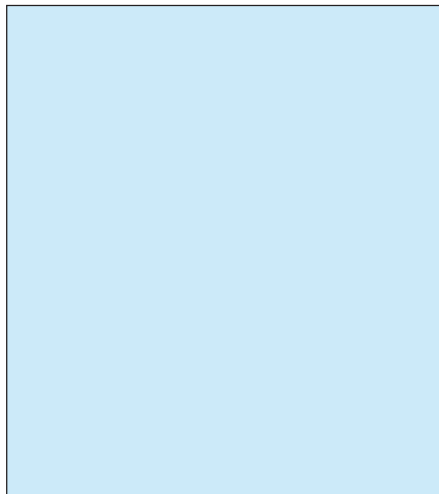
**Wiring example:
Power level**

Single-channel output

Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.



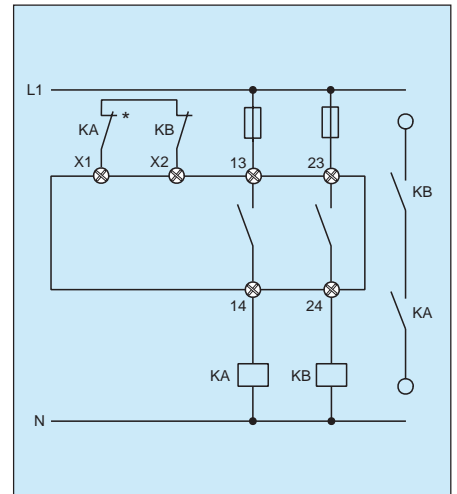
* Feedback loop



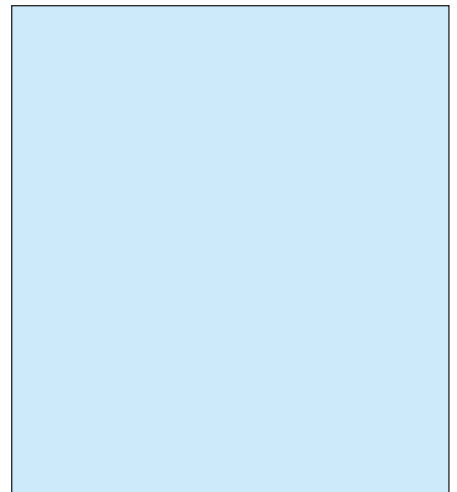
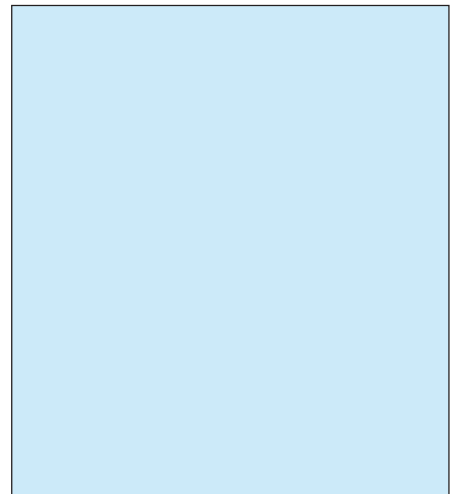
**Wiring example:
Power level**

Dual-channel output

Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.



* Feedback loop



SRB-2NA-R-E

Safety relay array for emergency stop devices, interlocking devices and others

- ➡ Monitored contact multiplication
- ➡ 3 safety enabling outputs
- ➡ 8 safety enabling outputs with extension module SRB-FE-R

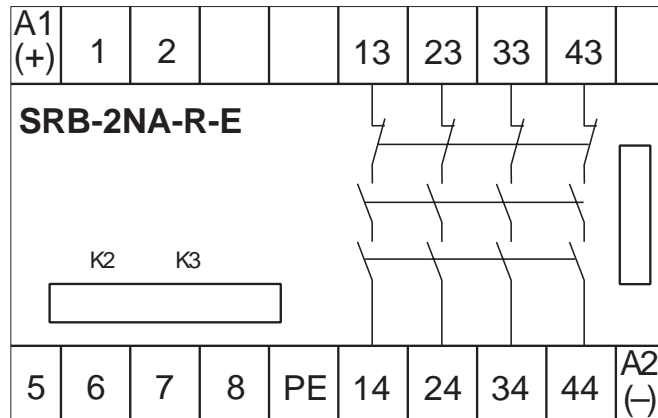
Features

- Relay output: 3 NO
- LED's for K2, K3
- DIN rail mounting
DIN EN 50 022
- Reset, feedback loop
- Housing 90 mm, made of thermoplastic in accordance with UL-94-V-0, red RAL 3000
- Input for emergency stop or door monitoring

Approvals



Front view

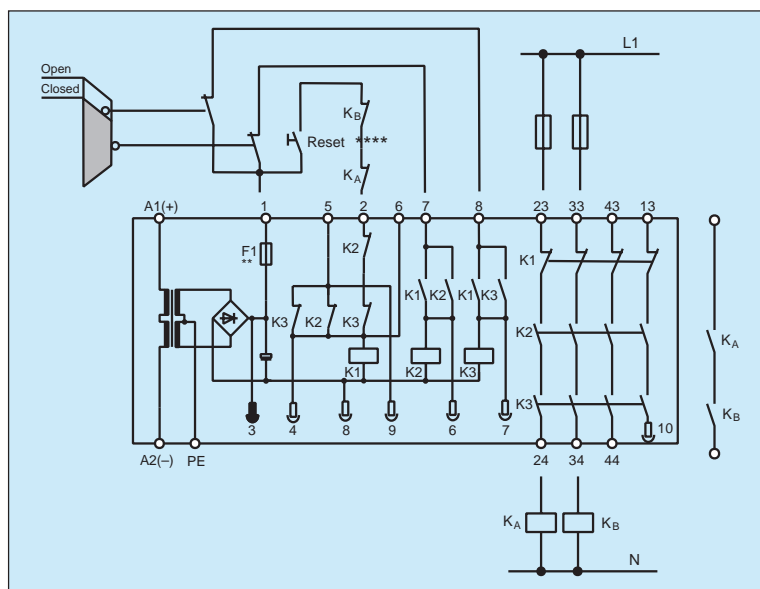


Product range

Type	Enabling outputs	Operating voltage	Part no.
SRB-2NA-R-E-24V	3 NO	24 VDC/VAC	600 0105
SRB-2NA-R-E-115VAC	3 NO	115 VAC	600 0173
SRB-2NA-R-E-230VAC	3 NO	230 VAC	600 0175

SRB-2NA-R-E (continued)

Wiring diagram



Example for dual-channel door monitoring using two limit switches (one with positive opening contacts) and external reset button.

Dual-channel output, suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.

**** = Feedback loop

Wire breakage and earth leakage in the monitoring circuits are detected.

For further examples refer to page 124/125

Model specific Technical data

(refer to page 157 for general data)

Operating voltage	24 VDC $-15\%/+20\%$, residual ripple max. 10% 24 VAC, 115 VAC, 230 VAC $-15\%/+6\%$
Frequency	50/60 Hz (for AC operating)
Fuse (power supply)	M 0.25 A/250 V (internal M 0.5 A/250 V)
Power consumption	max. 2.4 W, 4.6 VA
Switching capacity (enabling contacts)	230 VAC, ohmic (inductive with suitable suppression)
Fuse (enabling contacts)	6 A slow blowing
Switching capacity (monitoring contacts)	13/14 24 VDC/2 A (only together with SRB-FE-R)
Fuse (monitoring contacts)	13/14 2 low blowing
Application category	AC 15/DC 13, DIN VDE 0660 Part 200
Pick-up delay	≤ 200 ms
Drop-out delay	≤ 20 ms
Contact material / contacts	AgSnO, self cleaning, positively driven
Contact resistance	max. 100 mOhm when new
Air and creeping distances	DIN VDE 0110-1 (04.97), 4 kV/2
Connections	Self lifting screw terminals min. 0.5 qmm, max. 2.5 qmm
Dimensions	H/W/D 83 mm/90 mm/127 mm
Weight	600 g (850 g at 230 V and 115 V version)
Ambient operating temperature	-25 °C ... $+45$ °C (derating curve page 157)
Mechanical life	10^7 switching cycles
Terminal labeling	DIN EN 50 005/DIN 50 013

SRB-2NA-R-E (continued)

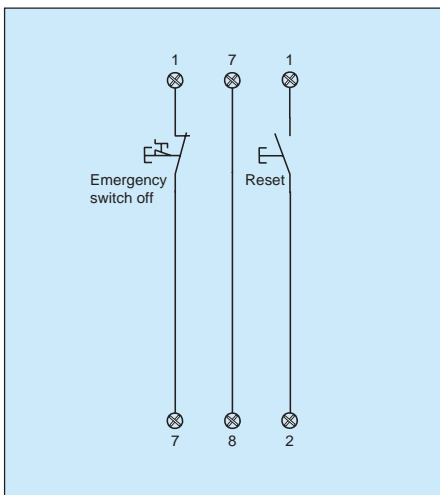
Wiring example: Input level

Single-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

With external reset button.

Safety category 2 in accordance with EN 954-1.



Wiring example: Input level

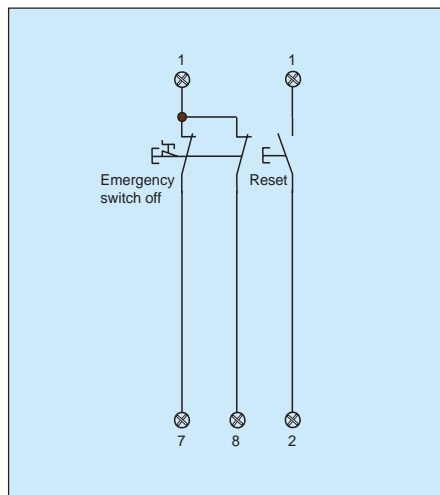
Dual-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

Cross-shorts in the emergency stop circuits are **not detected**.

With external reset button.

Safety category 3 or 4 in accordance with EN 954-1.



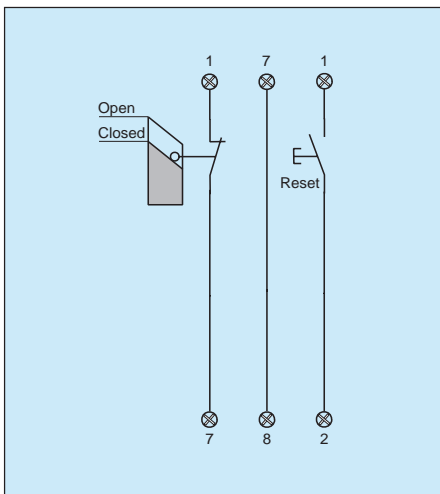
Wiring example: Input level

Single-channel door monitoring according to EN 1088 limit switch with positive opening contact.

Wire breakage and earth leakage in the door monitoring circuits are detected.

With external reset button for increased safety requirements.

Safety category 2 in accordance with EN 954-1.



Wiring example: Input level

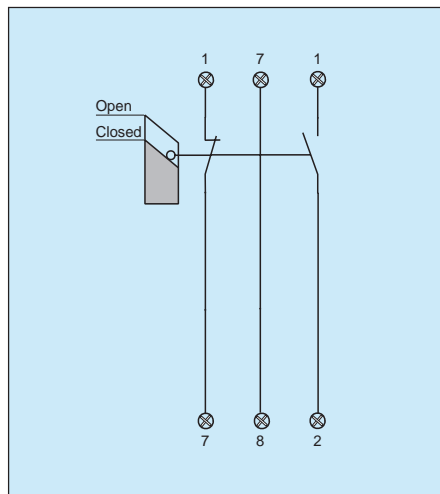
Single-channel door monitoring according to EN 1088 limit switch with positive opening contact and automatic initial start test.

Wire breakage and earth leakage in the door monitoring circuits are detected.

WARNING: Auto reset after closing door.

With external reset button.

Safety category 2 in accordance with EN 954-1.



Wiring example: Input level

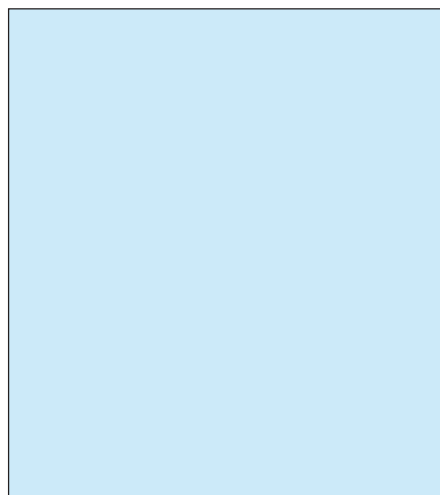
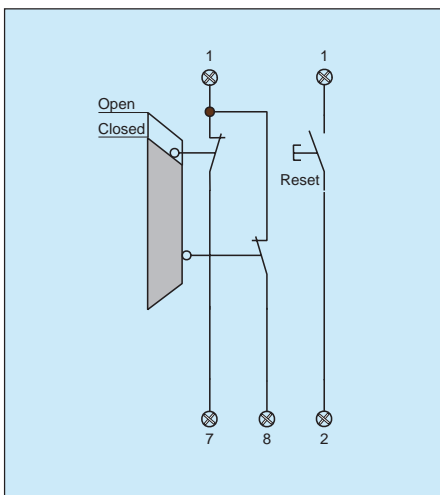
Dual-channel door monitoring according to EN 1088, one limit switch with positive opening contact.

Wire breakage and earth leakage in the door monitoring circuits are detected.

Cross-shorts in the door monitoring circuits are **not detected**.

With external reset button for increased safety requirements.

Safety category 3 or 4 in accordance with EN 954-1.



SRB-2NA-R-E (continued)

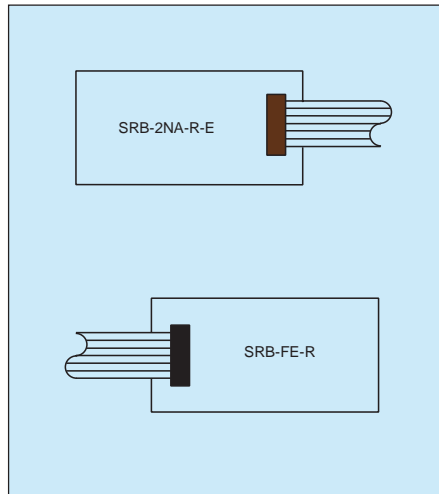
Advice:

Module can be used as a basic safety relay module or as a combination module with the extension module SRB-FE-R.

The contact multiplication must be done via a ribbon cable.

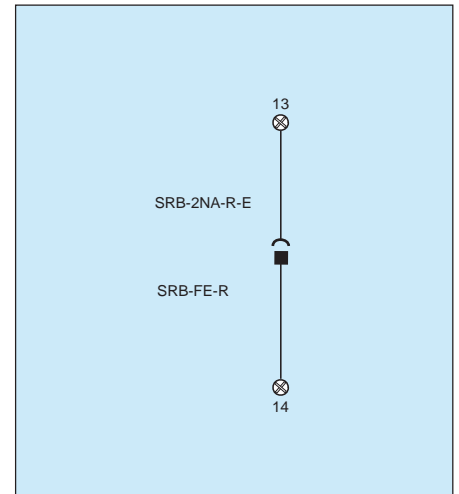
The end connector of the base module will be exchanged in this case with the ribbon cable.

The safety enabling output 13/14 can only be used in combination with the extension module.



Advice:

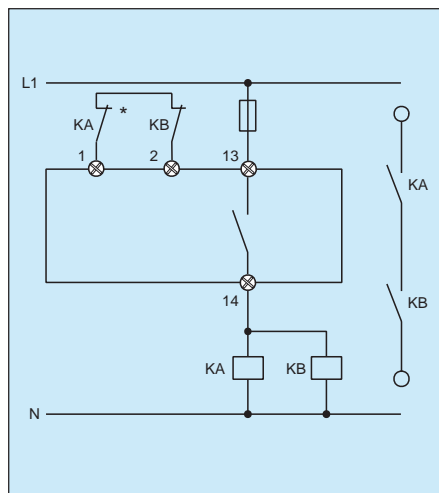
The max. load of safety enabling output 13/14 is limited to 2 A/24 VDC, due to technical reasons of the ribbon cable. Refer to technical data.



**Wiring example:
Power level**

Single-channel output

Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.

