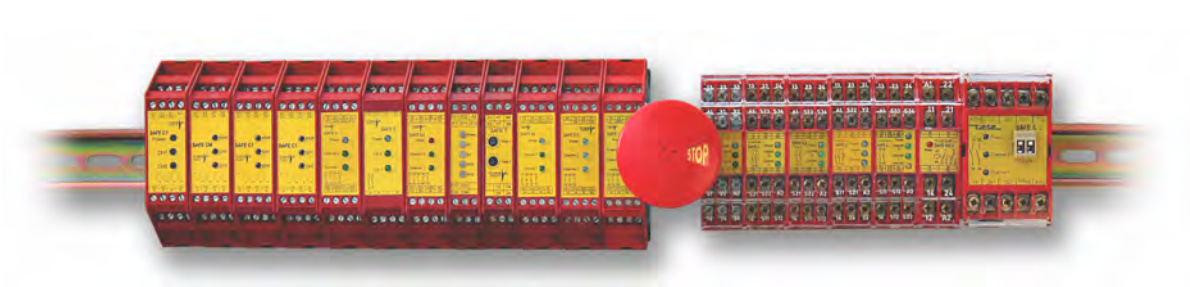
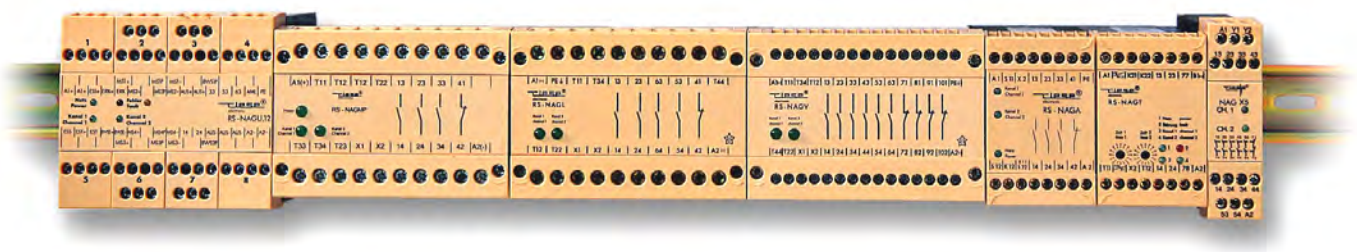


automation & safety

Safety relays 2010 / 2011

Applications	Typ	Approvalsn	Housing (mm)	Category	Page
Emergency stop	SAFE 4 / 4.1	CE, TÜV, UL, C-UL	22,5	4	6
..+ safety gate monitoring relays	SAFE 5 / 5.1	CE, TÜV, UL, C-UL	22,5	2 / 3	6
	SAFE C 1	CE, TÜV, UL, C-UL	22,5	4	7
	SAFE FLEX	CE, TÜV, UL, C-UL	22,5	4	18
	SAFE 1 / 1.1	CE, TÜV, UL, C-UL	22,5	2 / 3	7
	SAFE 2 / 2.1	CE, TÜV, UL, C-UL	22,5	4	8
	SAFE S.6	CE, TÜV, UL, C-UL	45	4	8
	RS-NAGMP / MP.1	CE, TÜV, UL*, C-UL*	100	3 / 4	9
	RS-NAGV	CE, TÜV, UL, C-UL	100	4	9
..+ time-delay function	SAFE T..	CE, TÜV, UL, C-UL	35	4	10
	SAFE T ON	CE, TÜV, UL, C-UL	35	4	10
	SAFE FLEX T	CE, TÜV, UL, C-UL	45		11
	RS-NAGT / T.1	CE, TÜV, UL, C-UL	45	3 / 4	11
..+ mat-, edges-control relays **	RS-NAGA / AO	CE, TÜV, UL, C-UL	45	4	12
Mat-, edges-control relays **	SAFE CM	CE, TÜV, UL, C-UL	22,5	4	12
	SAFE M / M.1	CE, TÜV, UL, C-UL	22,5	3	13
	SAFE 2.2	CE, TÜV, UL, C-UL	22,5	4	13
Control devices for safety ligth barriers	SAFE L.2	CE, TÜV, UL, C-UL	22,5	4	14
	SAFE CL	CE, TÜV , UL, C-UL	22,5	4	14
	SAFE FLEX	CE, TÜV, UL, C-UL	22,5	4	18
	RS-NAGL / L.1	CE, TÜV, UL, C-UL	100	4	15
..+ time-delay function	SAFE FLEX T	CE, TÜV*, UL*, C-UL*	45		11
Two hand control relays	SAFE Z.2	CE, TÜV, UL, C-UL	22,5	4	15
	SAFE CZ	CE, TÜV , UL, C-UL	22,5	4	16
	SAFE FLEX	CE, TÜV, UL, C-UL	22,5	4	18
	SAFE Z	CE, TÜV, UL, C-UL	22,5	4	16
..+ time-delay function	SAFE FLEX T	CE, TÜV*, UL*, C-UL*	45		11
Expansion modules	SAFE X4 / X4.1	CE, TÜV, UL, C-UL	22,5	4	17
	SAFE IRZ.2	CE	22,5	Ⓐ	17
	RS-NAGX 5	CE, TÜV, UL*, C-UL*	22,5	4	18
	SAFE IL2	CE, TÜV	63	4	20
Multifunctional	SAFE FLEX	CE, TÜV, UL, C-UL	22,5	4	18
..+ time-delay function	SAFE FLEX T	CE, TÜV*, UL*, C-UL*	45		11
A Standstill Monitor	SAFE SM	CE, TÜV*, UL*, C-UL*	22,5		20
Muting	RS-NAGU.12	CE, TÜV	90	2	19
	RS-NAGU.1	CE, TÜV, UL, C-UL	90	4	19
	RS-NAGU.2f	CE, UL, C-UL	90	4	19
Safety on BUS	SAFE IL1 / SAFE ILL	CE, TÜV / CE, TÜV	73 / 73	4	20
	SAFE ILZ / SAFE IL2	CE, TÜV* / CE, TÜV	73 / 63	4	20

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



Four housing lines - the big diversity at market

One of the smallest safety relays in the world: SAFE 1 / 2 / 2.2 / Z

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

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
1969 removal from Schönaich to Horb a.N.
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

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 -

Entwicklung und Produktion kundenspezifischer Baugruppen und Geräte (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?

What we can offer 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 to have a special colour?

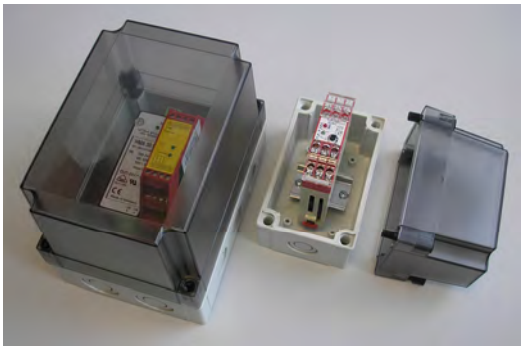
Your relay design department

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

Please ask us for your requirements.

Customized housings:

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



PRODUCT - NAVIGATOR

	Contacts				Operating voltage												EN954-1: risk categories				EN13849-1: categories				EN13849-1: PL					EN61508: SIL			
	NO	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	EC type examination	B/1	2	3	4	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 5 SAFE 5.1	2							x				22,5	x	6A	CE, TÜV UL, C-UL	√	√	√	√ *3		√	√	√ *3		√	√	√	√ *3	√				6
SAFE C1				4		x						22,5		1-1,8A	CE, TÜV UL, C-UL	√					√	√	√	√	√	√	√	√	√	√	√	√	7
SAFE FLEX	2					x						22,5		6A	CE, TÜV, UL, C-UL	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	18
SAFE 1 SAFE 1.1	3	1						x				22,5	x	5A	CE, TÜV UL, C-UL	√	√	√	√ *3		√	√	√ *3		√	√	√	√ *3					7
SAFE 2 SAFE 2.1	2							x				22,5	x	6A	CE, TÜV UL, C-UL	√	√	√	√	√	√	√	√	√	√	√	√	√				8
SAFE S.6	2					x	x	x	x	x	x	45		6A	CE, TÜV UL, C-UL	√	√	√	√	√	√	√	√	√	√	√	√	√				8
RS-NAGMP RS-NAGMP.1	3	1			x	x	x	x		x	x	100		8A	CE, TÜV UL*, C-UL*	√	√	√	√	√	√	√	√	√	√	√	√	√				9
RS-NAGV	6	4				x	x	x		x	x	100		4A	CE, TÜV UL, C-UL	√	√	√	√	√	√	√	√	√	√	√	√	√				9
Emergency stop / safety gate monitoring relays with time-delay																																	
SAFE T..	2+2	1						x				35	choose-able	6A	CE, TÜV UL, C-UL	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	10
SAFE T ON	2+2	1						x				35		6A	CE, TÜV UL, C-UL	√					√	√	√	√	√	√	√	√	√	√	√	10
SAFE FLEX T	4+2	1		1		x						45		6A	CE, TÜV*, UL*, C-UL*	√					√	√	√	√	√	√	√	√	√	√	√	11
RS-NAGT RS-NAGT.1	2+1							x		x	x	45		6A	CE, TÜV UL, C-UL	√	√	√	√	√ *2	√	√	√	√ *2	√	√	√	√	√ *2				11
Emergency stop / safety gate monitoring relays for function: mat-, edges-control relays																																	
RS-NAGA RS-NAGAO	3	1				x	x	x	x	x	x	45	x	6A	CE, TÜV UL, C-UL	√	√	√	√	√	√	√	√	√	√	√	√	√				12
Mat-, edges-control relays																																	
SAFE CM				4		x						22,5		1-1,8A	CE, TÜV UL, C-UL	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	12
SAFE M SAFE M.1	3	1						x				22,5	x	5A	CE, TÜV UL, C-UL	√	√	√	√		√	√	√		√	√	√	√	√	√	√	13
SAFE 2.2	2							x				22,5		6A	CE, TÜV UL, C-UL	√	√	√	√	√	√	√	√	√	√	√	√	√				13
Emergency stop for safety light barriers																																	
SAFE L.2	3							x				22,5	choos e-	6A	CE, TÜV UL, C-UL	√		√ *4		√		√ *4		√	√	√	√	√				14
SAFE CL				4		x						22,5		1-1,8A	CE, TÜV UL, C-UL	√					√	√	√	√	√	√	√	√	√	√	√	14
SAFE FLEX	2					x						22,5		6A	CE, TÜV, UL, C-UL	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	18
SAFE FLEX T	4+2	1		1		x						45		6A	CE, TÜV*, UL*, C-UL*	√					√	√	√	√	√	√	√	√	√	√	√	11
RS-NAGL RS-NAGL.1	2	1	1			x	x		x	x	x	100		6A	CE, TÜV UL, C-UL	√		√ *4		√		√ *4		√	√	√	√	√				15

The most devices conformal to RoHS . The exact conversion information (if and when) dates find you in the internet under: www.automation-safety.com/englisch/index.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 24/25.
Allmost all of our products are certified by:

TÜV Baumuster geprüft

c UL US LISTED IND.CONT.EQ 51BA

BG-PRÜFZERT

PRODUCT - NAVIGATOR

	Contacts				Operating voltage												EN954-1: risk categories				EN13849-1: categories				EN13849-1: PL					EN61508: SIL			
	NO	Auxiliary contacts NC	Auxiliary contacts other	Safety semic. output	12V DC	24V DC	24V AC	24V AC/DC	48V AC	110V AC	230V AC	Housing width in mm	Start circuit control	Circuit capacity	Approvals	EC type examination	B/1	2	3	4	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	√	√	√	√	√	√	√	√	√	√	√	√	√				15
SAFE CZ				4		x						22.5		1-1,8A	CE, TÜV*, UL*, C-UL*	√					√	√	√	√	√	√	√	√	√	√	√	16
SAFE FLEX	2					x						22,5		6A	CE, TÜV, UL, C-UL	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	18
SAFE FLEX T	4+2	1		1		x						45		6A	CE, TÜV*, UL*, C-UL*	√				√	√	√	√	√	√	√	√	√	√	√	√	11
SAFE Z	2	1				x						22,5		6A	CE, TÜV UL, C-UL	√	√	√	√	√	√	√	√	√	√	√	√	√				16
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		(A)															17
RS-NAGX5	5	1						x				22,5		6A	CE, TÜV, UL*, C-UL*	√	√	√	√	√	√	√	√	√	√	√	√	√				18
Multifunctional																																	
SAFE FLEX	2					x						22,5		6A	CE, TÜV, UL, C-UL	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	18
SAFE FLEX T	4+2	1		1		x						45		6A	CE, TÜV*, UL*, C-UL*	√				√	√	√	√	√	√	√	√	√	√	√	√	11
A Standstill Monitor																																	
SAFE SM	2					x						22,5		6A	CE, TÜV, UL, C-UL	√				√	√	√	√	√	√	√	√	√	√	√	√	20
Muting																																	
RS-NAGU.12			2	3		x						90	x	0,7-1,5A DC	CE, TÜV	√		√ *4				√ *4											19
RS-NAGU.1			2	3		x						90	x	0,7-1,5A DC	CE, TÜV, UL, C-UL	√			√				√					√					19
RS-NAGU.2f	3		4			x						90	x	3,5-6A AC/DC	CE, UL, C-UL	√			√				√					√					19
Safety on Bus																																	
SAFE IL1	1					x						73	choose-able	4A	CE, TÜV		√	√	√	√	√	√	√	√	√	√	√	√	√				20
SAFE ILL	1					x						73	choose-able	4A	CE, TÜV			√ *4		√		√ *4		√	√	√	√	√				20
SAFE ILZ	1					x						73		4A	CE, TÜV		√	√	√	√												20
SAFE IL2	3	1				x						63		12A	CE, TÜV		√	√	√	√												20

* 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

(A) Suitable up to risk category max. 4

√ - suitable up to risk category

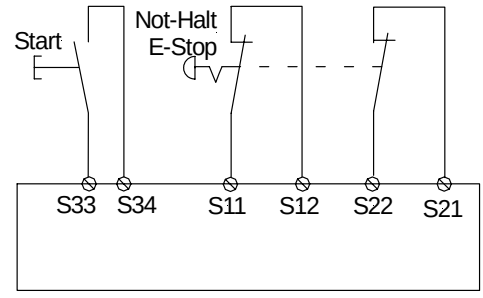
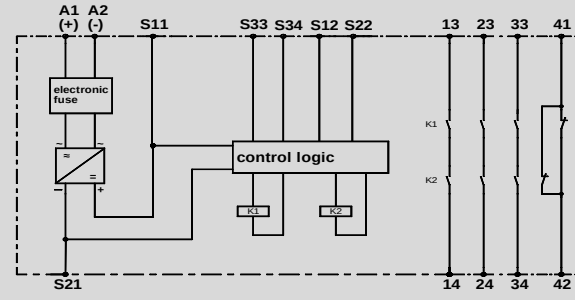
x - available

