Horb am Neckar

Langenwolschendorf

tiesse automation & safety

Catalog - Safety relays 2014 / 2015

Applications	Typ	Approvals	Housing (mm)	Category	Page
Emergency stop and safety gate monitoring relays	SAFE 4 / 4.1	CE, TÜV, UL, C-UL	22.5	4	6
	SAFE 4 eco / 4.1 eco	CE, TÜV, UL, C-UL	22.5	4	6
	SAFE 4.2 eco / 4.3 eco	CE, TÜV, UL, C-UL	22.5	4	7
	SAFE 5 / 5.1	CE, TÜV, UL, C-UL	22.5	2 / 3	8
	SAFE C 1	CE, TÜV, UL, C-UL	22.5	4	8
	SAFE FLEX	CE, TÜV, UL*, C-UL*	22.5	4	19
	SAFE 1 / 1.1	CE, TÜV, UL, C-UL	22.5	2 / 3	9
	SAFE 2 / 2.1	CE, TÜV, UL, C-UL	22.5	4	9
	SAFE S.6	CE, TÜV, UL, C-UL	45	4	10
	RS-NAGMP / MP.1	CE, TÜV, UL*, C-UL*	100	3 / 4	10
	RS-NAGV	CE, TÜV, UL, C-UL	100	4	11
+ time-delay function	SAFE T..	CE, TÜV, UL, C-UL	35	4	11
	SAFE T ON	CE, TÜV, UL, C-UL	35	4	12
	SAFE FLEX T	CE, TÜV*, UL*, C-UL*	45	4	12
+ mat-, edges-control relays **	RS-NAGAO	CE, TÜV, UL, C-UL	45	4	13
Mat-, edges-control relays **	SAFE CM	CE, TÜV, UL, C-UL	22.5	4	13
	SAFE M / M.1	CE, TÜV, UL, C-UL	22.5	3	14
	SAFE 2.2	CE, TÜV, UL, C-UL	22.5	4	14
Control devices for safety ligth barriers	SAFE L.2	CE, TÜV, UL, C-UL	22.5	4	15
	SAFE CL	CE, TÜV , UL, C-UL	22.5	4	15
	SAFE FLEX	CE, TÜV, UL*, C-UL*	22.5	4	19
+ time-delay function	SAFE FLEX T	CE, TÜV*, UL*, C-UL*	45	4	12
Two hand control relays	SAFE Z.2	CE, TÜV, UL, C-UL	22.5	4	16
	SAFE CZ	CE, TÜV , UL, C-UL	22.5	4	16
	SAFE FLEX	CE, TÜV, UL*, C-UL*	22.5	4	19
	SAFE Z	CE, TÜV, UL, C-UL	22.5	4	17
+ time-delay function	SAFE FLEX T	CE, TÜV*, UL*, C-UL*	45	4	12
Expansion modules	SAFE X4 / X4.1	CE, TÜV, UL, C-UL	22.5	4	17
	SAFE IRZ.2	CE	22.5	Ⓐ	18
	RS-NAGX 5	CE, TÜV, UL*, C-UL*	22.5	4	18
Multifunctional	SAFE FLEX	CE, TÜV, UL*, C-UL*	22.5	4	19
+ time-delay function	SAFE FLEX T	CE, TÜV*, UL*, C-UL*	45	4	12
A Standstill Monitor	SAFE SM	CE, TÜV*, UL*, C-UL*	22.5	4	20
Muting	RS-NAGU.1	CE, TÜV, UL, C-UL	90	4	19
	RS-NAGU.2f	CE, TÜV, UL, C-UL	90	4	19

Three housing lines: The big diversity at market

* Approvals pending
** Short-circuit-based mats
Ⓐ Suitable up to risk category max. 4

www.tecnelsystem.it
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ErP Energy-related Products made designed

TÜV NORD Baumuster geprüft

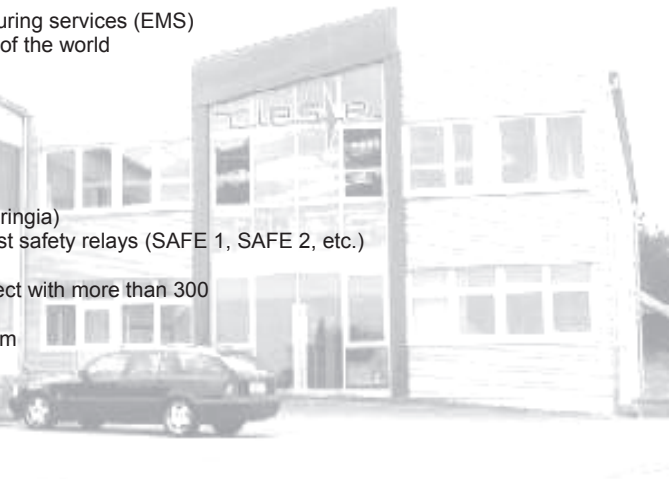
version 2014 / 15

About riese electronic:

riese electronic gmbh has been founded in 1958. There are working more than 100 employees in Horb a.N. (Baden-Württemberg – head office) and Langenwolschendorf (Thuringia - branch).

The divisions consist of the development, production and the Sale of the following product lines:
- safety relays (since 1990)
- time-, control- and measuring relays
- customized development and production of electronic devices and complete products which carry the label/logo of the customer.

Company history:
- 1958: foundation of riese electronic, division of electronic manufacturing services (EMS)
- 1961: formation of the first freely programmable punching machine of the world
- 1964: controller for the first electronic ticket machine of the world
- 1979: award from the manager magazine and the Deutsche Bank: "the best innovative middle class company in the year 1979"
- 1984: former beginning in the SMT Production technology
- 1987: former beginning of the mass production and of relays
- 1990: First safety relays
- 1991: dedication of the subsidiary plant in Zeulenroda-Triebes (Thuringia)
- 1998: development and at least production of the worldwide smallest safety relays (SAFE 1, SAFE 2, etc.)
- 2000: smallest two hand control relay in the world (SAFE Z)
- 2001: realisation and transformation of the largest outsourcing project with more than 300 devices and 3500 components and assemblies
- 2003: expansion of production, administration and training classroom
- 2005: expansion of the sales department and warehouse
- 2006: adjustment of the business in two divisions:
  1. EMS (Electronic Manufacturing Service) and
  2. Automation & Safety
     (Components for automation and safety technology)
- 2008: New building in Langenwolschendorf / Thuringa
- 2010: BEUS: First ultrasonic concrete freezing time measuring device
  3. place EEEfCOM innovation award
- 2011: 1. place BACO "Best PERFORMANCE Award"
  2. place „BEST EMS Award"
- 2012: SAFE 4 ECO: First safety relay in the world which is developed according to ErP-Guidelines
- 2013: BEUS laboratory version available



Since 1995 the quality management system of riese electronic gmbh has been certificated according to ISO 9001. Thus a continuous quality of the products and the services is guaranteed. riese electronic gmbh is one of the pioneers at the safety relay market!

riese – safety relays

With a wide product range (currently approx. 40 products) you are on the “safe side” with the newest safety technology from the descendants of “Adam Riese”. Detailed technical datas as well as application examples with detailing of safety categories for safety control devices and muting controller can be found in our application guide. This application guide contains approx. 139 pages with more than 181 different application examples, descriptions and explanations of the most important standards in the safety engineering.

Please ask for our application guide on CD-ROM:
Phone: 0049 / (0)7451 5501-18 // Fax: 0049 / (0)7451 5501-70
or write us an e-mail to relay@riese-electronic.de.
All operating instructions will be found under www.automation-safety.com

Further leaflets for riese electronic

time relays

- free of charge -

measuring relays

- free of charge -

application guide safety relays (only CD)

- free of charge -

Development and production of custom components and devices (EMS)

- free of charge -

Your personal brandlabel relay

Do You would like to have your own label on the safety relay you are using?

Do You have certain housing forms which you would like to apply?

We can offer to you is a longterm experience due to our customized division.

Thus we are able to meet your needs flexibly at any time.

Whether there should be "only" your logo on the relay or also a special colour is demanded we will together work out a complete Brandlabel project plan on which end there is your specific safety relay - fast and with competence.

choose your individual housing ...

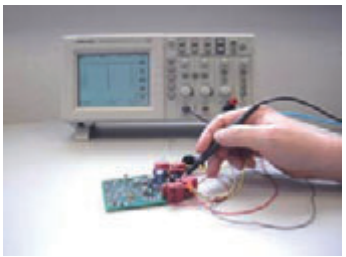
cage clamps, screw clamps, detachable or fixed?

would you like a special colour?

Your relay design department

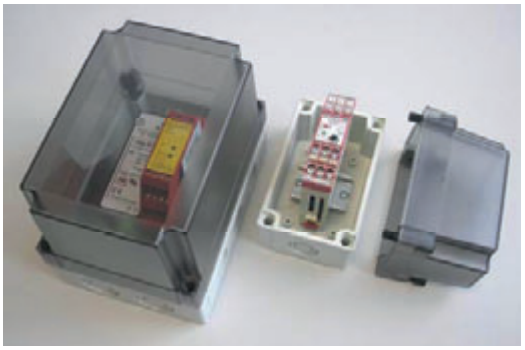
Our large relay design team of hard- and software engineers realize your wishes for new relays.

Please ask us for your requirements.



Customized housings:

Housing IP 67 applicable to Your relay – please ask for it!



PRODUCT - NAVIGATOR

	Contacts				Operating voltage												EN13849-1: categories				EN13849-1: PL					EN62061: EN61508: SIL			
	NO	Auxiliary contacts NC	Auxiliary contacts other	safety semic. output	DC 12V	DC 24V	AC 24V	AC/DC 24V	AC 48V	AC 110V	AC 230V	Housing width in mm	Start circuit control	Circuit capacity	Approvals	ErP	B/1	2	3	4	a	b	c	d	e	1	2	3	Page
Emergency stop / safety gate monitoring relays																													
SAFE 4 SAFE 4.1	3	1						x		x	x	22,5	x	5A	CE, TÜV UL, C-UL		√	√	√	√	√	√	√	√	√				6
SAFE 4 eco SAFE 4.1 eco	3	1						x		x	x	22,5	x	5A	CE, TÜV, UL, C-UL	√	√	√	√	√	√	√	√	√	√	√	√	√	6
SAFE 4.2 eco	3	1						x		x	x	22,5	wählbar	5A	CE, TÜV, UL, C-UL	√	√	√	√	√	√	√	√	√	√	√	√	√	7
SAFE 4.3 eco	3	1						x		x	x	22,5	wählbar	5A	CE, TÜV, UL, C-UL	√	√	√	√	√	√	√	√	√	√	√	√	√	7
SAFE 5 SAFE 5.1	2							x				22,5	x	6A	CE, TÜV UL, C-UL		√	√	√ *3		√	√	√	√ *3	√				8
SAFE C1				4		x						22,5	wählbar	1,8A	CE, TÜV UL, C-UL		√	√	√	√	√	√	√	√	√	√	√	√	8
SAFE FLEX	2					x						22,5	wählbar	6A	CE, TÜV, UL*, C-UL*		√	√	√	√	√	√	√	√	√	√	√	√	19
SAFE 1 SAFE 1.1	3	1						x				22,5	x	5A	CE, TÜV UL, C-UL		√	√	√ *3		√	√	√	√ *3					9
SAFE 2 SAFE 2.1	2							x				22,5	x	6A	CE, TÜV UL, C-UL		√	√	√	√	√	√	√	√	√				9
SAFE S.6	2					x	x	x	x	x	x	45		6A	CE, TÜV UL, C-UL		√	√	√	√	√	√	√	√	√				10
RS-NAGMP RS-NAGMP.1	3	1			x	x	x	x		x	x	100		8A	CE, TÜV UL*, C-UL*		√	√	√	√	√	√	√	√	√				10
RS-NAGV	6	4				x	x	x		x	x	100		4A	CE, TÜV UL, C-UL		√	√	√	√	√	√	√	√	√				11
Emergency stop / safety gate monitoring relays with time-delay																													
SAFE T…	2+2	1						x				35	wählbar	6A	CE, TÜV UL, C-UL		√	√	√	√	√	√	√	√	√	√	√	√	11
SAFE T ON	2+2	1						x				35	wählbar	6A	CE, TÜV UL, C-UL		√	√	√	√	√	√	√	√	√	√	√	√	12
SAFE FLEX T	4+2	1		1		x						45	wählbar	6A	CE, TÜV*, UL*, C-UL*		√	√	√	√	√	√	√	√	√	√	√	√	12
Emergency stop / safety gate monitoring relays for function: mat-, edges-control relays																													
RS-NAGAO	3	1				x	x	x	x	x	x	45		6A	CE, TÜV UL, C-UL		√	√	√	√	√	√	√	√	√				13
Mat-, edges-control relays																													
SAFE CM				4		x						22,5	wählbar	1,8A	CE, TÜV UL, C-UL		√	√	√	√	√	√	√	√	√	√	√	√	13
SAFE M SAFE M.1	3	1						x		x		22,5	x	5A	CE, TÜV UL, C-UL		√	√	√		√	√	√	√	√	√	√	√	14
SAFE 2.2	2							x				22,5		6A	CE, TÜV UL, C-UL		√	√	√	√	√	√	√	√	√				14
Emergency stop for safety light barriers																													
SAFE L.2	3							x				22,5	wählbar	6A	CE, TÜV UL, C-UL			√ *4		√	√	√	√	√	√				15
SAFE CL				4		x						22,5	wählbar	1,8A	CE, TÜV UL, C-UL		√	√	√	√	√	√	√	√	√	√	√	√	15
SAFE FLEX	2					x						22,5	wählbar	6A	CE, TÜV, UL*, C-UL*		√	√	√	√	√	√	√	√	√	√	√	√	19
SAFE FLEX T	4+2	1		1		x						45	wählbar	6A	CE, TÜV*, UL*, C-UL*		√	√	√	√	√	√	√	√	√	√	√	√	12

We are producing all devices according to the ROHS guidlines. Please find the exact information here:
www.automation-safety.com/englisch/sichrel_rohs.htm

All operating instructions can be found under www.automation-safety.com
Clearances for products will be found in the table. A Description of the norms will be found on page 21.