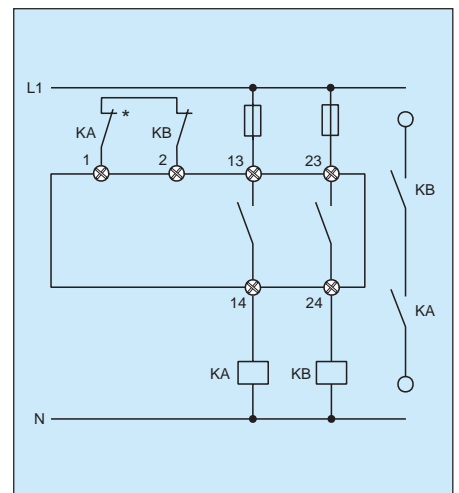


* Reset button wired in series to feedback loop.

**Wiring example:
Power level**

Dual-channel output

Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.



* Reset button wired in series to feedback loop.

SRB-FE-R

Safety relay array for emergency stop devices, interlocking devices and others

➔ 8 safety enabling outputs with basic module SRB-2NA-R-E

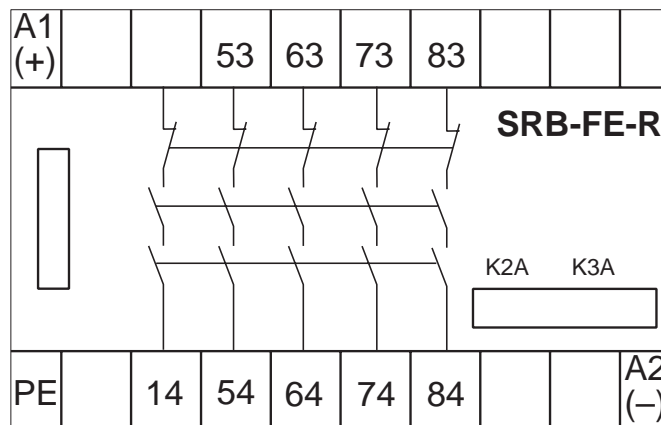
Features

- Relay output: 5 NO
 - Input for emergency stop or door monitoring
- LED's for K2A, K3A
 - Housing 90 mm, made of thermoplastic in accordance with UL-94-V-0, red RAL 3000
- DIN rail mounting
DIN EN 50 022

Approvals



Front view

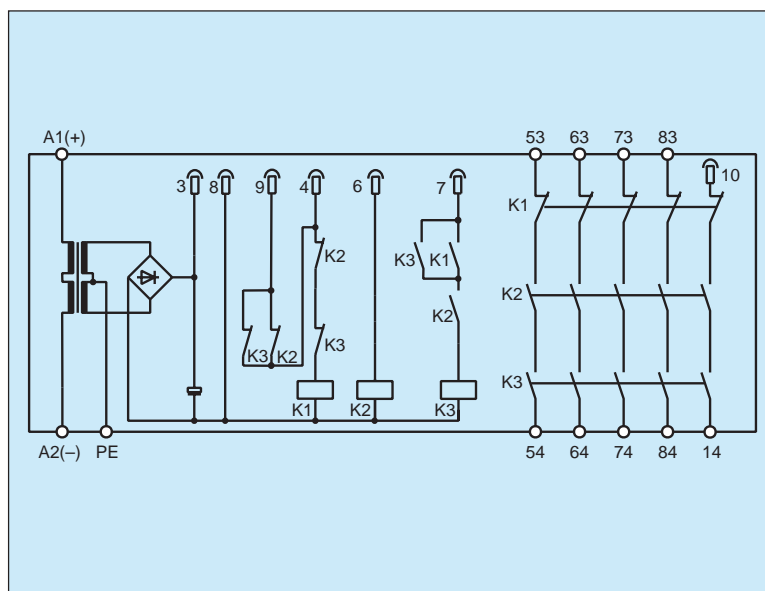


Product range

Type	Enabling outputs	Operating voltage	Part no.
SRB-FE-R-24V	5 NO	24 VDC/VAC	600 0500
SRB-FE-R-230VAC	5 NO	230 VAC	600 0570

SRB-FE-R (continued)

Wiring diagram



???

For further examples refer to page 128/129

Model specific Technical data

(refer to page 157 for general data)

Operating voltage	24 VDC -15%/+20%, residual ripple max. 10% 24 VAC, 230 VAC -15%/+6%
Frequency	50/60 Hz (for AC operating)
Fuse (power supply)	M 0.25 A/250 V (internal M 0.5 A/250 V)
Power consumption	max. 1.2 VA
Switching capacity (enabling contacts)	230 VAC, 6 A ohmic (inductive with suitable suppression)
Fuse (enabling contacts)	6 A slow blowing
Switching capacity (monitoring contacts)	13/14 24 VDC, 2 A (only together with SRB-2NA-R-E)
Fuse (monitoring contacts)	13/14 2 A slow blowing
Application category	AC 15/DC 13, DIN VDE 0660 Part 200
Pick-up delay	≤ 200 ms
Drop-out delay	≤ 20 ms
Contact material / contacts	AgSnO, self cleaning, positively driven
Contact resistance	max. 100 mOhm when new
Air and creeping distances	DIN VDE 0110-1 (04.97), 4 kV/2
Connections	Self lifting screw terminals min. 0.5 qmm, max. 2.5 qmm
Dimensions	H/W/D 83 mm/90 mm/127 mm
Weight	710 g (850 g at 230 V version)
Ambient operating temperature	-25 °C ... +45 °C (derating curve page 157)
Mechanical life	10 ⁷ switching cycles
Terminal labeling	DIN EN 50 005/DIN 50 013

SRB-FE-R (continued)

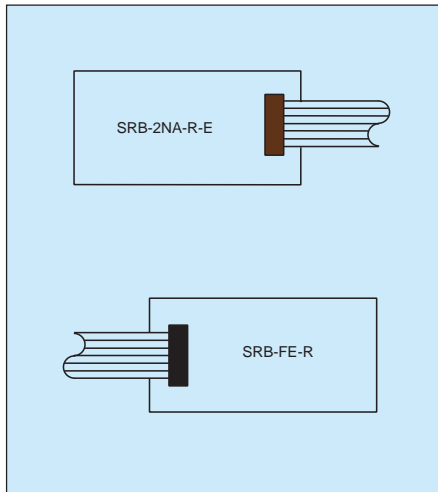
Advice:

Module SRB-2NA-R-E can be used as a basic safety relay module or as a combination module with the extension module SRB-FE-R.

The contact multiplication must be done via a ribbon cable.

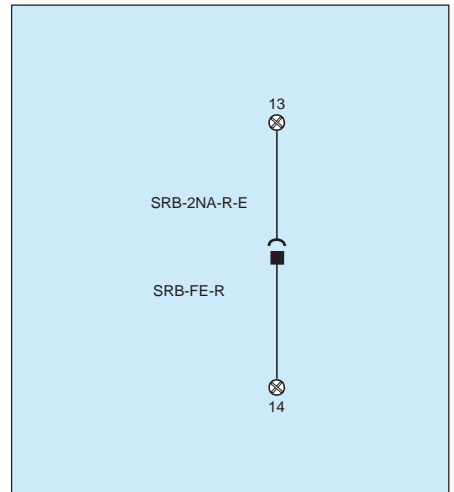
The end connector of the base module will be exchanged in this case with the ribbon cable.

The safety enabling output 13/14 can only be used in combination with the extension module.



Advice:

The max. load of safety enabling output 13/14 is limited to 2 A/24 VDC, due to technical reasons of the ribbon cable. Refer to technical data.



Notes

SRB-QS.1/SRB-QS.2

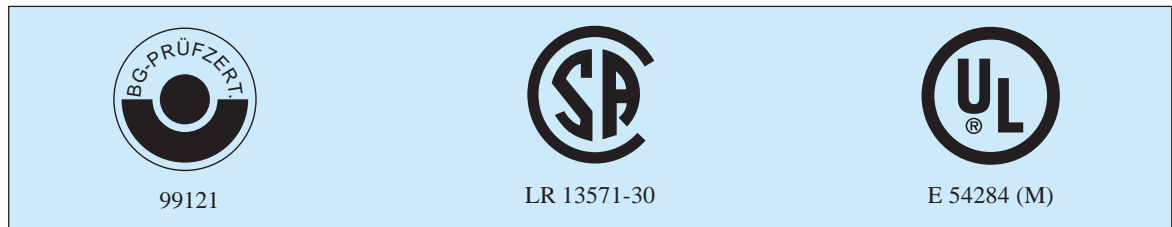
Safety relay array for emergency stop devices, interlocking devices and others

- ➔ 2-voltage version
- ➔ 3 safety enabling outputs and 1 monitoring output
- ➔ Cross-short recognition
- ➔ Wipe contact

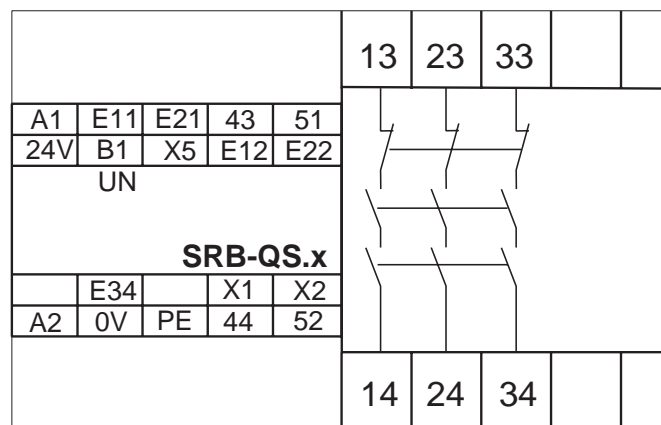
Features

- Relay output: 3 NO, 1 NO, 1 wipe contact
(Auxiliary NC for monitoring must not be used in safety enabling circuits!)
- Reset, feedback loop
- Input for emergency stop or door monitoring
- LED for U_N
- Housing 90 mm, made of thermoplastic in accordance with UL-94-V-0, red RAL 3000
- DIN rail mounting
DIN EN 50 022

Approvals



Front view

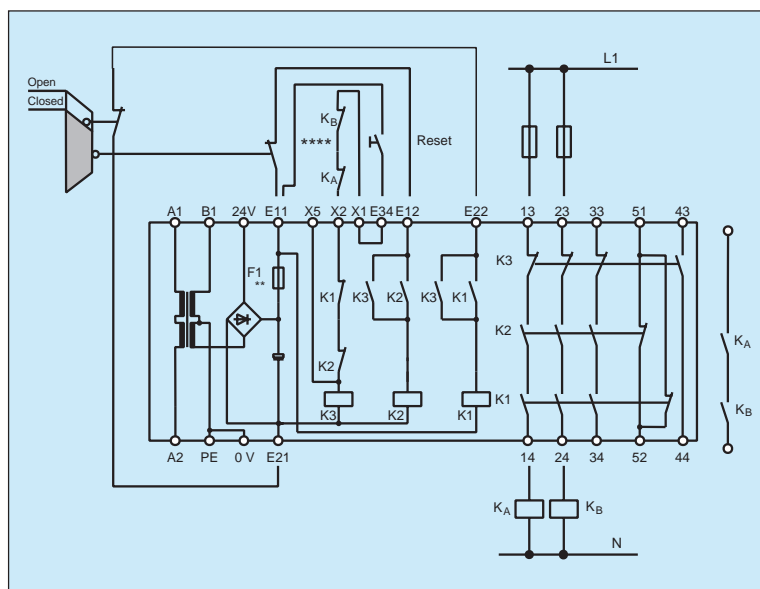


Product range

Type	Enabling outputs	Operating voltage	Part no.
SRB-QS.1	3 NO/1 NO/1 NC	24 VDC/VAC, 115 VAC	600 0590
SRB-QS.2	3 NO/1 NO/1 NC	24 VDC/VAC, 230 VAC	600 0600

SRB-QS.1/SRB-QS.2 (continued)

Wiring diagram



Example for dual-channel door monitoring using two limit switches (one with positive opening contacts) and external reset button.

Dual-channel output, suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.

**** = Feedback loop

Wire breakage and earth leakage in the monitoring circuits are detected.

For further examples refer to page 132/133

Model specific Technical data

(refer to page 157 for general data)

Operating voltage	24 VDC $-15\%/+20\%$, residual ripple max. 10% 115 VAC $-15\%/+6\%$ (SRB-QS.1), 230 VAC $-15\%/+6\%$ (SRB-QS.2)
Frequency	50/60 Hz (for AC operating)
Fuse (power supply)	M 0.25 A/250 V (internal M 0.5 A/250 V)
Power consumption	max. 3.9 VA
Switching capacity (enabling contacts)	230 VAC, 6 A ohmic (inductive with suitable suppression)
Fuse (enabling contacts)	6 A slow blowing
Switching capacity (monitoring contacts)	24 VDC, 2 A ohmic (inductive with suitable suppression)
Fuse (monitoring contacts)	2 A slow blowing
Application category	AC 15/DC 13, DIN VDE 0660 Part 200
Pick-up delay	≤ 200 ms
Drop-out delay	≤ 30 ms
Contact material / contacts	AgCdO self cleaning, positively driven
Contact resistance	max. 100 mOhm when new
Air and creeping distances	DIN VDE 0110-1 (04.97), 4 kV/2
Connections	Self lifting screw terminals min. 0.5 qmm, max. 2.5 qmm
Dimensions	H/W/D 83 mm/90 mm/140 mm
Weight	700 g
Ambient operating temperature	-25 °C ... $+45$ °C (derating curve page 157)
Mechanical life	10^7 switching cycles
Terminal labeling	DIN EN 50 005/DIN 50 013

SRB-QS.1/SRB-QS.2 (continued)

Wiring example: Input level

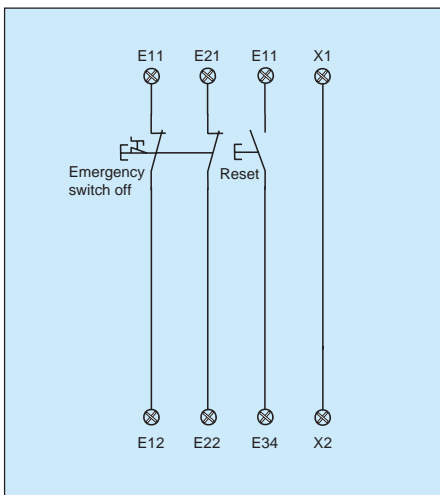
Dual-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

Cross-shorts in the emergency stop circuits are detected.

With external reset button.

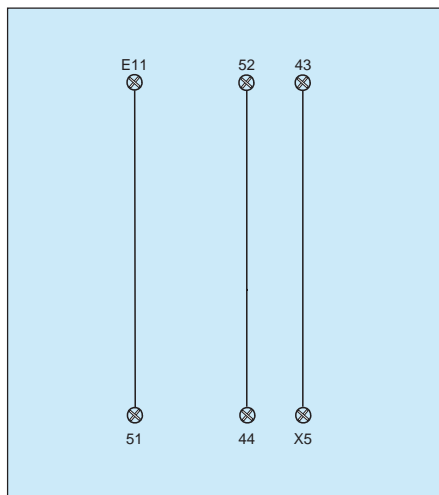
Safety category 3 or 4 in accordance with EN 954-1.



Advice:

Time window between channel 1 and channel 2 infinite.

WARNING: Auto reset after closing door.



Wiring example: Input level

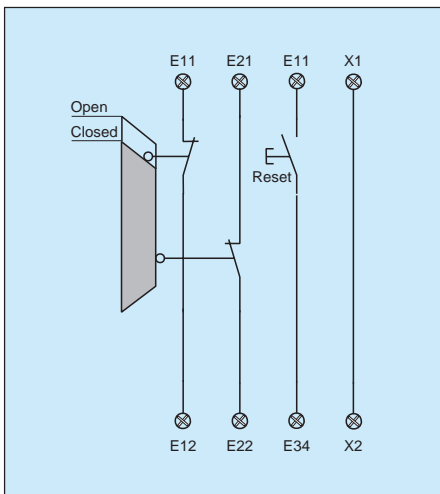
Dual-channel door monitoring according to EN 1088, one limit switch with positive opening contact.

Wire breakage and earth leakage in the door monitoring circuits are detected.