NO - Normally open contact

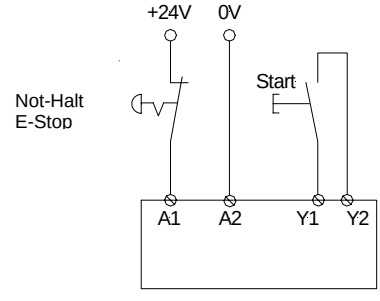
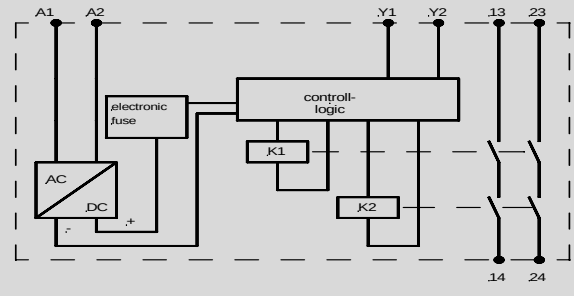
NC - Normally closed contact

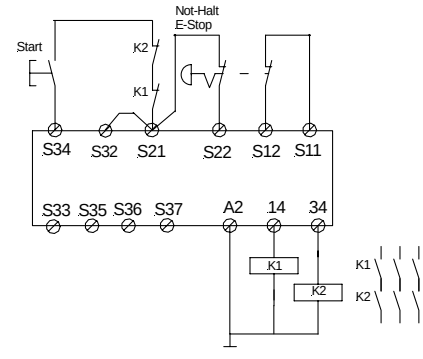
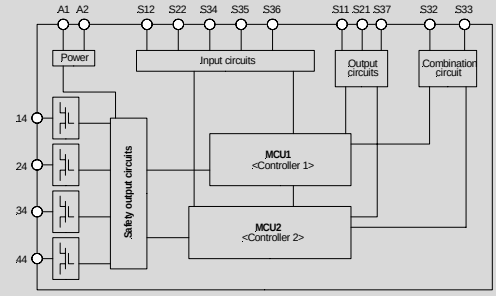
W - Change over contact

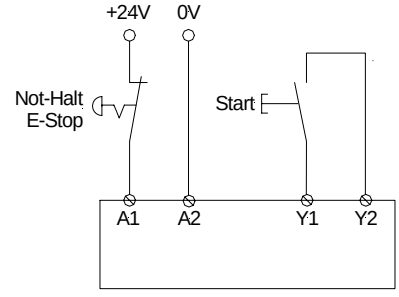
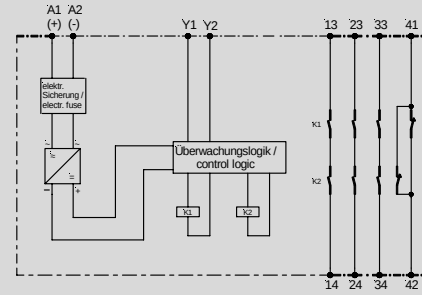
Emergency stop and safety gate monitoring

DEVICE	SAFE 4 / SAFE 4.1
APPLICATIONS	Emergency stop and safety gate monitoring relay
APPROVALS	CE, TÜV, UL, C-UL
CONTACTS	3 normally open safety, 1 normally auxiliary closed
SPECIAL CHARACTERISTICS	LED indicators for status and supply diagnostic Opposite polarity between channels With (SAFE 4) and without (SAFE 4.1) start control
LED	Power, channel 1 and channel 2
OPERATING VOLTAGE	24 V AC / DC (electronic fuse) 110, 230 V AC (with galvanic disconnection/transformer)
POWER CONSUMPTION	24 V AC: ca. 5 VA, 24 V DC: 3 W, 110/230 V AC: 3,7 VA
START UP DELAY / FALLBACK TIME	< 50 ms / < 30 ms (24 V AC < 50ms) ready after time delay < 0,5 s
CONTACT CAPACITY max.	5 A, 240 V AC, 24 V AC / DC
CONTACT CAPACITY min. at 24V DC (*)	6 mA
SIMULTANEITY	
ENVIRONMENTAL TEMPERATURE	-25°C to + 55°C
SWITCHING CAPACITY	1200 VA (resistive load)
CONTACT SECURITY	normally open 6,3 A quick acting or normally closed 4 A time lag
OPERATING MODE (*) We offer all devices who have a CONTACT CAPACITY of min. 100 mA at 24 V DC with hard gold-plated contacts. In this way the CONTACT CAPACITY of min. 100 mA is only 4 mA. Please ask our sales team!	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, 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!
CONNECTION DIAGRAM	
FUNCTION CIRCUIT DIAGRAM	
Certifications according to Safety relevant substance data Depending on wiring (only max. values are given)	EN ISO 13849-1: PLe, Cat. 4 MTTFd: 154 years / high, DC: 99% / high CCF: achieved

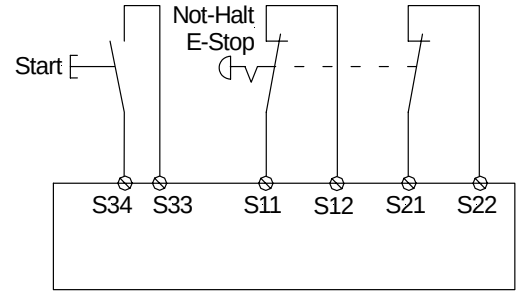
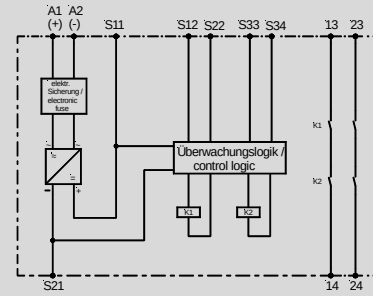
Emergency stop and safety gate monitoring relays

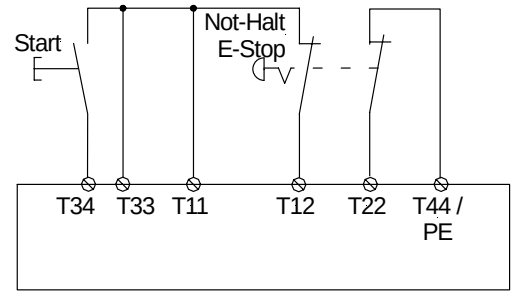
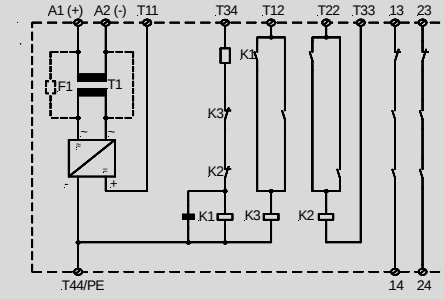
	DEVICE	SAFE 5 / SAFE 5.1
➡	APPLICATIONS	Emergency stop and safety gate monitoring relay
➡	APPROVALS	CE, TÜV, UL, C-UL
➡	CONTACTS	2 normally open safety
➡	SPECIAL CHARACTERISTICS	LED indicators for status and supply diagnostic With (SAFE 5) and without (SAFE 5.1) start control
➡	LED	Power, channel 1 and channel 2
➡	OPERATING VOLTAGE	24 V AC / DC (electronic fuse)
➡	POWER CONSUMPTION	ca. 1,6 VA / 1,6 W
➡	START UP DELAY / FALLBACK TIME	< 50 ms / < 80 ms (AC) , < 50 ms (DC)
➡	CONTACT CAPACITY max.	6 A, 250 V AC, 24 V DC
➡	CONTACT CAPACITY min. at 24V DC (*)	6 mA
➡	SIMULTANEITY	
➡	ENVIRONMENTAL TEMPERATURE	-25°C to + 55°C
➡	SWITCHING CAPACITY	1500 VA (resistive load)
➡	CONTACT SECURITY	6,3 A quick acting or 4 A time lag
➡	OPERATING MODE (*) We offer all devices who have a CONTACT CAPACITY of min. 100 mA at 24 V DC with hard gold-plated contacts. In this way the CONTACT CAPACITY of min. 100 mA is only 4 mA. Please ask our sales team!	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!
➡	CONNECTION DIAGRAM	
➡	FUNCTION CIRCUIT DIAGRAM	
➡	Certifications according to Safety relevant substance data Depending on wiring (only max. values are given)	EN ISO 13849-1: PLe, Cat. 3 (***see product-navigator page 4) MTTFd: 71 years / high, DC: 90% / medium CCF: achieved

	DEVICE	SAFE C1
	APPLICATIONS	Safety controller for e-stop and gate monitoring applications
	APPROVALS	CE, TÜV, UL, C-UL
	CONTACTS	4 safety semiconductor outputs
	SPECIAL CHARACTERISTICS	LED indicators for status and supply diagnostic Wearless contacts, "AND", "OR" functions between several SAFE C1 Automatic start possible
	LED	Power, channel 1 and channel 2 + flashing code
	OPERATING VOLTAGE	24 V DC (+ 25 - 20 %) Overvoltage protection
	POWER CONSUMPTION	ca. 3 W
	START UP DELAY / FALLBACK TIME	< 70 ms / < 30 ms
	CONTACT CAPACITY max.	total current 1,8 A
	CONTACT CAPACITY min. at 24V DC (*)	infinite
	SIMULTANEITY	no (special variants possible)
	ENVIRONMENTAL TEMPERATURE	-25°C to + 55°C
	SWITCHING CAPACITY	up to 43 W
	CONTACT SECURITY	short circuit proof
	OPERATING MODE (*) We offer all devices who have a CONTACT CAPACITY of min. 100 mA at 24 V DC with hard gold-plated contacts. In this way the CONTACT CAPACITY of min. 100 mA is only 4 mA. 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
	CONNECTION DIAGRAM	
	FUNCTION CIRCUIT DIAGRAM	
	Certifications according to Safety relevant substance data Depending on wiring (only max. values are given)	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

	DEVICE	SAFE 1 / SAFE 1.1
	APPLICATIONS	Emergency stop and safety gate monitoring relay
	APPROVALS	CE, TÜV, UL, C-UL
	CONTACTS	3 normally open safety, 1 normally auxiliary closed
	SPECIAL CHARACTERISTICS	LED indicators for status and supply diagnostic With (SAFE 1.1) and without (SAFE 1) start control
	LED	Power, channel 1 and channel 2
	OPERATING VOLTAGE	24 V AC / DC (electronic fuse)
	POWER CONSUMPTION	ca. 2,5 VA / 2,5 W
	START UP DELAY / FALLBACK TIME	< 50 ms / < 100 ms
	CONTACT CAPACITY max.	5 A, 250 V AC, 24 V DC
	CONTACT CAPACITY min. at 24V DC (*)	1 mA
	SIMULTANEITY	
	ENVIRONMENTAL TEMPERATURE	-25°C to + 55°C
	SWITCHING CAPACITY	1250 VA (resistive load)
	CONTACT SECURITY	6,3 A quick acting or 4 A time lag
	OPERATING MODE (*) We offer all devices who have a CONTACT CAPACITY of min. 100 mA at 24 V DC with hard gold-plated contacts. In this way the CONTACT CAPACITY of min. 100 mA is only 4 mA. Please ask our sales team!	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.
	CONNECTION DIAGRAM	
	FUNCTION CIRCUIT DIAGRAM	
	Certifications according to Safety relevant substance data Depending on wiring (only max. values are given)	EN ISO 13849-1: PLd, Cat. 3 (***see product-navigator page 4) MTTFd: 37,57 years / high, DC: 90% / medium, CCF: achieved

Emergency stop and safety gate monitoring relays

DEVICE	SAFE 2 / SAFE 2.1
APPLICATIONS	Emergency stop and safety gate monitoring relay
APPROVALS	CE, TÜV, UL, C-UL
CONTACTS	2 normally open safety
SPECIAL CHARACTERISTICS	LED indicators for status and supply diagnostic With (SAFE 2) and without (SAFE 2.1) start control
LED	Power, channel 1 and channel 2
OPERATING VOLTAGE	24 V AC / DC (electronic fuse)
POWER CONSUMPTION	ca. 2,5 VA / 2,5 W
START UP DELAY / FALLBACK TIME	< 50 ms / < 30 ms
CONTACT CAPACITY max.	6 A, 250 V AC, 24 V DC
CONTACT CAPACITY min. at 24V DC (*)	6 mA
SIMULTANEITY	
ENVIRONMENTAL TEMPERATURE	-25°C to + 55°C
SWITCHING CAPACITY	1500 VA (resistive load)
CONTACT SECURITY	6,3 A quick acting or 4 A time lag
OPERATING MODE (*) We offer all devices who have a CONTACT CAPACITY of min. 100 mA at 24 V DC with hard gold-plated contacts. In this way the CONTACT CAPACITY of min. 100 mA is only 4 mA. Please ask our sales team!	A supply voltage must be applied to terminals A1 and A2. Power LED illuminates and 24V 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.
CONNECTION DIAGRAM	
FUNCTION CIRCUIT DIAGRAM	
Certifications according to Safety relevant substance data Depending on wiring (only max. values are given)	EN ISO 13849-1: PLe, Cat.4 MTTFd: 69 years / high, DC: 99% / high, CCF: achieved

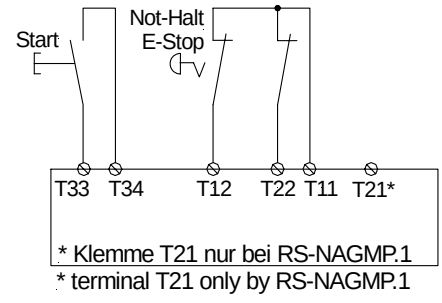
	DEVICE	SAFE S.6
	APPLICATIONS	Emergency stop and safety gate monitoring relay
	APPROVALS	CE, TÜV, UL, C-UL
	CONTACTS	2 normally open safety
	SPECIAL CHARACTERISTICS	LED indicators for status and supply diagnostic Selectable opposite polarity between channels
	LED	Power, channel 1 and channel 2
	OPERATING VOLTAGE	24 V AC / DC (without galvanic disconnection, but with a fuse F1) 24 V DC (without galvanic disconnection, but with an electronic fuse) 24, 48, 110-127, 230 V AC (with galvanic disconnection/transformer)
	POWER CONSUMPTION	ca. 3 VA
	START UP DELAY / FALLBACK TIME	< 150 ms / < 30 ms
	CONTACT CAPACITY max.	6 A, 250 V AC, 24 V DC
	CONTACT CAPACITY min. at 24V DC (*)	100 mA (*)
	SIMULTANEITY	Simultaneous protective door contacts : ca. 65 ms
	ENVIRONMENTAL TEMPERATURE	-25°C to + 55°C
	SWITCHING CAPACITY	1380 VA (resistive load)
	CONTACT SECURITY	6 A quick acting or 4 A time lag
	OPERATING MODE (*) We offer all devices who have a CONTACT CAPACITY of min. 100 mA at 24 V DC with hard gold-plated contacts. In this way the CONTACT CAPACITY of min. 100 mA is only 4 mA. Please ask our sales team!	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 24V 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 24V 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. 100mA at 24V DC with hard gold-plated contacts. In this way you get a contact capacity of 4mA.
	CONNECTION DIAGRAM	
	FUNCTION CIRCUIT DIAGRAM	
	Certifications according to Safety relevant substance data Depending on wiring (only max. values are given)	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