PRODUCT - NAVIGATOR

	Contacts				Operating voltage												EN13849-1: categories				EN13849-1: PL					EN62061: EN61508: SIL			
	NO	Auxiliary contacts NC	Auxiliary contacts other	Safety semic. output	DC 12V	DC 24V	AC 24V	AC/DC 24V	AC 48V	AC 110V	AC 230V	Housing width in mm	Start circuit control	Circuit capacity	Approvals	ErP	B/1	2	3	4	a	b	c	d	e	1	2	3	Page
Two hand control relays																													
SAFE Z.2	2	1	1					x	x	x	x	22,5		6A	CE, TÜV UL, C-UL		√	√	√	√	√	√	√	√	√				16
SAFE CZ				4		x						22,5		1,8A	CE, TÜV*, UL*, C-UL*		√	√	√	√	√	√	√	√	√	√	√	√	16
SAFE FLEX	2					x						22,5	select-able	6A	CE, TÜV, UL*, C-UL*		√	√	√	√	√	√	√	√	√	√	√	√	19
SAFE FLEX T	4+2	1		1		x						45	select-able	6A	CE, TÜV*, UL*, C-UL*		√	√	√	√	√	√	√	√	√	√	√	√	12
SAFE Z	2	1				x						22,5		6A	CE, TÜV UL, C-UL		√	√	√	√	√	√	√	√	√				17
Expansion modules																													
SAFE X4 SAFE X4.1	4	1						x	x	x	x	22,5		6A	CE, TÜV UL, C-UL		√	√	√	√	√	√	√	√	√				17
SAFE IRZ.2			2W					x				22,5		5A	CE			Ⓐ											18
RS-NAGX5	5	1						x				22,5		6A	CE, TÜV, UL*, C-UL*		√	√	√	√	√	√	√	√	√				18
Multifunctional																													
SAFE FLEX	2					x						22,5	select-able	6A	CE, TÜV, UL, C-UL		√	√	√	√	√	√	√	√	√	√	√	√	19
SAFE FLEX T	4+2	1		1		x						45	select-able	6A	CE, TÜV*, UL*, C-UL*		√	√	√	√	√	√	√	√	√	√	√	√	12
A Standstill Monitor																													
SAFE SM	2					x						22,5		6A	CE, TÜV*, UL*, C-UL*		√	√	√	√	√	√	√	√	√	√	√	√	20
Muting																													
RS-NAGU.1			2	3		x						90	x	1,5A DC	CE, TÜV, UL, C-UL					√					√				19
RS-NAGU.2f	3		4			x						90	x	1,5A AC/DC	CE, TÜV, UL, C-UL					√					√				19

* Approvals pending

*2 Undelayed terminals only

*3 According up to safety category 3 with two-phase off-switching of power supply and protected wiring

*4 Useable only with safety light barriers with integrated selftest

Ⓐ Suitable up to risk category max. 4

√ - suitable up to risk category

x - available

NO - Normally open contact

NC - Normally closed contact

W - Change over contact

Emergency stop and safety gate monitoring relays

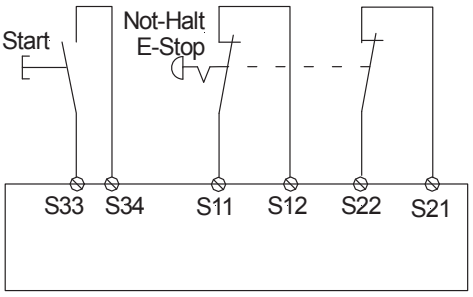
SAFE 4 / SAFE 4.1	SAFE 4 eco / SAFE 4.1 eco
Emergency stop and safety gate monitoring relay	Emergency stopp and safety gate monitoring relay pin and function compatible to Safe 4/4.1
CE, TÜV, UL, C-UL	CE, TÜV, UL, C-UL
3 normally open safety, 1 normally auxiliary closed	3 normally open safety, 1 normally auxiliary closed
LED indicators for status and supply diagnostic	LED indicators for status and supply diagnostic
Opposite polarity between channels	Opposite polarity between channels
With (SAFE 4) and without (SAFE 4.1) start control	With (SAFE 4 eco) and without (SAFE 4.1 eco) start control
Power, channel 1 and channel 2	Power, channel 1 and channel 2
24 V AC / DC (electronic fuse)	24 V AC / DC (electronic fuse)
110, 230 V AC (with galvanic disconnection / transformer)	115, 230 V AC (with galvanic disconnection / transformer)
24 V AC: ca. 5 VA, 24 V DC: 3 W, 110 / 230 V AC: 3,7 VA	24 V DC: 1,5 W / AC: 3,6 VA
<50 ms / <30 ms (24 V AC <50 ms) ready after time delay <0,5 s	200 ms / <10 ms ready after time delay <0,5 s
5 A, 240 V AC, 24 V AC / DC, AC15 230 V / 5 A, DC13 24 V / 5 A	5 A, 240 V AC, 24 V AC / DC
6 mA	10 mA
-25°C to + 55°C	-25°C to + 55°C
1200 VA (resistive load)	1200 VA (resistive load)
6,3 A quick acting or 4 A time lag	6,3 A quick acting or 4 A time lag

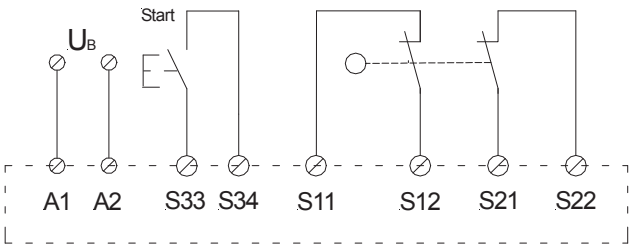
A supply voltage must be applied to terminals A1 and A2. The power LED illuminates and 24 V DC is available at terminal S11. Terminals S12 and S22 must be connected according to the application example selected to meet the application requirements. To start the unit terminals S33 and S34 must be bridged with a normally open contact. The unit works if you close this contact. At this time the contacts 13-14, 23-24 and 33-34 are closed. The LEDs channel 1 and channel 2 illuminate. In series to this start button an external contactor can be controlled.

For version with detachable clamps (screw - or cage clamps) ...
please ask our sales team!

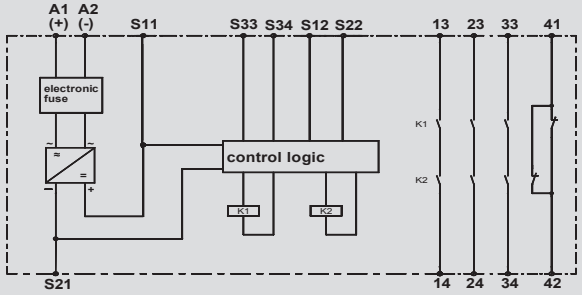
A supply voltage must be applied at terminals A1 and A2. The power LED lights. Terminals S11, S12, S21 and S22 have to be wired up as shown in the application examples. To start the unit, follow the examples described in the start applications section. In series to the start-button an external contactor can be controlled (see application example). After activation the contacts 13-14, 23-24 and 33-34 are closed, contact 41-42 is opened. The LEDs channel 1 and channel 2 are lit.

For version with detachable clamps (screw - or cage clamps) ...
please ask our sales team!

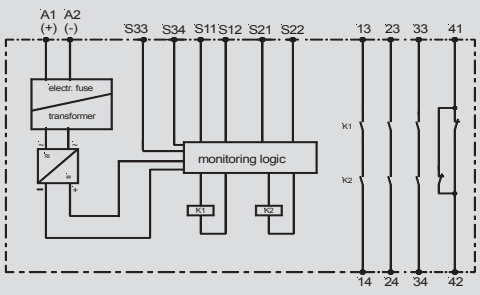




Dual channel safety gate monitoring with cross circuit monitoring and monitored start button



EN ISO 13849-1: PLe, Cat. 4
MTTFd: 154 years / high, DC: 99% / high,
CCF: achieved



EN ISO 13849-1 / DIN EN 61508 / DIN EN 62061: PLe, Cat. 4 / SIL3
MTTFd: 910 years / high, DC: 99% / high, CCF: achieved,
PFH: 2,32*10^{-9} $^{1}/_{h}$, SFF: > 99%, HFT: 1

SAFE 4.2 eco

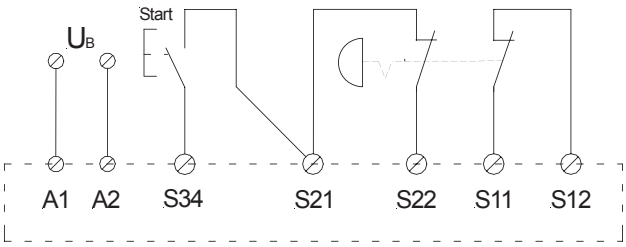
Emergency stop
and safety gate monitoring relay
CE, TÜV, UL, C-UL
3 normally open safety, 1 normally auxiliary closed
LED indicators for status and supply diagnostic
Opposite polarity between channels
With and without start control (selectable)
Power, channel 1 and channel 2
24 V AC / DC (electronic fuse)
115, 230 V AC (with galvanic disconnection / transformer)

24 V DC: 1,5 W / AC: 3,6 VA
200 ms / <10 ms ready after time delay <0,5 s
5 A, 240 V AC, 24 V AC / DC
10 mA

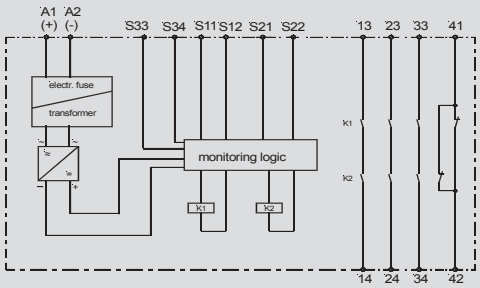
-25°C to + 55°C
1200 VA (resistive load)
6,3 A quick acting or 4 A time lag

A supply voltage must be applied at terminals A1 and A2. The power LED lights. Terminals S11, S12, S21 and S22 have to be wired up as shown in the application examples. To start the unit, follow the examples described in the start applications section. In series to the start-button an external contactor can be controlled (see application example). After activation the contacts 13-14, 23-24 and 33-34 are closed, contact 41-42 is opened. The LEDs channel 1 and channel 2 are lit.

For version with detachable clamps (screw - or cage clamps) ...
please ask our sales team!



Dual channel e-stop monitoring with cross circuit monitoring and monitored start button.



EN ISO 13849-1 / DIN EN 61508 / DIN EN 62061: PLe, Cat. 4 / SIL3
MTTFd: 910 years / high, DC: 99% / high, CCF: achieved,
PFH: 2,32*10^{-9} 1/h, SFF: > 99%, HFT: 1

SAFE 4.3 eco

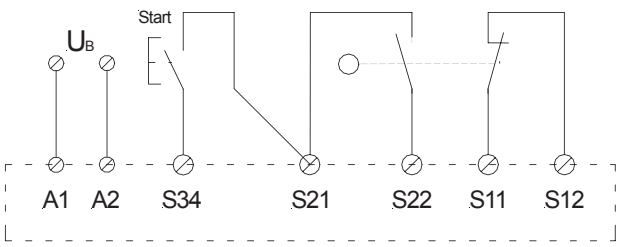
Safety gate monitoring relay, Safety magnetic switch monitoring,
Suitable for release button with reed contact outputs
CE, TÜV, UL, C-UL
3 normally open safety, 1 normally auxiliary closed
LED indicators for status and supply diagnostic
Opposite polarity between channels
With and without start control (selectable)
Power, channel 1 and channel 2
24 V AC / DC (electronic fuse)
115, 230 V AC (with galvanic disconnection / transformer)

24 V DC: 1,5 W / AC: 3,6 VA
200 ms / <10 ms ready after time delay <0,5 s
5 A, 240 V AC, 24 V AC / DC
10 mA

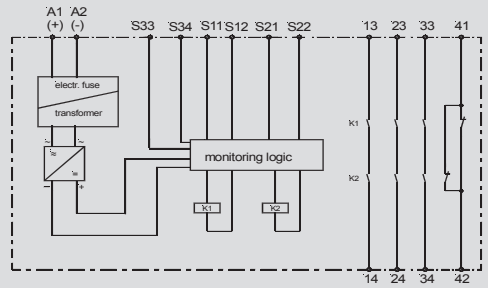
-25°C to + 55°C
1200 VA (resistive load)
6,3 A quick acting or 4 A time lag

A supply voltage must be applied at terminals A1 and A2. The power LED lights. Terminals S11, S12, S21 and S22 have to be wired up as shown in the application examples. To start the unit, follow the examples described in the start applications section. In series to the start-button an external contactor can be controlled (see application example). After activation the contacts 13-14, 23-24 and 33-34 are closed, contact 41-42 is opened. The LEDs channel 1 and channel 2 are lit.

For version with detachable clamps (screw - or cage clamps) ...
please ask our sales team!



Safety gate with monitored start button and antivalent switching safety gate contacts.



EN ISO 13849-1 / DIN EN 61508 / DIN EN 62061: PLe, Cat. 4 / SIL3
MTTFd: 910 years / high, DC: 99% / high, CCF: achieved,
PFH: 2,32*10^{-9} 1/h, SFF: > 99%, HFT: 1

Emergency stop and safety gate monitoring relays

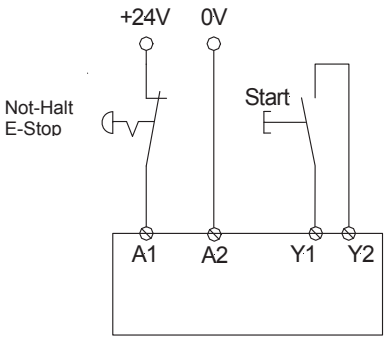
SAFE 5 / SAFE 5.1	SAFE C1
Emergency stop and safety gate monitoring relay	Safety controller for e-stop and gate monitoring applications
CE, TÜV, UL, C-UL	CE, TÜV, UL, C-UL
2 normally open safety	4 safety semiconductor outputs (OSSD)
LED indicators for status and supply diagnostic	LED indicators for status and supply diagnostic
With (SAFE 5) and without (SAFE 5.1) start control	Wearless semiconductor outputs , "AND", "OR" functions possible
	between several SAFE C1 Automatic start possible
Power, channel 1 and channel 2	Power, channel 1 and channel 2 + flashing code
24 V AC / DC (electronic fuse)	24 V DC (+ 25 - 20 %)
	Overvoltage protection
ca. 1,6 VA / 1,6 W	ca. 3 W
<50 ms / <80 ms (AC), <50 ms (DC)	<70 ms / <30 ms
6 A, 250 V AC, 24 V DC	total current 1,8 A
6 mA	infinite
	no (special variants possible)
-25°C to + 55°C	-25°C to + 55°C
1500 VA (resistive load)	up to 43 W
6,3 A quick acting or 4 A time lag	short circuit proof

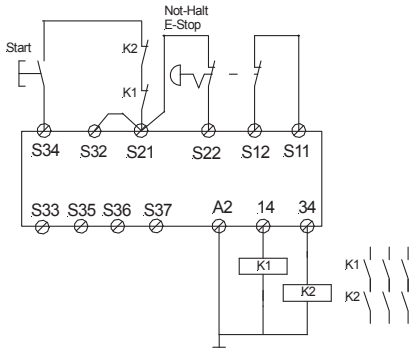
A supply voltage must be applied via emergency stop to terminals A1 and A2. Power LED illuminates if the emergency stop is closed. To start the unit terminals Y2 and Y1 must be bridged with a normally open contact. The unit works if you close this contact. At this time the contacts 13-14, 23-24 are closed. The LEDs channel 1 and channel 2 illuminate. In series to this start button an external contactor can be controlled.

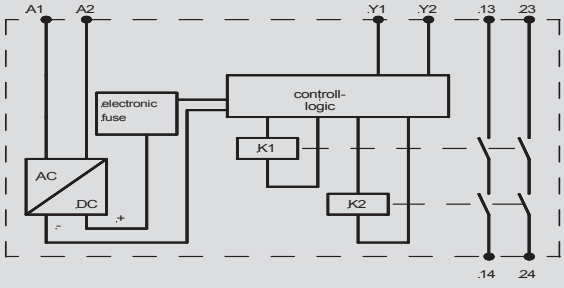
For version with detachable clamps (screw - or cage clamps) ...
please ask our sales team!