Cross-shorts in the door monitoring circuits are detected.

With external reset button for increased safety requirements.

Safety category 3 or 4 in accordance with EN 954-1.

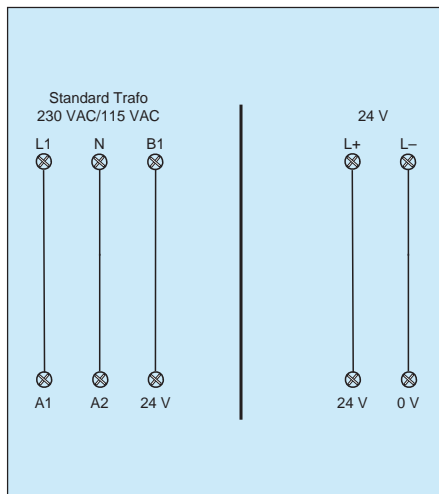


Wiring example: Input level

2-voltage-versions selectable:

115 VAC/24 V: version SRB-QS.1

230 VAC/24 V: version SRB-QS.2

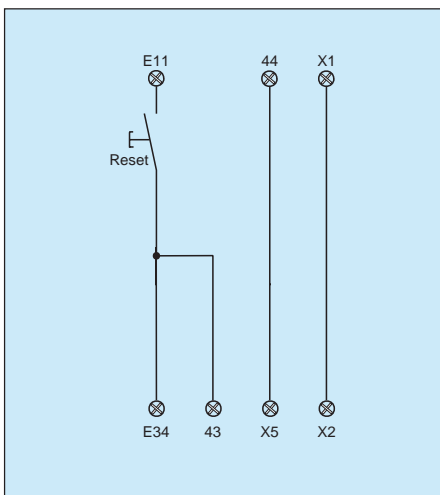


Wiring example: Input level

Start with trailing edge function.

Module is activated after release of the reset button.

This prevents tampering of the reset button which could lead to an automatic reset.



Advice:

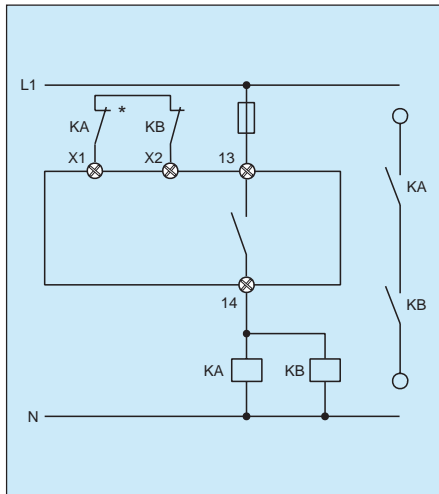
LED (U_N) is only ON if triggering circuits are activated.

SRB-QS.1/SRB-QS.2 (continued)

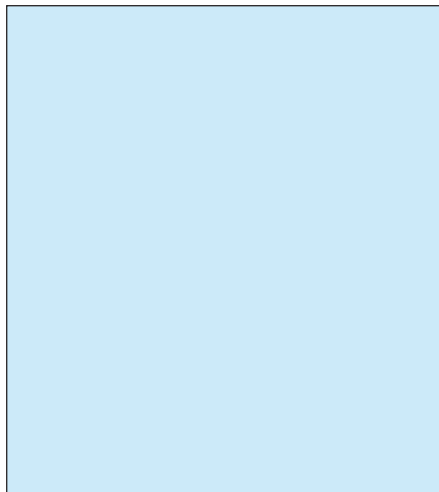
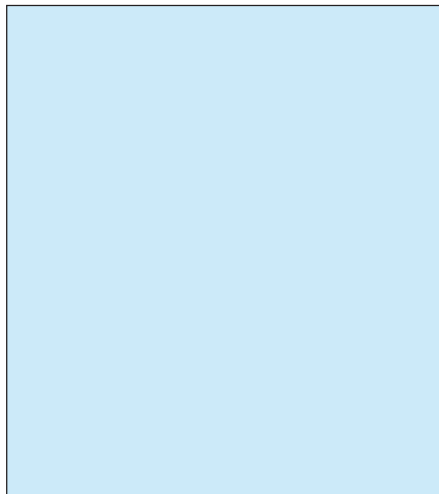
Wiring example: Power level

Single-channel output

Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.



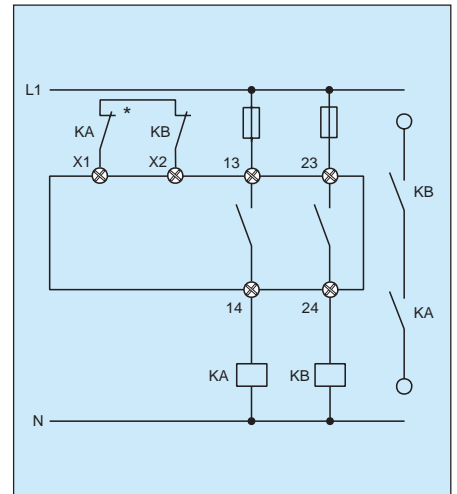
* Feedback loop



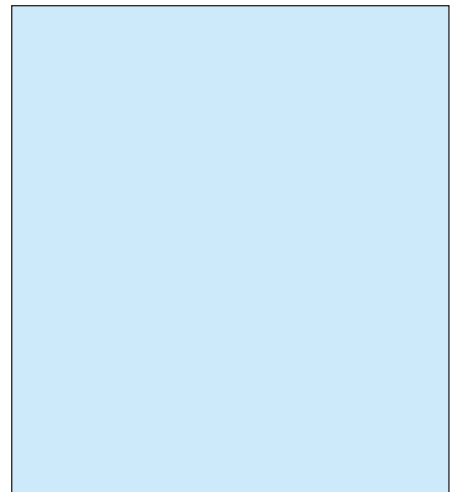
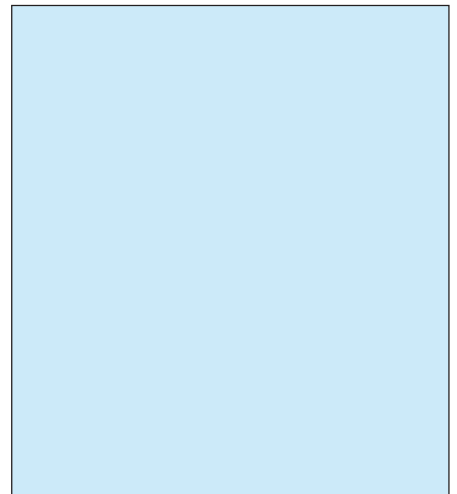
Wiring example: Power level

Dual-channel output

Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.



* Feedback loop



SRB-TF-R

Safety relay array for emergency stop devices, interlocking devices and others

- ➡ With separate output to operate solenoids suitable for spring forced interlocking devices
- ➡ 3 safety enabling outputs

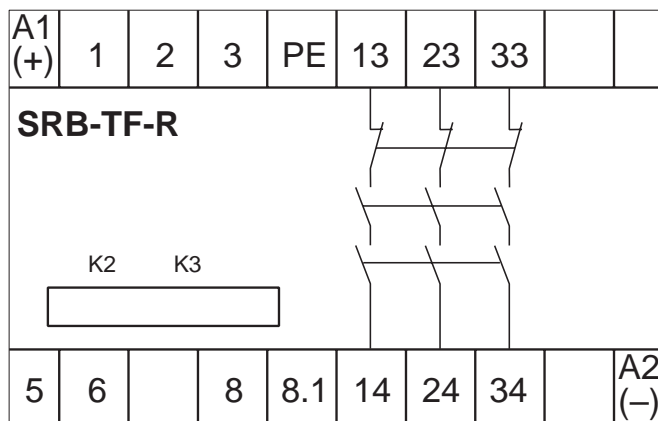
Features

- Relay output: 3 NO
- LED's for K1, K2
- DIN rail mounting DIN EN 50 022
- Reset, feedback loop
- Housing 90 mm, made of thermoplastic in accordance with UL-94-V-0, red RAL 3000
- Input for emergency stop or door monitoring

Approvals



Front view

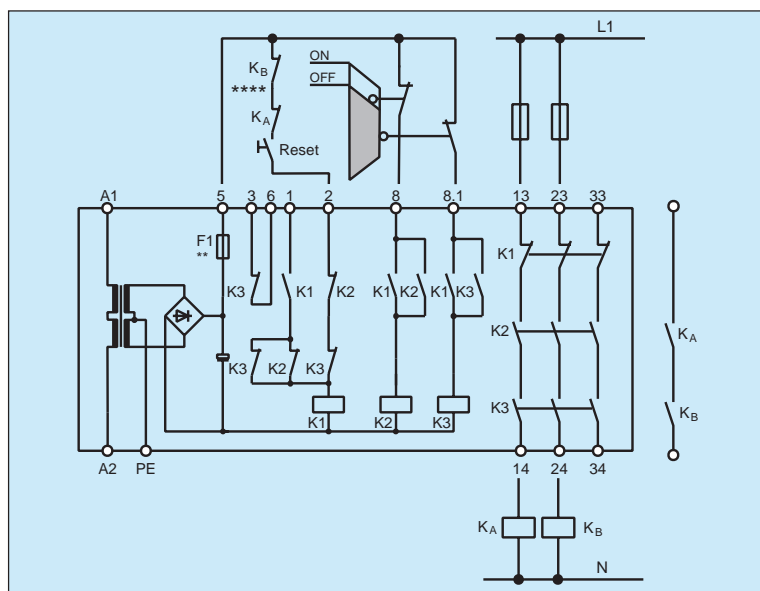


Product range

Type	Enabling outputs	Operating voltage	Part no.
SRB-TF-R-24V	3 NO	24 VDC/VAC	610 0300
SRB-TF-R-115VAC	3 NO	115 VAC	610 0350
SRB-TF-R-230VAC	3 NO	230 VAC	610 0370

SRB-TF-R (continued)

Wiring diagram



Example for dual-channel door monitoring using two limit switches (one with positive opening contacts) and external reset button.

Dual-channel output, suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.

**** = Feedback loop

Wire breakage and earth leakage in the monitoring circuits are detected.

** Fuse M 0.5 A
(an external leading fuse
M 0.25 A is recommended)

For further examples refer to page 136/137

Model specific Technical data

(refer to page 157 for general data)

Operating voltage	24 VDC $-15\%/+20\%$, residual ripple max. 10% 24 VAC, 115 VAC, 230 VAC $-15\%/+6\%$
Frequency	50/60 Hz (for AC operating)
Fuse (power supply)	F2: T 0.25 A/250 V (internal F1: T 0.5 A/250 V)
Power consumption	max. 3.6 VA
Switching capacity (enabling contacts)	230 VAC, 6 A ohmic (inductive with suitable suppression)
Fuse (enabling contacts)	6 A slow blowing
Application category	AC 15/DC 13, DIN VDE 0660 Part 200
Pick-up delay	≤ 200 ms
Drop-out delay	≤ 20 ms
Contact material / contacts	AgCdO, self cleaning, positively driven
Contact resistance	max. 100 mOhm when new
Air and creeping distances	DIN VDE 0110-1 (04.97), 4 kV/2
Connections	Self lifting screw terminals min. 0.5 qmm, max. 2.5 qmm
Dimensions	H/W/D 83 mm/90 mm/127 mm
Weight	580 g (830 g at 230 V and 115 V version)
Ambient operating temperature	-25 °C ... $+45$ °C (derating curve page 157)
Mechanical life	10^7 switching cycles
Terminal labeling	DIN EN 50 005/DIN 50 013

SRB-TF-R (continued)

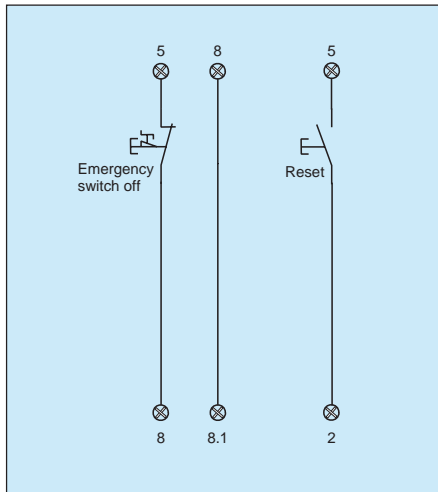
Wiring example: Input level

Single-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

With external reset button.

Safety category 2 in accordance with EN 954-1.



Wiring example: Input level

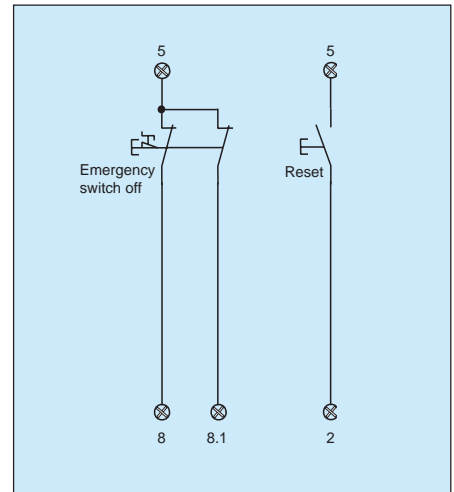
Dual-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

Cross-shorts in the emergency stop circuits are **not detected**.

With external reset button.

Safety category 3 or 4 in accordance with EN 954-1.



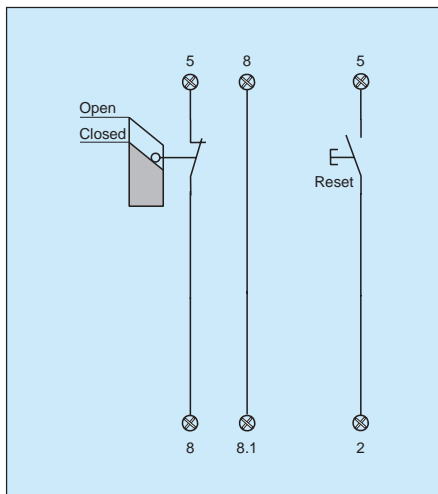
Wiring example: Input level

Single-channel door monitoring according to EN 1088 limit switch with positive opening contact.

Wire breakage and earth leakage in the door monitoring circuits are detected.

With external reset button for increased safety requirements.

Safety category 2 in accordance with EN 954-1.



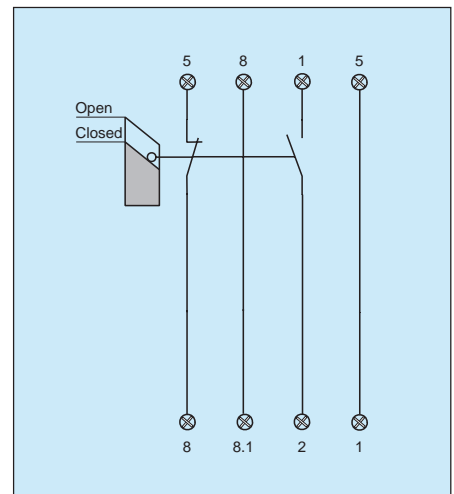
Wiring example: Input level

Single-channel door monitoring according to EN 1088 limit switch with positive opening contact and automatic initial start test.

Wire breakage and earth leakage in the door monitoring circuits are detected.

WARNING: Auto Reset after closing door.

Safety category 2 in accordance with EN 954-1.



Wiring example: Input level

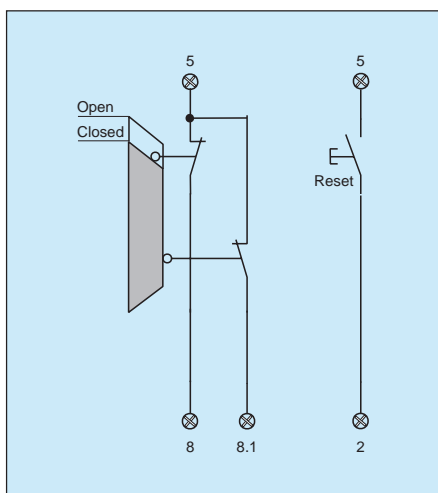
Dual-channel door monitoring according to EN 1088, one limit switch with positive opening contact.

Wire breakage and earth leakage in the door monitoring circuits are detected.

Cross-shorts in the door monitoring circuits are **not detected**.

With external reset button for increased safety requirements.

Safety category 3 or 4 in accordance with EN 954-1.