DEVICE	RS-NAGMP / RS-NAGMP.1
APPLICATIONS	Emergency stop and safety gate monitoring relay
APPROVALS	CE, TÜV, (UL, C-UL pending)
CONTACTS	3 normally open safety, 1 normally auxiliary closed
SPECIAL CHARACTERISTICS	LED indicators for status and supply diagnostic With (NAGMP.1) and without (NAGMP) choosable opposite polarity between channels
LED	Power, Channel 1 and channel 2
OPERATING VOLTAGE	24 V AC / DC (without galvanic disconnection, but with a safety 24 VDC / 12VDC (without galvanic disconnection, but with an electronic 24, 110-127, 230 V AC (with galvanic disconnection/transformer)
POWER CONSUMPTION	ca. 3,5 VA / 24VDC: 1,8W / 12VDC: 1,4W
START UP DELAY / FALLBACK TIME	< 300 ms / < 20 ms
CONTACT CAPACITY max.	8 A, 250 V AC, 250 V DC, normally closed: 24 V AC / DC
CONTACT CAPACITY min. at 24V DC (*)	10 mA
SIMULTANEITY	Simultaneous protective door contacts : ca. 75 ms
ENVIRONMENTAL TEMPERATURE	- 25°C to + 55°C
SWITCHING CAPACITY	2000 VA (resistive load), 200 W
CONTACT SECURITY	6 A quick acting or 4 A time lag

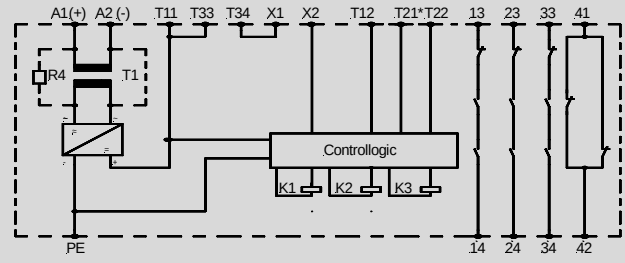
OPERATING MODE
(*) We offer all devices who have a CONTACT CAPACITY of min. 100 mA at 24 V DC with hard gold-plated contacts. In this way the CONTACT CAPACITY of min. 100 mA is only 4 mA. Please ask our sales team!

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 24V 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 24V 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.

CONNECTION DIAGRAM

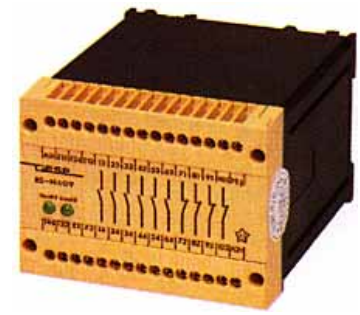


FUNCTION CIRCUIT DIAGRAM

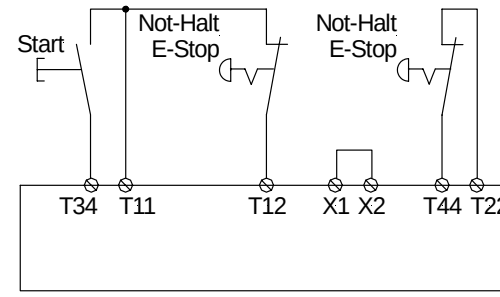
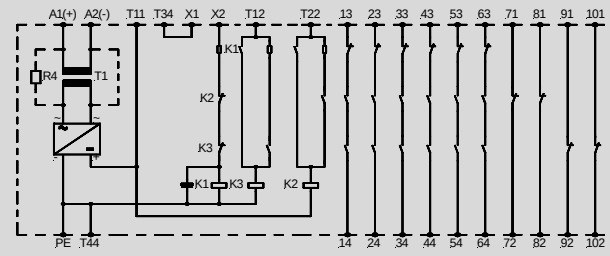


Certifications according to
Safety relevant substance data
Depending on wiring (only max. values are given)

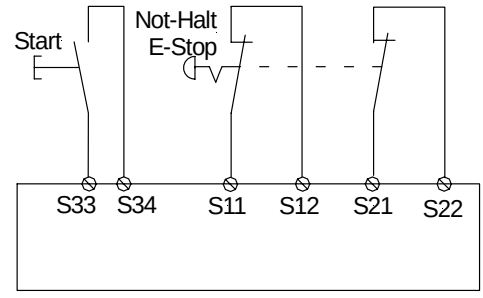
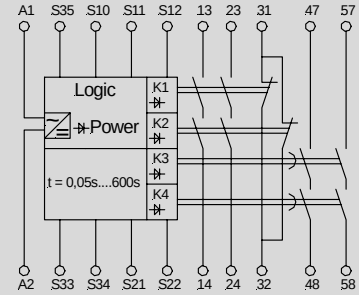
EN ISO 13849-1: RS-NAGMP: PLd, Cat.3 / RS-NAGMP.1: PLe, Cat.4
MTTFd: 73,61 years / high, DC: Cat. 3: 90% / medium, Cat. 4: 99% / high
CCF: achieved

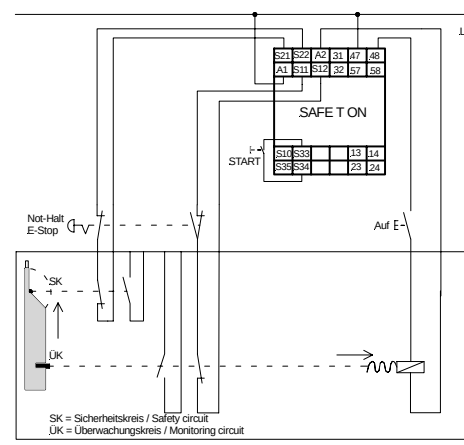
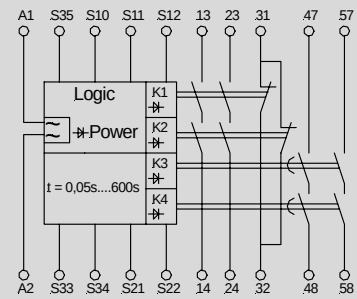


	DEVICE	RS-NAGV
	APPLICATIONS	Emergency stop and safety gate monitoring relay
	APPROVALS	CE, TÜV, UL, C-UL
	CONTACTS	6 normally open safety, 4 normally auxiliary closed
	SPECIAL CHARACTERISTICS	Opposite polarity between channels Cyclial monitoring of the function LED indicators for status and supply diagnostic
	LED	Channel 1 and channel 2
	OPERATING VOLTAGE	24 V AC / DC (without galvanic disconnection/ safety resistor) 24 V DC (without galvanic disconnection / electronic fuse), 24, 110-127, 230 V AC (with galvanic disconnection/transformer)
	POWER CONSUMPTION	ca. 6 VA
	START UP DELAY / FALLBACK TIME	< 200 ms / ca. 30 ms
	CONTACT CAPACITY max.	4 A, 240 V AC, 60 V DC
	CONTACT CAPACITY min. at 24V DC (*)	10 mA
	SIMULTANEITY	Simultaneous protective door contacts : ca. 75 ms
	ENVIRONMENTAL TEMPERATURE	- 25°C to + 55°C
	SWITCHING CAPACITY	1000 VA (resistive load), 120 W
	CONTACT SECURITY	4 A quick acting

	OPERATING MODE (*) We offer all devices who have a CONTACT CAPACITY of min. 100 mA at 24 V DC with hard gold-plated contacts. In this way the CONTACT CAPACITY of min. 100 mA is only 4 mA. Please ask our sales team!	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 24V 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 24V 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.
	CONNECTION DIAGRAM	
	FUNCTION CIRCUIT DIAGRAM	
	Certifications according to Safety relevant substance data Depending on wiring (only max. values are given)	EN ISO 13849-1: PLe, Cat.4 MTTFd: 74,61 years / high, DC: 99% / high CCF: achieved

Emergency stop and safety gate monitoring relays
with time-delay function

	DEVICE	SAFE T…
	APPLICATIONS	Emergency stop and safety gate monitoring relay with immediate and delayed outputs
	APPROVALS	CE, TÜV, UL, C-UL
	CONTACTS	2 n.o., 2 n.o. start up delayed, 1 n.c.
	SPECIAL CHARACTERISTICS	cross circuit protection or single-channel Time delay 0,05s - 600s in 64 steps, automatic or manually start with start button
	LED	Power, channel 1, cannel 2, channel 1 and channel 2 time-delayed
	OPERATING VOLTAGE	24 V AC / DC (+ 25 - 20 %) (electronic fuse)
	POWER CONSUMPTION	ca. 4,8 W
	START UP DELAY / FALLBACK TIME	< 400ms / < 30 ms / adjustment
	CONTACT CAPACITY max.	6 A , 250 V AC, 24 V DC
	CONTACT CAPACITY min. at 24V DC (*)	6 mA
	SIMULTANEITY	SAFE TN: 1s / SAFE TA,TR: 3s / TU: infinite
	ENVIRONMENTAL TEMPERATURE	- 25°C to + 55°C
	SWITCHING CAPACITY	1500 VA (resistive load)
	CONTACT SECURITY	3,6A
	OPERATING MODE (*) We offer all devices who have a CONTACT CAPACITY of min. 100 mA at 24 V DC with hard gold-plated contacts. In this way the CONTACT CAPACITY of min. 100 mA is only 4 mA. Please ask our sales team!	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.
	CONNECTION DIAGRAM	
	FUNCTION CIRCUIT DIAGRAM	
	Certifications according to Safety relevant substance data Depending on wiring (only max. values are given)	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

	DEVICE	SAFE T ON
	APPLICATIONS	Emergency stop and safety gate monitoring relay with immediate and delayed outputs
	APPROVALS	CE, TÜV, UL, C-UL
	CONTACTS	2 n.o., 2 n.o. start up delayed, 1 n.c.
	SPECIAL CHARACTERISTICS	cross circuit protection or single-channel Time delay 0,05s - 600s in 64 steps, automatic or manually start with start button
	LED	Power, channel 1, cannel 2, channel 1 and 2 delayed-on energisation
	OPERATING VOLTAGE	24 V AC / DC (+ 25 - 20 %) (electronic fuse)
	POWER CONSUMPTION	ca. 4,8 W
	START UP DELAY / FALLBACK TIME	400 ms / 30 ms
	CONTACT CAPACITY max.	6 A, 250 V AC, 24 V DC
	CONTACT CAPACITY min. at 24V DC (*)	6 mA
	SIMULTANEITY	no
	ENVIRONMENTAL TEMPERATURE	-25°C to +55°C
	SWITCHING CAPACITY	1500 VA (ohm load)
	CONTACT SECURITY	3,6A
	OPERATING MODE (*) We offer all devices who have a CONTACT CAPACITY of min. 100 mA at 24 V DC with hard gold-plated contacts. In this way the CONTACT CAPACITY of min. 100 mA is only 4 mA. Please ask our sales team!	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.
	CONNECTION DIAGRAM	
	FUNCTION CIRCUIT DIAGRAM	
	Certifications according to Safety relevant substance data Depending on wiring (only max. values are given)	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

	DEVICE	RS-NAGT / RS-NAGT.1
	APPLICATIONS	Emergency stop and safety gate monitoring relay with time-delayed safety output
	APPROVALS	CE, TÜV, UL, C-UL
	CONTACTS	2 normally open safety, 1 normally open time-delayed safety output
	SPECIAL CHARACTERISTICS	Selectable opposite polarity between channels NAGT : 0,1s - 10s ; NAGT.1 : 0,3 - 30s (ask for the ordering number) Ask for special versions
	LED	Power, channel 1, channel 2 and fault
	OPERATING VOLTAGE	Devices has two voltages : 1 voltage fixed : 24 V DC; Selectable : 24, 110-127 and 230 V AC (with galvanic disconnection/transformer)
	POWER CONSUMPTION	ca. 3 VA
	START UP DELAY / FALLBACK TIME	<150 ms/< 50 ms (undelayed)
	CONTACT CAPACITY max.	6 A, 250 V AC, 24 V DC
	CONTACT CAPACITY min. at 24V DC (*)	100 mA (*)
	SIMULTANEITY	Simultaneous protective door contacts : ca.75 ms
	ENVIRONMENTAL TEMPERATURE	- 25°C to + 50°C
	SWITCHING CAPACITY	1500 VA (resistive load)
	CONTACT SECURITY	10 A quick acting or 6 A time lag

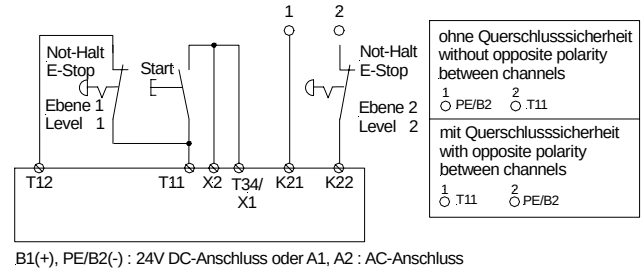
OPERATING MODE

(*) We offer all devices who have a CONTACT CAPACITY of min. 100 mA at 24 V DC with hard gold-plated contacts. In this way the CONTACT CAPACITY of min. 100 mA is only 4 mA. Please ask our sales team!

A supply voltage must be applied to terminals A1 and A2 (for AC supplies) or terminals B1 and B2 (for DC supplies). Once the supply voltage is applied, 24V DC is available at terminal T11; power LED illuminates. Terminals T12, K21 and K22 must be connected according to the application example selected to meet the application requirements. Feedback monitoring of external devices is accomplished by a connection between terminals T34 / X1 and X2. If the application does not require external monitoring, T34 / X1 and X2 must be bridged. To start the unit, terminal T11 and T34 / X1 must be bridged (automatic reset) or a momentary bridging of T11 and T34 / X1 must take place. With all of the above in place safety contacts 13-14, 23-24 and 77-78 close. Channel 1 (K2 energized) and channel 2 (K3 energized) green LEDs illuminate to show channel status. Fault LED illuminates when a short circuit takes place, at the input stage or internally.