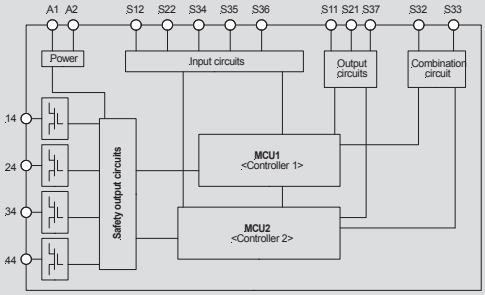
2-channel e-stop application with monitoring of reset circuit, opposite channels polarity and contact expansion.
The release button must be attached to the e-stop circuits (S11 / S12, S21 / S22) and the start button must be attached to the reset-circuit (S34 / A1). The activation of the semiconductor safety outputs takes place after closing of the reset circuit (pressing the start button).
By linkage more SAFE C1 with one another safety applications also complicated, with which different components are to be differently supervised, can be realized.
For monitoring of the external contactor, the NC contacts of the force guided contactors must be attached in series to the reset circuit.

A1 + 24 V DC
A2 0 V DC









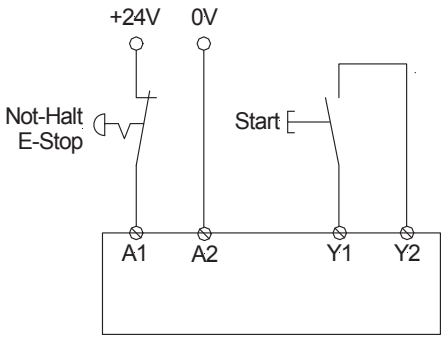
EN ISO 13849-1: PLe, Cat. 3 (***see product-navigator page 4)
MTTFd: 71 years / high, DC: 90% / medium,
CCF: achieved

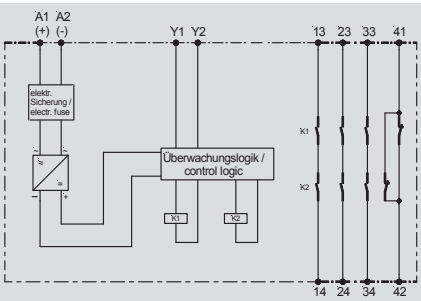
EN ISO 13849-1/ EN 61508: PLe, Cat. 4 / SIL3
MTTFd: 163 years / high, DC: high, CCF: achieved,
PFH: 2,87*10^{-9} $^{1}/_{h}$, PFD: 2,01*10^{-6} $^{1}/_{h}$, SFF: 0,9573

SAFE 1 / SAFE 1.1

Emergency stop and safety gate monitoring relay
CE, TÜV, UL, C-UL
3 normally open safety, 1 normally auxiliary closed
LED indicators for status and supply diagnostic
With (SAFE 1.1) and without (SAFE 1) start control
Power, channel 1 and channel 2
24 V AC / DC (electronic fuse)
ca. 2,5 VA / 2,5 W
<50 ms / <100 ms
5 A, 250 V AC, 24 V DC
1 mA
-25°C to + 55°C
1250 VA (resistive load)
6,3 A quick acting or 4 A time lag

A supply voltage must be applied via emergency stop button to terminals A1 and A2. Power LED illuminates if the emergency stop is closed. To start the unit terminals Y2 and Y1 must be bridged with a normally open contact. The unit works if you close this contact. At this time the contacts 13-14, 23-24 and 33-34 are closed, contact 41-42 is opened. The LEDs channel 1 and channel 2 illuminate. In series to this start button an external contactor can be monitored.



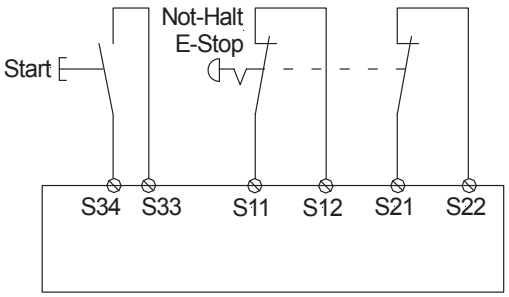


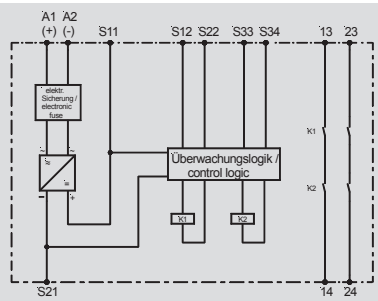
EN ISO 13849-1: PLd, Cat. 3 (***see product-navigator page 4)
MTTFd: 37,57 years / high, DC: 90% / medium,
CCF: achieved

SAFE 2 / SAFE 2.1

Emergency stop and safety gate monitoring relay
CE, TÜV, UL, C-UL
2 normally open safety
LED indicators for status and supply diagnostic
With (SAFE 2) and without (SAFE 2.1) start control
Power, channel 1 and channel 2
24 V AC / DC (electronic fuse)
ca. 2,5 VA / 2,5 W
<50 ms / <30 ms
6 A, 250 V AC, 24 V DC
6 mA
-25°C to + 55°C
1500 VA (resistive load)
6,3 A quick acting or 4 A time lag

A supply voltage must be applied to terminals A1 and A2. Power LED illuminates and 24 V DC is available at terminal S11. Terminals S12 and S22 must be connected according to the application example selected to meet the application requirements. To start the unit terminals S33 and S34 must be bridged with a normally open contact. The unit works if you close this contact. At this time the contacts 13-14 and 23-24 are closed. The LEDs channel 1 and channel 2 illuminate. In series to this start button an external contactor can be controlled.





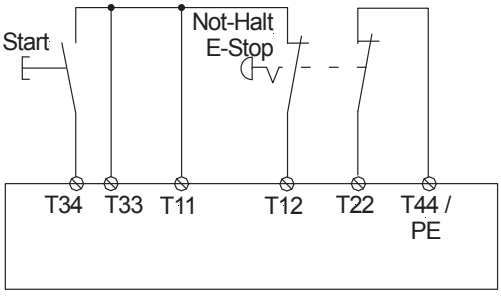
EN ISO 13849-1: PLe, Cat. 4
MTTFd: 69 years / high, DC: 99% / high,
CCF: achieved

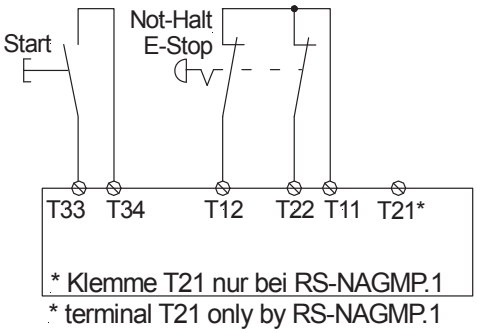
Emergency stop and safety gate monitoring relays

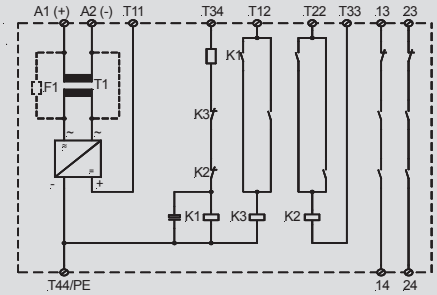
SAFE S.6	RS-NAGMP / RS-NAGMP.1
Emergency stop and safety gate monitoring relay	Emergency stop and safety gate monitoring relay
CE, TÜV, UL, C-UL	CE, TÜV, (UL, C-UL pending)
2 normally open safety	3 normally open safety, 1 normally auxiliary closed
LED indicators for status and supply diagnostic	LED indicators for status and supply diagnostic
Selectable opposite polarity between channels	With (NAGMP.1) and without (NAGMP) choosable opposite polarity between channels
Power, channel 1 and channel 2	Power, Channel 1 and channel 2
24 V AC / DC (without galvanic disconnection, but with a fuse F1)	24 V AC / DC (without galvanic disconnection, but with a safety resistor)
24 V DC (without galvanic disconnection, but with an electronic fuse)	24 V DC / 12 V DC (without galvanic disconnection, but with an electr. fuse)
24, 48, 110-127, 230 V AC (with galvanic disconnection / transformer)	24, 110-127, 230 V AC (with galvanic disconnection / transformer)
ca. 3 VA	ca. 3,5 VA / 24 V DC: 1,8 W / 12 V DC: 1,4 W
<150 ms / <30 ms	<300 ms / <20 ms
6 A, 250 V AC, 24 V DC	8 A, 250 V AC, 250 V DC, normally closed: 24 V AC / DC
100 mA(*)	10 mA
Simultaneous protective door contacts: ca. 65 ms	Simultaneous protective door contacts: ca. 75 ms
-25°C to + 55°C	- 25°C to + 55°C
1380 VA (resistive load)	2000 VA (resistive load), 200 W
6 A quick acting or 4 A time lag	6 A quick acting or 4 A time lag

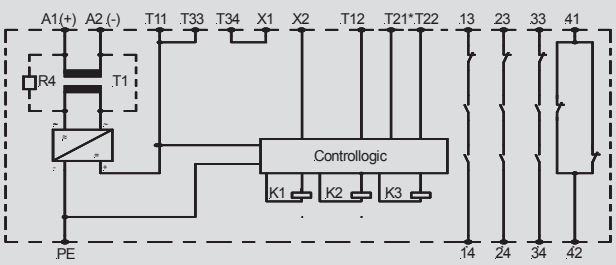
A supply voltage must be applied at terminals A1 and A2 in order to operate the device. If this is done there is a voltage of 24 V DC at terminal T11. Terminals T12 and T22 must be wired as shown in the application examples. To start the unit terminal T11 must be bridged with terminal T34 by means of a closing contact or terminal T34 must receive a 24 V DC impulse (short time bridging of the connection terminals T11-T34). If this is down contacts 13-14 and 23-24 close. The LEDs channel 1 and channel 2 illuminate. In series with the start button and terminals T11 / T34 the function of an external contactor can be monitored.
(*) We offer all devices which have a contact capacity of min. 100 mA at 24 V DC with hard gold-plated contacts. In this way you get a contact capacity of 4 mA.

A supply voltage must be applied at the terminals A1 and A2 in order to operate the device. If this is done there is a voltage of 24 V DC at the terminal T11. Terminals T12, T21, T22 and T23 have to be wired as it is shown in the application examples. To start the unit terminal T33 has to bridged with terminal T34 or terminal T34 has to get a 24 V DC impulse (short time bridging of the connection terminals T33-T34). If this is done the safety-contacts 13-14, 23-24 and 33-34 are closed and 41-42 are open. The LEDs channel 1 and channel 2 illuminate. Through terminals X1 and X2 the function of an external contactor can be monitored. Terminals X1 and X2 have to be bridged in order to operate the device.









EN ISO 13849-1: PLd / e, Cat. 3 / 4
MTTFd: 74,15 years / high, DC: Cat. 3: 90% / medium, Cat. 4: 99% / high,
CCF: achieved

EN ISO 13849-1: RS-NAGMP: PLd, Cat. 3 / RS-NAGMP.1: PLe, Cat. 4
MTTFd: 73,61 years / high, DC: Cat. 3: 90% / medium, Cat. 4: 99% / high
CCF: achieved

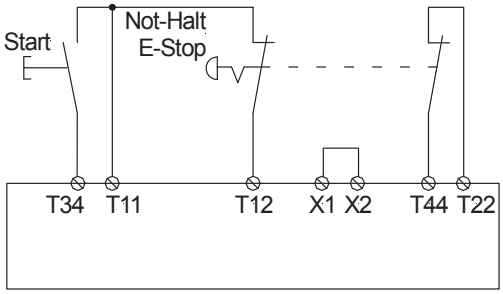
+ with time-delay function

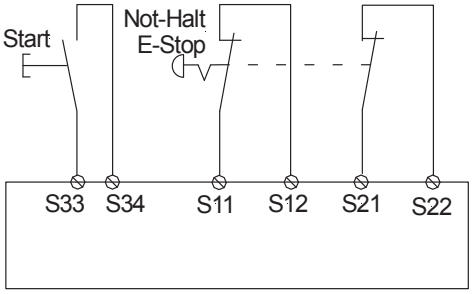
RS-NAGV	SAFE T...
Emergency stop and safety gate monitoring relay	Emergency stop and safety gate monitoring relay with immediate and delayed outputs
CE, TÜV, UL, C-UL	CE, TÜV, UL, C-UL
6 normally open safety, 4 normally auxiliary closed	2 NO, 2 NO start up delayed, 1 NC
Opposite polarity between channels	cross circuit protection or single-channel
Cyclial monitoring of the function LED indicators for status and supply diagnostic	Time delay 0,05 s – 600 s in 64 steps, automatic or manually start with start button
Channel 1 and channel 2	Power, channel 1, cannel 2, channel 1 and channel 2 time-delayed
24 V AC / DC (without galvanic disconnection / safety resistor)	24 V AC / DC (+ 25 - 20 %) (electronic fuse)
24 V DC (without galvanic disconnection / electronic fuse), 24, 110-127, 230 V AC (with galvanic disconnection / transformer)	
ca. 6 VA	ca. 4,8 W
<200 ms / ca. 30 ms	<400ms / <30 ms / adjustment
4 A, 240 V AC, 60 V DC	6 A, 250 V AC, 24 V DC
10 mA	6 mA
Simultaneous protective door contacts: ca. 75 ms	SAFE TN: 1 s / SAFE TA,TR: 3 s / TU: infinite
- 25°C to + 55°C	- 25°C to + 55°C
1000 VA (resistive load), 120 W	1500 VA (resistive load)
4 A quick acting	3,6 A

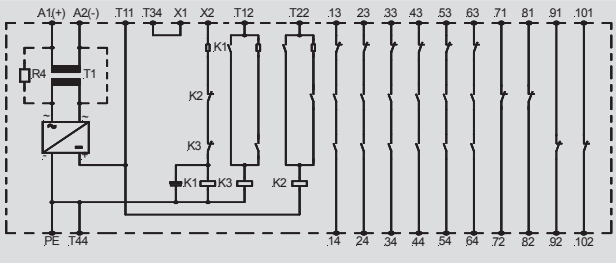
A supply voltage must be applied at terminals A1 and A2 in order to operate the device. If this is done there is a voltage of 24 V DC at terminals T11, T12 and T22 must be wired as shown in the application examples. To start the unit terminal T11 must be bridged with terminal T34 by means of a closing contact or terminal T34 must receive a 24 V DC impulse (short time bridging of the connection terminals T11-T34). If this is done contacts 13-14, 23-24, 33-34, 43-44, 53-54 and 63-64 close and 71-72, 81-82, 91-92 and 101-102 open. The LEDs channel 1 and channel 2 illuminate. Through terminal X1 and X2 the function of an external contactor can be monitored. Terminals X1 and X2 must be bridged in order to operate the device.

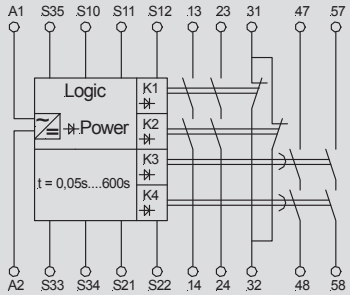
When releasing E-Stop button or opening the safety gate (E-Stop circuit are open) the contacts 13-14 and 23-24 (outputs) open. The contacts 47-48 / 57-58 open delayed at the adjusted time.

SAFE TN: standby time after applying of the supply voltage <0,95 s. Opening of the E-Stop circuits meanwhile results to failure.
SAFE TA: standby time after applying of the supply voltage <0,95 s. Opening of the E-Stop circuits meanwhile results to several activations of the outputs after the standby time.
SAFE TR: restart is possible during standby time.
SAFE TU: standby time after applying of the supply voltage <0,95 s. Opening of the E-Stop circuits meanwhile results to several activations of the outputs after the standby time.