Wiring example: Input level

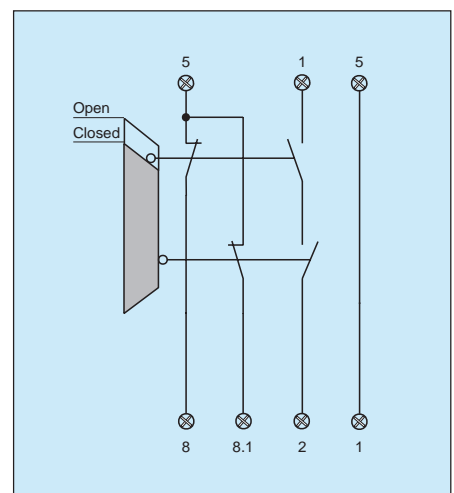
Dual-channel door monitoring according to EN 1088, one limit switch with positive opening contact and automatic initial start test.

Wire breakage and earth leakage in the door monitoring circuits are detected.

Cross-shorts in the door monitoring circuits are **not detected**.

WARNING: Auto reset after closing door.

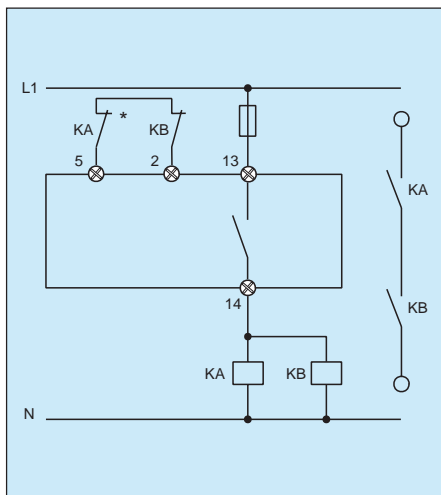
Safety category 3 or 4 in accordance with EN 954-1.



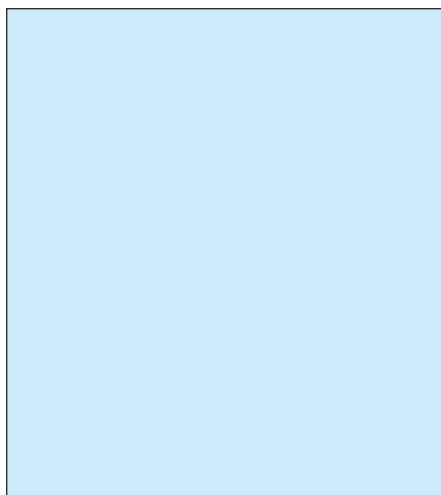
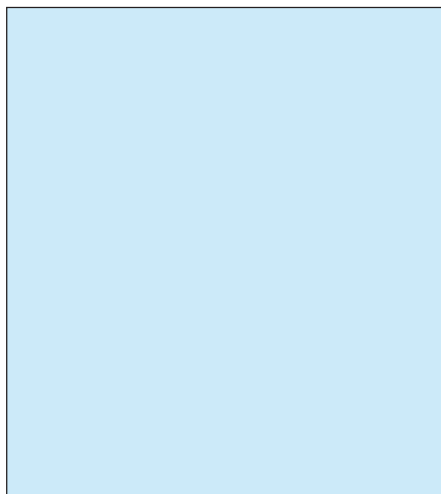
Wiring example: Power level

Single-channel output

Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.



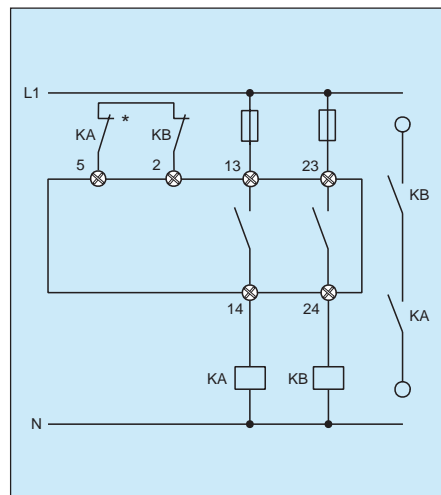
* Reset button wired in series to feedback loop.



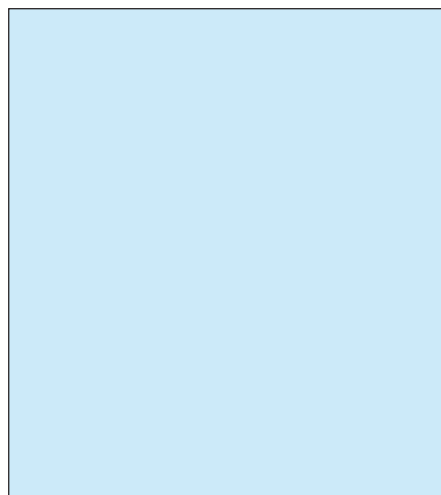
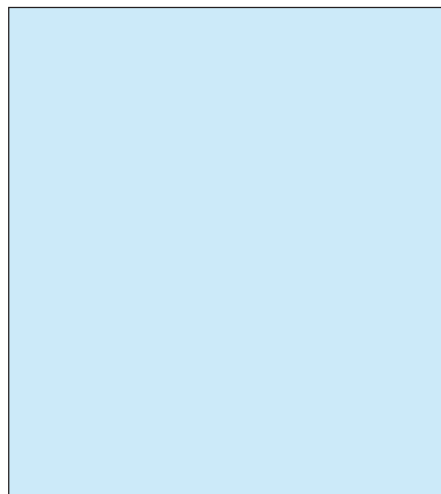
Wiring example: Power level

Dual-channel output

Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.



* Reset button wired in series to feedback loop.



SRB-TM-R

Safety relay array for emergency stop devices, interlocking devices and others

- ➔ With separate output to operate solenoids suitable for electro-magnetic forced interlocking devices
- ➔ 3 safety enabling outputs

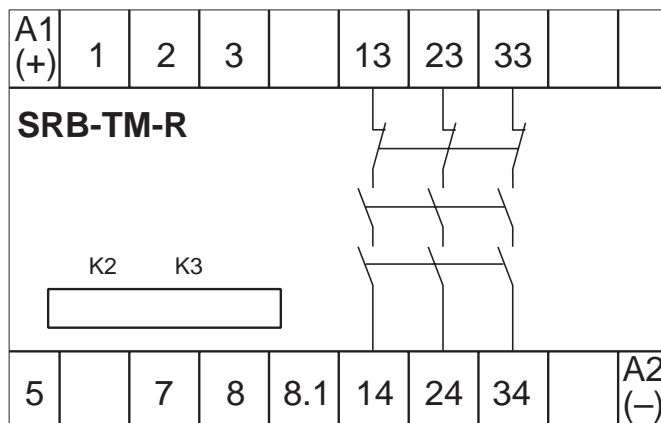
Features

- Relay output: 3 NO
- LED's for K1, K2
- DIN rail mounting
DIN EN 50 022
- Reset, feedback loop
- Housing 90 mm, made of thermoplastic in accordance with UL-94-V-0, red RAL 3000
- Input for emergency stop or door monitoring

Approvals



Front view

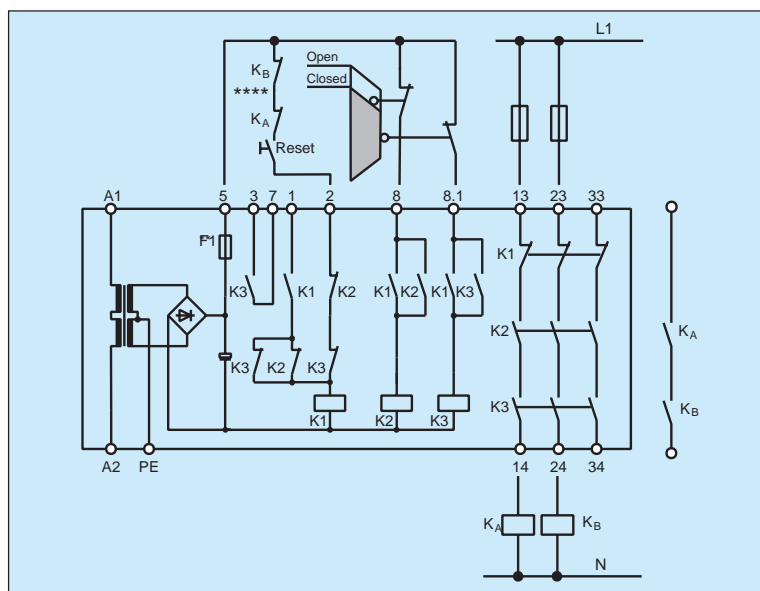


Product range

Type	Enabling outputs	Operating voltage	Part no.
SRB-TM-R-24V	3 NO	24 VDC/VAC	610 0200
SRB-TM-R-115V	3 NO	115 VAC	610 0250
SRB-TM-R-230V	3 NO	230 VAC	610 0270

SRB-TM-R (continued)

Wiring diagram



Example for dual-channel door monitoring using two limit switches (one with positive opening contacts) and external reset button.

Dual-channel output, suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.

**** = Feedback loop

Wire breakage and earth leakage in the monitoring circuits are detected.

** Fuse M 0.5 A
(an external leading fuse
M 0.25 A is recommended)

For further examples refer to page 140/141

Model specific Technical data

(refer to page 157 for general data)

Operating voltage	24 VDC $-15\%/+20\%$, residual ripple max. 10% 24 VAC, 115 VAC, 230 VAC $-15\%/+6\%$
Frequency	50/60 Hz (for AC operating)
Fuse (power supply)	M 0.25 A/250 V (internal M 0.5 A/250 V)
Power consumption	max. 3.6 VA
Switching capacity (enabling contacts)	230 VAC, 6 A ohmic (inductive with suitable suppression)
Fuse (enabling contacts)	6 A slow blowing
Application category	AC 15/DC 13, DIN VDE 0660 Part 200
Pick-up delay	≤ 200 ms
Drop-out delay	≤ 20 ms
Contact material / contacts	AgCdO, self cleaning, positively driven
Contact resistance	max. 100 mOhm when new
Air and creeping distances	DIN VDE 0110-1 (04.97), 4 kV/2
Connections	Self lifting screw terminals min. 0.5 qmm, max. 2.5 qmm
Dimensions	H/W/D 83 mm/90 mm/127 mm
Weight	580 g (830 g at 230 V and 115 V version)
Ambient operating temperature	-25 °C ... $+45$ °C (derating curve page 157)
Mechanical life	10^7 switching cycles
Terminal labeling	DIN EN 50 005/DIN 50 013

SRB-TM-R (continued)

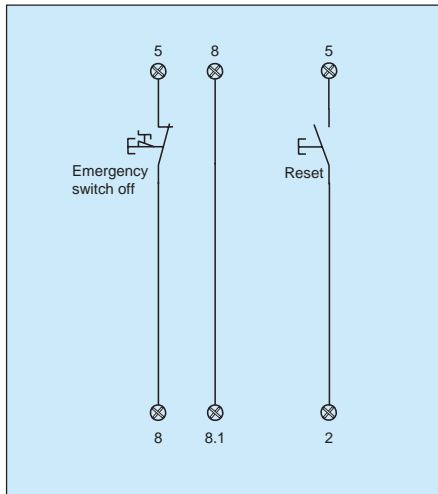
Wiring example: Input level

Single-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

With external reset button.

Safety category 2 in accordance with EN 954-1.



Wiring example: Input level

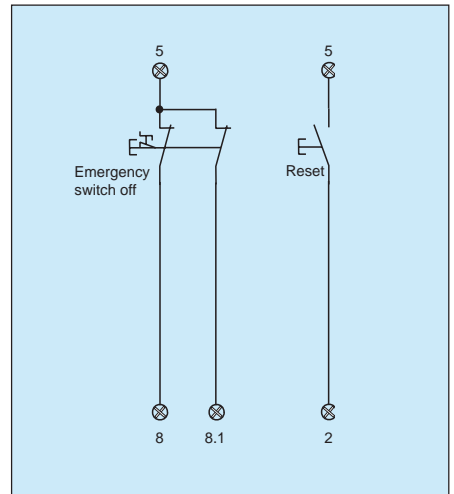
Dual-channel emergency stop switch according to EN 60 204-1.

Wire breakage and earth leakage in the emergency stop circuits are detected.

Cross-shorts in the emergency stop circuits are **not detected**.

With external reset button.

Safety category 3 or 4 in accordance with EN 954-1.



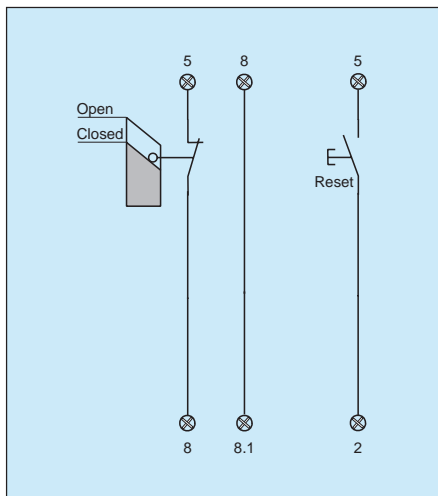
Wiring example: Input level

Single-channel door monitoring according to EN 1088 limit switch with positive opening contact.

Wire breakage and earth leakage in the door monitoring circuits are detected.

With external reset button for increased safety requirements.

Safety category 2 in accordance with EN 954-1.



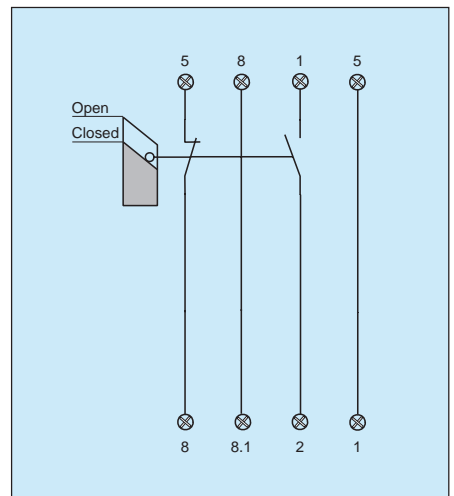
Wiring example: Input level

Single-channel door monitoring according to EN 1088 limit switch with positive opening contact and automatic initial start test.

Wire breakage and earth leakage in the door monitoring circuits are detected.

WARNING: Auto reset after closing door.

Safety category 2 in accordance with EN 954-1.



Wiring example: input level

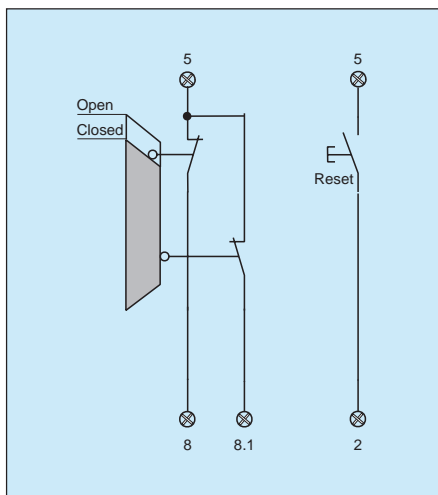
Dual-channel door monitoring according to EN 1088, one limit switch with positive opening contact.

Wire breakage and earth leakage in the door monitoring circuits are detected.

Cross-shorts in the door monitoring circuits are **not detected**.

With external reset button for increased safety requirements.

Safety category 3 or 4 in accordance with EN 954-1.



Wiring example: Input level

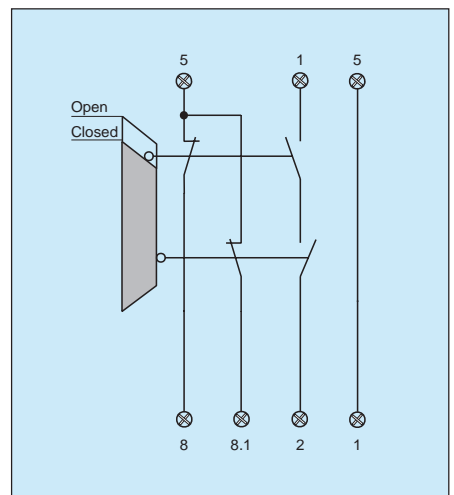
Dual-channel door monitoring according to EN 1088, one limit switch with positive opening contact and automatic initial start test.