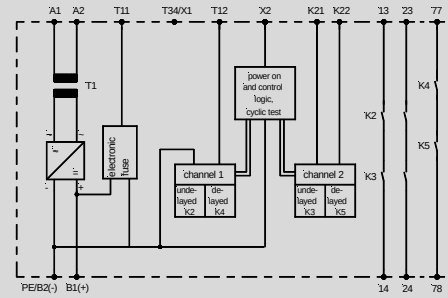
(*) Special edition with hard gold-plated contacts is also available. Connecting the ground wire to PE - see page 22.

CONNECTION DIAGRAM



B1(+), PE/B2(-) : 24V DC-Anschluss oder A1, A2 : AC-Anschluss

FUNCTION CIRCUIT DIAGRAM

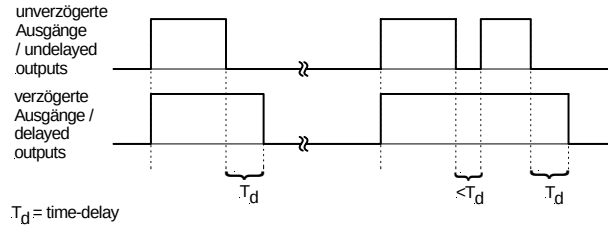


Certifications according to
Safety relevant substance data
Depending on wiring (only max. values are given)

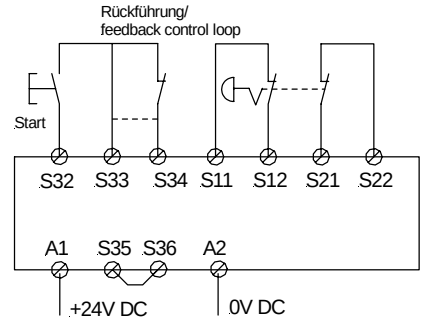
EN ISO 13849-1: PLe, Cat. 4 / PLd, Cat. 3 (time delayed)
MTTFd: 57 years / high, DC: Cat. 3: 90% / medium, Cat.4: 99% / high
CCF: achieved

	DEVICE	SAFE FLEX T *(OUTLOOK)*
	APPLICATIONS	Safety controller with choosable multi functions and adjustable time delay
	APPROVALS	CE, (TÜV, UL, C-UL pending)
	CONTACTS	4 normally open (1x basic insulation), 2 normally open time-delayed,
	SPECIAL CHARACTERISTICS	LED indicators for status and supply diagnostic optical failure indication by LEDs , Automatic start possible
	LED	
	OPERATING VOLTAGE	24 V DC (+ 20 - 25 %) Overvoltage protection
	POWER CONSUMPTION	
	START UP DELAY / FALLBACK TIME	
	CONTACT CAPACITY max.	
	CONTACT CAPACITY min. at 24V DC (*)	5 mA
	SIMULTANEITY	depending on the choosen functionality (see technical data)
	ENVIRONMENTAL TEMPERATURE	- 25°C to + 55°C
	SWITCHING CAPACITY	
	CONTACT SECURITY	6 A quick acting or 4 A time lag

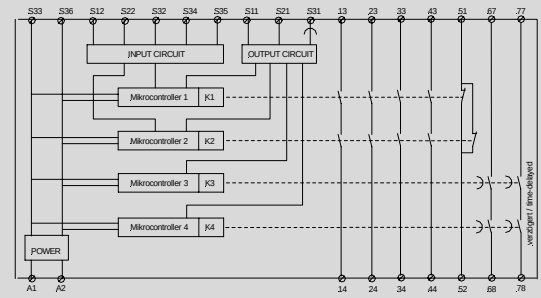
OPERATING MODE
(*) We offer all devices who have a CONTACT CAPACITY of min. 100 mA at 24 V DC with hard gold-plated contacts. In this way the CONTACT CAPACITY of min. 100 mA is only 4 mA. Please ask our sales team!



CONNECTION DIAGRAM



FUNCTION CIRCUIT DIAGRAM



Certifications according to
Safety relevant substance data
Depending on wiring (only max. values are given)

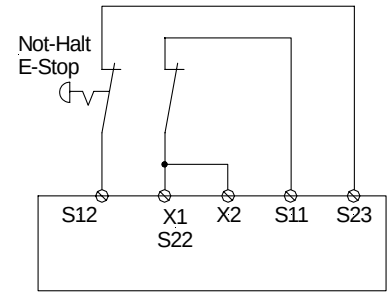
Mat-, edges-control relays

DEVICE	RS-NAGA / RS-NAGAO
APPLICATIONS	Emergency stop and safety gate and mat control relay (the device-system isn´t guide positive for the "start" push button)
APPROVALS	CE, TÜV, UL, C-UL
CONTACTS	3 normally open safety, 1 normally auxiliary closed
SPECIAL CHARACTERISTICS	LED indicators for status ans supply diagnostic Selectable opposite polarity between channels With (RS-NAGA) and without (RS-NAGAO) start control
LED	Power, channel 1 and channel 2
OPERATING VOLTAGE	24 V DC (with electronic fuse) 24, 48, 110-127, 230 V AC (with galvanic disconnection/transformer) 24 V AC / DC (fuse F1) not useable for safety mats
POWER CONSUMPTION	ca. 3,5 VA, 24 V DC: 2W
START UP DELAY / FALLBACK TIME	< 150 ms / < 50 ms
CONTACT CAPACITY max.	6 A, 250 V AC, 250 V DC
CONTACT CAPACITY min. at 24V DC (*)	10 mA
SIMULTANEITY	Simultaneous protective door contacts : ca.75 ms
ENVIRONMENTAL TEMPERATURE	- 25°C to + 55°C
SWITCHING CAPACITY	1500 VA (resistive load), 100W
CONTACT SECURITY	6 A quick acting (normally open), 4 A time lag (normally closed)

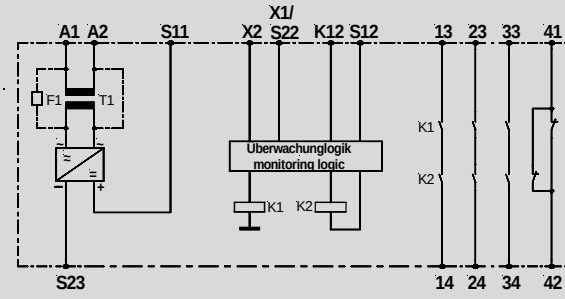
OPERATING MODE
(*) We offer all devices who have a CONTACT CAPACITY of min. 100 mA at 24 V DC with hard gold-plated contacts. In this way the CONTACT CAPACITY of min. 100 mA is only 4 mA. Please ask our sales team!

A supply voltage must be applied to terminals A1 and A2. Once the supply voltage is applied, 24V 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. At the variation "with reset-monitoring" (RS-NAGA) the relay reacts after removing the bridge X2 to X1/S22. At the variation "without reset-monitoring" (RS-NAGAO) the function starts after bridging X2 and X1/S22. With all of the above in place safety contacts 13-14, 23-24, 33-34 closed 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.

CONNECTION DIAGRAM

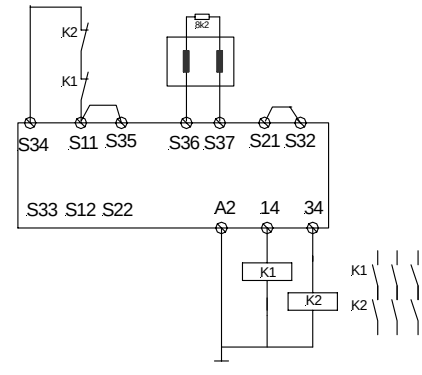
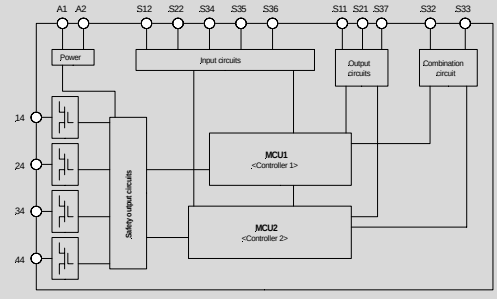


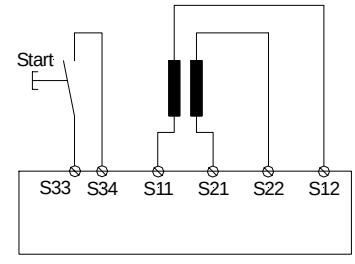
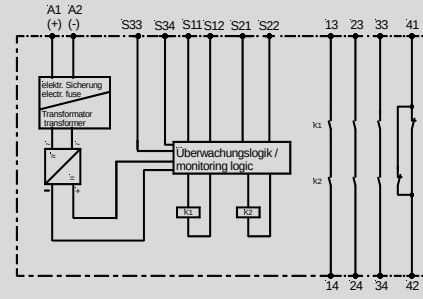
FUNCTION CIRCUIT DIAGRAM

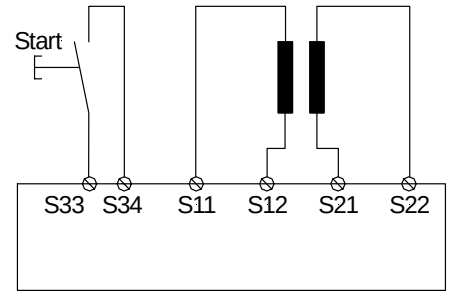
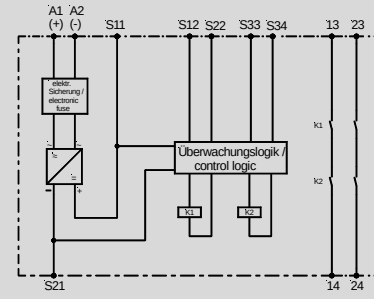


Certifications according to
Safety relevant substance data
Depending on wiring (only max. values are given)

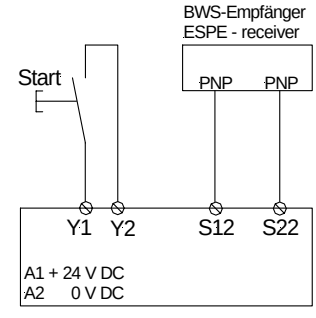
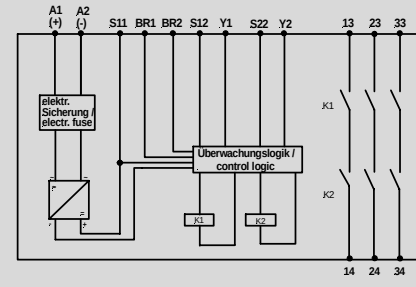
EN ISO 13849-1: PLe, Cat. 4
MTTFd: 73,21 years / high, DC: Cat.4: 99% / high
CCF: achieved

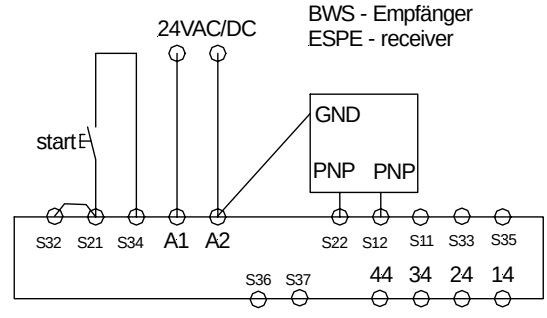
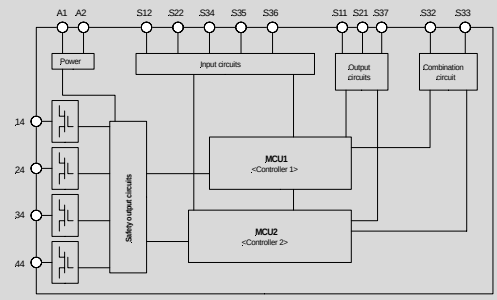
DEVICE	SAFE CM
APPLICATIONS	Safety controller for safety mats and safety bars with a maximum resistance of 500 ohms
APPROVALS	CE, TÜV, UL, C-UL
CONTACTS	4 safety semiconductor outputs
SPECIAL CHARACTERISTICS	LED indicators for status and supply diagnostic wearless contacts, "AND" function between several SAFE C possible, automatic start possible
LED	Power, channel 1 and channel 2
OPERATING VOLTAGE	24 V DC (+ 25 - 20 %) Overvoltage protection
POWER CONSUMPTION	ca. 3 W
START UP DELAY / FALLBACK TIME	< 30 ms / < 140ms (single channel < 360 ms)
CONTACT CAPACITY max.	total current 1,8 A
CONTACT CAPACITY min. at 24V DC (*)	infinite
SIMULTANEITY	not necessary
ENVIRONMENTAL TEMPERATURE	-25°C to + 55°C
SWITCHING CAPACITY	to 43 W
CONTACT SECURITY	short circuit proof
OPERATING MODE (*) We offer all devices who have a CONTACT CAPACITY of min. 100 mA at 24 V DC with hard gold-plated contacts. In this way the CONTACT CAPACITY of min. 100 mA is only 4 mA. Please ask our sales team!	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
CONNECTION DIAGRAM	
FUNCTION CIRCUIT DIAGRAM	
Certifications according to Safety relevant substance data Depending on wiring (only max. values are given)	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

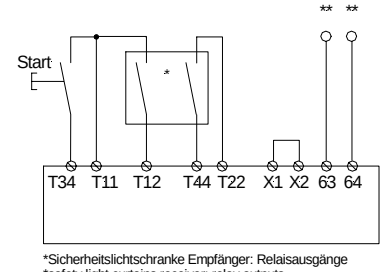
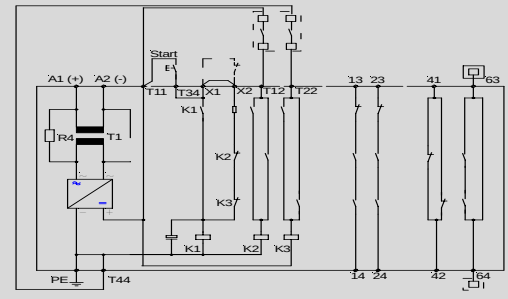
	DEVICE	SAFE M / SAFE M.1
	APPLICATIONS	Mat and contact edges control relay with a max. mats-resistance of 200 ohms
	APPROVALS	CE, TÜV, UL, C-UL
	CONTACTS	3 normally open safety, 1 normally auxiliary closed
	SPECIAL CHARACTERISTICS	LED indicators for status and supply diagnostic Opposite polarity between chanels With (SAFE M) and without (SAFE M.1) automatic start
	LED	Power, channel 1 and channel 2
	OPERATING VOLTAGE	24 V AC / DC (electronic fuse) SAFE M: 115 V AC (with galvanic disconnection/transformer)
	POWER CONSUMPTION	24, 115 V AC: ca. 5 VA, 24 V DC: 3 W
	START UP DELAY / FALLBACK TIME	< 50 ms / < 30 ms (24 V AC < 50 ms)
	CONTACT CAPACITY max.	5 A, 240 V AC, 24 V DC
	CONTACT CAPACITY min. at 24V DC (*)	6 mA
	SIMULTANEITY	
	ENVIRONMENTAL TEMPERATURE	-25°C to + 55°C
	SWITCHING CAPACITY	1200 VA (resistive load)
	CONTACT SECURITY	6,3 A quick acting (normally open) or 4 A time lag (normally closed)
	OPERATING MODE (*) We offer all devices who have a CONTACT CAPACITY of min. 100 mA at 24 V DC with hard gold-plated contacts. In this way the CONTACT CAPACITY of min. 100 mA is only 4 mA. Please ask our sales team!	A supply voltage must be applied to terminals A1 and A2. Power LED illuminates and 24V 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!
	CONNECTION DIAGRAM	
	FUNCTION CIRCUIT DIAGRAM	
	Certifications according to Safety relevant substance data Depending on wiring (only max. values are given)	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%