EN ISO 13849-1: PLe, Cat. 4
MTTFd: 74,61 years / high, DC: 99% / high,
CCF: achieved

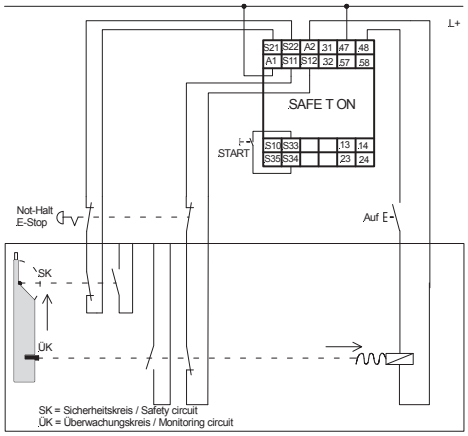
EN ISO 13849-1 / EN 62061: PLe, Cat. 4 / SIL3, SIL CL3
PFH: $3,4*10^{-9}$ 1/h, PFD: $9,32*10^{-6}$ 1/h, SFF: 94%,
MTTFd: >100 years / high, DC: 99% / high, CCF: achieved

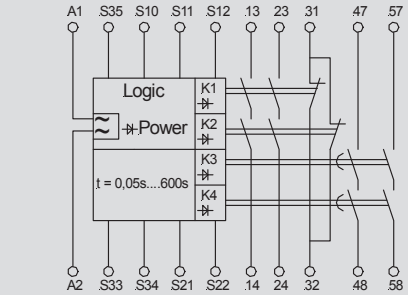
E-stop and safety gate relays with time-delay

SAFE T ON

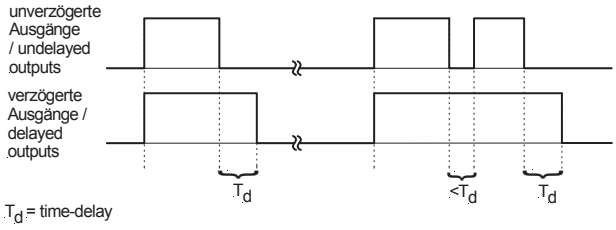
Emergency stop and safety gate monitoring relay with immediate and delayed outputs
CE, TÜV, UL, C-UL
2 NO, 2 NO start up delayed, 1 NC
Cross circuit protection or single-channel
Time delay 0,05 s – 600 s in 64 steps,
automatic or manually start with start button
Power, channel 1, cannel 2, channel 1 and 2 delayed-on energisation
24 V AC / DC (+ 25 - 20 %) (electronic fuse)
ca. 4,8 W
400 ms / 30 ms
6 A, 250 V AC, 24 V DC
6 mA
no
-25°C to +55°C
1500 VA (ohm load)
3,6 A

If the input circuits S11, S12 and S21, S22 are closed and the start button is released, the safety circuits 13-14, 23-24 will close. By pressing the stop button, the safety circuits 13-14 and 23-24 open. After the set time period has elapsed, the relay K3 and K4 energise. The safety gate switch is released and the safety gate can be opened. By pressing the start button the relay K3 and K4 are energised, K1 and K2 energised and close the safety circuits 13-14 and 23-24.

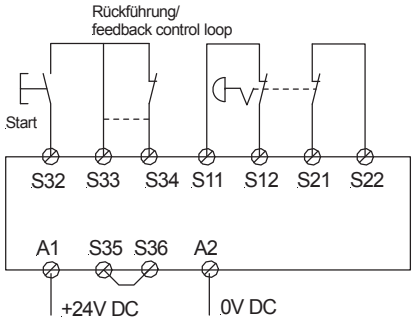


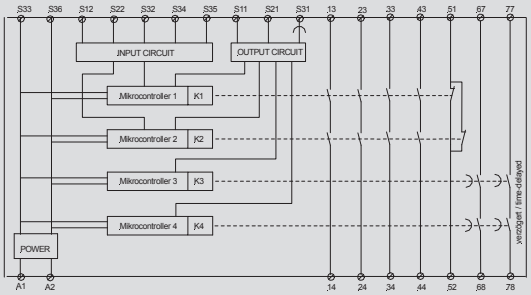


EN ISO 13849-1 / EN 62061: PLe, Cat. 4 / SIL3, SIL CL3
PFH: 3,4*10^{-9} $^{1}/_{h}$, PFD: 9,32*10^{-6} $^{1}/_{h}$, SFF: 94%,
MTTFd: >100 years / high, DC: 99% / high, CCF: achieved



Td = time-delay





EN ISO 13849-1 / DIN EN 61508 / DIN EN 62061:
Specific values in progress

Multifunctional relay with time-delay

SAFE FLEX T *(OUTLOOK)*

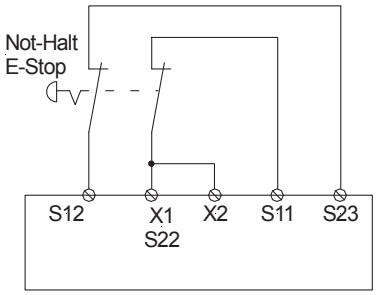
Safety controller
with choosable multi functions and adjustable time delay
CE, (TÜV, UL, C-UL pending)
4 NO (1x basic insulation), 2 NO time-delayed, 1 NC (basic insulation),
1 auxiliary outputs time-delayed
LED indicators for status and supply diagnostic
Optical failure indication by LEDs, Automatic start possible
24 V DC (+ 20 - 25 %)
Overvoltage protection
5 mA
depending on the choosen functionality (see technical data)
- 25°C to + 55°C
6 A quick acting or 4 A time lag

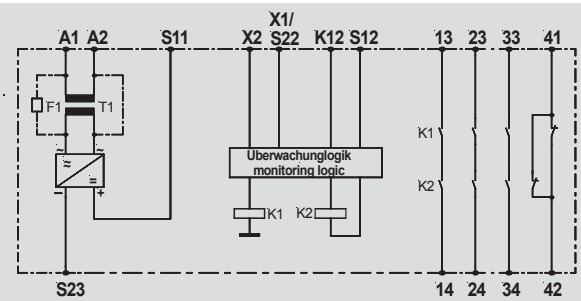
E-stop / mat-, edges-control relays

RS-NAGAO

Emergency stop and safety gate and mat control relay
CE, TÜV, UL, C-UL
3 normally open safety, 1 normally auxiliary closed
LED indicators for status and supply diagnostic
Selectable opposite polarity between channels
Without monitoring of start button
Power, channel 1 and channel 2
24 V DC (with electronic fuse)
24, 48, 110-127, 230 V AC (with galvanic isolation / transformer)
24 V AC / DC (fuse F1) not useable for safety mats
ca. 3,5 VA, 24 V DC: 2 W
<150 ms / <50 ms
6 A, 250 V AC, 250 V DC
10 mA
Simultaneous protective door contacts: ca. 75 ms
- 25°C to + 55°C
1500 VA (resistive load), 100 W
6 A quick acting or 4 A time lag

A supply voltage must be applied to terminals A1 and A2. Once the supply voltage is applied, 24 V DC is available at terminal S11; power LED illuminates. Terminals S12, K12 and X1 / S22 must be connected according to the application example selected to meet the application requirements. To start the unit, terminal X2 and X1 / S22 must be bridged. The function starts after bridging X2 and X1 / S22. With all of the above in place safety contacts 13-14, 23-24, 33-34 close and 41-42 open. Channel 1 and channel 2 LEDs illuminate. In series to the reset-button at terminals X2 and X1 / S22 an external device can be monitored.





EN ISO 13849-1: PLe, Cat. 4
MTTFd: 73,21 years / high, DC: Cat. 4: 99% / high,
CCF: achieved

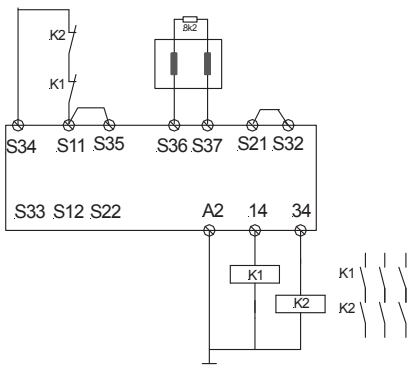
Mat-, edges-control relays

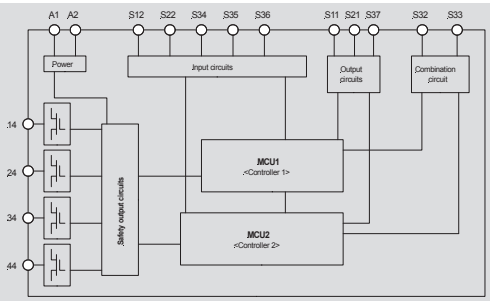
SAFE CM

Safety controller for safety mats and safety bars with a maximum 500 ohms or a finalizing resistor 8,2 kOhms
CE, TÜV, UL, C-UL
4 safety semiconductor outputs (OSSD)
LED indicators for status and supply diagnostic
wearless semiconductor outputs, "AND" function
between several SAFE C possible, automatic start possible
Power, channel 1 and channel 2
24 V DC (+ 25 - 20 %)
Overvoltage protection
ca. 3 W
<30 ms / <140 ms (single channel <360 ms)
total current 1,8 A
infinite
not necessary
-25°C to + 55°C
to 43 W
short circuit proof

4 wire technology with wire break protection or 2 wire technology and terminating resistor with wire break protection are optional. Start monitoring and automatic start are optional. For monitoring of external relays to n.c. contacts are put in series of the start circuit "AND" function among several SAFE C is possible.

A1 + 24 V DC
A2 0 V DC





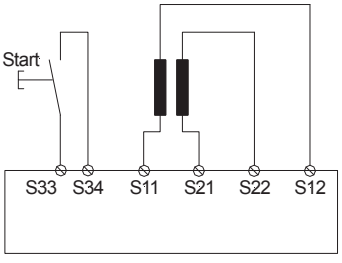
EN ISO 13849-1 / EN 61508: PLe, Cat. 4 / SIL3
MTTFd: 163 years / high, DC: high, CCF: achieved,
PFH: 2,87*10^{-9} $^{1}/_{h}$, PFD: 2,01*10^{-6} $^{1}/_{h}$, SFF: 0,9573

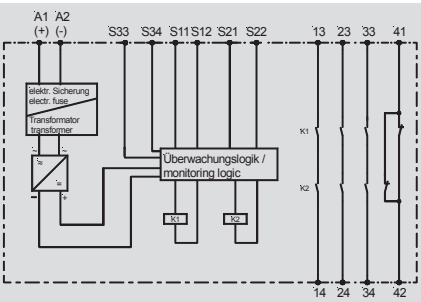
SAFE M / SAFE M.1

Mat and contact edges control relay with a max. mats-resistance of 200 ohms
CE, TÜV, UL, C-UL
3 normally open safety, 1 normally auxiliary closed
LED indicators for status and supply diagnostic
Opposite polarity between chanels
With (SAFE M) and without (SAFE M.1) automatic start
Power, channel 1 and channel 2
24 V AC / DC (electronic fuse)
SAFE M: 115 V AC (with galvanic disconnection / transformer)
24, 115 V AC: ca. 5 VA, 24 V DC: 3 W
<50 ms / <30 ms (24 V AC <50 ms)
5 A, 240 V AC, 24 V DC
6 mA
-25°C to + 55°C
1200 VA (resistive load)
6,3 A quick acting or 4 A time lag

A supply voltage must be applied to terminals A1 and A2. Power LED illuminates and 24 V DC is available at terminal S11. Terminals S12 and S22 must be connected according to the application example selected to meet the application requirements. To start the unit terminals S33 and S34 must be bridged with a normally open contact. The unit works if you close this contact. At this time the contacts 13-14, or bridge for automatically start 23-24 and 33-34 are closed. The LEDs channel 1 and channel 2 illuminate. In series to this start button an external contactor can be controlled.
For automatic start (SAFE M only) the terminals S33 and S34 must be brigded. The safety mats and safety bars must be of 4 wire technology or 2 wire technology and have to agree to the cross circuit principle.

For version with detachable clamps (screw - or cage clamps) ...
please ask our sales team!



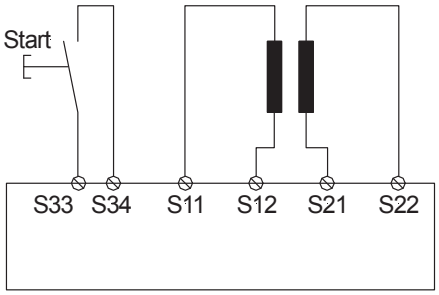


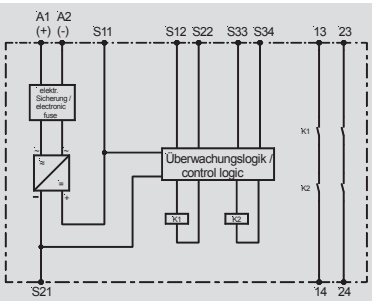
EN ISO 13849-1: PLe, Cat. 3
MTTFd: 73,21 years / high, DC: 90% / medium, CCF: achieved
PFH: 5,81*10^{-9} 1/h, SFF: 99%

SAFE 2.2

Mat and contact edges control relay
CE, TÜV, UL, C-UL
2 normally open safety
LED indicators for status and supply diagnostic
Safety category 4, opposite polarity between channels
without start control
Power, channel 1 and channel 2
24 V AC / DC (electronic fuse)
ca. 2,5 VA / 2,5 W
<50 ms / <30 ms
6 A, 250 V AC, 24 V DC
1 mA
Simultaneous protective door contacts: ca. 40 ms
-25°C to + 55°C
1500 VA (resistive load)
6,3 A quick acting or 4 A time lag

A supply voltage must be applied to terminals A1 and A2. Power LED illuminates and 24 V DC is available at terminal S11. Terminals S12 and S22 must be connected according to the application example selected to meet the application requirements. To start the unit terminals S33 and S34 must be bridged with a normally open contact. The unit works if you close this contact. At this time the contacts 13-14 and 23-24 are closed. The LEDs channel 1 and channel 2 illuminate. In series to this start button an external contactor can be controlled. SAFE 2.2 can be used as control relay for safety mats and safety contact edges. These mats and edges must work like a normally opened contact. If someone steps on the mats or presses the contact edges the normally opened contact closes and SAFE 2.2 detects this.





EN ISO 13849-1: PLe, Cat. 4
MTTFd: 69 years / high, DC: 99% / high,
CCF: achieved

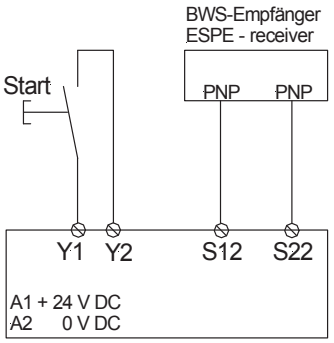
Control devices for safety light barriers

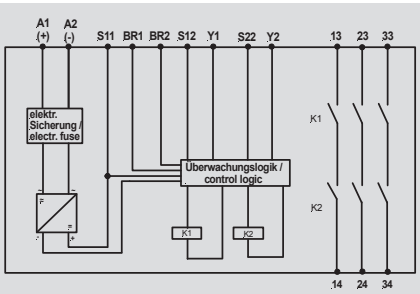
SAFE L.2

Emergency stop relay for safety light curtains / barriers
CE, TÜV, UL, C-UL
3 normally open safety
LED indicators for status and supply diagnostic
Without opposite polarity between channels
start control choosable by a extern bridge
Power, channel 1, channel 2 and restart interlock
24 V DC (electronic fuse)
ca. 2,5 W
<50 ms / <30 ms
6 A, 250 V AC, 24 V DC
10 mA
Simultaneous: ca. 40 ms
- 25 °C to + 55 °C
1500 VA (resistive load)
6 A quick acting or 4 A time lag

A supply voltage must be applied to terminals A1 and A2. The "Power" and "restart interlock" LED´s illuminate. If this is done, a voltage of 24 V DC is available on the terminal S11. Terminals S12 and S22 must be wired as shown in the application examples. To start the module, the terminals Y1 and Y2 must be bridged over normally open contact. In the following the contacts 13-14, 23-24 and 33-34 are closed.
The LED´s of channel 1, channel 2 are illuminate and "restart interlock" must be switched off. In series to the start-button, wired on terminals Y1 and Y2, an external contactor can be controlled. Monitoring of the reset circuit can be configured by external bridge between terminals BR1 an BR2.