Wire breakage and earth leakage in the door monitoring circuits are detected.

Cross-shorts in the door monitoring circuits are **not detected**.

WARNING: Auto reset after closing door.

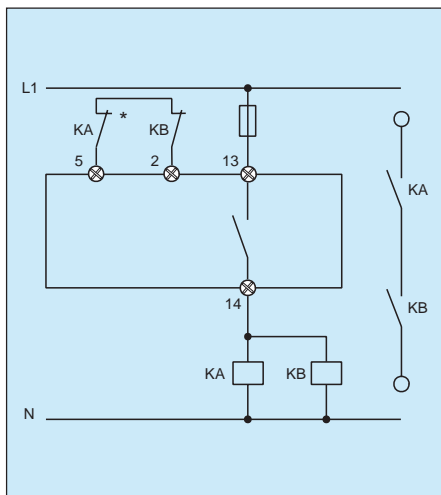
Safety category 3 or 4 in accordance with EN 954-1.



Wiring example: Power level

Single-channel output

Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.

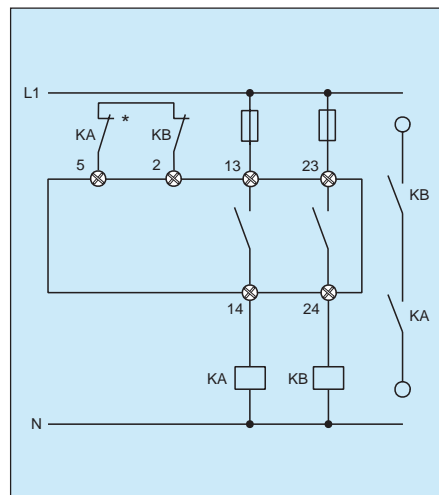


* Reset button wired in series to feedback loop.

Wiring example: Power level

Dual-channel output

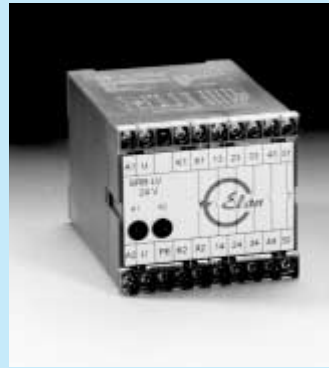
Suitable for contact reinforcement or contact multiplication, using relays or contactors with positively guided contacts.



* Reset button wired in series to feedback loop.

Modules for contact multiplying

- ✦ max. 6 enabling outputs or max. 4 enabling outputs and 1 monitoring output
- ✦ max. load current: 6 Ampere
- ✦ 22.5 mm and 90 mm wide
- ✦ 1- or 2-channel triggering
- ✦ 24 VDC/VAC, 48 VAC, 115 VAC and 230 VAC versions
- ✦ Approvals: CSA, UL



Type	Enabling outputs STOP cat. 0	Enabling outputs STOP cat. 1	⇒ load current (A)	Auxiliary NC output	⇒ max. load current (A)	Time window	Cross-short recognition	Single-channel 1/2	Trailing edge recognition	External powered triggering	Initial start test	24 VDC/VAC	48 VAC	115 VAC	230 VAC	BG approval	CSA approval	UL approval
SRB-NA-R-C.EW	4	6								●						✓	✓	refer to page 144
SRB-ZB-Mo	6	6								●						✓	✓	refer to page 148
SRB-LV	4	6	1	2						●	●	●	●			✓	✓	refer to page 152

● = selectable; ✓ = approved

SRB-NA-R-C.EW

Output expansion module for additional enabling outputs

- ➡ 4 enabling outputs
- ➡ 22.5 mm housing

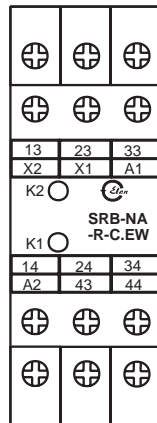
Features

- Relay output: 4 NO
- LED's for K1, K2
- Feedback circuit X1, X2
- Housing 22.5 mm, made of thermoplastic in accordance with UL-94-V-0, red RAL 3000
- DIN rail mounting DIN EN 50 022

Approvals



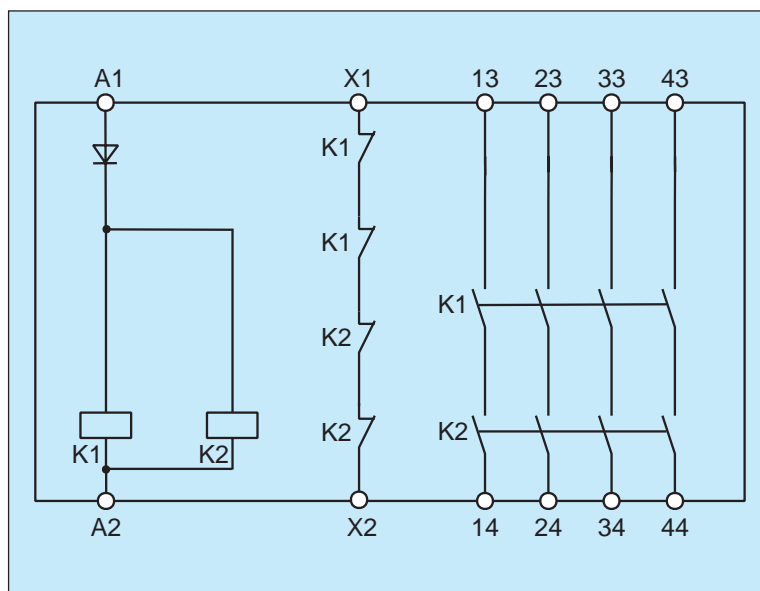
Front view



Product range

Type	Enabling outputs	Operating voltage	Part no.
SRB-NA-R-C.EW-24V	4 NO	24 VDC/VAC	610 0405

Wiring diagram



For further examples refer to page 146/147

Model specific Technical data

(refer to page 157 for general data)

Operating voltage	24 VDC $-15\%/+20\%$, residual ripple max. 10% 24 VAC $-15\%/+6\%$
Frequency	50/60 Hz (for AC operating)
Fuse (power supply)	M 0.25 A/250 V
Power consumption	max. 1.2 VA
Switching capacity (enabling contacts)	230 VAC, 6 A ohmic (inductive with suitable suppression)
Application category	AC 15/DC 13, DIN VDE 0660 Part 200
Pick-up delay	≤ 20 ms
Drop-out delay	≤ 35 ms
Contact material / contacts	AgSnO, self cleaning, positively driven
Contact resistance	max. 100 mOhm when new
Air and creeping distances	DIN VDE 0110-1 (04.97), 4 kV/2
Connections	Self lifting screw terminals min. 0.6 qmm, max. 2.5 qmm
Dimensions	H/W/D 82 mm/22.5 mm/98 mm
Weight	190 g
Ambient operating temperature	-25 °C ... $+45$ °C (derating curve page 157)
Mechanical life	10^7 switching cycles
Terminal labeling	DIN EN 60 445/DIN 40 719 Part 2

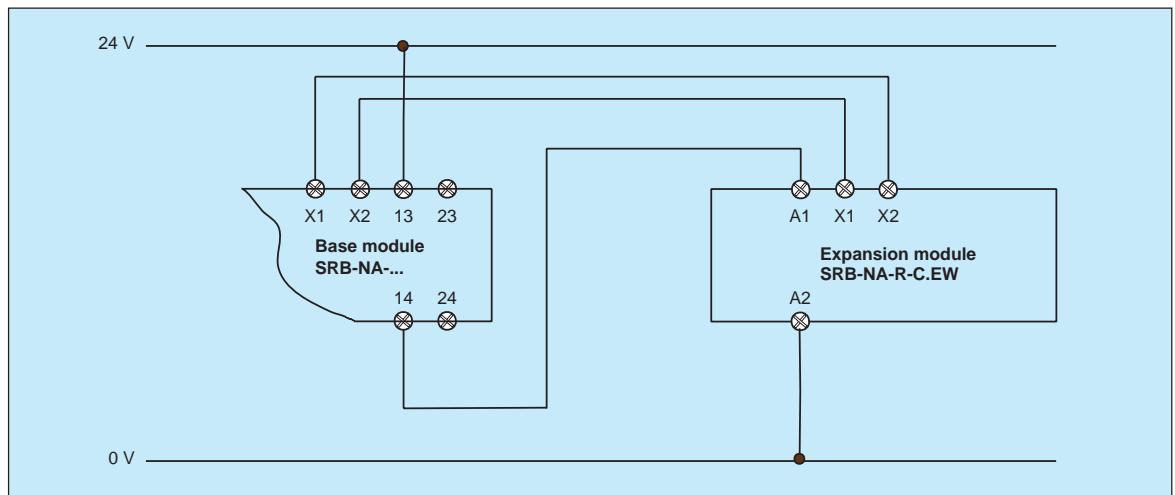
SRB-NA-R-C.EW (continued)

Wiring example: Input level

Single-channel control of the expansion module SRB-NA-R-C.EW via one enabling output of the base module.

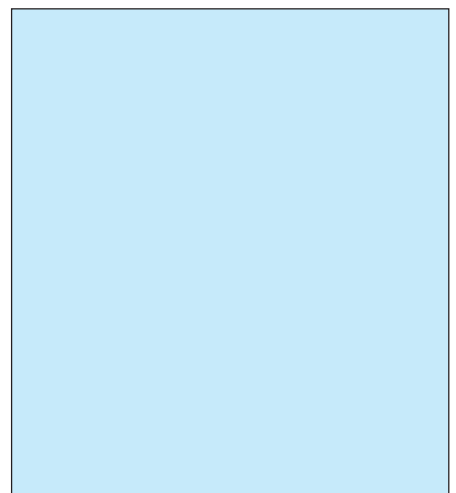
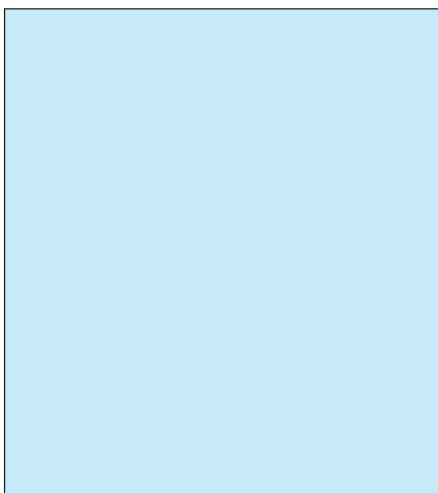
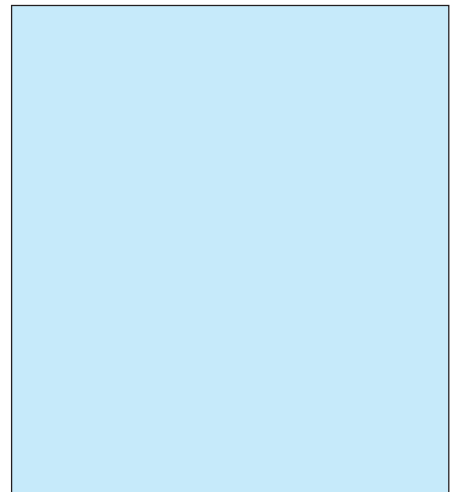
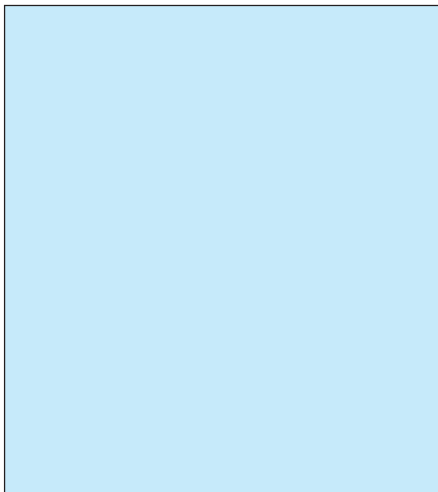
A fault in the expansion module is **not detected** by the base module.

Connect terminals X1 and X2 to the feedback loop of the base module.



Advice:

Warning !
The expansion module must be installed according to the example since the device is not fitted with its own safety circuits.



Notes

SRB-ZB-Mo

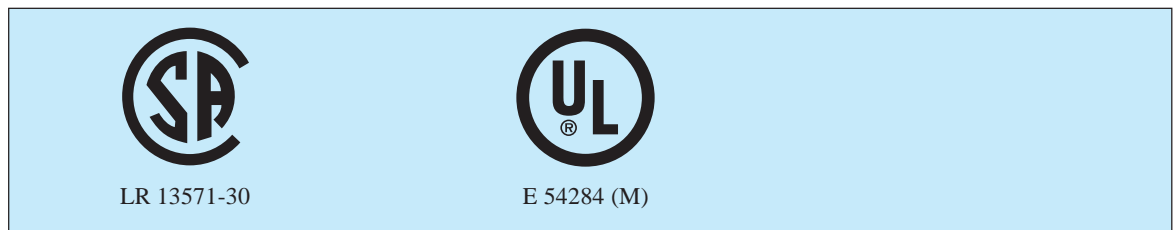
Output expansion module for additional enabling outputs

- ➡ 6 enabling outputs
- ➡ 90 mm housing

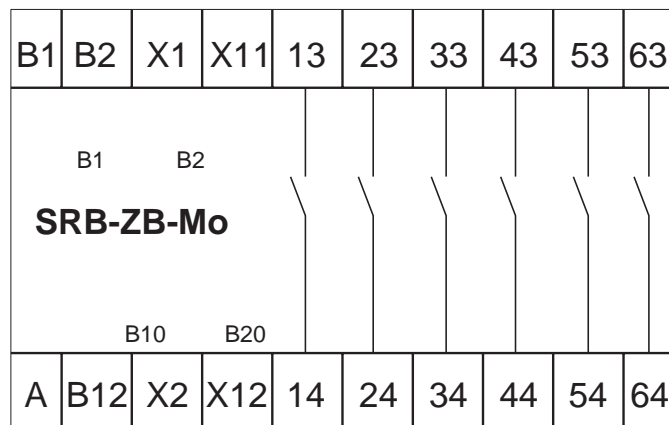
Features

- Relay outputs: 2 x 3 NO
- LED's for B1, B2, B10, B20
- Feedback circuit X1, X2 and X11, X12
- Housing 90 mm, made of thermoplastic in accordance with UL-94-V-0, red RAL 3000
- DIN rail mounting DIN EN 50 022

Approvals



Front view

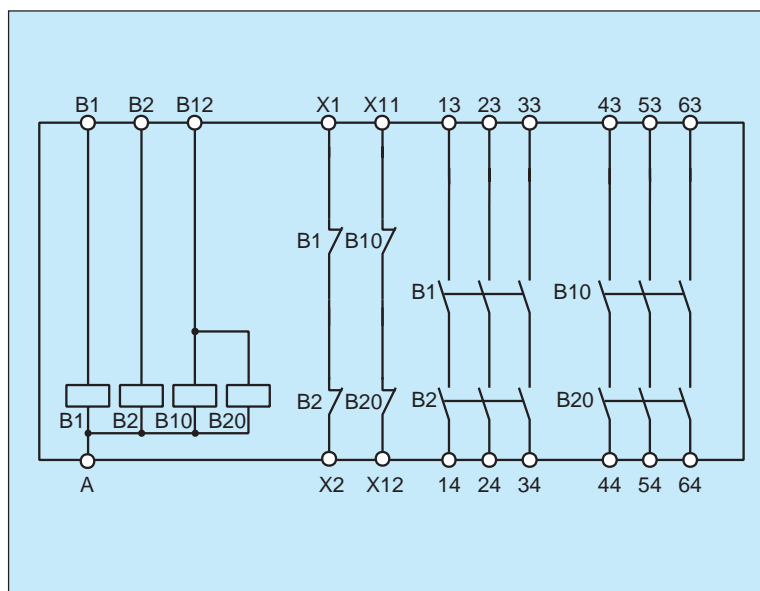


Product range

Type	Enabling outputs	Operating voltage	Part no.
SRB-ZB-Mo-24VDC	2 x 3 NO	24 VDC	610 0620

SRB-ZB-Mo (continued)

Wiring diagram



For further examples
refer to page 150/151

Model specific Technical data

(refer to page 157
for general data)

Operating voltage	24 VDC -15%/+20%, residual ripple max. 10%
Fuse (power supply)	M 0.25 A/250 V
Power consumption	max. 2.4 W
Switching capacity (enabling contacts)	230 VAC, 6 A ohmic (inductive with suitable suppression)
Fuse (enabling contacts)	6 A slow blowing
Application category	AC 15/DC 13, DIN VDE 0660 Part 200
Pick-up delay	≤ 30 ms
Drop-out delay	≤ 20 ms
Contact material / contacts	AgSnO, self cleaning, positively driven
Contact resistance	max. 100 mOhm when new
Air and creeping distances	DIN VDE 0110-1 (04.97), 4 kV/2
Connections	Self lifting screw terminals min. 0.5 qmm, max. 2.5 qmm
Dimensions	H/W/D 83 mm/90 mm/127 mm
Weight	470 g
Ambient operating temperature	-25 °C ... +45 °C (derating curve page 157)
Mechanical life	10 ⁷ switching cycles
Terminal labeling	DIN EN 50 005/DIN 50 013

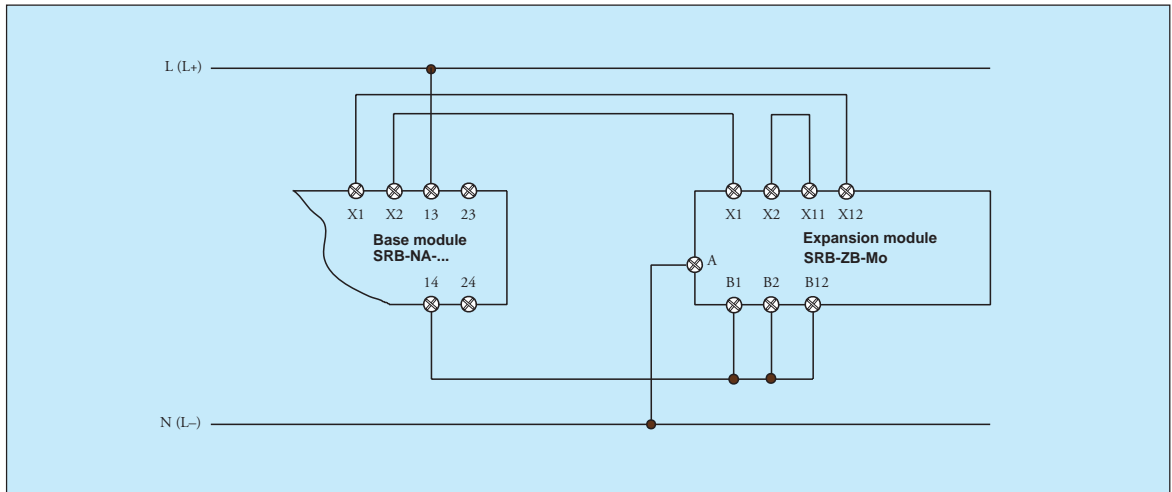
SRB-ZB-Mo (continued)

Wiring example: Input level

Single-channel control of the expansion module SRB-NA-R-C.EW via one enabling output of the base module.

A fault in the expansion module is **not detected** by the base module.

Connect terminals X1 and X2 to the feedback loop of the base module.

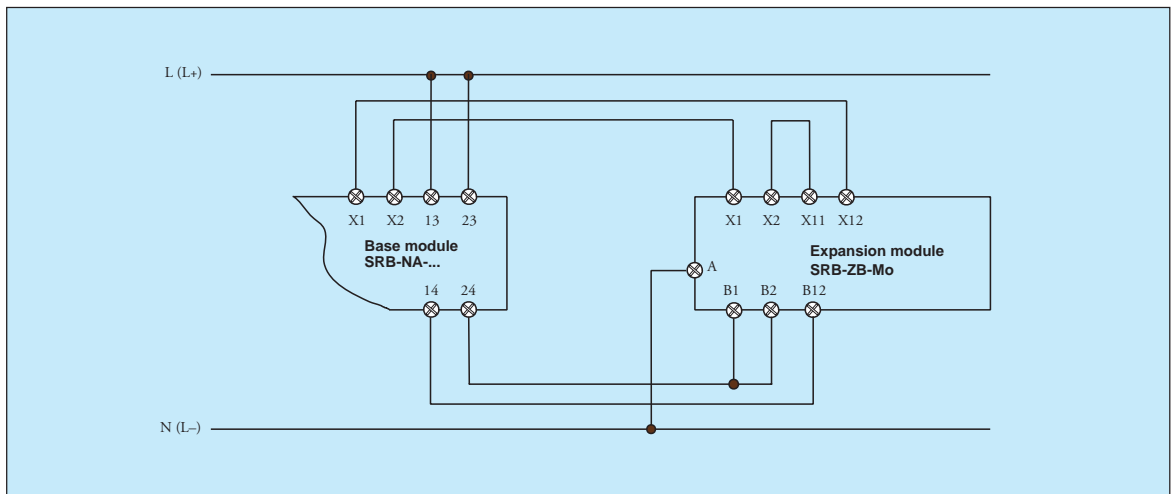


Wiring example: Input level

Dual-channel control of the expansion module SRB-NA-R-C.EW via two enabling outputs of the base module.

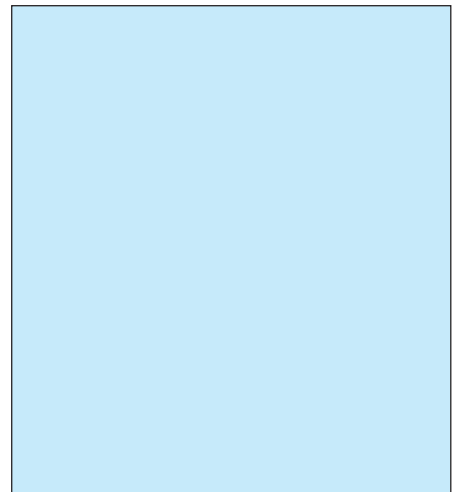
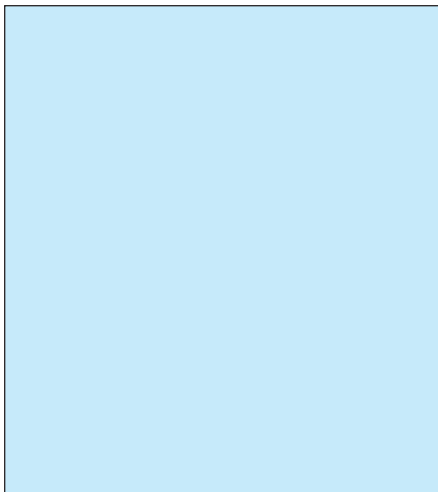
A fault in the expansion module is **not detected** by the base module.

Connect terminals X1, X2 and X11, X12 to the feedback loop of the base module.



Advice:

WARNING: The expansion module must be installed according to the example shown since the device is not fitted with its own safety monitoring.



Notes

SRB-LV

Output expansion module for additional enabling outputs

- ➡ 4 enabling outputs and 1 monitoring output
- ➡ 90 mm housing

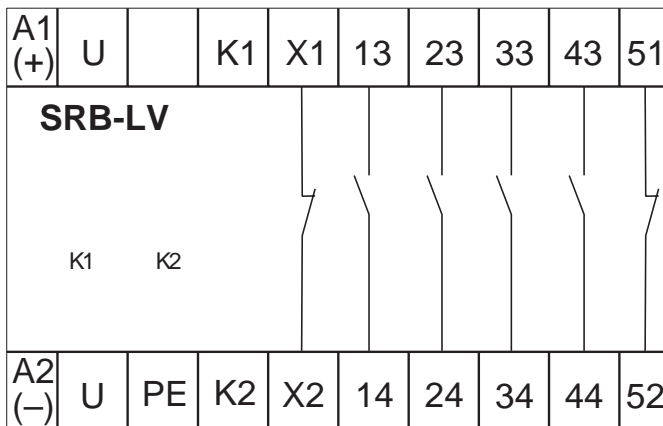
Features

- Relay output: 4 NO, 1 NC (Auxiliary NC for monitoring must not be used in safety enabling circuits!)
- LED's for K1, K2
- Feedback circuit X1, X2
- Housing 90 mm, made of thermoplastic in accordance with UL-94-V-0, red RAL 3000
- DIN rail mounting
DIN EN 50 022

Approvals



Front view

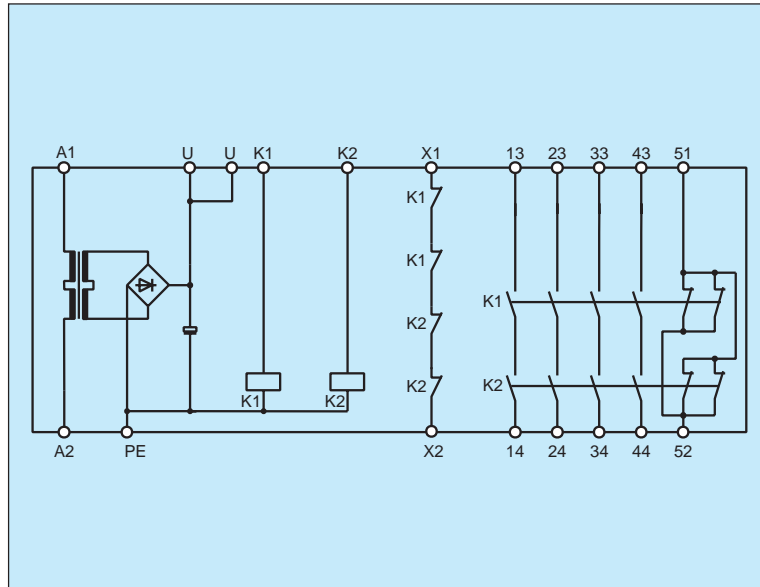


Product range

Type	Enabling outputs	Operating voltage	Part no.
SRB-LV-24V	4 NO/1 NC	24 VDC/VAC	610 0400
SRB-LV-115V	4 NO/1 NC	115 VAC	610 0450
SRB-LV-230V	4 NO/1 NC	230 VAC	610 0470

SRB-LV (continued)

Wiring diagram



For further examples
refer to page 154/155

Model specific Technical data

(refer to page 157
for general data)

Operating voltage	24 VDC $-15\%/+20\%$, residual ripple max. 10% 24 VAC, 115 VAC, 230 VAC $-15\%/+6\%$
Frequency	50/60 Hz (for AC operating)
Fuse (power supply)	M 0.25 A/250 V
Power consumption	max. 1.2 VA
Switching capacity (enabling contacts)	230 VAC, 6 A ohmic (inductive with suitable suppression)
Fuse (enabling contacts)	6 A slow blowing
Switching capacity (monitoring contacts)	24 VDC/2 A
Fuse (monitoring contacts)	2 A slow blowing
Application category	AC 15/DC 13, DIN VDE 0660 Part 200
Pick-up delay	≤ 20 ms
Drop-out delay	≤ 20 ms
Contact material / contacts	AgSnO, self cleaning, positively driven
Contact resistance	max. 100 mOhm when new
Air and creeping distances	DIN VDE 0110-1 (04.97), 4 kV/2
Connections	Self lifting screw terminals min. 0.6 qmm, max. 2.5 qmm
Dimensions	H/W/D 83 mm/90 mm/127 mm
Weight	410 g (500 g at 115 V and 230 V version)
Ambient operating temperature	-25 °C ... $+45$ °C (derating curve page 157)
Mechanical life	10^7 switching cycles
Terminal labeling	DIN EN 60 445/DIN 40 719 Part 2

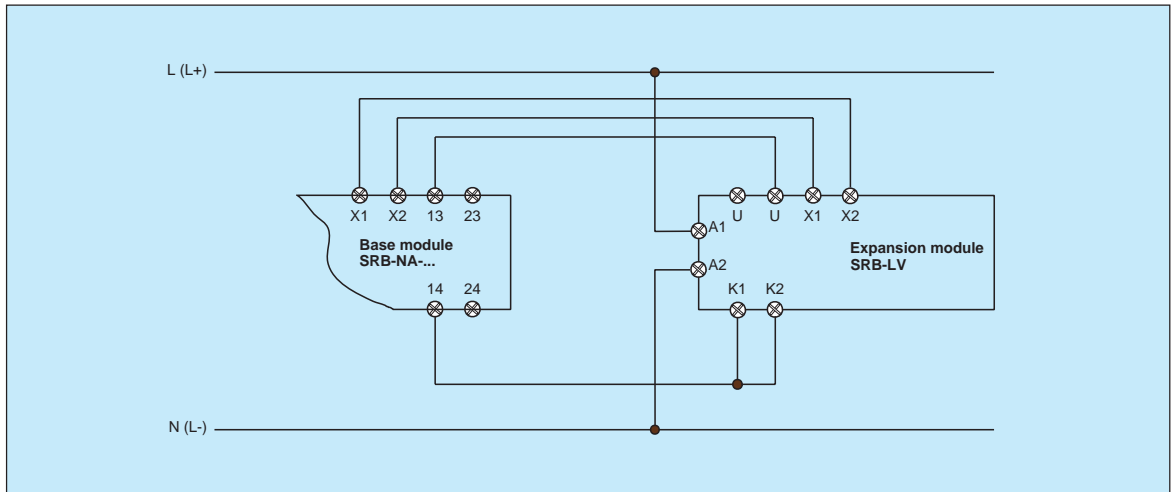
SRB-LV (continued)

Wiring example: Input level

Single-channel control of the expansion module SRB-LV via one enabling output of the base module.

A fault in the expansion module is **not detected** by the base module.

Connect terminals X1 and X2 to the feedback loop of the base module.

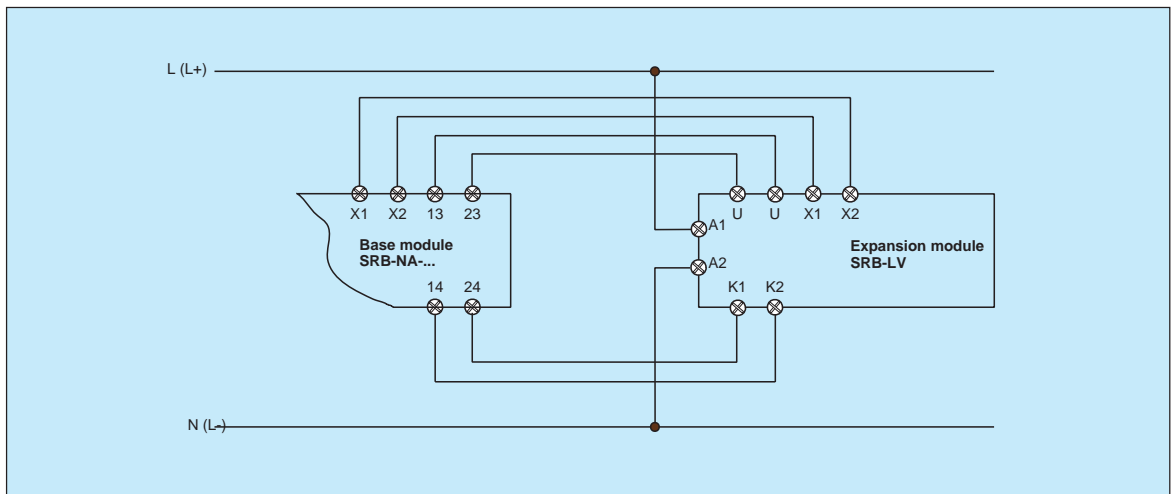


Wiring example: Input level

Dual-channel control of the expansion module SRB-LV via one enabling output of the base module.

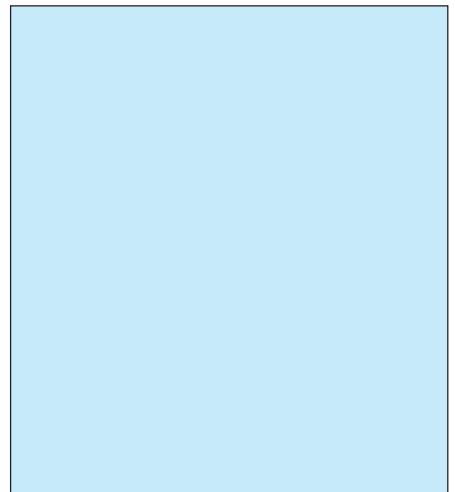
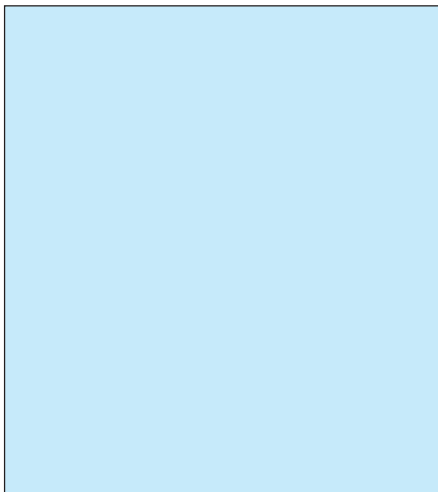
A fault in the expansion module is **not detected** by the base module.

Connect terminals X1 and X2 to the feedback loop of the base module.



Advice:

Warning !
The expansion module must be installed according to the example since the device is not fitted with its own safety circuits.



Notes

General technical data

Design

Housing material	Fibre glass reinforced thermoplastic, self-extinguishing in accordance with UL-94-V-0
Colour	Red RAL 3000
Protection class	Built-in device
Enclosure protection	IP 40
Terminal protection	IP 20
Indicator lights	LED's

Mechanical data

Mounting	Top hat rail DIN EN 50 022 Warning: Modules must be assembled with a distance of 10 mm, if the operating voltage or the ambient operating temperature exceeds.
Mechanical stability	VDE 0435
Mounting position	optional
Air and creepage distance	DIN VDE 0110 Part 1

Electrical data

Running time	100% ED
Additional data	Refer to device descriptions

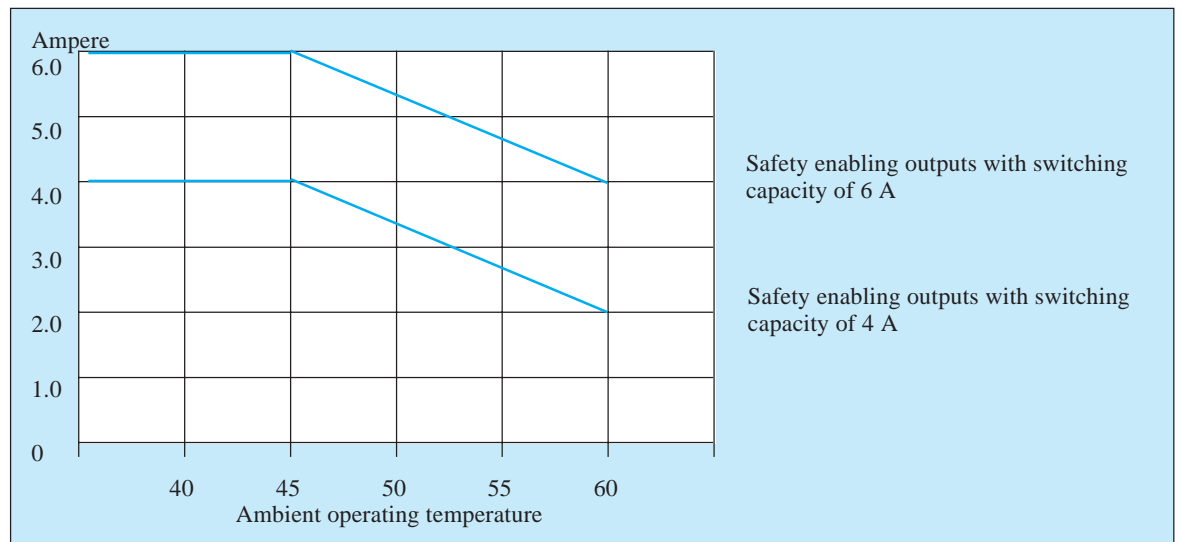
EMC

Interference suppression	Integrated suppressor, electronic EMC suppressor circuit if necessary
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Approvals

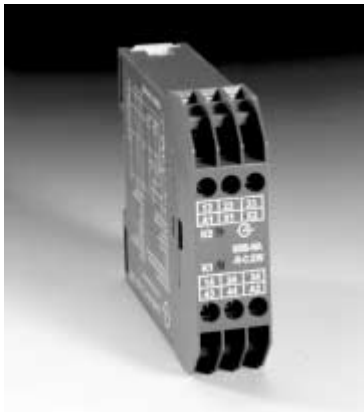
BG, CSA, UL	Refer to product ranges (copies available upon request)
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Derating curve SRB-...



Modules for special applications

Modules for contact multiplying



▲ Examples of SRB modules for contact multiplying

Modules SRB-NA-R-C.EW, SRB-LV and SRB-ZB-MO are designed for multiplying of enabling outputs of other SRB modules.

Due to a feed back loop to the SRB module also in the contact multiplying module the same safety level (category 3 or category 4) is achieved as in the corresponding basic module.

However, the availability is different compared to the SRB combination SRB-2NA-R-E/SRB-FE-R for 8 enabling outputs. In case of a broken wire between the basic module and the contact multiplying module just the additional enabling outputs of the contact multiplying module will disconnect at once. The enabling outputs of the basic module will disconnect only when the safety

inputs are interrupted. Also after restart only the enabling outputs of the basic module will be activated, but not those of the contact multiplying module.

Distinct restart

SRB module C.25 is equipped with a particular restart circuit. The module itself determines which event has caused the drop out of the enabling outputs. If for instance a loss in power or because a protective device was operated.

Automatic restart is provided after a previous power down situation, whilst a restart after operating a protective device needs an extra restart signal.

This feature for SRB module C.25 was developed for applications in which a restart via Reset button would require an unreasonable lot of performance, i.e. in large installations with decentralized locations of E-Stops and protective devices where only short time supply failures may cause a drop out of the relay circuit. In situations however, when a safety device was operated a manual restart is essential. The function of “distinct restart” needs a special risk assessment by the user in order to make sure, that the automatic restart function does not involve a risk for personal protection function.



▲ Example of SRB module with distinct restart

Dual channel antivalent input circuits for humid environments

Customarily dual channel inputs for SRB modules have the same operating principle, normally based on two NC contacts, one of these at least with positive opening function. For SRB module C.26 in particular an antivalent input circuit, one consisting of a positively opening NC contact and the other of a NO



contact is provided. The monitoring of these distinct input circuits enables for instance to detect the ingress of a conductive liquid into an external safety device.

◀ *Example of SRB module with dual channel antivalent input circuits for humid environments*

SRB modules operated by battery powered networks in vehicles and others



The typical inconstancy of the voltage in battery powered ship and vehicle networks makes it critical to use standard safety relay circuits in such a supply system.

The characteristics of the SRB modules SRB-NA-NF is an extra integrated voltage regulator which can accomodate tolerances from

-25% to +35% of the supply voltage. Furthermore the voltage regulator is designed to cope with typical situations in such networks i.e. the critical interference caused by "load" and "dump".

◀ *Example of SRB module for battery powered safety circuits in vehicles a. o.*

SRB modules with output to operate solenoids

The specific feature of this SRB module is an extra output to drive the solenoids in interlocking devices with guard-locking function, either for devices interlocked by spring force or interlocked by electro magnetic force. This additional contact serves as a selfholding contact for the interlock pushbutton

or as a selfholding contact via the guard monitoring contact in case of automatic interlocking.



Example of SRB module with output to operate solenoids ▶

Modules for special applications (continued)

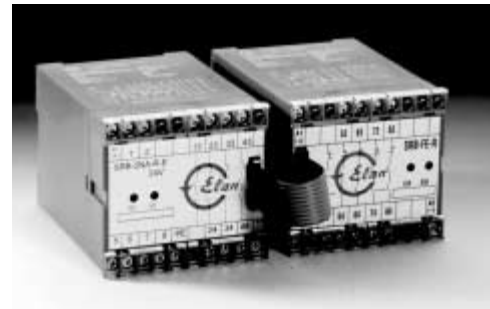
SRB combination modules for 8 enabling outputs

This module combination consists of the basic module SRB-2NA-R-E (with termination plug = 3 enabling outputs) and the extension module SRB-FE-R (with ribbon cable = 8 enabling outputs).

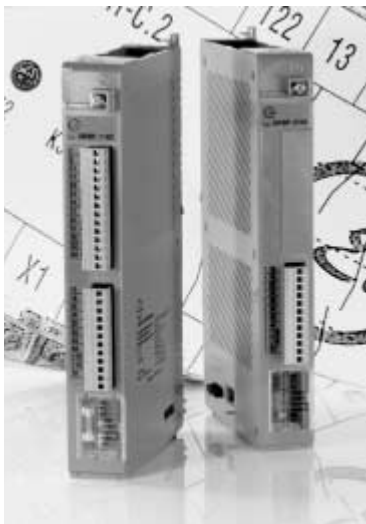
Therefore wiring errors can be excluded.

A broken wire in hard wired contact multiplying circuits would shut down the enabling outputs in the extension module only and the failure detection via a process interrupt is not guaranteed.

Example of SRB modules for 8 enabling outputs



SRBF modules



The housing SRBF is designed for relay circuits with high complexity and therefore more space consuming because of the number of relays and other components.

In all situations where modules with 45 mm, 90 mm and more are an obstacle because of the dimension, the circuits might be redesigned into a shape fitting into the SRBF housing. The described SRBF are only representative examples.

Further special features of the SRBF housings:

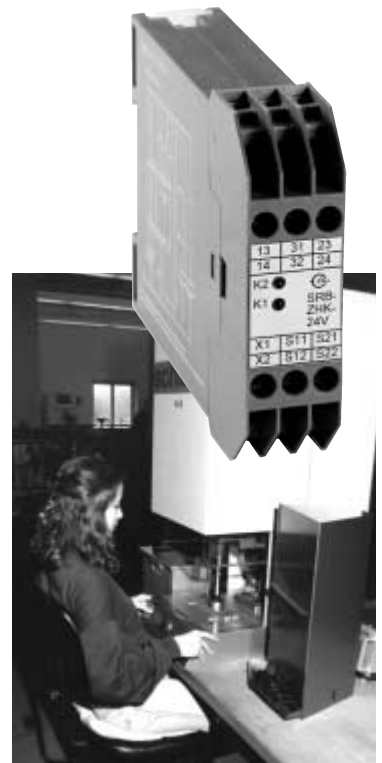
- connection via quick disconnect strips, alternatively with screw terminals or with cage clamps,
- convenient setting for mode, delay time etc. via DIP switches.

Muting controls

refer to catalogue SRB-MS

Two-hand relay modules

refer to customer information or catalogue ZHS



Scope of products

were der Verletzung
 Leichte (normalerweise reversible) Verletzung
 Schwere (normalerweise irreversible) Verletzung, einschließlich Tod

Häufigkeit und/oder Dauer der Gefährdungsexposition
 Selten bis öfter und/oder kurze Dauer der Exposition
 Häufig bis dauernd und/oder längere Dauer der Exposition

Möglichkeit zur Vermeidung der Gefährdung
 Möglich unter bestimmten Bedingungen
 Kaum möglich

1. Kategorien für sicherheitsbezogene Teile von Steuerungen erzeugte Kategorien für Bezugspunkte gleiche Kategorien, die zusätzliche Maßnahmen erfordern räumlich orientierte Maßnahmen in Bezug auf das zutreffende Risiko

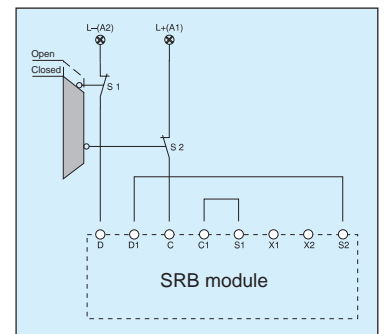
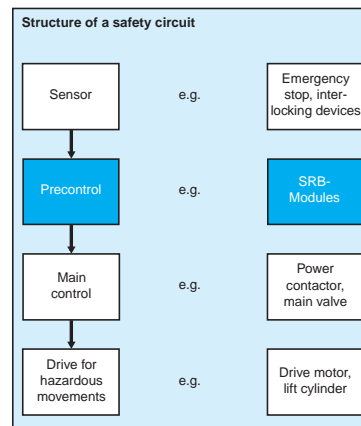


Control categories according EN 954-1

The internal circuits of the SRB modules are designed to correspond generally with control category 4, in exemptions with category 3.

The final achieved control category of the complete safety circuit and therefore the achieved level of safety depends however mainly on the structure of the input and output circuits.

In the view of control categories those SRB modules allowing the loop-in of input channels only into the power supply are predetermined to control category 3. No practical input circuits are existing which could eliminate such kind of errors leading to a possible accumulation of failures as described in the requirements of control category 4.



Category	Summary of requirements	System behaviour	Principles
B	Safety related parts of machine control systems and/or their protective equipment as well as their components shall be designed, constructed, selected, assembled and combined in accordance with relevant standards so that they can withstand the expected influences.	When a fault occurs it can lead to the loss of the safety function.	Mainly characterized by selection of components
1	Requirements of B shall apply. Use well-trying components and well-trying safety principles.	As described for Category B, but with higher safety related reliability of the safety function.	
2	Requirements of B and the use of well-trying safety principles shall apply. Safety function shall be checked at suitable intervals by the machine control system.	The occurrence of a fault can lead to the loss of the safety function between the checking intervals. The loss of safety functions is detected by.	Mainly characterized by structure
3	Requirements of B and the use of well-trying safety principles shall apply. Control systems shall be designed so that: 1. a single fault in the control does not lead to the loss of the safety function, 2. whenever reasonably practicable, a single fault is detected.	Some but not all fault will be detected. Accumulation of undetected faults can lead to the loss of the safety function.	
4	Requirements of B and the use of well-trying safety principles shall apply. Safety related parts shall be designed so that: 1. a single fault in any of these parts does not lead to the loss of the safety function, 2. the single fault is detected at or before the next demand on the safety function or, if this is not possible, an accumulation of faults shall not lead to a loss of safety functions.	When the faults occur the safety function is always performed. Faults will be detected in time to prevent the loss of the safety function.	

Scope of products (continued)

Circuit layout

Depending on the utilization purpose the internal circuits of the SRB modules are carried out in so-called 2-relay or 3-relay technique.

3-relay technique represents a circuit with own start relay (K1) which is set into operation separately by the start signal and then consecutively triggers the channel relays K2 and K3.

Unlike to the above the circuit in 2-relay technique is not triggered by an own start relay. The initial start test and setting into operation is achieved by setting the channel relays into latch state in one step.

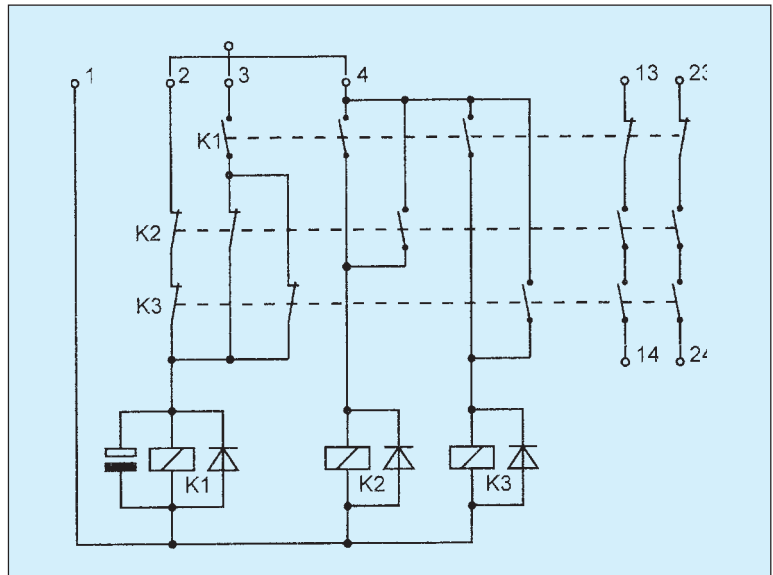
Resulting from the different operations of relay modules in 2-relay or in 3-relay technique various functional possibilities are on disposition.

The advantages of the 2-relay technique are quite obvious:

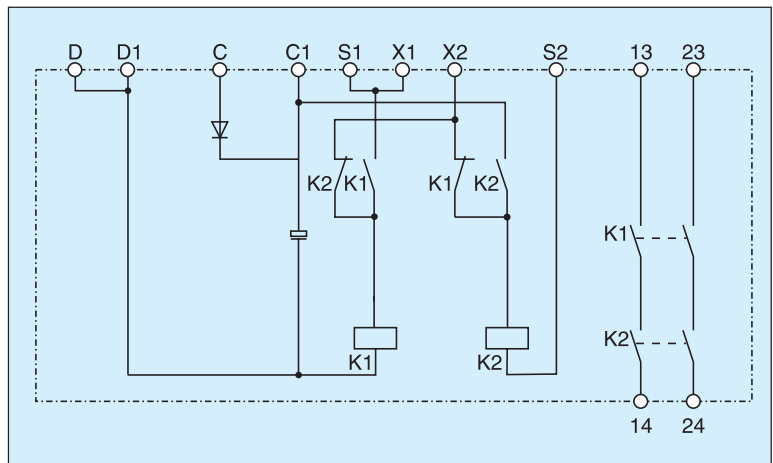
- Primarily is the space saving in the control cabinet since the modules for 24 V generally are 22.5 mm wide only.
- The second important advantage is the cost saving.

From the safety point of view there is no difference between these two circuit techniques. But certain functional characteristics i.e. performing of initial start test as required in control categories 2 and 4 (see par. "Initial Start Test" on page 163) or start procedures in connection with feed-back signals are practically realized only with circuits using 3 (internal) safety relays.

In all circuits only safety relays with positively guided contacts are applied. The majority of the circuits is equipped with pivoting armature relays, some others with cutout blade relays.



▲ Example circuit of a SRB module with three safety relays in power off state.



▲ Example circuit of a SRB module with two safety relays in power off state.

Input circuitry

Input circuits as proposed below are sufficient in standard situations:

Control category 1:
single channel input without initial start test.

Control category 2:
Single channel input with initial start test.

Control category 3:
Dual channel input without initial start test.

Control category 4:
Dual channel input with initial start test.

A dual channel safety circuit is not necessarily the answer to the question if a moveable protective gate needs to be monitored by one or by two Safety Limit Switches. This is to be found either in the corresponding product standards (C-standards) or is resulting of a risk assessment as per EN 1050.

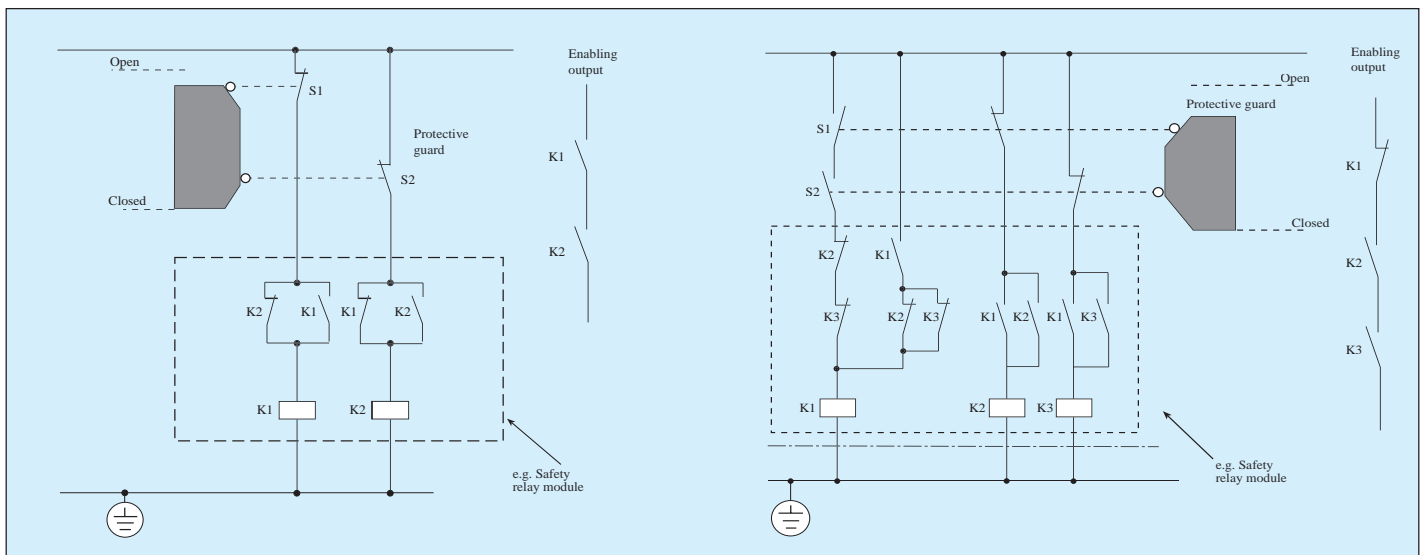


▲ Examples of SRB modules with option "Initial start test"

Initial start test means the complete safety circuit needs to perform a test run on power up prior to be set into the determined function in order to detect possible hidden defects.

If such an initial start test is not part of the safety device itself like in non

contact safety devices (i.e. light curtains) relay circuits may be needed to perform such a test independently from intention. This means in the case of a door interlocking that the protective door must be opened and closed to initialize the safety circuit, proper result provided.



▲ Example of graded protective measures, Category 3

Execution:

1. Two contacts of which at least one contact is positive opening
2. Enclosure for contactor/relay to IP 54
3. Jacketed cables conforming to relevant standards
4. Contactor/relay coils with common connection to ground of control current circuit.

▲ Example of graded protective measures, Category 4

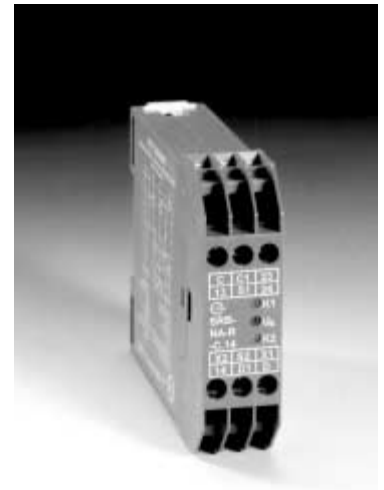
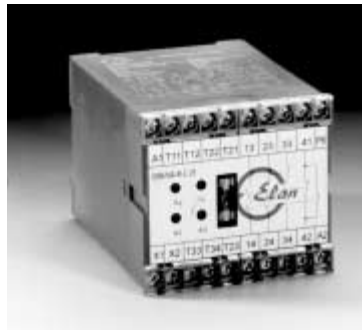
Execution:

1. Requirements of Category 3
2. Wiring of protective devices in separate jacketed cables or sequentially with short and cross detection or "special shielded cable"
3. Initial start test

Scope of products (continued)

Peculiarities of control category 4

Additional to the initial start test in category 4 it is required to ensure a cross short proof installation at the input channels. This is to be achieved either by using a separate multi-core cable ("shielded cable") for each channel or by fitting a Safety Relay with cross short recognition.



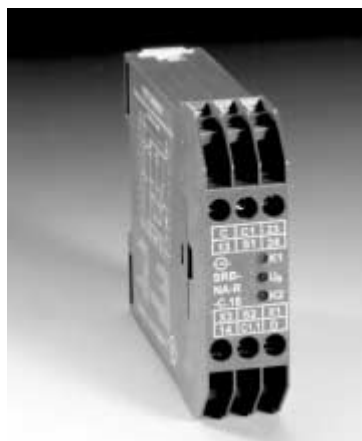
◀▶ Examples of SRB modules with cross-short recognition

SRB modules capable for external powered inputs

Relay circuits are generally designed for inputs from safety devices fitted with mechanical contacts. For safety reasons the operating voltage for the safety devices is sourced from the SRB modules.

Connection of safety devices with non isolated contacts i.e. light barriers with semi-conductor outputs or from safety devices with outputs powered from own power supply needs suitable circuits (refer to appropriate data sheet).

Connection of safety devices with isolated contacts is of course still practical.



▶ Examples of SRB modules for externally powered inputs from electronic devices. Connection of safety devices with potential free contacts is of course still practical.

**"Reset button" :
Automatic
restart**

The purpose of using a reset button or start button in the input circuitry of a relay circuit is under safety aspects persuading the operator to observe a danger free restart. A typical example are E-stop circuits. Any restart needs always a separate Reset button.

Sometimes optional, sometimes it is mandatory to provide a dynamic Start signal from the Start button

with trailing edge function (slope detection) to prevent unexpected restart in case of a faulty start button.

Trailing edge function means the relay circuit does not process the rising slope from an operated start button, but the trailing slope after releasing the button.

Signal processing based on trailing edge function is recommended when

monitoring accessible chambers in machines and in manufacturing systems. In some cases it is even required by regulations i.e. when using safety mats or optical safety devices. It must be ensured if a regulation requires a trailing edge function resp. a slope detection, the involved control part is carried out in fail safe technique, too.

Output circuitry

SRB modules are available with 2 and with 3 enabling outputs (plus feedback contact) for standard applications and for more complex applications with 4 or 5 enabling outputs (plus feedback contact). Furthermore the enabling outputs can be selected in correspondence to

Stop category 0 or to Stop category 1 (see EN 60 204-1 : 1998-11, Part 9.5.4).

In Stop category 0 (= uncontrolled stopping) the enabling outputs will drop out immediately in order to interrupt the power supply for the motors etc. as quickly as possible.

In Stop category 1 (= controlled stopping) the enabling outputs will drop out time delayed. Purpose is to maintain the power supply to the motors etc. to complete a controlled stop. After run out of delay time the power will then be cut off.

**Time delayed
enabling out-
puts**

An immediate shut down of the power supply to the motors of hazardous motions etc. does not always lead to the endeavored quick stop.

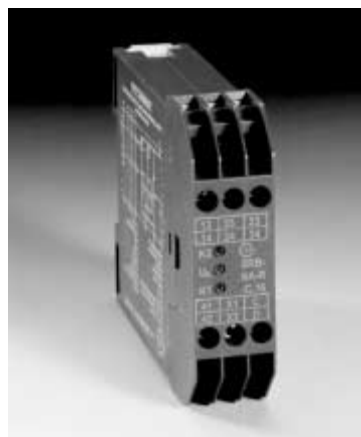
A typical example are motors which can be slowed down to stand still by generative brake mode more rapidly rather than by immediate shut down of the energy. In this case drift to stand still will take more time and is therefore more dangerous. Time delayed enabling outputs are also taking care that fuses in intermediate circuits of closed loop drives and also the drives itself are not being destroyed.

The delayed shut down of energy, adapted to the maximum breaking time of the drive serves as a protection in the case of failure and protects against unintended restart.

Depending on the application SRB modules with time delayed enabling outputs – some up to 30 seconds – are available.

- Drop out delay time is either fix or is preset in the factory according to customers request and/or adjusted on site by the user.

- If convenient and adequate in respect to the process the set delay time may be reduced by an external control signal given to a separate input terminal.



▲ Examples of SRB modules with time delayed enabling outputs

Scope of products (continued)

Scheme of time delayed enabling outputs

The delay function of drop out delayed enabling outputs in SRB modules is carried out by using 2 independent time channels each triggering 2 independent safety relays (does not apply for SRB type C.16). The circuit also corresponds to EN 60 204 : 1998-11 for E-stop signals.

Errors in the time modules due to component defects do not affect the safety related function of the delayed enabling outputs. The protection in case of fault corresponds with control category 4 (EN 954-1).

In time delayed enabling outputs it is state of the art to disregard multiple errors based on component up drifts leading to increased time. The Berufsgenossenschaft, however, is setting a time limit to max. 30 sec. if human protection is involved.



▲ Further SRB modules with time delayed enabling outputs

Not considered in the error analyses of time delayed enabling outputs is "Power down" and component down drift which are reducing (already also as first error) the delay time accordingly.

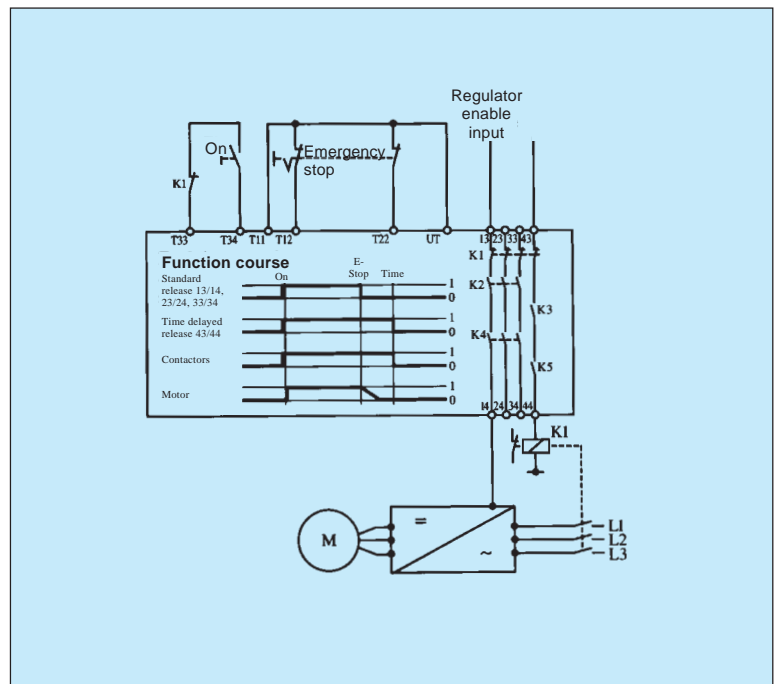
Application of time delayed enabling contacts is up to the risk and responsibility of the user.

Power outputs/ Contact multiplying

Instructions regarding the power output circuitry of SRB modules can be concluded normally out of the C-standards.

In many cases a single over rated power relay (contactor) with positively guided contacts and a NC-contact wired into the feedback loop for safety check routines is sufficient.

When using redundant power relays (contactors) one NC-contact of each must be looped in (in series). For safety reasons also in this case contactors with positively guided contacts shall be preferred. The regulations for the feedback loop applies also for further relays used for contact multiplying.



▲ Controlled shut-down of STOP category 1 in accordance with EN 60 204-1 : 1998-11. In this example the controller enable was shut down immediately after a stop signal from an emergency stop device and the power contactor K1 only after the operational brake time of the motor.

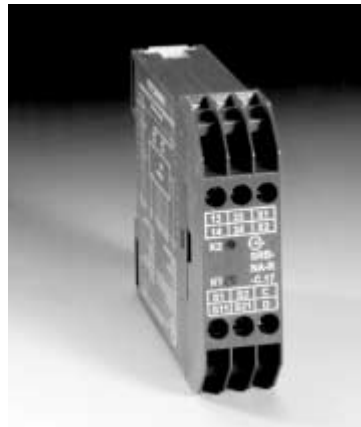
Another good opportunity to perform dual channel on the power side without doubling contactors is to include the enabling input of the closed loop regulator as a second channel in the shut down system of a dangerous motion (see fig.).

This would also avoid dangerous situations at the power side caused by a welded contact of the contactor. In this case the interrupted enabling input would stop the dangerous motion or vice versa.

Should the enabling of the regulator not work properly it can be assumed the contactor works correctly and brings the dangerous motion to stop.

If the regulator provides also a feedback signal an error detection also of this channel is possible.

In practice after a given Stop signal the enabling input of the regulator would interrupt at once and the contactor K1 after the preset slow down time of the motor.



In case of dual channel control on the power level the use of SRB modules providing SUVA circuitry is recommended. The term SUVA circuitry is rooted back to requirements from the Swiss occupational safety organization SUVA. This circuit is covering also the simultaneous welding of contacts in the channel relays.

A sophisticated combination of positively guided contacts ensures maximum only one safety contact could be affected in case of failure. For SUVA dual channel outputs on the power side are essential.



▲ Examples of SRB modules with SUVA circuitry

Fuses

Generally all SRB modules are equipped with internal fuses (glass tube type). In 45 mm wide modules – excluding exceptions – for free access an additional second fuse with lower rated current is located on the front lid for a simplified fuse exchange. Otherwise it is recommended to furnish an additional fuse with lower rated current in the power supply circuit.

On request the outputs are provided with an automatic unlatched short circuit protection. Please note: In application without Reset button an unintentional restart is to be expected. The consideration of this warning is on the users side.



In the SRB module C.17 a special electronic overload protection is performed. In case of overload reset is achieved by power down followed by power up. So no exchange of blown fuses is necessary and on the other hand the danger of unintended restart is eliminated.

Notes

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