DEVICE	SAFE 2.2
APPLICATIONS	Mat and contact edges control relay
APPROVALS	CE, TÜV, UL, C-UL
CONTACTS	2 normally open safety
SPECIAL CHARACTERISTICS	LED indicators for status and supply diagnostic Safety category 4, opposite polarity between channels without start control
LED	Power, channel 1 and channel 2
OPERATING VOLTAGE	24 V AC / DC (electronic fuse)
POWER CONSUMPTION	ca. 2,5 VA / 2,5 W
START UP DELAY / FALLBACK TIME	< 50 ms / < 30 ms
CONTACT CAPACITY max.	6 A, 250 V AC, 24 V DC
CONTACT CAPACITY min. at 24V DC (*)	1 mA
SIMULTANEITY	Simultaneous protective door contacts : ca.40 ms
ENVIRONMENTAL TEMPERATURE	-25°C to + 55°C
SWITCHING CAPACITY	1500 VA (resistive load)
CONTACT SECURITY	6,3 A quick acting or 4 A time lag
OPERATING MODE (*) We offer all devices who have a CONTACT CAPACITY of min. 100 mA at 24 V DC with hard gold-plated contacts. In this way the CONTACT CAPACITY of min. 100 mA is only 4 mA. Please ask our sales team!	A supply voltage must be applied to terminals A1 and A2. Power LED illuminates and 24V 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.
CONNECTION DIAGRAM	
FUNCTION CIRCUIT DIAGRAM	
Certifications according to Safety relevant substance data Depending on wiring (only max. values are given)	EN ISO 13849-1: PLe, Cat.4 MTTFd: 69 years / high, DC: 99% / high, CCF: achieved

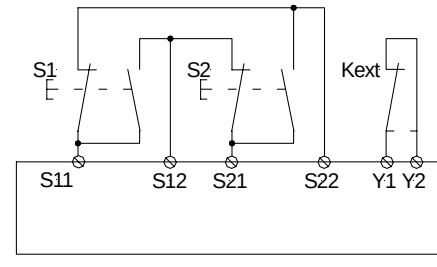
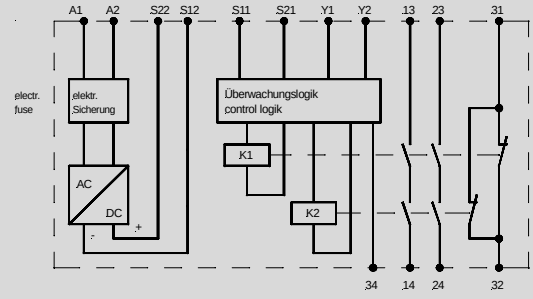
Control devices for safety light barriers

	DEVICE	SAFE L.2
	APPLICATIONS	Emergency stop relay for safety light curtains / barriers
	APPROVALS	CE, TÜV, UL, C-UL
	CONTACTS	3 normally open safety
	SPECIAL CHARACTERISTICS	LED indicators for status and supply diagnostic Without opposite polarity between channels start control choosable by a extern bridge
	LED	Power, channel 1, channel 2 and restart interlock
	OPERATING VOLTAGE	24 V DC (electronic fuse)
	POWER CONSUMPTION	ca. 2,5 W
	START UP DELAY / FALLBACK TIME	< 50 ms / < 30 ms
	CONTACT CAPACITY max.	6 A, 250 V AC, 24 V DC
	CONTACT CAPACITY min. at 24V DC (*)	10 mA
	SIMULTANEITY	Simultaneous: ca. 40ms
	ENVIRONMENTAL TEMPERATURE	- 25 °C to + 55 °C
	SWITCHING CAPACITY	1500 VA (resistive load)
	CONTACT SECURITY	6 A quick acting or 4 A time lag
	OPERATING MODE (*) We offer all devices who have a CONTACT CAPACITY of min. 100 mA at 24 V DC with hard gold-plated contacts. In this way the CONTACT CAPACITY of min. 100 mA is only 4 mA. Please ask our sales team!	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 be 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!
	CONNECTION DIAGRAM	
	FUNCTION CIRCUIT DIAGRAM	
	Certifications according to Safety relevant substance data Depending on wiring (only max. values are given)	EN ISO 13849-1: PLe, Cat.4 MTTFd: 36,16 years / high, DC: 99% / high, CCF: achieved

	DEVICE	SAFE CL
	APPLICATIONS	Safety controller for safety light barriers and safety light curtain
	APPROVALS	CE, TÜV, UL, C-UL
	CONTACTS	4 OSSD
	SPECIAL CHARACTERISTICS	LED indicators for status and supply diagnostic wearless contacts, "AND" function between several SAFE C possible, automatic start possible
	LED	Power, channel 1, channel 2
	OPERATING VOLTAGE	24 V DC (+ 25 - 20 %) Overvoltage protection
	POWER CONSUMPTION	ca. 3 W
	START UP DELAY / FALLBACK TIME	< 70 ms / < 30 ms
	CONTACT CAPACITY max.	total current bis 1,8 A
	CONTACT CAPACITY min. at 24V DC (*)	infinite
	SIMULTANEITY	S12 before S22 < 0,5 s / S22 before S12 infinite
	ENVIRONMENTAL TEMPERATURE	-25°C to +55°C
	SWITCHING CAPACITY	to 43 W
	CONTACT SECURITY	short circuit proof
	OPERATING MODE (*) We offer all devices who have a CONTACT CAPACITY of min. 100 mA at 24 V DC with hard gold-plated contacts. In this way the CONTACT CAPACITY of min. 100 mA is only 4 mA. Please ask our sales team!	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.
	CONNECTION DIAGRAM	
	FUNCTION CIRCUIT DIAGRAM	
	Certifications according to Safety relevant substance data Depending on wiring (only max. values are given)	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

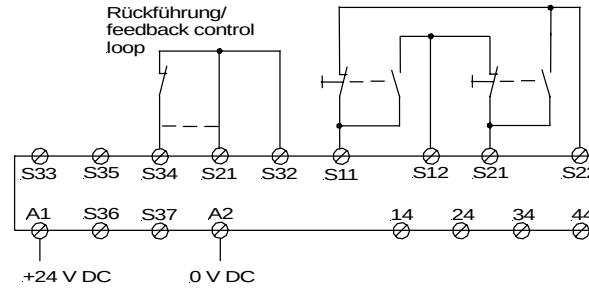
	DEVICE	RS-NAGL / RS-NAGL.1
	APPLICATIONS	Emergency stop relay for safety light curtains / barriers
	APPROVALS	CE, TÜV, UL, C-UL
	CONTACTS	2 normally open safety, 1 normally auxiliary closed, 1 auxiliary n. c.
	SPECIAL CHARACTERISTICS	LED indicators for status and supply diagnostic With (NAGL) and without (NAGL.1) opposite polarity between channels
	LED	Channel 1 and channel 2
	OPERATING VOLTAGE	RS-NAGL / L.1: 24 V DC (without galvanic disconnection) RS-NAGL: 48, 110-127, 230 V AC (with galvanic 24 V AC / DC (without galvanic disconnection, but with a safety
	POWER CONSUMPTION	24 V DC: 2W, 24 V AC / DC: 4,5 VA, other: 4,6 VA
	START UP DELAY / FALLBACK TIME	< 150 ms / < 30 ms
	CONTACT CAPACITY max.	6 A, 250 V AC, 250 V DC
	CONTACT CAPACITY min. at 24V DC (*)	10 mA
	SIMULTANEITY	
	ENVIRONMENTAL TEMPERATURE	- 25°C to + 55°C
	SWITCHING CAPACITY	1500 VA (resistive load), 100 W
	CONTACT SECURITY	6 A quick acting (normally open) or 4 A time lag (normally closed)
	OPERATING MODE (*) We offer all devices who have a CONTACT CAPACITY of min. 100 mA at 24 V DC with hard gold-plated contacts. In this way the CONTACT CAPACITY of min. 100 mA is only 4 mA. Please ask our sales team!	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 24V DC at terminal T11. T12 and T22 must be wired as shown in the application examples. Contacts 13-14, 23-24 and 63-64 open and contact 41-42 closes. In some cases, the transmitter from the light curtains / barrier requires a test input and is connected to output 63-64. If 63-64 does not close, the transmitter and the receiver will not work. This output ensures that a complete system is created. To start the unit terminal T11 must be bridged with terminal T34 through a normally open contact (reset) or the terminal T34 must receive a 24V DC impulse (short time bridging of the connection terminals T11-T34). If the light curtains is aligned properly and the protection zone is free, the receiver switches. At terminal T12 there is a of voltage 24V DC and at T22 is ground. After releasing the on button or interrupting the connection between T11 and T34 the relays K1 and K4 deenergize. Safety outputs 13-14 and 23-24 close. Contacts 53-54 and 63-64 remain closed, contacts 41-42 open.
	CONNECTION DIAGRAM	 *Sicherheitslichtschranke Empfänger: Relaisausgänge *safety light curtains receiver: relay outputs **Anschluss Sicherheitslichtschranke Sender: Testeingang **safety light curtains transmitter: test input
	FUNCTION CIRCUIT DIAGRAM	
	Certifications according to Safety relevant substance data Depending on wiring (only max. values are given)	EN ISO 13849-1: PLe, Cat.4 MTTFd: 69,05 years / high, DC: 99% / high, CCF: achieved

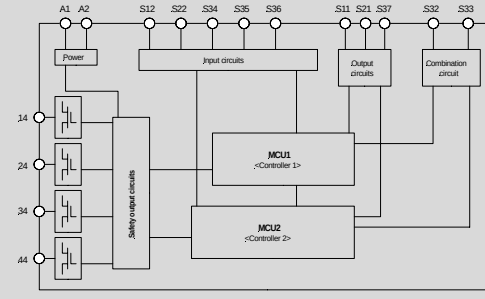
Two hand control relays

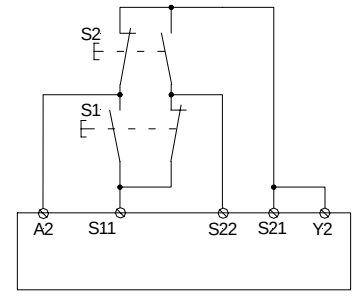
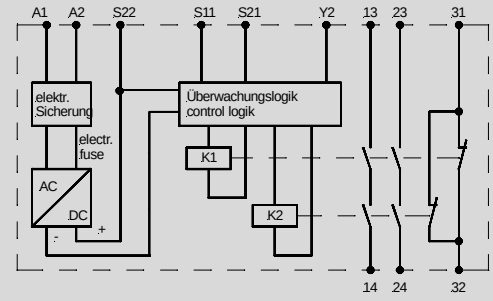
	DEVICE	SAFE Z.2
	APPLICATIONS	Two hand control relay for type I-III c
	APPROVALS	CE, TÜV, UL, C-UL
	CONTACTS	2 normally open safety, 1 normally auxiliary closed, 1 PLC-output
	SPECIAL CHARACTERISTICS	LED indicators for status and supply diagnostic Two hand control relay according ZH 1 / 456 and DIN EN 574
	LED	Power, channel 1 and channel 2
	OPERATING VOLTAGE	24 V AC / DC (electronic fuse) 48, 115, 230 V AC (with galvanic disconnection / transformer)
	POWER CONSUMPTION	ca. 2 VA
	START UP DELAY / FALLBACK TIME	< 50 ms / < 25 ms
	CONTACT CAPACITY max.	6 A, 250 V AC, 24 V DC
	CONTACT CAPACITY min. at 24V DC (*)	6 mA
	SIMULTANEITY	Simultaneous: 0,5s
	ENVIRONMENTAL TEMPERATURE	- 25 °C to + 55 °C
	SWITCHING CAPACITY	1500 VA (resistive load)
	CONTACT SECURITY	6,3 A quick acting or 4 A time lag
	OPERATING MODE (*) We offer all devices who have a CONTACT CAPACITY of min. 100 mA at 24 V DC with hard gold-plated contacts. In this way the CONTACT CAPACITY of min. 100 mA is only 4 mA. Please ask our sales team!	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
	CONNECTION DIAGRAM	
	FUNCTION CIRCUIT DIAGRAM	
	Certifications according to Safety relevant substance data Depending on wiring (only max. values are given)	EN ISO 13849-1: PLe, Cat.4 MTTFd: 36,45 years / high, DC: 99% / high, CCF: achieved

Two hand control relays

	DEVICE	SAFE CZ
	APPLICATIONS	Two hand control relay for type IIIc or II
	APPROVALS	CE, (TÜV, UL, C-UL pending)
	CONTACTS	4 OSSD
	SPECIAL CHARACTERISTICS	LED indicators for status and supply diagnostic wearless contacts, "AND" function between several SAFE C possible, automatic start possible
	LED	Power, channel 1 and channel 2
	OPERATING VOLTAGE	24 V DC (+ 25 - 20 %) Overvoltage protection
	POWER CONSUMPTION	ca. 3 W
	START UP DELAY / FALLBACK TIME	< 100 ms / < 25 ms
	CONTACT CAPACITY max.	total current bis 1,8 A
	CONTACT CAPACITY min. at 24V DC (*)	infinite
	SIMULTANEITY	0,5 s
	ENVIRONMENTAL TEMPERATURE	-25°C to +55°C
	SWITCHING CAPACITY	to 43 W
	CONTACT SECURITY	short circuit proof
	OPERATING MODE (*) We offer all devices who have a CONTACT CAPACITY of min. 100 mA at 24 V DC with hard gold-plated contacts. In this way the CONTACT CAPACITY of min. 100 mA is only 4 mA. Please ask our sales team!	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.
	CONNECTION DIAGRAM	
	FUNCTION CIRCUIT DIAGRAM	
	Certifications according to Safety relevant substance data Depending on wiring (only max. values are given)	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