For version with detachable clamps (screw - or cage clamps) ...
please ask our sales team!



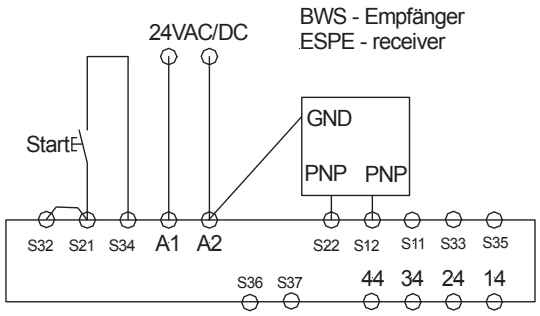


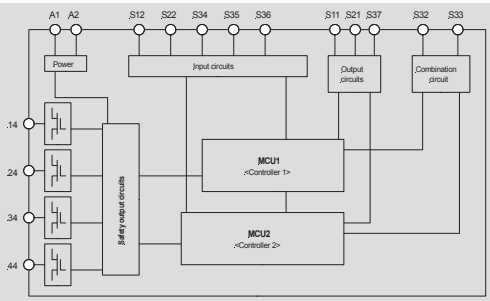
EN ISO 13849-1: PLe, Cat. 4
MTTFd: 36,16 years / high, DC: 99% / high,
CCF: achieved

SAFE CL

Safety controller for safety light barriers and safety light curtain
CE, TÜV, UL, C-UL
4 safety semiconductor outputs (OSSD)
LED indicators for status and supply diagnostic
Wearless semiconductor outputs, "AND" function
between several SAFE C possible, automatic start possible
Power, channel 1, channel 2
24 V DC (+ 25 - 20 %) Overvoltage protection
ca. 3 W
<70 ms / <30 ms
total current bis 1,8 A
infinite
S12 before S22 <0,5 s / S22 before S12 infinite
-25°C to +55°C
to 43 W
short circuit proof

Even ESPE type 4 with OSSDs and relay contacts as well as ESPE type 2 with one OSSD and test input are supported. Monitoring of movement direction is available by different simultaneousnesses.





EN ISO 13849-1/ EN 61508: PLe, Cat. 4 / SIL3
MTTFd: 163 years / high, DC: high, CCF: achieved,
PFH: 2,87*10^{-9} $^{1}/_{h}$, PFD: 2,01*10^{-6} $^{1}/_{h}$, SFF: 0,9573

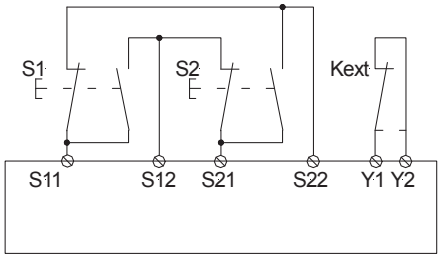
Two hand control relays

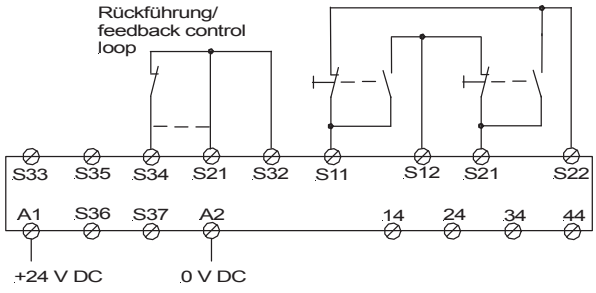
SAFE Z.2	SAFE CZ
Two hand control relay for type I-III c	Two hand control relay for type IIIc or II
CE, TÜV, UL, C-UL	CE, TÜV, UL, C-UL
2 normally open safety, 1 normally auxiliary closed, 1 PLC-output	4 safety semiconductor outputs (OSSD)
LED indicators for status and supply diagnostic	LED indicators for status and supply diagnostic
Two hand control relay according ZH 1 / 456 and DIN EN 574	wearless semiconductor outputs, "AND" function between several SAFE C possible, automatic start possible
Power, channel 1 and channel 2	Power, channel 1 and channel 2
24 V AC / DC (electronic fuse)	24 V DC (+ 25 - 20 %)
48, 115, 230 V AC (with galvanic disconnection / transformer)	Overvoltage protection
ca. 2 VA	ca. 3 W
<50 ms / <25 ms	<100 ms / <25 ms
6 A, 250 V AC, 24 V DC	total current bis 1,8 A
6 mA	infinite
Simultaneous: 0,5 s	0,5 s
- 25 °C to + 55 °C	-25°C to +55°C
1500 VA (resistive load)	to 43 W
6,3 A quick acting or 4 A time lag	short circuit proof

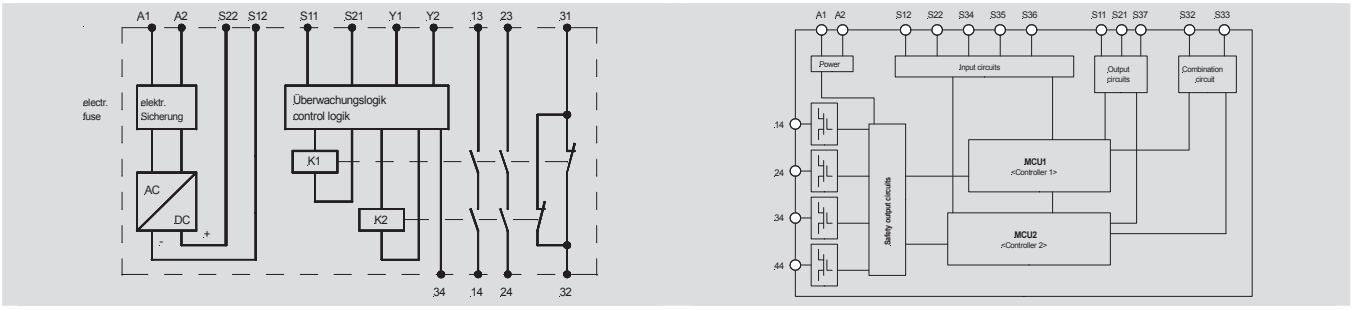
After supply voltage was applied to terminals A1 and A2, the SAFE Z will be ready for operation. The power LED illuminates. If the button S1 is pressed and within 0,5 sec. the button S2 also pressed, the outputs 13-14, 23-24 are closed and 31-32 will be opened. The machine will be started. The PLC-output (34) is connected with 24 V supply voltage. If one or both buttons are released, the outputs 13-14 and 23-24 open immediately. The output 31-32 closes. Only after releasing of both buttons S1 and S2, a new cycle can be started. If the time for pressing the buttons S1 and S2 will be longer than 0,5 sec., the outputs were not released. The outputs 13-14 and 23-24 keep open. The machine cannot be started. On the terminals Y1 and Y2 machine release circuit (repeating contactor control) or a bridge can be connected.

For version with detachable clamps (screw - or cage clamps) ...
please ask our sales team!
Still available: RS-NAGZ with an additionally auxiliary contact. For further information please see the manual or www.automation-safety.com

In use of the application below the simultaneousness of both switches is monitored (less than 0,5 s). This behaviour corresponds to EN 954-1 safety category 4.
This application is suitable for type II of DIN EN 574 and corresponds to EN 954-1 safety category 3.
Wiring changes during operation are not allowed and lead to a failure message.
Application corresponds to EN 954-1 type IIIc and safety category 4, EN IEC 62061 up to SIL3 and EN ISO 13849-1 up to PLe.







EN ISO 13849-1: PLe, Cat. 4
MTTFd: 36,45 years / high, DC: 99% / high,
CCF: achieved

EN ISO 13849-1/ EN 61508: PLe, Cat. 4 / SIL3
MTTFd: 163 years / high, DC: high, CCF: achieved,
PFH: 2,87*10^{-9} $^{1}/_{h}$, PFD: 2,01*10^{-6} $^{1}/_{h}$, SFF: 0,9573

Two hand control relays

Expansion modules

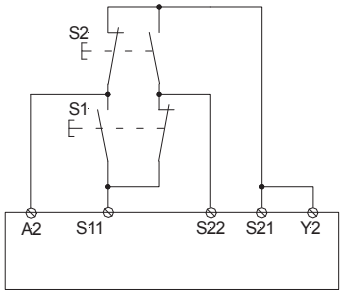
SAFE Z	SAFE X4 / SAFE X4.1
Two hand control relay for type I-III c	Expansion module for emergency stop relay according to VDE 0113
CE, TÜV, UL, C-UL	CE, TÜV, UL, C-UL
2 normally open safety, 1 normally auxiliary closed	4 normally open safety and 1 normally safety closed (feedback)
LED indicators for status and supply diagnostic	With (SAFE X4) and without (SAFE X4.1) opposite polarity between channels
Two hand control relay according ZH 1 / 456 and DIN EN 574	Easy way to increase the number of contacts
	Compact housing
Power, channel 1 and channel 2	Channel 1, channel 2 and fault
24 V DC (electronic fuse)	48, 110-127, 230 V AC (with galvanic disconnection / transformer) 24 V AC / DC (without galvanic disconnection, but with a safety resistor)
ca. 3 VA	ca. 4 VA
<50 ms / <30 ms	- / <15 ms
6 A, 250 V AC, 24 V DC	6 A, 250 V AC, 24 V DC, sum of currents <16 A
1 mA	6 mA
Simultaneous: 0,5 s	
- 25 °C to + 55 °C	- 25°C to + 55 °C
1500 VA (resistive load)	1500 VA
6 A quick acting or 4 A time lag	10 A quick acting

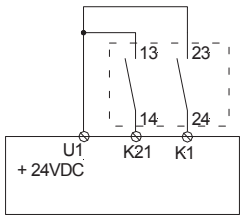
After supply voltage was applied to terminals A1 and A2, the SAFE Z.2 will be ready for operation. The power LED illuminates. If the button S1 is pressed and within 0,5 sec. the button S2 is also pressed, the outputs 13-14, 23-24 are closed and 31-32 will be opened. The machine will be started. If one or both buttons are released, the outputs 13-14 and 23-24 open immediately.The output 31-32 closes. Only after releasing the both buttons S1 and S2, a new cycle can be started. If the time for pressing the buttons S1 and S2 will be longer as 0,5 sec., the outputs were not released. The outputs 13-14 and 23-24 keep open. The machine cannot be started. On the terminals Y1 and Y2 machine release circuits (repeating contactor control) can be connected.

The expansion module is used to increase the number of outputs of a safety relay according to VDE 0113. Several expansion modules can be connected to one safety relay. A supply voltage must be applied at terminals A1 and A2 in order to operate the device. If this is done there is a voltage of 24 V DC at terminal U1. Terminals K21 and K1 must be wired as shown in the application examples. To start the module, closed safety circuits from the safety relay must be connected with K21 and K1 and contacts 13-14,

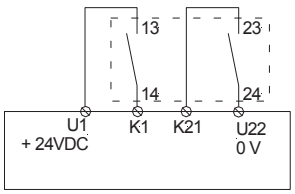
23-24, 33-34, 43-44, 53-53, 63-64, 73-74 and 83-84 close. The LED´s channel 1 and 2 illuminate. The stop LED illuminates if one or more safety circuits are open. The stop LED will be illuminated while the expansion module relay is operational.

For version with detachable clamps (screw - or cage clamps) ...
please ask our sales team!

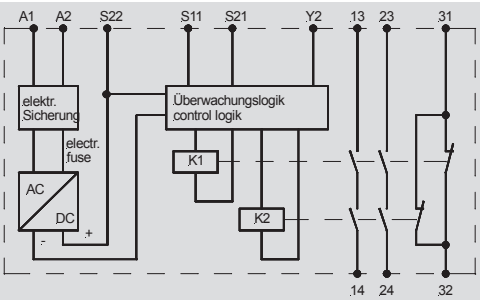


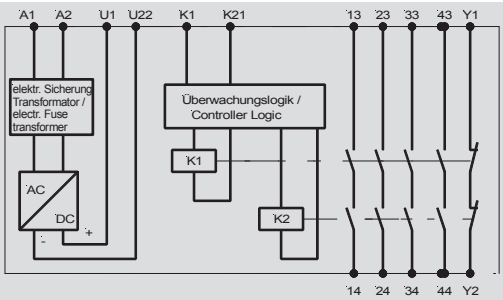


ohne Querschlusssicherheit /
without opposite polarity



mit Querschlusssicherheit /
with opposite polarity





EN ISO 13849-1: PLe, Cat. 4
MTTFd: 36,85 years / high, DC: 99% / high,
CCF: achieved

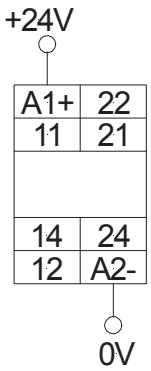
EN ISO 13849-1: PLe, Cat. 4
MTTFd: 185 years / high, DC: 99% / high,
CCF: achieved

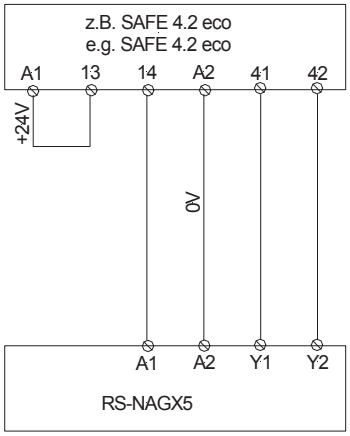
SAFE IRZ.2	RS-NAGX 5
Industrial relay with positive guided contacts	Expansion module for emergency stop relay according to VDE 0113
CE	CE, TÜV (UL, C-UL pending)
2 change over contacts	5 normally open safety and 1 normally safety closed (feedback)
LED indicators for status and supply diagnostic	LED indicators for status and supply diagnostic
Initializing input	Easy way to increase the number of contacts
	Compact housing
Power	Channel 1 and channel 2
24 V AC / DC	24 V AC / DC (without galvanic disconnection, but with a safety resistor)
1 W, 1 VA	ca. 2,4 VA
<25 ms	<30 ms
5 A, 250 V AC, 24 V DC	6 A, 250 V AC, 24 V DC, sum of currents <16 A
100 mA(*)	6 mA
-25°C to + 55°C	- 25°C to + 55 °C
1250 VA	1500 VA
5 A quick acting	6 A quick acting or 4 A time lag

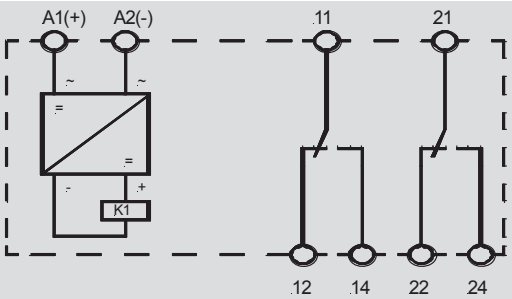
The device is an industrial relay with positive guidance for high switching cycles. The delay on and delay off times are smaller than 25 ms. After connecting the power supply on terminals A1 and A2 the relay activates immediately. If the power on terminals A1 and A2 is removed, the relay drops into the initial state.