DEVICE	SAFE Z
APPLICATIONS	Two hand control relay for type I-III c
APPROVALS	CE, TÜV, UL, C-UL
CONTACTS	2 normally open safety, 1 normally auxiliary closed
SPECIAL CHARACTERISTICS	LED indicators for status and supply diagnostic Two hand control relay according ZH 1 / 456 and DIN EN 574
LED	Power, channel 1 and channel 2
OPERATING VOLTAGE	24 V DC (electronic fuse)
POWER CONSUMPTION	ca. 3 VA
START UP DELAY / FALLBACK TIME	< 50 ms / < 30 ms
CONTACT CAPACITY max.	6 A, 250 V AC, 24 V DC
CONTACT CAPACITY min. at 24V DC (*)	1 mA
SIMULTANEITY	Simultaneous: 0,5 s
ENVIRONMENTAL TEMPERATURE	- 25 °C to + 55 °C
SWITCHING CAPACITY	1500 VA (resistive load)
CONTACT SECURITY	6 A quick acting or 4 A time lag
OPERATING MODE (*) We offer all devices who have a CONTACT CAPACITY of min. 100 mA at 24 V DC with hard gold-plated contacts. In this way the CONTACT CAPACITY of min. 100 mA is only 4 mA. Please ask our sales team!	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.
CONNECTION DIAGRAM	
FUNCTION CIRCUIT DIAGRAM	
Certifications according to Safety relevant substance data Depending on wiring (only max. values are given)	EN ISO 13849-1: PLe, Cat.4 MTTFd: 36,85 years / high, DC: 99% / high, CCF: achieved

Expansion modules

	DEVICE	SAFE X4 / SAFE X4.1
	APPLICATIONS	Expansion module for emergency stop relay according to VDE 0113
	APPROVALS	CE, TÜV, UL, C-UL
	CONTACTS	4 normally open safety and 1 normally safety closed (feedback)
	SPECIAL CHARACTERISTICS	With (SAFE X4) and without (SAFE X4.1) opposite polarity between Easy way to increase the number of contacts Compact housing
	LED	Channel 1, channel 2 and fault
	OPERATING VOLTAGE	48, 110-127, 230 V AC (with galvanic disconnection/transformer) 24 V AC / DC (without galvanic disconnection, but with a safety
	POWER CONSUMPTION	ca. 4 VA
	START UP DELAY / FALLBACK TIME	- / < 50 ms
	CONTACT CAPACITY max.	6 A, 250 V AC, 24 V DC, sum of currents < 16 A
	CONTACT CAPACITY min. at 24V DC (*)	6 mA
	SIMULTANEITY	
	ENVIRONMENTAL TEMPERATURE	- 25°C to + 55 °C
	SWITCHING CAPACITY	1500 VA
	CONTACT SECURITY	10 A quick acting

OPERATING MODE

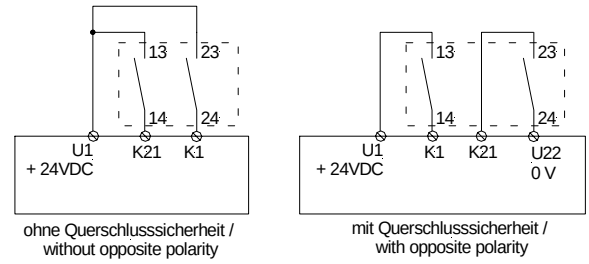
(*) We offer all devices who have a CONTACT CAPACITY of min. 100 mA at 24 V DC with hard gold-plated contacts. In this way the CONTACT CAPACITY of min. 100 mA is only 4 mA. Please ask our sales team!

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 24V 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 fault LED illuminates if one or more safety circuits are open. The fault 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!

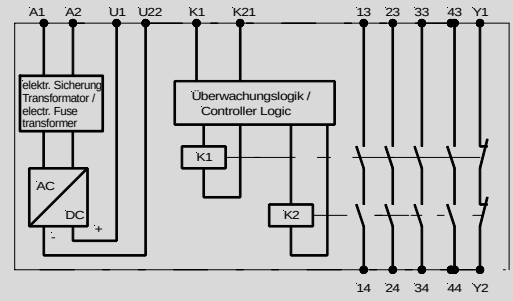
CONNECTION DIAGRAM



ohne Querschlusssicherheit / without opposite polarity

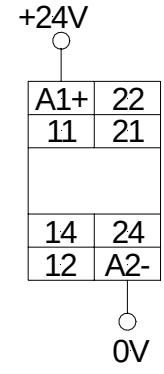
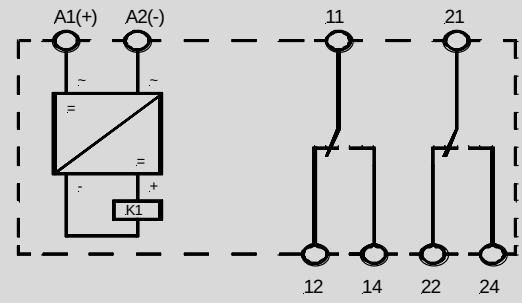
mit Querschlusssicherheit / with opposite polarity

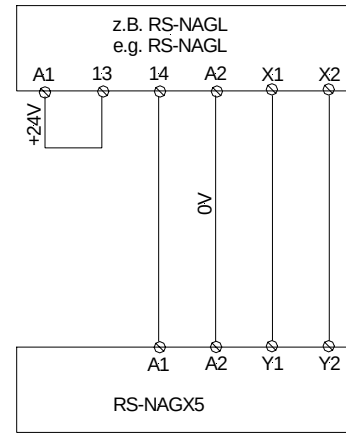
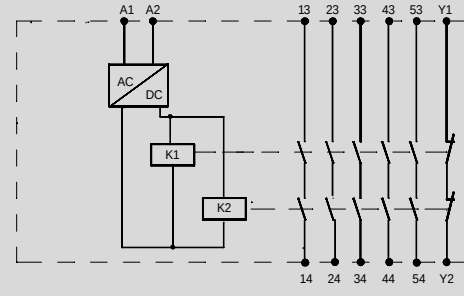
FUNCTION CIRCUIT DIAGRAM



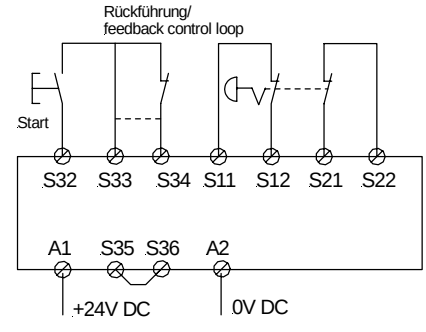
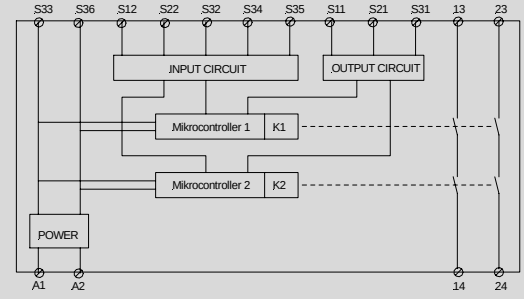
Certifications according to
Safety relevant substance data
Depending on wiring (only max. values are given)

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

	DEVICE	SAFE IRZ.2
	APPLICATIONS	Industrial relay with positive guided contacts
	APPROVALS	CE
	CONTACTS	2 change over contacts
	SPECIAL CHARACTERISTICS	LED indicators for status and supply diagnostic Initializing input
	LED	Power
	OPERATING VOLTAGE	24 V AC / DC
	POWER CONSUMPTION	1 W, 1 VA
	START UP DELAY / FALLBACK TIME	< 25 ms
	CONTACT CAPACITY max.	5 A, 250 V AC, 24 V DC
	CONTACT CAPACITY min. at 24V DC (*)	100 mA (*)
	SIMULTANEITY	
	ENVIRONMENTAL TEMPERATURE	-25°C to + 55°C
	SWITCHING CAPACITY	1250 VA
	CONTACT SECURITY	5 A quick acting
	OPERATING MODE (*) We offer all devices who have a CONTACT CAPACITY of min. 100 mA at 24 V DC with hard gold-plated contacts. In this way the CONTACT CAPACITY of min. 100 mA is only 4 mA. Please ask our sales team!	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. 100mA at 24VDC with hard gold-plated contacts. In this way you get a contact capacity of 4mA. If you want such a relay please write for example "AR.1632.2010 hard gold-plated contacts".
	CONNECTION DIAGRAM	
	FUNCTION CIRCUIT DIAGRAM	
	Certifications according to Safety relevant substance data Depending on wiring (only max. values are given)	

	DEVICE	RS-NAGX 5
	APPLICATIONS	Expansion module for emergency stop relay according to VDE 0113
	APPROVALS	CE, TÜV (UL, C-UL pending)
	CONTACTS	5 normally open safety and 1 normally safety closed (feedback)
	SPECIAL CHARACTERISTICS	LED indicators for status and supply diagnostic Easy way to increase the number of contacts Compact housing
	LED	Channel 1 and channel 2
	OPERATING VOLTAGE	24 V AC / DC (without galvanic disconnection, but with a safety resistor)
	POWER CONSUMPTION	ca. 2,4 VA
	START UP DELAY / FALLBACK TIME	< 30 ms
	CONTACT CAPACITY max.	6 A, 250 V AC, 24 V DC, sum of currents <16 A
	CONTACT CAPACITY min. at 24V DC (*)	6 mA
	SIMULTANEITY	
	ENVIRONMENTAL TEMPERATURE	- 25°C to + 55 °C
	SWITCHING CAPACITY	1500 VA
	CONTACT SECURITY	6 A quick acting or 4 A time lag
	OPERATING MODE (*) We offer all devices who have a CONTACT CAPACITY of min. 100 mA at 24 V DC with hard gold-plated contacts. In this way the CONTACT CAPACITY of min. 100 mA is only 4 mA. Please ask our sales team!	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.
	CONNECTION DIAGRAM	
	FUNCTION CIRCUIT DIAGRAM	
	Certifications according to Safety relevant substance data Depending on wiring (only max. values are given)	EN ISO 13849-1: PLe, Cat.4 MTTFd: 74,2 years / high, DC: 99% / high, CCF: achieved

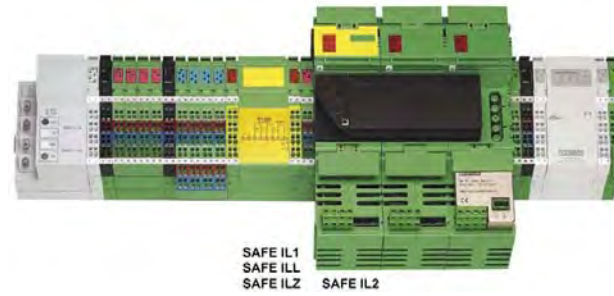
Multifunctional

	DEVICE	SAFE FLEX
	APPLICATIONS	Safety controller with choosable multi functions
	APPROVALS	CE, TÜV, UL, C-UL
	CONTACTS	2 normally open, 1 PNP output
	SPECIAL CHARACTERISTICS	LED indicators for status and supply diagnostic optical failure indication by LEDs Automatic start possible
	LED	Power, channel 1 IN/OUT, channel 2 IN/OUT, failure
	OPERATING VOLTAGE	24 V DC (+ 20 - 25 %) Overvoltage protection
	POWER CONSUMPTION	< 3 W
	START UP DELAY / FALLBACK TIME	e-stop,BWS, Two hand,safety gate monitoring relay <= 30ms
	CONTACT CAPACITY max.	6 A, 250 V AC, 250 V DC
	CONTACT CAPACITY min. at 24V DC (*)	5 mA
	SIMULTANEITY	depending on the choosen functionality (see technical data)
	ENVIRONMENTAL TEMPERATURE	- 25°C to + 55°C
	SWITCHING CAPACITY	1500 VA
	CONTACT SECURITY	6 A quick acting or 4 A time lag
	OPERATING MODE (*) We offer all devices who have a CONTACT CAPACITY of min. 100 mA at 24 V DC with hard gold-plated contacts. In this way the CONTACT CAPACITY of min. 100 mA is only 4 mA. Please ask our sales team!	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.
	CONNECTION DIAGRAM	
	FUNCTION CIRCUIT DIAGRAM	
	Certifications according to Safety relevant substance data Depending on wiring (only max. values are given)	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%

Muting

DEVICE	RS-NAGU.12
APPLICATIONS	Muting control
APPROVALS	CE, TÜV
CONTACTS	3 electronic safety semiconductor outputs (2 PNP / 1 NPN)
SPECIAL CHARACTERISTICS	4 muting sensors connectable Control of filament of external muting lamp Suitable for ESPE-2 with selftest
LED	Power, channel 1, channel 2, fault and restart interlock
OPERATING VOLTAGE	24 V DC
POWER CONSUMPTION	10 W (up to 60 W including peripheral devices)
START UP DELAY / FALLBACK TIME	< 6 ms
CONTACT CAPACITY max.	0,7 - 1,5 A(*2), 24 V DC
CONTACT CAPACITY min. at 24V DC (*)	1 mA
SIMULTANEITY	Simultaneous of the muting sensors : 3 s
ENVIRONMENTAL TEMPERATURE	- 25°C to + 55°C
SWITCHING CAPACITY	17 W
CONTACT SECURITY	outputs are permanently short circuit proof
OPERATING MODE (*) We offer all devices who have a CONTACT CAPACITY of min. 100 mA at 24 V DC with hard gold-plated contacts. In this way the CONTACT CAPACITY of min. 100 mA is only 4 mA. Please ask our sales team!	RS-NAGU.12 could be used together with safety light barriers and safety light curtains with safety category 2 which have a selftest. The RS-NAGU.12 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 and channel are illuminated. If LED channel 1 is blinking, a fault exists or a wrong connection has been made. In ready condition the RS-NAGU.12 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.12 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.12 will initiate a muting cycle. Interruption of the light barrier will not cause a stop of the machine. If 3 of the 4 muting sensors are deactivated, the muting cycle will end after 0.25 sec.
CONNECTION DIAGRAM	
FUNCTION CIRCUIT DIAGRAM	(*2) 1,5 A permanent output (1 output) up to 4,5 A start-up current (t<1s, Uv>21,6V), 1 A permanent current (2 outputs), 0,7 A permanent current (3 outputs) Notice: please ask for detailed documentation.
Certifications according to Safety relevant substance data Depending on wiring (only max. values are given)	EN ISO 13849-1: PLe, Cat.4 MTTFd: >100 years / high, DC: 99% / high, CCF: achieved