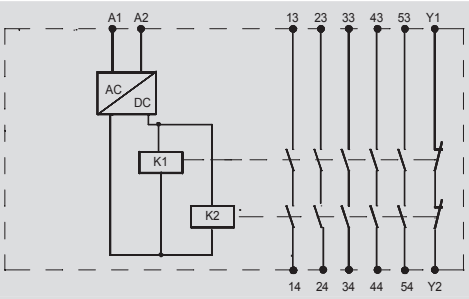
(*) We offer all devices which have a contact capacity of min. 100 mA at 24 V DC with hard gold-plated contacts. In this way you get a contact capacity of 4 mA. If you want such a relay please write for example "AR.1632.2010 hard gold-plated contacts".

Input circuit A1 is to be connected with one of the redundant safety outputs (13-14). Errors of the expansion unit will be announced over the feedback control loop (Y1-Y2) and the next activation will be disabled.
In case of protected wiring (short current circuit exclusion) and regularly tests, for example during maintenance, up to safety category 4.









EN ISO 13849-1: PLe, Cat. 4
MTTFd: 74,2 years / high, DC: 99% / high,
CCF: achieved

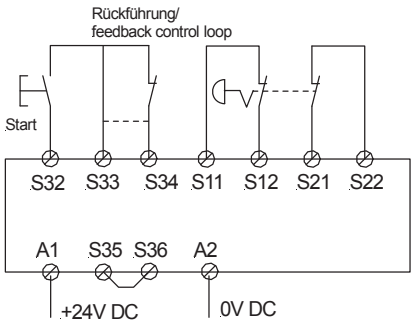
Multifunctional

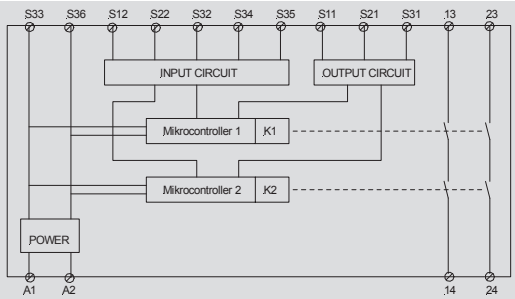
Muting

SAFE FLEX

RS-NAGU.1 / RS-NAGU.2f

Safety controller with choosable multi functions	Muting control RS-NAGU.1: CE, TÜV, UL, C-UL,
CE, TÜV, (UL, C-UL pending)	RS-NAGU.2f: CE, TÜV, UL, C-UL
2 normally open, 1 PNP output	RS-NAGU.1: 3 electr. Safety semicond. outp. / RS-NAGU.2 f: 3 normally open
LED indicators for status and supply diagnostic	4 muting sensors connectable
optical failure indication by LEDs	Control of filament of external muting lamp
Selectable monitored or not monitored start	pushbutton
Power, channel 1 IN / OUT, channel 2 IN / OUT, failure	Power indication, channel 1, channel 2, fault and restart interlock
24 V DC (+ 20 - 25 %) Overvoltage protection	24 V DC
<3 W	10 W (up to 60W including peripheral devices)
e-stop, BWS, Two hand, safety gate monitoring relay <= 30 ms	RS-NAGU.1: <6 ms - RS-NAGU.2f <20 ms
6 A, 250 V AC, 250 V DC	RS-NAGU.1: 0,7 - 1,5 A(*2), 24 V DC / RS-NAGU.2f: 1,5 A, 24 V AC / DC
5 mA	RS-NAGU.1: 1 mA / RS-NAGU.2f: 100 mA(*)
depending on the choosen functionality (see technical data)	Simultaneous of the muting sensors: 3 s
- 25°C to + 55°C	- 25°C to + 55°C
1500 VA	NAGU.1: 17 W, NAGU.2f: 84 W
6 A quick acting or 4 A time lag	RS-NAGU.1: outputs are permanently short circuit proof RS-NAGU.2f: 1 A quick acting or 3,15 A time lag
By wiring the following functionality is are choosable: - E-Stop safety controller cat. 4 - safety gate controller cat. 4 - Two-Handed safety controller cat. 3c - ESPE safety controller (light barriers and curtains) cat. 4 and cat. 2 - single pole safety devices with cyclic testing cat. 4 Wiring changes during operation are not allowed and lead to a failure message.	NAGU is used for muting of safety light barriers and safety light curtains, so that material - transport to or from a machine can be done. Applications can be found in the automotive industry, packaging machines or at highly automated production systems. The differentiation between human beings and material flow is done with up to four muting sensors or two safety light barriers. Inductive sensors or mechanical switches can also be used as muting sensors. After connection as per application guide, the device will be ready as soon as the power LED´s and channel 1 and channel 2 are illuminated. If LED´s channel 1 / 2 are blinking, a fault exists or a wrong connection has been made. In ready condition the RS-NAGU can be started by pushing the start key. If it cannot be started, then at least one of the muting sensors is blocked or not connected correctly. If a muting sensor is blocked by material supply, a muting can be initiated by actuation of the key switch. If the light barrier is interrupted after a muting cycle, RS-NAGU can be activated by pushing the start key after the failure has been fixed. As soon as muting sensors 1 and 2, respectively 3 and 4 will be activated within 3 sec., the RS-NAGU will initiate a muting cycle. Muting takes place so long the inputs of both groups of muting sensors are in active state plus 0,25 s time-delay. RS-NAGU.1: 3 electronic safety semiconductor outputs. RS-NAGU 2f: 3 normally open safety, 3 normally open signal outputs (release, and safety light barrier)





(*) We offer all devices which have a contact capacity of min. 100 mA at 24 V DC with hard gold-plated contacts. In this way you get a contact capacity of 4 mA.

(*2) 1,5 A permanent current (1 output) up to 4,5 A peak current (t<1s,UV>21,6V), 1 A permanent current (2outputs), 0,7 A permanent current (3 outputs)

Notice: please ask for detailed documentation.

EN ISO 13849-1 / EN 62061: PLe, Cat. 4 / SIL3
MTTFd: >100 years / high, DC: 99% / high, CCF: achieved,
PFH: 2,15*10^{-9} 1/h, SSF: 94,65%

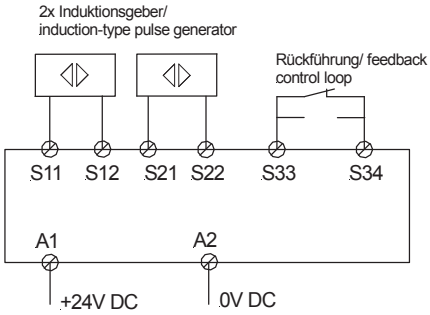
EN ISO 13849-1: PLe, Cat. 4
MTTFd: >100 years / high, DC: 99% / high,
CCF: achieved

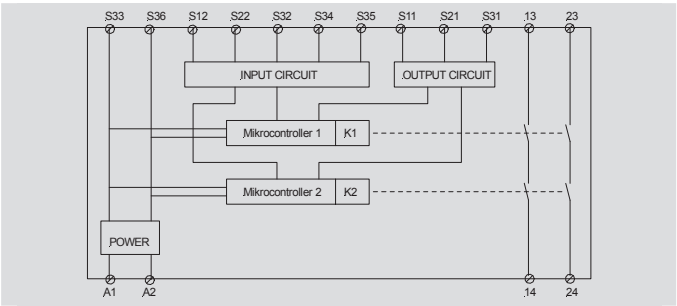
Safety standstill monitor

SAFE SM

Safety standstill monitor
CE, (TÜV, UL, C-UL pending)
2 normally open, 1 PNP output
LED indicators for status and supply diagnostic
optical failure indication by LEDs
Selectable monitored or not monitored start
Power, channel 1 IN / OUT, channel 2 IN / OUT, failure
24 V DC (+ 20 - 25 %)
Overvoltage protection
<3 W
frequency dependent
6 A, 250 V AC, 250 V DC
5 mA
- 25°C to + 55°C
1500 VA
6 A quick acting or 4 A time lag

The SAFE SM is a safe standstill monitor. It is designed to monitor safe speeds. Digitally switches e.g. inductive sensors or ESPD's are supported. SAFE SM is a two channel device. Therefore, two digitally switches are necessary. Four safe speeds are monitored: 0.2 Hz, 0.5 Hz, 1.0 Hz and 2.0 Hz, the shifting is done via configuration wirings.
The SAFE SM monitors the speed directly on any part of the machine, means not only the motor is monitored. Even breakages are to be monitored. Rotational and translational moves are monitored as well.





EN ISO 13849-1: Ple, Cat. 4
Specific values in progress

Overview of the standards:

The replacement of EN 954-1
Previously, the machine constructing engineer had, according to the EN 954-1 (safety-related parts of control systems, part 1: General design principles) to proof the compliance of the general safety requirements according to the European machinery directive.

This standard demanded a risk analysis with the resulting safety categories (B, 1, 2, 3, 4). B stands for low and almost no safety respectively, 4 stands for high safety. The safety devices for a system were chosen with the safety category.

The EN 954-1 was replaced because programmable electronic systems were considered insufficiently and the time response (e.g. testing intervals, life cycles) and the failure probability of components were not considered. The following standards **EN 13849-1** (safety of machines – safety-related parts of control systems, part 1: General design principles) and **EN 62061** (safety of machines – functional safety of electrical, electronic and programmable electronic control systems) create remedy and consider the above approaches.

Definition of the safety requirements
It is divided into two parts: Safety of machines and the functional safety.

Safety of machines
After finished risk evaluation according to EN ISO 14121-1, measures for reducing of the detected risks will be defined. Afterwards, the risks will be reduced up to an acceptable residual risk.

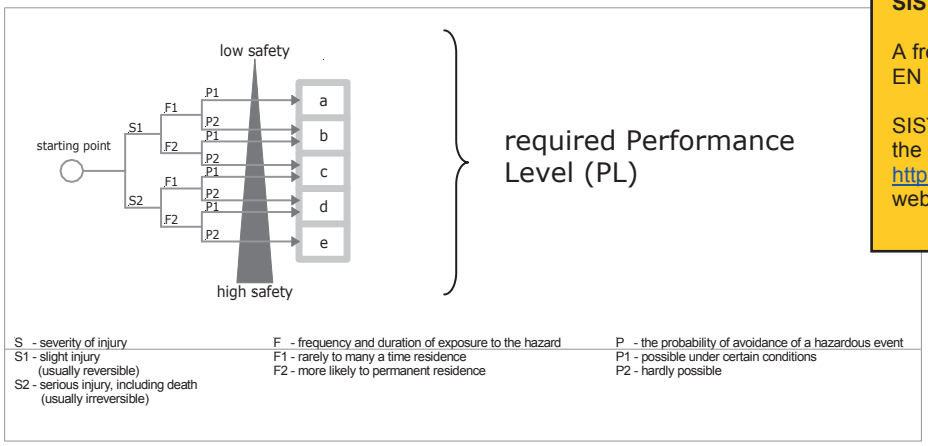
Functional safety
The functional safety follows from the results of the machinery safety. The functional safety is divided into 6 steps:

1. Definition of the safety-technological requirements
2. Selection of the required performance
3. Safety design
4. Definition of the achived performance
5. Verification
6. Validation

Definition of the safety-technological requirements
The required safety function characteristics are defined e.g. ESPD-function with automatic start, no simultaneity, etc. and a detailed description with the necessary interfaces to the other parts of control systems will be prepared.

Selection of the required performance
The definition is done with a risk graph. For new systems it can be generally done with two standards:

EN 13849-1 (Safety of machines – safety-related parts of control systems, part 1: General design principles)
With the risk graph it is possible to investigate all safety-related functions and areas of a machine respectively. The results are the so-called Performance Level / PL (***a-e***). The PL is needed for the selection of the safety setup and the corresponding components including wiring.
The ***a*** stands for low safety and the ***e*** for high safety.



SISTEMA

A free tool to calculate the parameters of EN ISO13849 of a given safety chain.

SISTEMA can be downloaded from the ifa website
http://www.dguv.de/ifa
webcode e34183

EN 62061 (Safety of machines - functional safety of safety-related electrical, electronic and programmable electronic control systems)
With the risk graph it is possible to investigate all safety-relevant functions and areas of a machine respectively. The results are the so-called Safety Integrity Level / SIL (1 - 3).The SIL is required for the selection of the safety setup and the corresponding components including wiring. The 1 stands for low safety and the 3 for high safety.

Effect and severity	S	Frequency and duration	F	Probability	P	Avoidance	A	Class K (=F+P+A) 3-4	5-7	8-10	11-13	14-15
Death, losing an eye or arm	4	≤ 1 h	5	very high	5			SIL2	SIL2	SIL2	SIL3	SIL3
Permanent, losing a finger	3	> 1 h - ≤ 1day	5	likely	4				OM	SIL1	SIL2	SIL3
Reversible, requiring attention from a medical practioner	2	> 1 day - ≤ 2 weeks	4	possible	3	impossible	5			OM	SIL1	SIL2
Requiring first help	1	> 2 weeks - ≤ 1 year	3	rarely	2	possible	3				OM	SIL1
		> 1 year	2	negligible	1	likely	1					

OM = other measures advised

Safety design
The safety function described in step 1 is designed. The single components are defined, e.g. safety relais SAFE CL for the ESPD-function.

Definition of the achieved performance
The actual performance of the safety function is detected. The safety function is divided in sensors, logic and actuators. The parameters required to calculation are provided by the component manufactures.

Verification
For each single safety function, the in step 4 achieved performance has to be bigger or equal as the in step 2 defined required performance. If this is not the case the safety function has to be improved.

Validation
For the safety function, the validation ensures that all safety-relevant parts achieve the requirements.