DEVICE	RS-NAGU.1 / RS-NAGU.2f
APPLICATIONS	Muting control
APPROVALS	RS-NAGU.1 : CE, TÜV, UL, C-UL, RS-NAGU.2f : CE, UL, C-UL
CONTACTS	RS-NAGU.1: 3 electr. Safety semicond. outp. / RS-NAGU.2 f: 3 normally
SPECIAL CHARACTERISTICS	4 muting sensors connectable Control of filament of external muting lamp pushbutton
LED	Power indication, channel 1, channel 2, fault and restart interlock
OPERATING VOLTAGE	24 V DC
POWER CONSUMPTION	10 W (up to 60W including peripheral devices)
START UP DELAY / FALLBACK TIME	RS-NAGU.1 : < 6 ms - RS-NAGU.2f : < 20 ms
CONTACT CAPACITY max.	RS-NAGU.1 : 0,7 - 1,5 A(*2), 24 V DC / RS-NAGU.2f : 3,5 - 6 A(*3), 24 V
CONTACT CAPACITY min. at 24V DC (*)	RS-NAGU.1 : 1 mA / RS-NAGU.2f: 100 mA(*)
SIMULTANEITY	Simultaneous of the muting sensors : 3 s
ENVIRONMENTAL TEMPERATURE	- 25°C to + 55°C
SWITCHING CAPACITY	NAGU.1 : 17 W, NAGU.2f: 84 W
CONTACT SECURITY	RS-NAGU.1 : outputs are permanently short circuit proof RS-NAGU.2f :4 A quick acting or 3,15 A time lag
OPERATING MODE (*) We offer all devices who have a CONTACT CAPACITY of min. 100 mA at 24 V DC with hard gold-plated contacts. In this way the CONTACT CAPACITY of min. 100 mA is only 4 mA. Please ask our sales team!	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 channel1/2 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 0,25s time-delay.
CONNECTION DIAGRAM	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) RS-NAGU (housing with detachable terminal strips) also this unit is available
FUNCTION CIRCUIT DIAGRAM	(*) We offer all devices which have a contact capacity of min. 100 mA at 24 VDC 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) (*3) 6 A permanent current (1 output), 3,5 A permanent current (3 outputs)
Certifications according to Safety relevant substance data Depending on wiring (only max. values are given)	EN ISO 13849-1: PLe, Cat.4 MTTFd: >100 years / high, DC: 99% / high, CCF: achieved



Safety on Bus

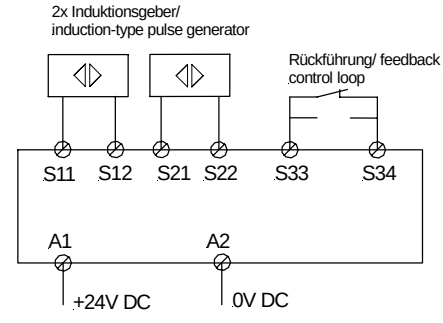
DEVICE	SAFE IL1 / IL2 / ILL / IL2
APPLICATIONS	Interbus INLINE devices (emergency stop, safety gate controlling, two hand controlling, safety light curtains/barriers)
APPROVALS	CE, TÜV
CONTACTS	1 normally open safety
SPECIAL CHARACTERISTICS	LED indicators for status and supply diagnostic diagnostic with fieldbus, integration in the inline system
LED	Channel 1, channel 2, US, UM, diagnostic
OPERATING VOLTAGE	24 V DC
POWER CONSUMPTION	ca. 1,7 W
START UP DELAY / FALLBACK TIME	-- / < 20 ms
CONTACT CAPACITY max.	4A DC, 24 V
CONTACT CAPACITY min. at 24V DC (*)	10 mA
SIMULTANEITY	
ENVIRONMENTAL TEMPERATURE	-25°C to +55°C
SWITCHING CAPACITY	120 W
CONTACT SECURITY	4 A time lag
OPERATING MODE (*) We offer all devices who have a CONTACT CAPACITY of min. 100 mA at 24 V DC with hard gold-plated contacts. In this way the CONTACT CAPACITY of min. 100 mA is only 4 mA. Please ask our sales team!	For the operation of the device the device must be connected into a Inline station. The voltage supply is taken over the Inlinesystem. The LED "UM" illuminates. For a detailed description please see appropriate manuals. Please pay attention to our circuit breaker SAFE IL2.
CONNECTION DIAGRAM	Sales only on inquiry
FUNCTION CIRCUIT DIAGRAM	Notice: please ask for detailed documentation.
Certifications according to Safety relevant substance data Depending on wiring (only max. values are given)	

Safety standstill monitor

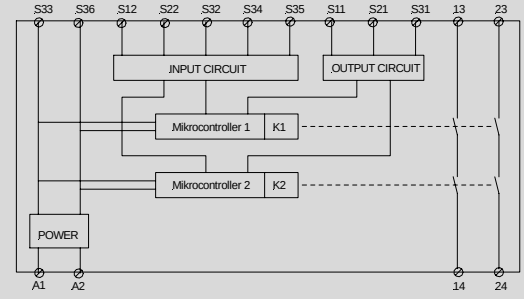
	DEVICE	SAFE SM *(OUTLOOK)*
	APPLICATIONS	Safety standstill monitor
	APPROVALS	CE, (TÜV, UL, C-UL pending)
	CONTACTS	2 normally open, 1 PNP output
	SPECIAL CHARACTERISTICS	LED indicators for status and supply diagnostic optical failure indication by LEDs Automatic start possible
	LED	Power, channel 1 IN/OUT, channel 2 IN/OUT, failure
	OPERATING VOLTAGE	24 V DC (+ 20 - 25 %) Overvoltage protection
	POWER CONSUMPTION	< 3 W
	START UP DELAY / FALLBACK TIME	frequency dependent
	CONTACT CAPACITY max.	6 A, 250 V AC, 250 V DC
	CONTACT CAPACITY min. at 24V DC (*)	5 mA
	SIMULTANEITY	
	ENVIRONMENTAL TEMPERATURE	- 25°C to + 55°C
	SWITCHING CAPACITY	1500 VA
	CONTACT SECURITY	6 A quick acting or 4 A time lag
	OPERATING MODE	The riese 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.

(*) We offer all devices who have a CONTACT CAPACITY of min. 100 mA at 24 V DC with hard gold-plated contacts. In this way the CONTACT CAPACITY of min. 100 mA is only 4 mA. Please ask our sales team!

CONNECTION DIAGRAM



FUNCTION CIRCUIT DIAGRAM



Certifications according to
Safety relevant substance data
Depending on wiring (only max. values are given)

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

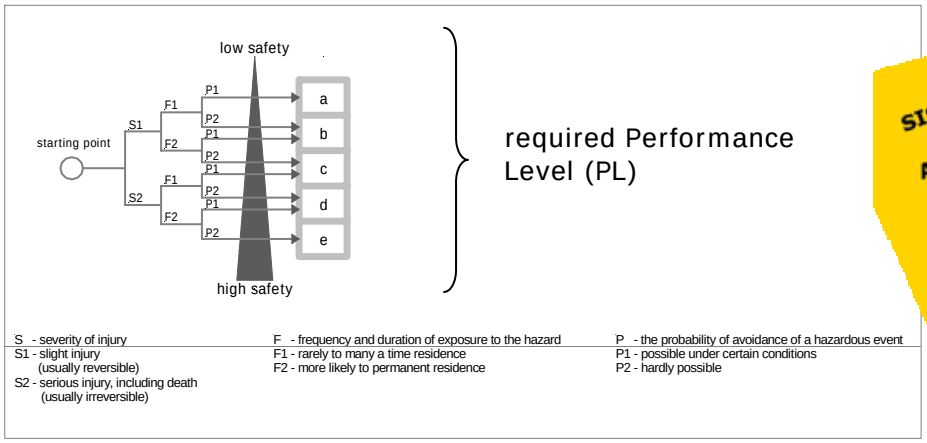
The required safety function characteristics are defined e.g. ESPD-function with automatic start, no simultaneity, etc. and a detailed description with the necessary interfaces to the other parts of control systems will be prepared.

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.



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 achived 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

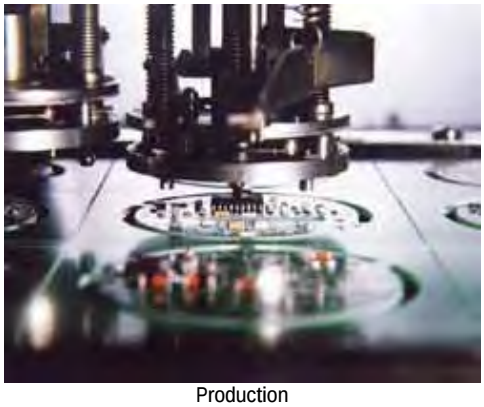
► Voltage range	SAFE 1/1.1 / SAFE 2/2.1/2.2 / SAFE S.6 / SAFE 4/4.1 / SAFE M RS-NAGV / RS-NAGT/T.1 / SAFE L/L.1 / SAFE L.2 / SAFE Z / SAFE IRZ.2 RS-NAGU.12 / RS-NAGU.1 / RS-NAGU.2f	0,9 to 1,1 UB
	RS-NAGMP/P.1 / RS-NAGA/AO SAFE IL1 / SAFE 5/5.1 / RS-NAGL/L.1 / SAFE ILL / SAFE Z.2 / RS-NAGZ / SAFE ILZ SAFE X4/4.1 / RS-NAGX5 / SAFE IL2 / FI1	0,85 to 1,1 UB
	SAFE C1, CL, CM, CZ, SAFE TU/ TA/ TN/ TR/ TON, SAFE FLEX, FLEX T, SAFE SM	0,8 to 1,25 UB
	FA1	over ASI-Bus
► Clearance and creeping distance	DIN EN 50178, or DIN VDE 0160 at pollution grade 2, over voltage category 3/300V	
► max. switching voltage	SAFE IL2 :	12 A AC, cos φ = 1
	RS-NAGMP/MP.1 :	8 A AC, cos φ = 1; 8 A DC, τ =0
	SAFE IRZ.2, SAFE 1/ 1.1/ 4/ 4.1/ M:	5 A AC, cos φ = 1; 5 A DC, τ =0
	SAFE IL1, SAFE IL L, SAFE IL Z, RS-NAGV:	4 A AC, cos φ = 1; 4 A DC, τ =0
	RS-NAGU.2f:	6 A DC (1 Kontakt), τ = 0
	RS-NAGU.1/RS-NAGU.12:	1,5 A DC (1 Kontakt), τ = 0
	SAFE C1, SAFE CL, SAFE CM, SAFE CZ:	1,8 A DC
	Other :	6 A AC, cos φ = 1; 6 A DC, τ =0
► Protection classes	Space requirements :	IP 54
	Housing :	IP 40
	Terminal area :	IP 20
► Mechanical life time	10^7 switching cycles	
► Electronical life time	10^5 switching cycles	
► Mounting	DIN rail EN 50022 (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~ / whit 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 / RS-NAGU.1f / RS-NAGU.12)
- ► wireless layout
- ► housing of self extinguishing plastic according to UL 94-V1
- ► 100% computer assisted check

Testing area

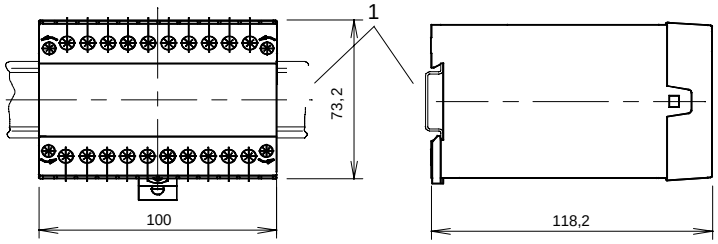
Dimensions

RS-NAGZ

RS-NAGMP
RS-NAGMP.1

RS-NAGL
RS-NAGL.1

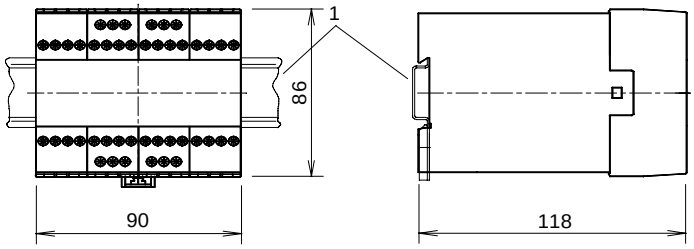
RS-NAGV



RS-NAGU.1

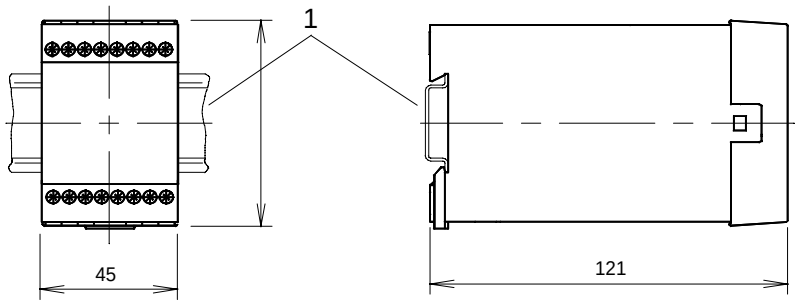
RS-NAGU.2f
(Ⓐ nstead of 4,
now 7 terminals)