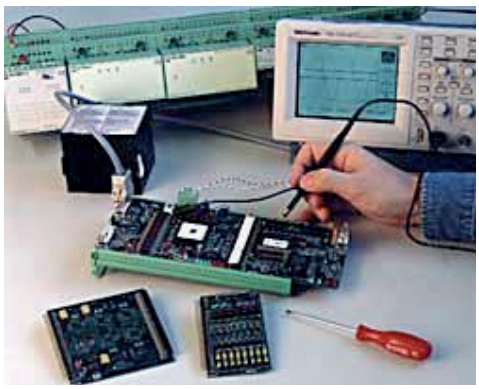
Technical data

► Voltage range	SAFE 1/1.1 / SAFE 2/2.1/2.2 / SAFE S.6 / SAFE 4/4.1 / SAFE M/M.1 RS-NAGV / SAFE L.2 / SAFE Z / SAFE IRZ.2 RS-NAGU.1 / RS-NAGU.2f	0,9 to 1,1 UB
	RS-NAGMP/MP.1 / RS-NAGAO SAFE 5/5.1 / SAFE Z.2 SAFE X4/4.1 / RS-NAGX5	0,85 to 1,1 UB
	SAFE 4/4.1 eco / SAFE 4.2 eco / SAFE 4.3 eco	0,85 bis 1,2 UB
	SAFE C1, CL, CM, CZ, SAFE FLEX, FLEX T, SAFE SM	0,8 to 1,25 UB
	SAFE TU/ TA/ TN/ TR/ TON	DC: 0,8 to 1,25 UB AC: 0,8 to 1,1 UB
► Clearance and creeping distance	DIN EN 50178, or DIN VDE 0160 at pollution grade 2, over voltage category 3/300V	
► max. switching load	RS-NAGMP/MP.1 :	8 A, 250 VAC, cos φ = 1; 8 A, 24 VDC, τ =0
	SAFE IRZ.2, SAFE 1 / 1.1 / 4 / 4.1 / M/M.1, SAFE 4 eco / 4.1 eco / 4.2 eco / 4.3 eco:	5 A, 250 VAC, cos φ = 1; 5 A, 24 VDC, τ =0
	RS-NAGV:	4 A, 250 VAC, cos φ = 1; 4 A, 24 VDC, τ =0
	RS-NAGU.2f:	1,5 A, 24 VAC / DC
	RS-NAGU.1	1,5 A, 24 VDC (1 Kontakt), τ = 0
	SAFE C1, SAFE CL, SAFE CM, SAFE CZ:	1,8 A, 24 VDC
	Other :	6 A, 250 VAC, cos φ = 1; 6 A, 24 VDC, τ =0
► Protection classes	Space requirements : Housing : Terminal area :	IP 54 IP 40 IP 20
► Mechanical life time	10^7 switching cycles	
► Electronical life time	10^5 switching cycles	
► Mounting	DIN rail DIN 46 277 (35 mm)	

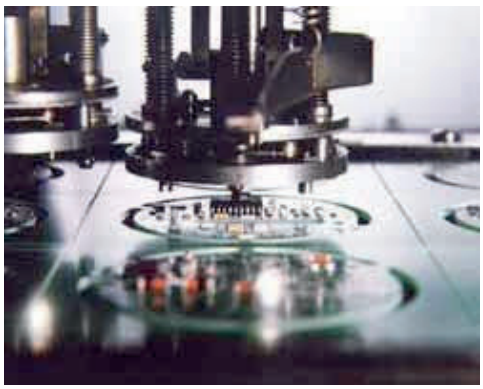
Pay attention to housing with detachable terminal strips: if you would like to detach the terminal strips please take away the power first.

► The ground wire has to be connected to terminal PE when an auxillary voltage used (at the terminals A1 and A2) UB~ / with galvanic disconnection to connect a protective conductor. By AC / DC or DC - devices is this not permitted.

All operating instructions can be found under www.automation-safety.com



Developement



Production

Special advantages

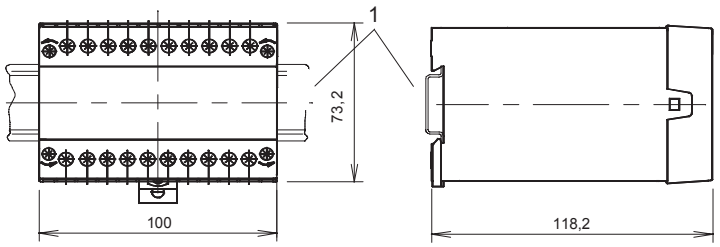
- ► emergency stop according to EN60204
- ► redundant positiv guided relay
- ► cyclical monitoring of the function
- ► housing with detachable terminal strip (for a quick change of the devices) by the NAG-line (without RS-NAGU.1 / RS-NAGU.2f)
- ► wireless layout
- ► housing of self extinguishing plastic according to UL 94-V1
- ► 100% computer assisted check

Testing area

Dimensions

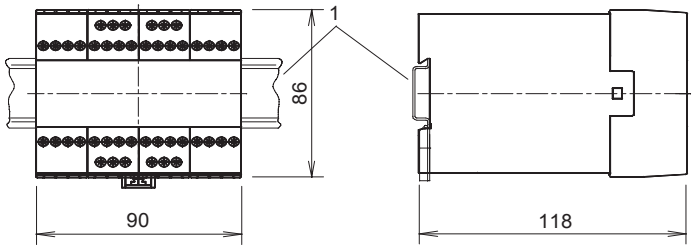
RS-NAGMP
RS-NAGMP.1

RS-NAGV

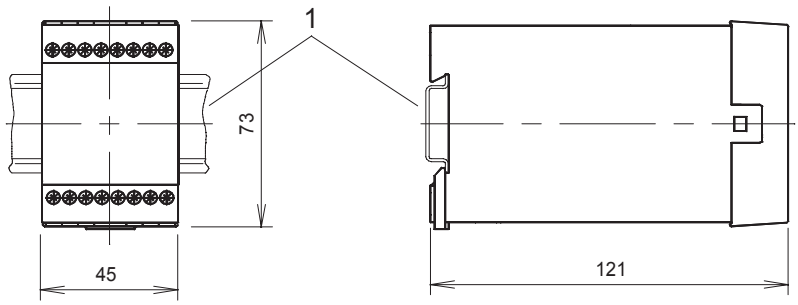


RS-NAGU.1

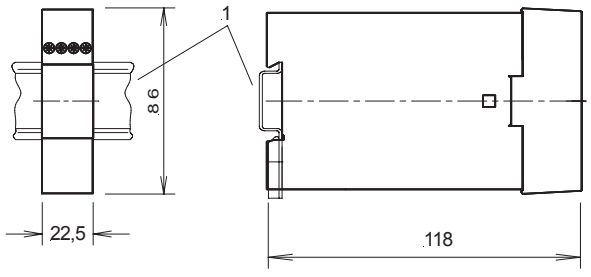
RS-NAGU.2f



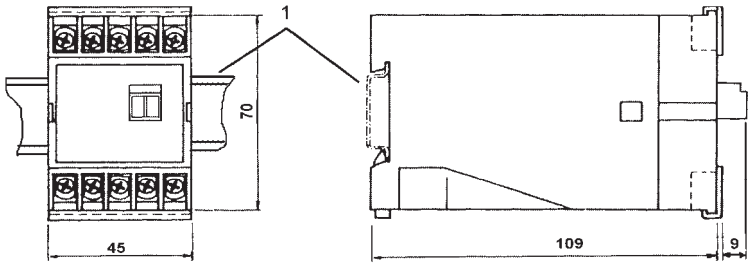
RS-NAGAO



RS-NAGX5



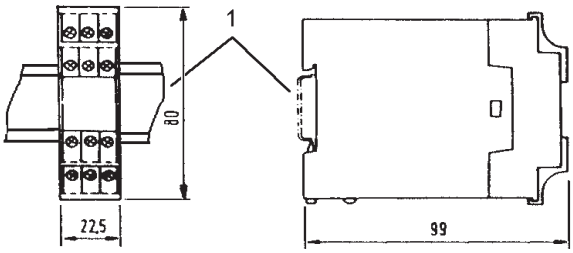
SAFE S.6



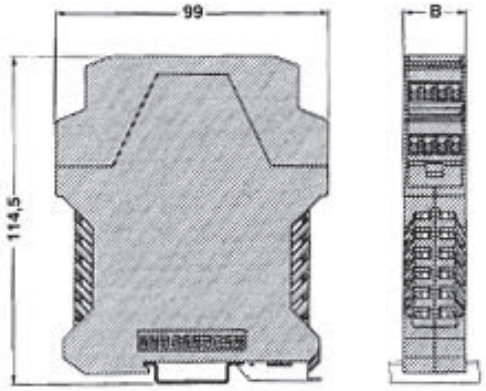
Dimensions

SAFE 1
SAFE 1.1
SAFE 2
SAFE 2.1
SAFE 2.2
SAFE Z

SAFE IRZ.2
(8 terminals)



	B[mm]
SAFE 4 / 4.1	22,5
SAFE 4 eco / 4.1 eco	22,5
SAFE 4.2 eco / 4.3 eco	22,5
SAFE 5 / 5.1	22,5
SAFE C1	22,5
SAFE CL	22,5
SAFE CM	22,5
SAFE CZ	22,5
SAFE M / M.1	22,5
SAFE L.2	22,5
SAFE X4 / 4.1	22,5
SAFE Z.2	22,5
SAFE FLEX	22,5
SAFE FLEX T	45
SAFE SM	22,5
SAFE T	35
SAFE TON	35



Legend:
1 - Attachment rail DIN 46 277

Printed: 01.08.2013
We reserve the right to make changes to the technical specification.
Not responsible for typographical text and drawing errors. With this leaflet all leaflets before are no longer valid. Since text and pictures in this folder are only for handling and illustration, we cannot take over adhesion for possible errors.

Product- / part number index

Type::	Voltage:	Part.-Nr.:
SAFE 4	24 V AC/DC	AR.9659.2000
SAFE 4	110 V AC	AR.9659.4000
SAFE 4	230 V AC	AR.9659.5000
SAFE 4.1	24 V AC/DC	AR.9660.2000
SAFE 4.1	110 V AC	AR.9660.4000
SAFE 4.1	230 V AC	AR.9660.5000
SAFE 4 eco	24 V AC/DC	AA.9675.2000
SAFE 4 eco	115 V AC	AA.9675.4000
SAFE 4 eco	230 V AC	AA.9675.5000
SAFE 4.1 eco	24 V AC/DC	AR.9678.2000
SAFE 4.1 eco	115 V AC	AR.9678.4000
SAFE 4.1 eco	230 V AC	AR.9678.5000
SAFE 4.2 eco	24 V AC/DC	AR.9676.2000
SAFE 4.2 eco	115 V AC	AR.9676.4000
SAFE 4.2 eco	230 V AC	AR.9676.5000
SAFE 4.3 eco	24 V AC/DC	AR.9677.2000
SAFE 4.3 eco	115 V AC	AR.9677.4000
SAFE 4.3 eco	230 V AC	AR.9677.5000
SAFE 5	24 V AC/DC	AR.9645.2000
SAFE 5.1	24 V AC/DC	AR.9646.2000
SAFE C1	24 V DC	AR.9680.9000
SAFE 1	24 V AC/DC	AR.9655.2000
SAFE 1.1	24 V AC/DC	AR.9654.2000
SAFE 2	24 V AC/DC	AR.9656.2000
SAFE 2.1	24 V AC/DC	AR.9657.2000
SAFE S.6	24 V DC	AR.9650.9000
SAFE S.6	24 V AC	AR.9650.8000
SAFE S.6	24 V AC/DC	AR.9650.2000
SAFE S.6	48 V AC	AR.9650.3000
SAFE S.6	110-127 V AC	AR.9650.4000
SAFE S.6	230 V AC	AR.9650.5000
NAGMP	12 V DC	AR.9605.1001
NAGMP	24 V DC	AR.9605.9001
NAGMP	24 V AC	AR.9605.8001
NAGMP	24 V AC/DC	AR.9605.2001
NAGMP	110-127 V AC	AR.9605.4001
NAGMP	230 V AC	AR.9605.5001
NAGMP.1	12 V DC	AR.9605.1002
NAGMP.1	24 V DC	AR.9605.9002
NAGMP.1	24 V AC	AR.9605.8002
NAGMP.1	24 V AC/DC	AR.9605.2002
NAGMP.1	110-127 V AC	AR.9605.4002
NAGMP.1	230 V AC	AR.9605.5002

Type::	Voltage:	Part.-Nr.:
NAGV	24 V DC	AR.9640.9000
NAGV	24 V AC	AR.9640.8000
NAGV	24 V AC/DC	AR.9640.2000
NAGV	48 V AC	AR.9640.3000
NAGV	110-127 V AC	AR.9640.4000
NAGV	230 V AC	AR.9640.5000
SAFE TN	24 V AC/DC	AR.9621.2010
SAFE TA	24 V AC/DC	AR.9621.2011
SAFE TR	24 V AC/DC	AR.9621.2012
SAFE TU	24 V AC/DC	AR.9621.2013
SAFE TON	24 V AC/DC	AR.9621.2100
SAFE FLEX T	24 V DC	on request
NAGAO	24 V DC	AR.9665.9000
NAGAO	24 V AC	AR.9665.8000
NAGAO	24 V AC/DC	AR.9665.2000
NAGAO	48 V AC	AR.9665.3000
NAGAO	115-127 V AC	AR.9665.4000
NAGAO	230 V AC	AR.9665.5000
SAFE CM	24 V DC	AR.9680.9002
SAFE M	24 V AC/DC	AR.9647.2000
SAFE M	115 V AC	AR.9647.4000
SAFE M.1	24 V AC/DC	AR.9648.2000
SAFE 2.2	24 V AC/DC	AR.9657.2010
SAFE L.2	24 V AC/DC	AR.9671.2100
SAFE CL	24 V DC	AR.9680.9001
SAFE Z.2	24 V AC/DC	AR.9673.2000
SAFE Z.2	48 V AC	AR.9673.3000
SAFE Z.2	110-127 V AC	AR.9673.4000
SAFE Z.2	230 V AC	AR.9673.5000
SAFE CZ	24 V DC	AR.9680.9003
SAFE Z	24 V DC	AR.9672.9000
SAFE X4	24 V AC/DC	AR.9613.2000
SAFE X4	48 V AC	AR.9613.3000
SAFE X4	110-127 V AC	AR.9613.4000
SAFE X4	230 V AC	AR.9613.5000
SAFE X4.1	24 V AC/DC	AR.9613.2010
SAFE X4.1	48 V AC	AR.9613.3010
SAFE X4.1	110-127 V AC	AR.9613.4010
SAFE X4.1	230 V AC	AR.9613.5010
SAFE IRZ.2	24 V AC/DC	AR.1632.2010
NAGX5	24 V AC/DC	AR.9615.2000
SAFE FLEX	24 V DC	AR.9690.2000
NAGU.1	24 V DC	AR.9667.9010
NAGU.2f	24 V DC	AR.9667.9020
SAFE SM	24 V DC	AR.9669.8000

No longer available:

Type::	Voltage:	Part.-Nr.:	Succeeding product: refer technical data
NAGE	24 V AC	AR.9607.8000	NAGMP / MP.1
NAGE	24 V AC/DC	AR.9607.2000	NAGMP / MP.1
NAGE	24 V DC	AR.9607.9000	NAGMP / MP.1
NAGE	110-127 V AC	AR.9607.4000	NAGMP / MP.1
NAGE	230 V AC	AR.9607.5000	NAGMP / MP.1
NAGK	12 V AC/DC	AR.9662.1000	NAGAO
NAGK	24 V AC	AR.9662.2000	NAGAO
NAGK	110-127 V AC	AR.9662.4000	NAGAO
NAGK	230 V AC	AR.9662.5000	NAGAO
NAGM	12 V AC/DC	AR.9605.1000	NAGMP / MP.1
NAGM	24 V AC	AR.9605.8000	NAGMP / MP.1
NAGM	24 V AC/DC	AR.9605.2000	NAGMP / MP.1
NAGM	24 V DC	AR.9605.9000	NAGMP / MP.1
NAGM	110-127 V AC	AR.9605.4000	NAGMP / MP.1
NAGM	230 V AC	AR.9605.5000	NAGMP / MP.1
NAGT	24 V AC/DC	AR.9661.2000	SAFE T…
NAGT	110-127 V AC	AR.9661.4000	SAFE T…
NAGT	230 V AC	AR.9661.5000	SAFE T…
NAGT.1	110-127VAC	AR.9661.4005	SAFE T…
NAGT.1	230 V AC	AR.9661.5005	SAFE T…
NAGU.12	24 V DC	AR.9667.9012	NAGU.1