RS-NAGU.12



RS-NAGA
RS-NAGAO

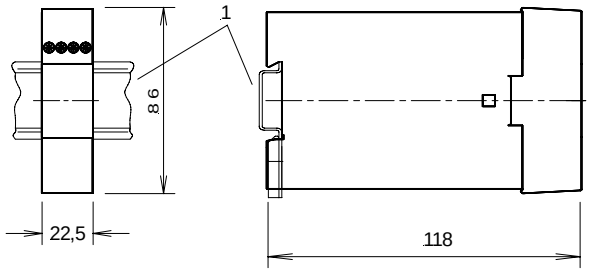
RS-NAGT
RS-NAGT.1



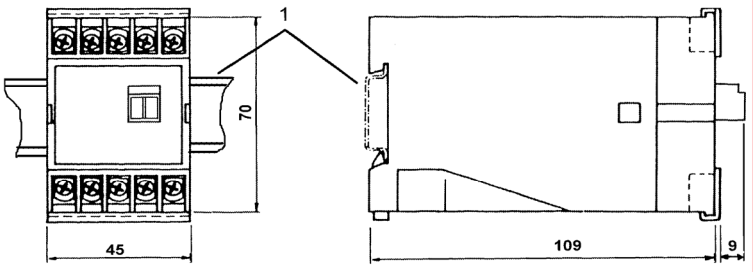
FA1

FI1

RS-NAGX5

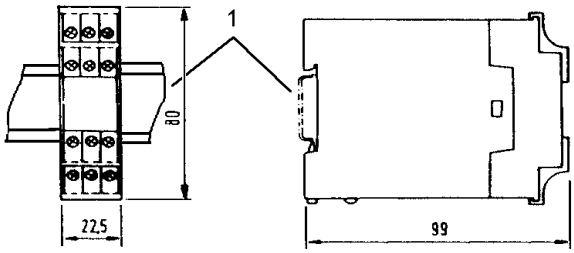


SAFE S.6

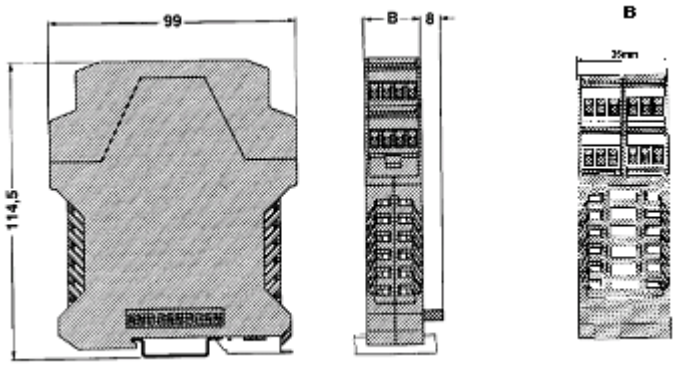


Dimensions

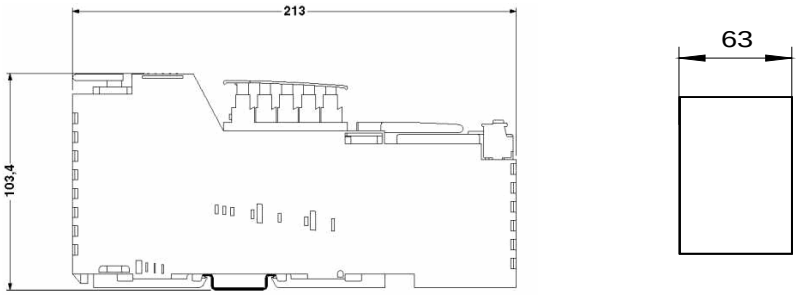
SAFE 1
SAFE 1.1
SAFE 2
SAFE 2.1
SAFE 2.2
SAFE Z
SAFE IRZ.2
(8 terminals)



	B[mm]
SAFE 4/4.1	22,5
SAFE 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



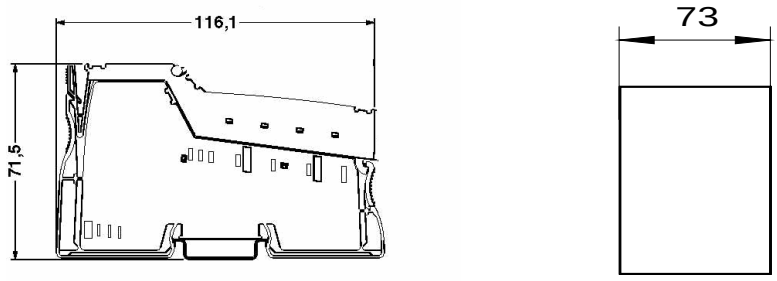
SAFE IL2



SAFE IL1

SAFE ILL

SAFE ILZ



Legend:
1 - Attachment rail DIN EN 50022

Printed: 01.03.2010
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.:
NAGA	24 V DC	AR.9663.9000
NAGA	24 V AC	AR.9663.8000
NAGA	24 V AC/DC	AR.9663.2000
NAGA	48 V AC	AR.9663.3000
NAGA	110-127 V AC	AR.9663.4000
NAGA	230 V AC	AR.9663.5000
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	110-127 V AC	AR.9665.4000
NAGAO	230 V AC	AR.9665.5000
NAGL	24 V AC/DC	AR.9610.2000
NAGL	48 V AC	AR.9610.3000
NAGL	110-127 V AC	AR.9610.4000
NAGL	230 V AC	AR.9610.5000
NAGL.1	24 V DC	AR.9610.9003
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
NAGT	24 V AC/DC	AR.9661.2000
NAGT	110-127VAC/24VDC	AR.9661.4000
NAGT	230 V AC	AR.9661.5000
NAGT.1	110-127VAC/24VDC	AR.9661.4005
NAGT.1	230 V AC	AR.9661.5005
NAGU.12	24 V DC	AR.9667.9012
NAGU.1	24 V DC	AR.9667.9010
NAGU.2f	24 V DC	AR.9667.9020
NAGV	24 V DC	AR.9640.9000
NAGV	24 V AC	AR.9640.8000
NAGV	24 V AC/DC	AR.9640.2000
NAGV	110-127 V AC	AR.9640.4000
NAGV	230 V AC	AR.9640.5000
NAGX5	24 V AC/DC	AR.9615.2000

Type:	Voltage:	Part-nr.:
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 2.2	24 V AC/DC	AR.9657.2010
SAFE 4	24 V AC/DC	AR.9659.2000
SAFE 4	110-127 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	110-127 V AC	AR.9660.4000
SAFE 4.1	230 V AC	AR.9660.5000
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 CL	24 V DC	AR.9680.9001
SAFE CM	24 V DC	AR.9680.9002
SAFE CZ	24 V DC	AR.9680.9003
SAFE FLEX	24 V DC	auf Anfrage
SAFE L.2	24 V AC/DC	AR.9671.2100
SAFE M	24 V AC/DC	AR.9647.2000
SAFE M.1	24 V AC/DC	AR.9648.2000
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
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 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 Z	24 V DC	AR.9672.9000
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

Only for spare part:

Type:	Voltage:	Part-nr.:
FA 1	24 V DC	auf Anfrage
FI 1	24 V DC	auf Anfrage
NAGU.1b	24 V DC	auf Anfrage
NAGZ	24 V DC	AR.9611.9000
NAGZ	24 V AC	AR.9611.8000
NAGZ	48 V AC	AR.9611.3000
NAGZ	110-127 V AC	AR.9611.4000
NAGZ	230 V AC	AR.9611.5000
SAFE IL.1	24 V DC	auf Anfrage
SAFE IL.2	24 V DC	auf Anfrage
SAFE IL L	24 V DC	auf Anfrage
SAFE IL Z	24 V DC	auf Anfrage
SAFE IRZ.2	24 V AC/DC	AR.1632.2010
SAFE L	24 V AC/DC	AR.9671.2000
SAFE L.1	24 V AC/DC	AR.9671.2010

Following devices are still available with some changes

NAGU	24 V DC	AR.9667.9000
detachable clamps		

No longer available:

Type:	Voltage:	Part-nr.:	Succeding product
NAGE	24 V AC	AR.9607.8000	NAGMP/P.1
NAGE	24 V AC/DC	AR.9607.2000	NAGMP/P.1
NAGE	24 V DC	AR.9607.9000	NAGMP/P.1
NAGE	110-127 V AC	AR.9607.4000	NAGMP/P.1
NAGE	230 V AC	AR.9607.5000	NAGMP/P.1
NAGK	12 V AC/DC	AR.9662.1000	NAGA bzw. NAGA/O
NAGK	24 V AC	AR.9662.2000	NAGA bzw. NAGA/O
NAGK	110-127 V AC	AR.9662.4000	NAGA bzw. NAGA/O
NAGK	230 V AC	AR.9662.5000	NAGA bzw. NAGA/O
NAGM	12 V AC/DC	AR.9605.1000	NAGMP bzw. NAGMP.1
NAGM	24 V AC	AR.9605.8000	NAGMP bzw. NAGMP.1
NAGM	24 V AC/DC	AR.9605.2000	NAGMP bzw. NAGMP.1
NAGM	24 V DC	AR.9605.9000	NAGMP bzw. NAGMP.1
NAGM	110-127 V AC	AR.9605.4000	NAGMP bzw. NAGMP.1
NAGM	230 V AC	AR.9605.5000	NAGMP bzw. NAGMP.1
NAGX4	24 V AC	AR.9614.8000	SAFE X.4 bzw. X4.1 oder NAGX5
NAGX4	24 V AC/DC	AR.9614.2000	SAFE X.4 bzw. X4.1 oder NAGX5
NAGX4	24 V DC	AR.9614.9000	SAFE X.4 bzw. X4.1 oder NAGX5
NAGX4	110-127 V AC	AR.9614.4000	SAFE X.4 bzw. X4.1
NAGX4	230 V AC	AR.9614.5000	SAFE X.4 bzw. X4.1
NAGX8	24 V AC	AR.9618.8000	zwei SAFE X.4 bzw. X4.1 oder NAGX5
NAGX8	24 V AC/DC	AR.9618.2000	zwei SAFE X.4 bzw. X4.1 oder NAGX5
NAGX8	24 V DC	AR.9618.9000	zwei SAFE X.4 bzw. X4.1 oder NAGX5
NAGX8	110-127 V AC	AR.9618.4000	zwei SAFE X.4 bzw. X4.1
NAGX8	230 V AC	AR.9618.5000	zwei SAFE X.4 bzw. X4.1
NAGP	24 V AC	AR.9601.8000	NAGMP
NAGP	24 V AC/DC	AR.9601.2000	NAGMP
NAGP	24 V DC	AR.9601.9000	NAGMP
NAGP	48 V AC	AR.9601.3000	NAGMP
NAGP	110-127 V AC	AR.9601.4000	NAGMP
NAGP	230 V AC	AR.9601.5000	NAGMP

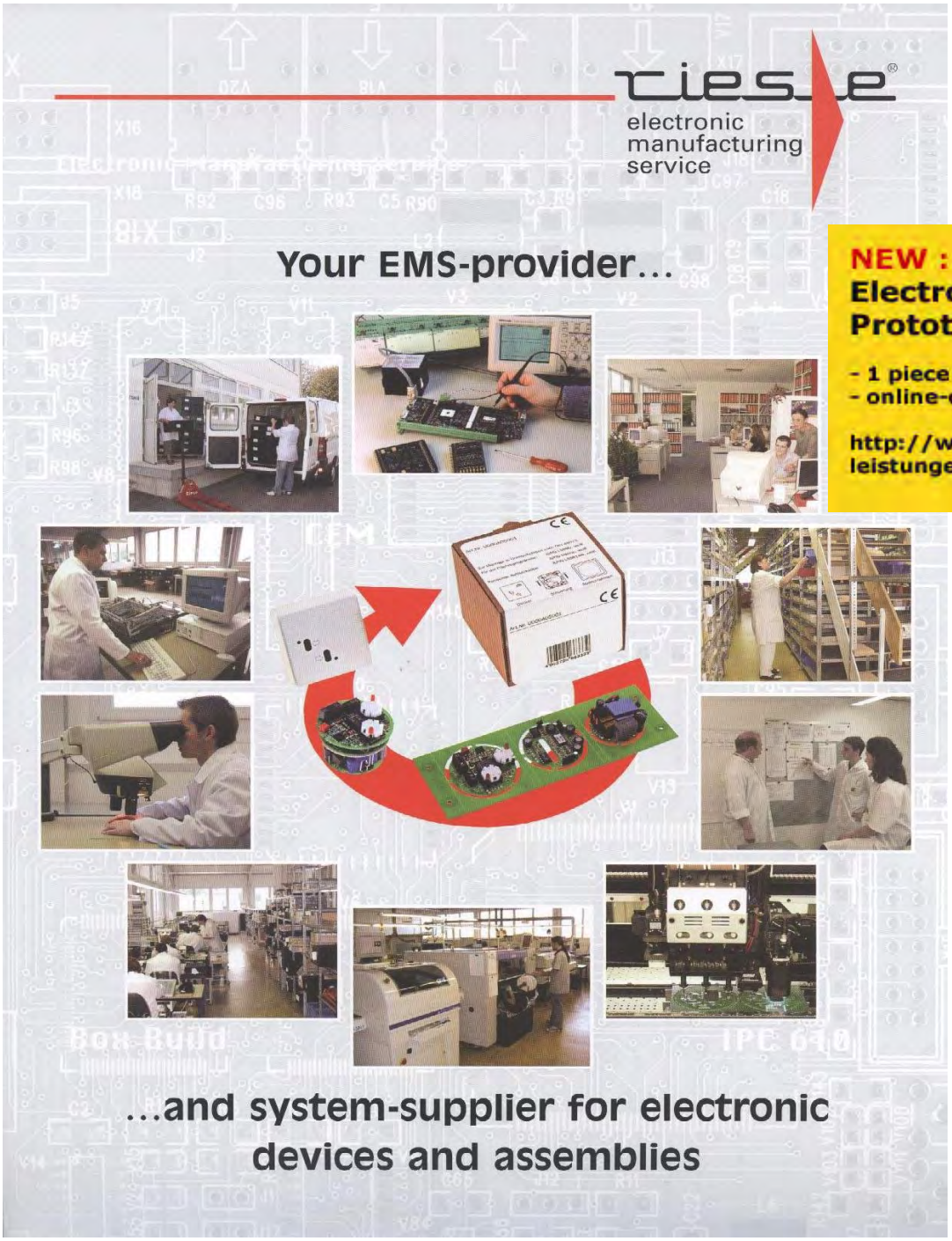
Relevant information: partly also available with hard gold-plated contacts. Please ask for price and delivery time by hard gold-plated contacts.
All operating instructions can be found under www.automation-safety.com

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.

automation & safety

Time-delay relays from riese

Applications	Relay designations (all with CE)	Column	EN 954 safety class
On-delay	RS-VR1, RS-VR2, RS-ZR1, RS-ZR2, RS-ER1, RS-ER2, RS-ERF, RS-EB, RS-LR1, RS-LR2, RS-LZ1, RS-LZ2, RS-LZF	1 2, 3 4, 5, 6 7, 8	1 1 1 1
Off-delay	RS-AR1, RS-AR2, RS-AZ1, RS-AZ2, RS-LA1, RS-LA2, RS-AZS	9,10 11, 12	1 1
Flashing	RS-BR1, RS-BR2, RS-BRS1, RS-BRS2	13, 14	1
Clock-pulsed	RS-TG1, RS-TG2, RS-TGI1, RS-TGI2	15, 16	1
Multifunction	RS-MF	17	1
Interval time-delay	RS-EI1, RS-EI2, RS-EIF, RS-WAR, RS-WAR2	18, 19, 20	1 1
Star-delta	RS-SD, RS-SDS	21, 22	1

automation & safety

Measuring relays from riese

Applications	Relay designations (all with CE)	Column	EN 954 safety class
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-NR4, 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