Type::	Voltage:	Part.-Nr.:	Succeeding product: refer technical data
NAGX4	24 V AC	AR.9614.8000	SAFE X.4 / X4.1 or NAGX5
NAGX4	24 V AC/DC	AR.9614.2000	SAFE X.4 / X4.1 or NAGX5
NAGX4	24 V DC	AR.9614.9000	SAFE X.4 / X4.1 or NAGX5
NAGX4	110-127 V AC	AR.9614.4000	SAFE X.4 / X4.1
NAGX4	230 V AC	AR.9614.5000	SAFE X.4 / X4.1
NAGX8	24 V AC	AR.9618.8000	two SAFE X.4 / X4.1 or NAGX5
NAGX8	24 V AC/DC	AR.9618.2000	two SAFE X.4 / X4.1 or NAGX5
NAGX8	24 V DC	AR.9618.9000	two SAFE X.4 / X4.1 or NAGX5
NAGX8	110-127 V AC	AR.9618.4000	two SAFE X.4 / X4.1
NAGX8	230 V AC	AR.9618.5000	two SAFE X.4 / X4.1
NAGA	24 V AC	AR.9663.8000	SAFE M/M.1 or SAFE 4.2 eco
NAGA	24 V AC/DC	AR.9663.2000	SAFE M/M.1 or SAFE 4.2 eco
NAGA	24 V DC	AR.9663.9000	SAFE M/M.1 or SAFE 4.2 eco
NAGA	110-127 V AC	AR.9663.4000	SAFE M/M.1 or SAFE 4.2 eco
NAGA	230 V AC	AR.9663.5000	SAFE M/M.1 or SAFE 4.2 eco
NAGL	24 V AC/DC	AR.9610.2000	SAFE FLEX or SAFE L.2
NAGL	48 V AC	AR.9610.3000	SAFE FLEX or SAFE L.2
NAGL	110-127 V AC	AR.9610.4000	SAFE FLEX or SAFE L.2
NAGL	230 V AC	AR.9610.5000	SAFE FLEX or SAFE L.2
NAGL.1	24 V DC	AR.9610.9003	SAFE FLEX or SAFE L.2

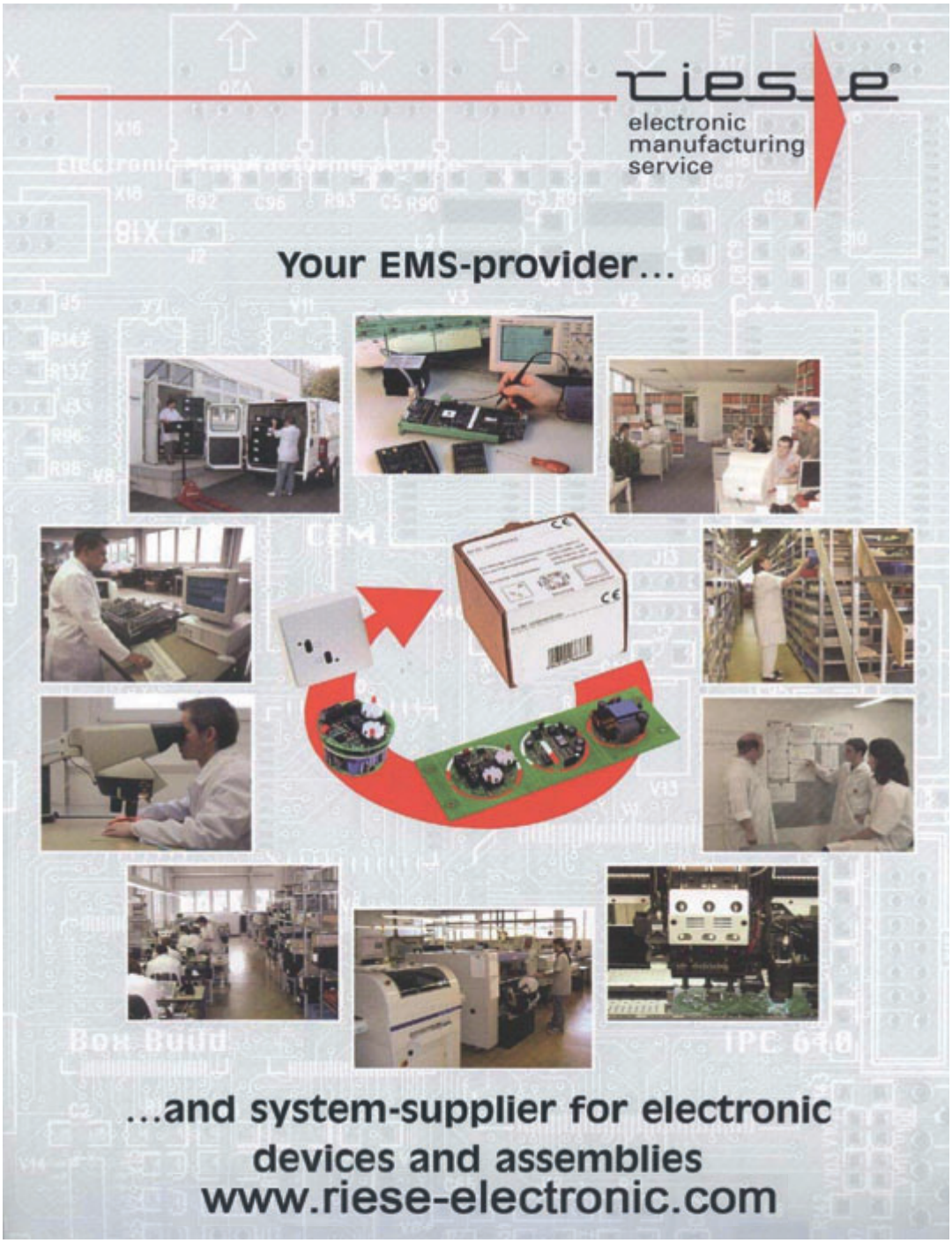
Relevant information: partly also available with hard gold-plated contacts. Please ask for price and delivery time by hard gold-plated contacts.
All operating instructions can be found under www.automation-safety.com

Infos on our business division EMS (electronic manufacturing service):

riese electronic manufacturing service

Development, production and tests for user-specific electronic devices and assemblies

www.riese-electronic.com



- ► Our customers are situated in the business of engineering, automation, automotive, medical technology and control devices.
- ► riese electronic employs 120 staff at it's two plants in Horb (Baden-Württemberg) and Langenwolschendorf (Thuringia).
- ► partners in Hungary and China

Further product line on our business division A+S (automation & safety) :

producer of time, measuring and safety relays, representative of automation and safety products

www.automation-safety.com

Since 1987 riese electronic has been developing, producing and testing the time-delay and measuring relays. We not just test our relay after it´s finished we test it at every step of production! Our testing strategy thoroughly checks all functions of every single relay by means of a computerized testing system which we developed ourselves. We simulate situations in which the worse scenarious happen all at once. Only after such testing does a relay get the "thumbs-up". Therefore, "riese-relays" are ideally situated to rough environments, e.g. severe vibrations, temperature fluctuations or voltage discrepancies.

Special features

- ► **12 V relays**, e.g. for vehicles, vehicle mountings We have developed a number of relays especially for this purpose. Not all types are included in this leaflet so please call us for details.
- ► **24 V relays**, e.g. for railways, tram systems. Peculiar to railways and tram systems is the fact that the voltage changes depending on the number of vehicles. We have managed to overcome these and other specific problems.
- ► **Brand-name labeling**. Do you need relays with your company logo? No problem!
- ► **Special designs.** If you can't find the relay you're looking for in our range, then please contact our design department. We relish the opportunity to discover new ways of optimizing your applications.

Time-delay relays from riese

- *Clock-pulsed*
- *Multifunction*
- *Interval time-delay*
- *Flashing*
- *On-delay*
- *Off-delay*

Applications	Relay designations	Column	Category according to EN 13849-1
On-delay	RS-VR1, RS-VR2, RS-ZR1, RS-ZR2, RS-ER1, RS-ER2, RS-ERF, RS-LR1,RS-LR2, RS-LZ1, RS-LZ2, RS-LZF	1 2, 3 4, 5, 6, 7	1 1 1 1 1 1 1
Off-delay	RS-AR1, RS-AR2, RS-AZ1, RS-AZ2, RS-LA1, RS-LA2, RS-AZS	8, 9 10, 11	1 1 1 1
Flashing	RS-BR1, RS-BR2, RS-BRS1, RS-BRS2	12, 13	1 1
Clock-pulsed	RS-TG1, RS-TG2, RS-TGI1, RS-TGI2	14, 15	1 1
Multifunction	RS-MF	16	1
Interval time-delay	RS-EI1, RS-EI2, RS-EIF, RS-WAR	17, 18, 19	1 1 1

Measuring relays from riese

- *Voltage relays*
- *Industrial relay*
- *PTC-resistor release relays*
- *Level relays*
- *Phase relays*
- *Current relays*

Applications	Relay designations	Column	Category according to EN 13849-1
PTC-resistor release relays	RS-TMSA, RS-TMSA-2 RS-TMKA, RS-TMKA-2 RS-TMSW, RS-TMSW-2 RS-TMKW, RS-TMKW-2 RS-TMSV, RS-TMSV-2 RS-TMKV, RS-TMKV-2 PTC-resistor release relay in 22.5 mm housing RS-TMVW	1 2 3 4 5 6 8 7	1 1 1 1 1 1 1 1
Level relays	RS-NR-4, RS-NRU-4 RS-NR2	9, 10 11	1, 1 1
Current relays	RS-185-4, RS-186-4 RS-187-4, RS-188-4	12, 13 14, 15	1, 1 1, 1
Voltage relays	RS-190-4, RS-191-4 RS-192-4, RS-193-4	16, 17 18, 19	1, 1 1, 1
Phase relays	RS-PH1-4	20	1
Industrial relay (High frequency switching)	RS-IR2	21	1

Headquarter

riese electronic gmbh

Junghansstr. 16
72160 Horb am Neckar
Telefon +49 (0) 74 51 55 01 0
Telefax +49 (0) 74 51 55 01 70
info@riese-electronic.de
www.automation-safety.com

Subsidiary East

Industrievertretung für Automation und Sicherheit
Dr.-Riese-Str. 1
07937 Langenwolschendorf
Telefon +49 (0) 3 66 28 7 25 0
Telefax +49 (0) 3 66 28 7 25 17
info-lawo@automation-sicherheit.de
www.automation-safety.com

riese automation & safety

EUROPE

Austria

Distributor
Reliste Steuerungstechnik GesmbH
Vertriebsleitung
Enzersdorfer Str. 8-10
A-2345 Brunn am Gebirge
Phone +43 22 36 31 52 50
Fax +43 22 36 31 52 56 0
office@reliste.at
www.reliste.at

Belgium

Representative
Koning & Hartmann B.V.
Div. Multitechnic
Woluwelaan 31
B-1800 Vilvoorde
Phone +32 22 57 02 40
Mobil +0478 93 90 26
Fax +32 22 57 02 49
michael.wauters@KoningenHartmann.be
www.multitechnic.be

Belgium

Distributor
Rotero Belgium BVBA
Wayenborgstraat 10
B-2800 Mechelen
Phone +32 15 45 18 40
Fax +32 15 45 18 41
info@rotero.be
www.rotero.be

Belgium

Distributor
Laumans BVBA:
Weertersteenweg 138/2
B-3680 Kinrooi
Phone +32 89 70 20 96
Fax +32 89 70 20 97
sales@laumans.com
www.laumans.com

Finland

Distributor
UTU Powel Oy, Components
P.O.Box 33, Palopellonkatu 7
FIN-04251 Kerava
Phone +35 89 27 46 41 1
Fax +35 89 27 46 41 41
powel@utu.eu
www.utupowel.fi

France

Representative
DISIMPEX
14 rue Joseph Graff
F-67810 Holzheim
Telefon +03 90 20 74 20
Fax +03 88 76 90 83
info@disimpex.com
www.disimpex.com

Hungary

Representative
Merker 2007 Zrt.
Kistályai út 14.
H-3300 Eger
Phone +36 36 52 42 00
Fax +36 36 31 15 10
ferenczm@tervker.hu
www.tervker.hu

Italy

Representative
Tecnel System SpA
Via Brunico 15
I-20126 Milano
Phone +39 02 25 78 80 3
Fax +39 02 27 00 10 38
tecnel@tecnelsystem.it
www.tecnelsystem.it

Netherlands

Distributor
Laumans Techniek B.V.:
Fahrenheitsstraat 12
NL-6003 DC Weert
Phone +31 49 55 21 06 7
Fax +31 49 55 42 45 7
sales@laumans.com
www.laumans.com

Netherlands

Distributor
Rotero B.V.
Postbus 126
NL-3440 AC Woerden
Phone +31 34 84 95 15 0
Fax +31 34 84 95 17 1
info@rotero.com
www.rotero.com

Netherlands

Distributor
Isotron Systems B.V.
Afrikalaan 21-23
NL-5232 BD 's-Hertogenbosch
Phone +31 73 63 91 63 9
Fax +31 73 63 91 69 9
info@isotron.nl
www.isotron.nl

Spain

Representative
Soltekin S.L.
Apdo. Correos No 62
C/EI Fou No 84
E-08440 Cardedeu
Phone +34 (9) 38 71 19 45
Fax +34 (9) 38 46 23 32
central@soltekin.com
www.soltekin.com

Switzerland

Representative
Bachofen AG
Industrielle Automation
Abteilung Schalttechnik
Ackerstrassen 42
CH-8610 Uster
Phone +41 (0) 44 944 11 11
Fax +41 (0) 44 944 10 04
sg@bachofen.ch
www.bachofen.ch

Switzerland

Distributor
Surber AG
Industriestr. 7
CH-4653 Obergösgen
Phone +41 62 29 50 33 3
Fax +41 62 29 50 30 2
info@surberag.ch
www.surberag.ch

WORLDWIDE

China

Distributor
Shanghai Controlway Technology Co., Ltd
Room 305 No.1870, DongFangRoad
Shanghai 200125, China
Telefon +86 10 88 47 09 73
Telefax +86 10 88 44 71 90
assist@controlway.cn
www.controlway.com

China

Distributor
Techimport Int'l LLC
5F, No.196 Xinjinqiao Road
Shanghai 201206, China
Telefon +86 21 50 31 17 27
Telefax +86 21 58 99 00 53
elainelee@techimport.com
www.techimport.com

South Africa

Representative
Curmec CC
P.O.Box 1818
Bedfordview 2008/Gauteng
ZA-Germiston 1401
Phone +27 11 87 30 53 6
Fax +27 11 87 39 74 3
info@curmec.co.za
www.curmec.co.za

South Korea

Representative
TELKO Korea Co. Ltd.
Seoul, Korea
Phone +82 23 27 37 80 0
Fax +82 23 27 37 80 2
telko@unitel.co.kr
www.telko.co.kr

Taiwan

Representative
Daybreak International (Taiwan) Corporation
TAIPEI, ROC TAIWAN
Phone +88 62 88 66 12 31
Fax +88 62 88 66 12 39
day111@ms23.hinet.net
www.daybreak.com.tw

USA/Canada/Mexico

Representative
Norstat Inc.
ROCKAWAY, NJ 07866, USA
Phone +1 (973) 586 25 00
Fax +1 (973) 586 15 90
info@norstat.com
www.norstat.com

Handed over by: