

Product Catalogue



Safety relay

Who we are

Certified

to DIN EN ISO 9001 No. S 89403

Approvals: TÜV / UL / C-UL

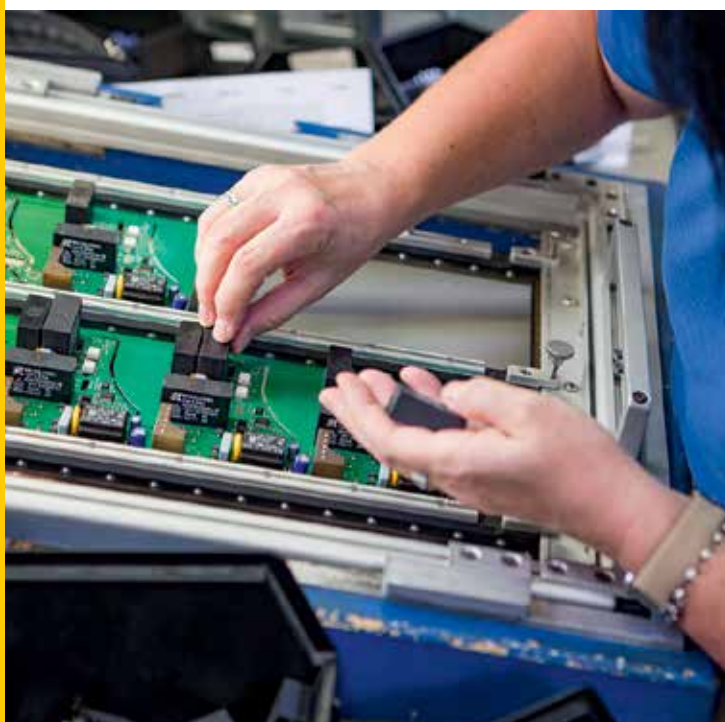
TÜV
type-
tested



General terms and conditions of sale

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www.cm-manufactory.com,
or simply scan the QR code.



Achieving more together

The electronics industry offers a multitude of wide-ranging possibilities like no other. Companies looking to take advantage need a strong partner. With experience gained over many years and comprehensive service, the CM Group offers customised consultation and solutions.

The three companies **CM Manufactory GmbH**, **CM Systems GmbH** and **CM Security GmbH** place their focus on “Achieving more together”. The three divisions are split into the following areas:

- Development and production of electronic assemblies and systems
- Development and production of safety relays
- Manufacture of customer-specific cable harnesses
- Safety technology, alarm technology, video technology, access control systems

By bringing all these areas together, the CM Group can offer customer-specific system solutions.

We will be happy to provide you with consultation.

You can reach us on: **+49 (0) 74 76/94 95-0**

You can find more information on our homepage:

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What we offer



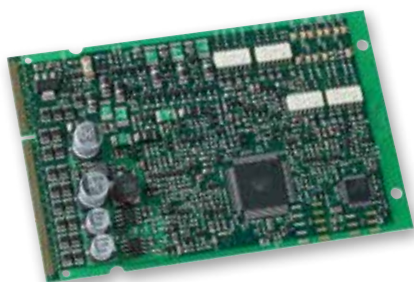
Ideal compliance with safety requirements



We develop electronic safety relays for all standard applications as well as for special customer-specific requirements. **You are welcome to brand under your own label.** We also offer custom housing shapes in various colours, with removable or fixed screw or spring terminals.

Fields of competence in safety relays

- In-house development and production
- Smallest housing
- Relay for special applications
- Testing programmes developed in-house
- Special developments tailored to your requirements





In addition to in-house developments, the CM Group also markets products from renowned manufacturers such as BACO, rounding off its range.

BACO®

BACO simplifies day-to-day work with sophisticated, easy-to-integrate solutions, offers customised solutions that guarantee the success of our customers and can be used in a virtually unlimited number of individual combinations.

Command and signal units



Cam switches



Load interrupter switches



Product overview of safety relays

Contacts				Operating voltage							EN 13849-1: Category				EN 13849-1: PL					Page											
NO	NC	Auxiliary contacts	Other	Semiconductor outputs				DC	24 V	AC /DC	24 V	AC	48 V	AC	110 V	AC	230 V	Housing width in mm	Monitoring of the start button		Switching capacity	Approvals	ErP	B/1	2	3	4	a	b	c	d

1 | Emergency stop / safety gate monitoring relays

SAFE 4	3	1				x		x	x	22.5	x	5 A	TÜV, UL, C-UL			✓	✓	✓	✓	✓	✓	✓	✓	✓	8
SAFE 4.1	3	1				x		x	x	22.5		5 A	TÜV, UL, C-UL	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	8
SAFE 4.1 eco	3	1				x		x	x	22.5		5 A	TÜV, UL, C-UL	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	8
SAFE 4.2 eco	3	1				x		x	x	22.5	choos-able	5 A	TÜV, UL, C-UL	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	9
SAFE 4.3 eco	3	1				x		x	x	22.5	choos-able	5 A	TÜV, UL, C-UL	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	9
SAFE 5	2					x				22.5	x	6 A	TÜV, UL, C-UL			✓	✓	✓ ³		✓	✓	✓	✓ ³	✓	10
SAFE 5.1	2					x				22.5	x	6 A	TÜV, UL, C-UL			✓	✓	✓ ³		✓	✓	✓	✓ ³	✓	10
SAFE C1				4	x					22.5	choos-able	1.8 A ²	TÜV, UL, C-UL			✓	✓	✓	✓	✓	✓	✓	✓	✓	10
SAFE FLEX	2				x					22.5	choos-able	6 A	TÜV, UL, C-UL			✓	✓	✓	✓	✓	✓	✓	✓	✓	11
SAFE 1	3	1				x				22.5	x	5 A	TÜV, UL, C-UL			✓	✓	✓ ³		✓	✓	✓	✓ ³		11
SAFE 1.1	3	1				x				22.5	x	5 A	TÜV, UL, C-UL			✓	✓	✓ ³		✓	✓	✓	✓ ³		11
SAFE 2	2					x				22.5	x	6 A	TÜV, UL, C-UL			✓	✓	✓	✓	✓	✓	✓	✓	✓	12
SAFE 2.1	2					x				22.5	x	6 A	TÜV, UL, C-UL			✓	✓	✓	✓	✓	✓	✓	✓	✓	12
SAFE S.6	2					x	x	x	x	45		6 A	TÜV, UL, C-UL			✓	✓	✓	✓	✓	✓	✓	✓	✓	12
SAFE G1																									13
SAFE G2				4	x					18	choos-able	0.4 A	TÜV, UL, C-UL			✓	✓	✓	✓	✓	✓	✓	✓	✓	14
SAFE GT																									14
SAFE GL																									14

2 | Emergency stop / safety gate monitoring relays with switch-off time-delay

SAFE T...	2+2	1				x				35	choos-able	6 A	TÜV, UL, C-UL			✓	✓	✓	✓	✓	✓	✓	✓	✓	15
SAFE T ON	2+2	1				x				35	choos-able	6 A	TÜV, UL, C-UL			✓	✓	✓	✓	✓	✓	✓	✓	✓	15
SAFE GT				2+2	x					18	choos-able	0.4 A	TÜV, UL, C-UL			✓	✓	✓	✓	✓	✓	✓	✓	✓	16
SAFE FLEX T	4+2	1		1	x					45	choos-able	6 A	TÜV, UL*, C-UL*			✓	✓	✓	✓	✓	✓	✓	✓	✓	16

3 | Safety relays for safety mats and safety edges

SAFE CM				4	x					22.5	choos-able	1.8 A ²	TÜV, UL, C-UL			✓	✓	✓	✓	✓	✓	✓	✓	✓	17
SAFE M	3	1				x			x	22.5	x	5 A	TÜV, UL, C-UL			✓	✓	✓		✓	✓	✓	✓	✓	17
SAFE M.1	3	1				x			x	22.5	x	5 A	TÜV, UL, C-UL			✓	✓	✓		✓	✓	✓	✓	✓	17
SAFE 2.2	2					x				22.5		6 A	TÜV, UL, C-UL			✓	✓	✓	✓	✓	✓	✓	✓	✓	18
SAFE G1																									18
SAFE G2																									18
SAFE GT				4	x					18	choos-able	0.4 A	TÜV, UL, C-UL			✓	✓	✓	✓	✓	✓	✓	✓	✓	19
SAFE GL																									19



Contacts				Operating voltage										EN 13849-1: Category				EN 13849-1: PL					Page																							
NO	NC	Auxiliary contacts	Other	Semiconductor outputs				DC	24 V	AC/DC	24 V	AC	48 V	AC	110 V	AC	230 V	Housing width in mm				Monitoring of the start button				Switching capacity				Approvals				ErP				B/1	2	3	4	a	b	c	d	e

4 | Safety relays for ESPEs (Electro-sensitive protective equipment)

SAFE L.2	3				x					22.5	choos-able	6 A	TÜV, UL, C-UL		√ ⁴		√	√	√	√	√	√	21
SAFE CL			4	x						22.5	choos-able	1.8 A ^{*2}	TÜV, UL, C-UL		√	√	√	√	√	√	√	√	21
SAFE FLEX	2				x					22.5	choos-able	6 A	TÜV, UL, C-UL		√	√	√	√	√	√	√	√	22
SAFE FLEX L	2				x					22.5	choos-able	6 A	TÜV, UL*, C-UL*		√	√	√	√	√	√	√	√	22
SAFE G1																							23
SAFE G2																							
SAFE GT																							
SAFE GL																							
			4	x						18	choos-able	0.4 A	TÜV, UL, C-UL		√	√	√	√	√	√	√	√	24

NEW

5 | Two hand control relays

SAFE Z.2	2	1	1		x	x	x	x		22.5		6 A	TÜV, UL, C-UL		√	√	√	√	√	√	√	√	25
SAFE CZ				4	x					22.5		1.8 A ^{*2}	TÜV, UL, C-UL		√	√	√	√	√	√	√	√	25
SAFE FLEX	2				x					22.5	choos-able	6 A	TÜV, UL, C-UL		√	√	√	√	√	√	√	√	26

6 | Expansion modules

SAFE X4	4	1			x	x	x	x		22.5		6 A	TÜV, UL, C-UL		√	√	√	√	√	√	√	√	27
SAFE X4.1																							
SAFE IRZ.2			2W		x					22.5		5 A			Ⓐ								27

7 | Multi-functional relays for emergency stop, safety gate, light barrier and two-hand applications

SAFE FLEX	2				x					22.5	choos-able	6 A	TÜV, UL, C-UL		√	√	√	√	√	√	√	√	28
SAFE FLEX T	4+2	1		1	x					45	choos-able	6 A	TÜV, UL*, C-UL*		√	√	√	√	√	√	√	√	28

8 | Safe standstill monitor

SAFE SM	2				x					22.5		6 A	TÜV, UL*, C-UL*		√	√	√	√	√	√	√	√	29
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9 | Multi-functional relay with optional properties for lift applications, certified to EN 81

SAFE GL				4	x					18	choos-able	0.4 A	TÜV, UL, C-UL		√	√	√	√	√	√	√	√	30
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NEW

* approvals pending

*2 total current

*3 According to safety category 3 with two-phase off-switching of the power supply, protected wiring and cyclic testing, e.g. during maintenance

*4 Useable only with safety light barriers with integrated selftest

Ⓐ Depending on wiring, suitable for up to max. Cat. 4

√ suitable

x available

NO normally open

NC normally closed

W changeover

TÜV
type-
tested

UL
LISTED



1 | Emergency stop / safety gate monitoring relays

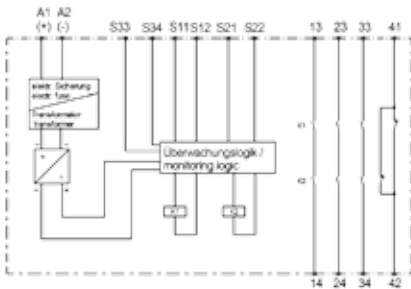


SAFE 4 / SAFE 4.1

Application	For single and dual channel applications, additionally with AC supply
Approval	TÜV, UL, C-UL
Contacts	3 normally open, 1 normally closed
Special characteristics	Cross-circuit protection, Monitoring of the START button: with (SAFE 4) and without (SAFE 4.1)
LED	Power, channel 1 and channel 2 indicating the state of the relay
Ambient temperature	-25°C to +55°C
Switching capacity	1200 W (resistive load)
Contact fuse	NO: 6.3 A fast, NC: 4 A
Operating voltages	24 V AC/DC (electronic fuse) 110, 230 V AC (galvanic isolation / transformer)
Power consumption	24 V AC: approx. 5 VA, 24 V DC: 3 W, 110/230 V AC: 3.7 VA
Fallback time / Recovery time	DC: <30 ms; AC: <50 ms / <0,5 s
Contact ratings (max.)	5 A, 240 V AC, 24 V AC/DC, AC15 230 V / 5 A, DC13 24 V / 5 A
Contact rating (min.)	10 mA

SAFE 4 is an emergency stop and safety gate relay for single and dual channel applications up to Cat. 4/PLc.
SAFE 4: With monitoring of the start button
SAFE 4.1: Without monitoring of the start button.
This enables automatic start (attention: not for emergency stop!)

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



	SAFE 4			SAFE 4.1		
Operating voltages	24 V AC/DC	110 V AC	230 V AC	24 VAC/DC	110 V AC	230 V AC
Art. no.	46353	46355	46357	46354	46356	46358
	45042	45045	45255	45046	45052	45054

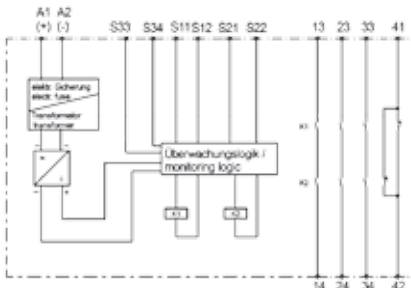
SAFE 4.1 eco

Application	Pin and function compatible with SAFE 4.1, very fast fallback time
Approval	TÜV, UL, C-UL
Contacts	3 normally open, 1 normally closed
Special characteristics	Cross-circuit protection - without monitoring of the START button
LED	Power, channel 1 and channel 2 indicating the state of the relay
Ambient temperature	-25°C to +55°C
Switching capacity	1200 W (resistive load)
Contact fuse	NO: 6.3 A fast, NC: 4 A
Operating voltages	24 V AC/DC (electronic fuse)
Power consumption	24 V DC: 1.5 W / AC: 3.6 VA
Switch-on / Fallback time / Recovery time	200 ms / < 10 ms / <0.5 s
Contact ratings (max.)	5 A, 240 V AC, 24 V AC/DC
Contact rating (min.)	10 mA

This variant is compatible with the SAFE 4.1 in terms of pins and function.
SAFE 4 eco devices are characterised by their low power consumption and very fast fallback time (<10 ms). They are also available in AC variants.

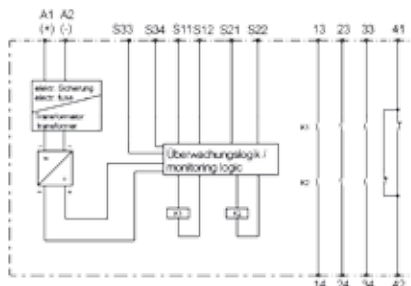
EN ISO 13849: PLc, Cat. 4 | MTTFd: 910 years / high / DC=99 % / high | CCF: achieved
Supplementary information as per EN 61508: SIL3 | PFH: 2.32*10⁻⁹ 1/h | PFD: 7.3*10⁻⁸ 1/h | SFF=99 % | HFT: 1

Up to 40 % less energy consumption.



Art. no.	45069
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SAFE 4.2 eco



Application	Choosable monitored or non-monitored start, very fast fallback time
Approval	TÜV, UL, C-UL
Contacts	3 normally open, 1 normally closed
Special characteristics	Cross-circuit protection - with and without monitoring of the START button
LED	Power, channel 1 and channel 2 indicating the state of the relay
Ambient temperature	-25°C to +55°C
Switching capacity	1200 W (resistive load)
Contact fuse	NO: 6.3 A fast, NC: 4 A
Operating voltages	24 V AC/DC (electronic fuse) 115, 230 V AC (galvanic isolation / transformer)
Power consumption	24 V DC: 1.5 W / AC: 3.6 VA
Switch-on / Fallback time / Recovery time	200 ms / <10 ms / <0.5 s
Contact ratings (max.)	5 A, 240 V AC, 24 V AC/DC
Contact rating (min.)	10 mA

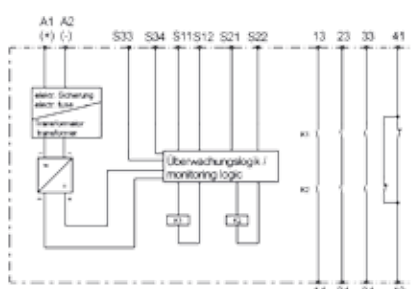
SAFE 4.2 eco: Choosable monitored and non-monitored start (manual/automatic).

EN ISO 13849: PLe, Cat. 4 | MTTfD: 910 years/high/DC=99%/high | CCF: achieved

Supplementary information as per EN 61508: SIL3 | PFH: $2.32 \cdot 10^{-9}$ 1/h | PFD: $7.3 \cdot 10^{-6}$ 1/h | SFF=99% | HFT: 1

Operating voltages	24 V AC/DC	115 V AC	230 V AC
Art. no.	45317	45318	45319

SAFE 4.3 eco



Application	For safety magnetic switches with antivalent reed contact outputs (1 NO / 1 NC), very fast fallback time
Approval	TÜV, UL, C-UL
Contacts	3 normally open, 1 normally closed
Special characteristics	Cross-circuit protection, antivalent contacts of the release button - with and without monitoring of the START button
LED	Power, channel 1 and channel 2 indicating the state of the relay
Ambient temperature	-25°C to +55°C
Switching capacity	1200 W (resistive load)
Contact fuse	NO: 6.3 A fast, NC: 4 A
Operating voltages	24 V AC/DC (electronic fuse) 115, 230 V AC (galvanic isolation / transformer)
Power consumption	24 V DC: 1.5 W / AC: 3.6 VA
Switch-on / Fallback time / Recovery Time	200 ms / <10 ms / <0.5 s
Contact ratings (max.)	5 A, 240 V AC, 24 V AC/DC
Contact rating (min.)	10 mA

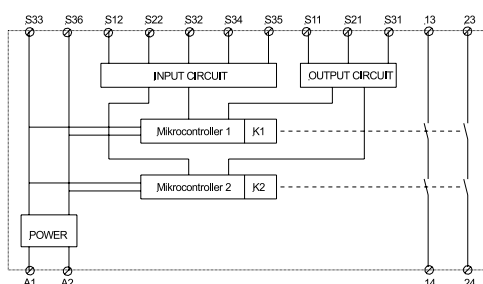
SAFE 4.3 eco: Specifically designed for safety gate applications with antivalent reed contacts (sensor current < 10 mA), consisting of one normally open and one normally closed contact, as well as choosable start control (manual/automatic).

EN ISO 13849: PLe, Cat. 4 | MTTfD: 910 years/high/DC=99%/high | CCF: achieved

Supplementary information as per EN 61508: SIL3 | PFH: $2.32 \cdot 10^{-9}$ 1/h | PFD: $7.3 \cdot 10^{-6}$ 1/h | SFF=99% | HFT: 1

Operating voltages	24 V AC/DC	115 V AC	230 V AC
Art. no.	45320	45321	45322

SAFE FLEX



Application	Safety relay with choosable function variants
Approval	TÜV, UL, C-UL
Contacts	2 normally open, 1 auxiliary output (PNP)
Special characteristics	Monitored and non-monitored start choosable
LED	Power, channel 1 IN/OUT, channel 2 IN/OUT, fault indicating the state of the relay
Ambient temperature	-25°C to +55°C
Switching capacity	1500 VA
Contact fuse	6.3 A fast or 4 A slow
Operating voltages	24 V DC (+20 – 25 %) overvoltage protection
Power consumption	<3 W
Fallback time	<=30 ms depending on the choosen functionality
Contact ratings (max.)	6 A, 250 V AC, 250 V DC
Contact rating (min.)	5 mA

By wiring one of the following functionalities is choosable:

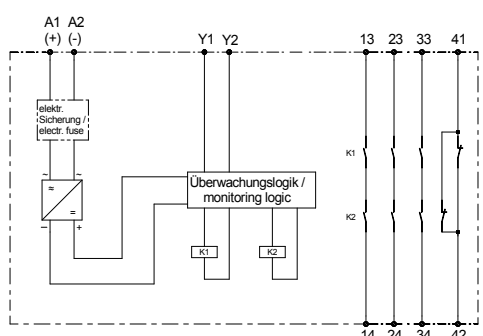
- Emergency stop Cat. 4
- Safety gate monitoring Cat. 4
- Two hand control type IIIC Cat. 4
- ESPE safety (light barriers and curtains) type 4 and type 2
- Single channel safety devices with cyclic testing Cat. 4

Wiring changes during operation are not allowed and lead to a failure.

EN ISO 13849: PLc, Cat. 4 | MTTFd: >100 years/high | DC: 99 %/high
Supplementary information as per EN 61508: SIL3 | PFH: $2.15 \cdot 10^{-9}$ 1/h | SSF: 94.65 %

Art. no.	45332
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SAFE 1 / SAFE 1.1



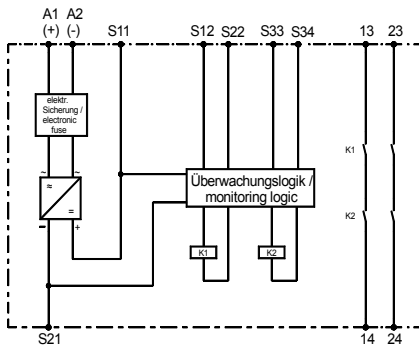
Application	Single and dual channel switching technology for emergency stop switches or level switches for safety gates, low-cost up to Cat. 3/PLd, small design
Approval	TÜV, UL, C-UL
Contacts	3 normally open, 1 normally closed
Special characteristics	With (SAFE 1.1) or without (SAFE 1) monitoring of the START button
LED	Power, channel 1 and channel 2 indicating the state of the relay
Ambient temperature	-25°C to +55°C
Switching capacity	1250 W (resistive load)
Contact fuse	6.3 A fast or 4 A slow
Operating voltages	24 V AC/DC (electronic fuse)
Power consumption	Approx. 2.5 VA/2.5 W
Fallback time / Recovery time	<=100 ms / <=0,5 s
Contact ratings (max.)	5 A, 250 V AC, 24 V DC
Contact rating (min.)	1 mA

Emergency stop and safety gate monitoring relay up to Cat. 3/PLd in a small design.
Single and dual channel applications possible.
Also for AC supply.

EN ISO 13849-1: PLd, Cat. 3 (**see product navigator page 7) | MTTFd: 37.57 years/high
DC: 90 %/medium | CCF: achieved

	SAFE 1	SAFE 1.1
Art. no.	45037	45036

1 | Emergency stop / safety gate monitoring relays



SAFE 2 / SAFE 2.1

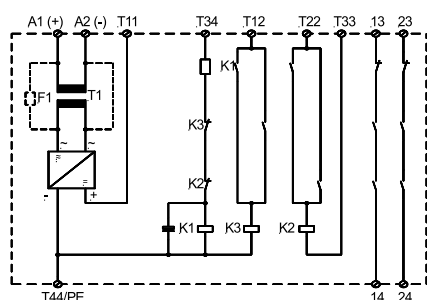
Application	Single and dual channel switching device for emergency stop switches or level switches for safety gates, small design
Approval	TÜV, UL, C-UL
Contacts	2 normally open
Special characteristics	With (SAFE 2) or without (SAFE 2.1) monitoring of the START button
LED	Power, channel 1 and channel 2 indicating the state of the relay
Ambient temperature	-25°C to +55°C
Switching capacity	1500 W (resistive load)
Contact fuse	6.3 A fast or 4 A slow
Operating voltages	24 V AC/DC (electronic fuse)
Power consumption	Approx. 2.5 VA / 2.5 W
Fallback time	<30 ms
Contact ratings (max.)	6 A, 250 V AC, 24 V DC
Contact rating (min.)	6 mA

Emergency stop and safety gate monitoring relay up to Cat. 4 / PLe for single and dual channel applications.
 SAFE 2: With monitoring of the start button (manual start)
 SAFE 2.1: Without monitoring of the start button (automatic start)

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

	SAFE 2	SAFE 2.1
Art. no.	45038	45039

SAFE S.6



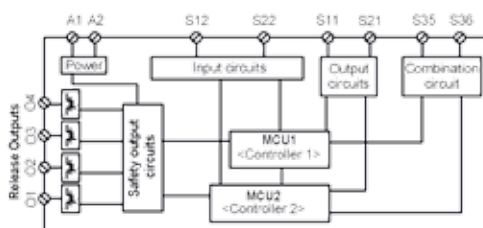
Application	Single and dual channel switching technology for emergency stop switches or level switches for safety gates, robust design
Approval	TÜV, UL, C-UL
Contacts	2 normally open
Special characteristics	Choosable cross-circuit protection
LED	Power, channel 1 and channel 2 indicating the state of the relay
Ambient temperature	-25°C to +55°C
Switching capacity	1380 W (resistive load)
Contact fuse	6 A fast or 4 A slow
Operating voltages	24 V AC/DC (no galvanic isolation/with fuse), 24 V DC (no galvanic isolation/electronic fuse), 24, 48, 110-127, 230 V AC (galvanic isolation/transformer)
Power consumption	Approx. 3 VA
Fallback time	100 ms
Contact ratings (max.)	6 A, 240 V AC, 24 V DC
Contact rating (min.)	50 mA

The robust emergency stop and safety gate monitoring relay is available in many voltage variants.

EN ISO 13849-1: PLd/e, Cat. 3 / 4 (depending on wiring) | MTTFd: 74.15 years / high
 DC: Cat. 3: 90 % / medium, Cat. 4: 99 % / high | CCF: achieved

Operating voltages	24 V AC/DC	48 V AC	110 -127 V AC	230 VAC
Art. no.	45244	45035	45245	45246

NEW



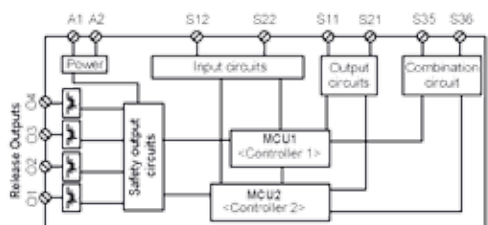
SAFE G1

Application	Multi-functional safety relay with choosable properties
Approval	SIL3, SIL _{CL} 3, PLe, Cat. 4, EN ISO 13849, EN 62061, EN 61508, MTTfD=2403 years; PFH=1.89 E-09 1/h;
Outputs	4 OSSDs (safety semiconductor outputs), short-circuit proof • 3 normally open direct, 1 normally closed direct • Emergency stop and safety gate monitoring relay - 2 channels, 4-wire 2 channels, 3-wire 1 channel, 2-wire • Safety relay for ESPE - Type 4 - Type 2 • Safety relay for safety mats and safety edges
Functions, optional	Optionally with automatic or manual start (monitored)
Start behaviour	Visual status indication via LED, fault indication by flashing LED
LED	Monitoring of external contactors
Special characteristics	0°C to +55°C
Ambient temperature	4x 400 mA, 24 V DC
Switching capacity	24 V DC ± 20 %
Operating voltages	Approx. 3 W (idle)
Power consumption	20 ms
Fallback time	250 ms - only ESPE type 2
(Direct contacts)	18 x 90 x 58 mm
Housing (W x H x D)	

The SAFE G1 is an inexpensive variant with a fixed output configuration of 3 normally opened/1 normally closed function.

Art. no.	45337
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NEW



SAFE G2

Application	Multi-functional safety relay with choosable properties
Approval	SIL3, SIL _{CL} 3, PLe, Cat. 4, EN ISO 13849, EN 62061, EN 61508, MTTfD=2403 years; PFH=1.89 E-09 1/h;
Outputs	4 OSSDs (safety semiconductor outputs), short-circuit proof • 4 normally open direct • Emergency stop and safety gate monitoring relay - 2 channels, 4-wire 2 channels, 3-wire 1 channel, 2-wire • Safety relay for ESPE - Type 4 - Type 2 • Safety relay for safety mats and safety edges
Functions, optional	Optionally with automatic or manual start (monitored)
Start behaviour	Visual status indication via LED, fault indication by flashing LED
LED	Monitoring of external contactors
Special characteristics	0°C to +55°C
Ambient temperature	4x 400 mA, 24 V DC
Switching capacity	24 V DC ± 20 %
Operating voltages	Approx. 3 W (idle)
Power consumption	20 ms
Fallback time	250 ms - only ESPE type 2
(Direct contacts)	18 x 90 x 58 mm
Housing (W x H x D)	

The SAFE G2 is an inexpensive variant with a fixed output configuration of 4 normally opened function.

Art. no.	45338
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1 | Emergency stop / safety gate monitoring relays

NEW



SAFE GT

Application

Approval

Outputs

Functions, optional

Start behaviour

LED

Special characteristics

Ambient temperature

Switching capacity

Operating voltages

Power consumption

Fallback time

(Direct contacts)

Housing (W x H x D)

Multi-functional safety relay with optional properties, optional output configuration and adjustable switch-off delay time

SIL3, SIL_{PL}3, PL_e, Cat. 4, EN ISO 13849, EN 62061, EN 61508, MTTFd=2403 years; PFH=1.89 E-09 1/h;

4 OSSDs (safety semiconductor outputs), short-circuit proof, choosable

- 3 normally open direct, 1 normally closed direct
- 4 normally open direct
- 2 normally open direct, 2 normally open delayed, adj. 0.1 s to 30 s

- Emergency stop and safety gate monitoring relay
 - 2 channels, 4-wire | 2 channels, 3-wire | 1 channel, 2-wire
- Safety relay for ESPE
 - Type 4
 - Type 2
- Safety relay for safety mats and safety edges

Optionally with automatic or manual start (monitored)

Visual status indication via LED, fault indication by flashing LED

Monitoring of external contactors

0°C to +55°C

4x 400 mA, 24 V DC

24 V DC ± 20 %

Approx. 3 W (idle)

20 ms

250 ms - only ESPE type 2

18 x 90 x 58 mm

The SAFE GT is the variant with a hex switch, which can be used to set numerous options for the output configuration. Various delay times from 0.1 - 30 s can be set.

Art. no.	45336
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NEW



SAFE GL

Application

Approval

Outputs

Functions, optional

Start behaviour

LED

Special characteristics

Ambient temperature

Switching capacity

Operating voltages

Power consumption

Fallback time

(Direct contacts)

Housing (W x H x D)

Multi-functional safety relay with optional properties for lift applications according to EN81

SIL3, SIL_{PL}3, PL_e, Cat. 4, EN81-20, EN81-50, EN ISO 13849, EN 61508, EN 62061, MTTFd=1268 years; PFH=3.58 E-09 1/h;

4 OSSDs (safety semiconductor outputs), short-circuit proof

- 3 normally open direct, 1 normally closed direct
- Emergency stop and safety gate monitoring relay
 - 2 channels, 4-wire | 2 channels, 3-wire | 1 channel, 2-wire
- Safety relay for ESPE
 - Type 4
 - Type 2
- Safety relay for safety mats and safety edges

Optionally with automatic or manual start (monitored)

Visual status indication via LED, fault indication by flashing LED

Monitoring of external contactors

0°C to +65°C

4x 400 mA, 24 V DC

24 V DC ± 20 %

Approx. 3 W (idle)

20 ms

250 ms - only ESPE type 2

18 x 90 x 58 mm

The SAFE GL is the variant with lift approval according to EN81.

Art. no.	45335
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2 | Emergency stop / safety gate monitoring relays with time-delay



SAFET...

Application	Safety relay with direct and delayed outputs
Approval	TÜV, UL, C-UL
Contacts	2 normally open direct, 2 normally open switch-off delayed, 1 normally closed direct
Special characteristics	Cross-circuit protection or single-channel Time delay 0.05 s – 600 s in 64 steps Automatic or manually start with start button
LED	Power, channel 1 and 2, channel 1 and 2 delayed indicating the state of the relay
Ambient temperature	-25°C to +55°C
Switching capacity	1500 W (resistive load)
Contact fuse	3.6 A
Operating voltages	24 V AC/DC (DC: +25 -20 %, AC: +10 -20 %) (electronic fuse)
Power consumption	Approx. 4.8 W
Switch-on / Fallback time	<400 ms / <30 ms
Contact ratings (max.)	6 A, 250 V AC, 24 V DC
Contact rating (min.)	3 mA

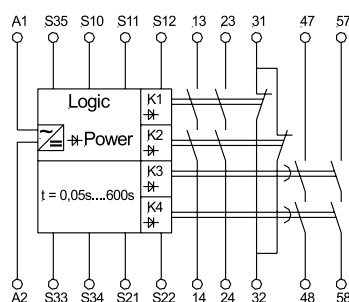
Emergency stop and safety gate monitoring relay with switch-off delay function that can be configured over a wide range. The recovery time after the delay is <0.95 s.

SAFE TN: After pressing the releasing trigger element (e.g. emergency-button) the simultaneity starts. The duration is 1 seconds. Within this time both channels have to be activated if two channel application is used. From activation of both channels till the end of time delay the releasing element must not be activated again (e.g. deactivation of the emergency-button). So a failure of the button or contact is detected immediately. **SAFE TA:** During the complete time lapse the releasing element can be activated (e.g. releasing of the emergency-button). The duration of simultaneity is 3 seconds. Restart takes place only after timing.

SAFE TR: The relay is retriggerable (e.g. new start after deactivation of the emergency-button) during the complete time lapses. The duration of simultaneity is 3 seconds. **SAFE TU:** The releasing element can be activated during the complete time lapses (e.g. deactivation of the emergency-button). There is no simultaneity (endless simultaneity). Restart possible only after timing.

EN IS 3849: PLe, Cat. 4 | MTTFd: >100 years | DC: 99 %

Supplementary information as per EN 61508: PFH: 3.4*10⁻⁹ 1/h, PFD: 9.32*10⁻⁶ 1/h | SFF: 94 %



SAFET ON

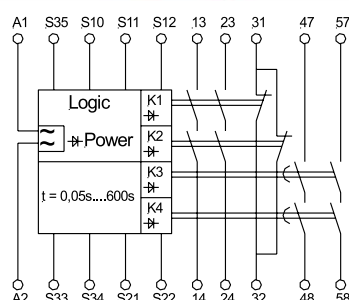
Application	For safety gates with magnetic interlock
Approval	TÜV, UL, C-UL
Contacts	2 normally open, 2 normally open switch-on delayed, 1 normally closed
Special characteristics	Cross-circuit protection or single-channel Time delay 0.05 s – 600 s in 64 steps Automatic or manually start with start button
LED	Power, channel 1 and 2, channel 1 and 2 delayed indicating the state of the relay
Ambient temperature	-25°C to +55°C
Switching capacity	1500 W (resistive load)
Contact fuse	3.6 A
Operating voltages	24 V AC/DC (DC: +25 -20 %, AC: +10 -20 %) (electronic fuse)
Power consumption	Approx. 4.8 W
Switch-on / Fallback time	400 ms / 30 ms
Contact ratings (max.)	6 A, 250 V AC, 24 V DC
Contact rating (min.)	3 mA

The device is designed for controlling safety gates with magnetic interlocks.

Safety gate monitoring relay with switch-on delay function that can be configured over a wide range.

EN ISO 13849: PLe, Cat. 4 | MTTFd: >100 years | DC: 99 %

Supplementary information as per EN 61508: PFH: 3.4*10⁻⁹ 1/h, PFD: 9.32*10⁻⁶ 1/h | SFF: 94 %



Art. no.	45215
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2 | Emergency stop / safety gate monitoring relays with time-delay

NEW



SAFE GT

Application

Multi-functional safety relay with optional properties, optional output configuration and adjustable switch-off delay time

Approval

SIL3, SIL_{CL}3, PLe, Cat. 4, EN ISO 13849, EN 62061, EN 61508, MTTFd=2403 years; PFH=1.89 E-09 1/h;

Outputs

4 OSSDs (safety semiconductor outputs), short-circuit proof, choosable

- 3 normally open direct, 1 normally closed direct
- 4 normally open direct
- 2 normally open direct, 2 normally open delayed, adj. 0.1 s to 30 s

Functions, optional

- Emergency stop and safety gate monitoring relay
 - 2 channels, 4-wire | 2 channels, 3-wire | 1 channel, 2-wire
- Safety relay for ESPE
 - Type 4
 - Type 2
- Safety relay for safety mats and safety edges

Start behaviour

Optionally with automatic or manual start (monitored)

LED

Visual status indication via LED, fault indicating by flashing LED

Special characteristics

Monitoring of external contactors

Ambient temperature

0°C to +55°C

Switching capacity

4x 400 mA, 24 V DC

Operating voltages

24 V DC ±20 %

Power consumption

Approx. 3 W (idle)

Fallback time

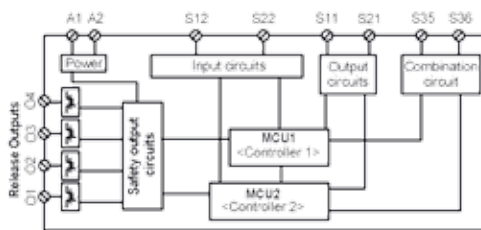
20 ms

(Direct contacts)

250 ms - only ESPE type 2

Housing (W x H x D)

18 x 90 x 58 mm



The SAFE GT is the variant with a hex switch, which can be used to set numerous options for the output configuration. Various delay times from 0.1 - 30 s can be set.

Art. no.

45336

SAFE FLEXT (outlook)

Application

Safety relay with choosable multi-functions and adjustable time delay

Approval

TÜV (UL, C-UL requested)

Contacts

4 normally open (1x basic isolation), 2 normally open delayed, 1 normally closed (basic isolation), 1 auxiliary output (PNP) delayed

Special characteristics

Autostart possible

LED

POWER, channel 1 and 2, channel 1 and 2 delayed, fault; indicating the state of the relay

Ambient temperature

-25°C to +55°C

Switching capacity

-

Contact fuse

6.3 A fast or 4 A slow

Operating voltages

24 V DC (+20 - 25 %) overvoltage protection

Power consumption

-

Pick-up/reverse delay

-

Contact rating (max.)

-

Contact rating (min.)

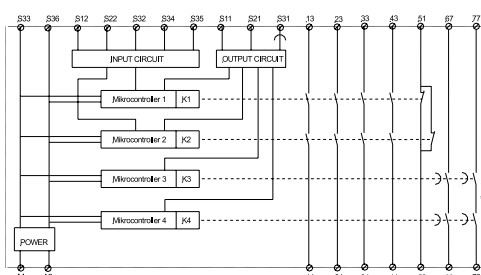
5 mA

The relay works the same than the SAFE FLEX, but with an additional switch-off delay.

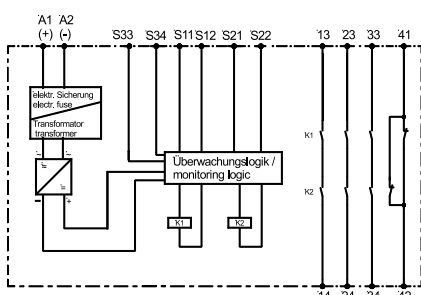
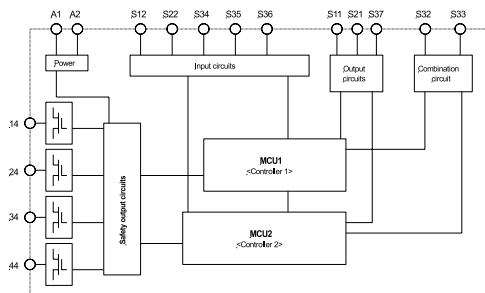
EN ISO 13849-1 / DIN EN 61508 / DIN EN 62061: parameters in preparation

Art. no.

4638X



3 | Safety relays for safety mats and safety edges



SAFE CM

Application	Safety relay for safety mats and safety edges with max. 500 Ohms or a terminating resistor of 8.2 kOhms, with wear-free safety semiconductor outputs and logical AND link
Approval	TÜV, UL, C-UL
Contacts	4 safety semiconductor outputs (OSSD)
Special characteristics	Wear-free safety semiconductor outputs, "AND" linkage between multiple devices from the SAFE C family possible, automatic start possible
LED	Power, channel 1 and channel 2 + flashing codes for diagnostics
Ambient temperature	-25°C to +55°C
Switching capacity	Up to 43 W
Contact fuse	Short-circuit proof
Operating voltages	24 V DC (+ 25 - 20 %) overvoltage protection
Power consumption	Approx. 3 W
Switch-on / Fallback time	<= 140 ms (single channel <= 360 ms) / <= 30 ms
Contact rating (max.)	Total current up to 1.8 A (individual or in total)
Contact rating (min.)	Unlimited

The SAFE CM for safety mats and safety edges or similar comes with 4 wear-free semiconductor outputs (OSSD). As a result, the device is suitable for applications with high frequent actuations. Short-circuit mats with a terminating resistor of 8.2 kΩ (2-wire technology) and 4-wire technology are supported. Control relay functions can be realized with the additional AND linkage; choosable with manual or automatic start.

EN ISO 13849: PLe, Cat. 4 | MTTFd: 163 years / high | DC: 99 %

Supplementary information as per EN 61508: SIL3 | PFH: $2.87 \cdot 10^{-9}$ 1/h | PFD: $2.01 \cdot 10^{-6}$ 1/h | SFF: 95.73 %

Art. no.

45071

SAFE M / SAFE M.1

Application	Safety relay for safety mats and safety edges with a max. mat resistance of 200 Ohms, 4-wire technology
Approval	TÜV, UL, C-UL
Contacts	3 normally open, 1 normally closed
Special characteristics	Cross-circuit protection up to safety category 3 With (SAFE M) or without (SAFE M.1) autostart
LED	Power, channel 1 and channel 2 indicating the state of the relay
Ambient temperature	-25°C to +55°C
Switching capacity	1200 W (resistive load)
Contact fuse	NO: 6.3 A fast, NC: 4 A
Operating voltages	24 V AC/DC (electronic fuse) SAFE M: 115 V AC (galvanic isolation / transformer)
Power consumption	24, 115 V AC: approx. 5 VA, 24 V DC: 3 W
Fallback time	DC: <30 ms / AC: <50 ms
Contact ratings (max.)	5 A, 240 V AC, 24 V DC
Contact rating (min.)	10 mA

In addition to DC supply, the safety relay for 4-wire technology with wire break protection for short-circuit mats is available for DC and AC supply.

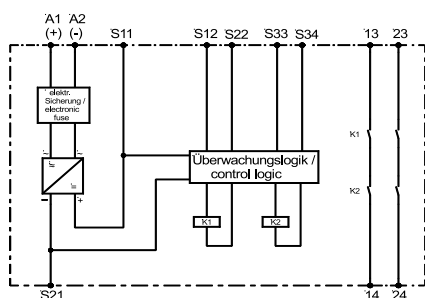
EN ISO 13849-1: PLe, Cat. 3 | MTTFd: 73.21 years / high | DC: 90 % / medium | CCF: achieved

Supplementary information as per EN 61508: PFH: $5.81 \cdot 10^{-9}$ 1/h | SSF: 99 %

	SAFE M		SAFE M.1
Operating voltages	24 V AC/DC	115 V AC	24 V AC/DC
Art. no.	46365	46366	46367
	45029	45240	45034

3 | Safety relays for safety mats and safety edges

NEW DESIGN



SAFE 2.2

Application

Safety relay for safety mats and safety edges for mats with short-circuit principle (4-wire technology)

Approval

TÜV, UL, C-UL

Contacts

2 normally open

Special characteristics

Up to safety category 4, for 4-wire technology with wire break protection and without monitoring of the START button

LED

Power, channel 1 and channel 2 indicating the state of the relay

Ambient temperature

-25°C to +55°C

Switching capacity

1500 W (resistive load)

Contact fuse

6.3 A fast or 4 A slow

Operating voltages

24 V AC/DC (electronic fuse)

Power consumption

Approx. 2.5 VA / 2.5 W

Fallback time

<30 ms

Contact ratings (max.)

6 A, 250 V AC, 24 V DC

Contact rating (min.)

10 mA

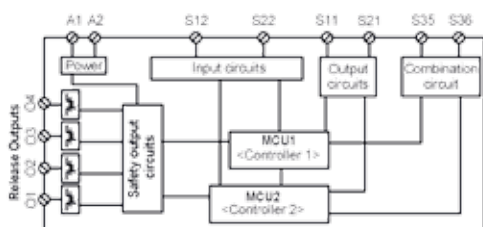
Short-circuit mats the 4-wire principle are supported.

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

Art. no.

46387

NEW



SAFE G1

Application

Multi-functional safety relay with choosable properties

Approval

SIL3, SIL_{CL}3, PL_e, Cat. 4,
EN ISO 13849, EN 62061, EN 61508,
MTTFd=2403 years; PFH=1.89 E-09 1/h;

Outputs

- 4 OSSDs (safety semiconductor outputs), short-circuit proof
 - 3 normally open direct, 1 normally closed direct
- Emergency stop and safety gate monitoring relay
 - 2 channels, 4-wire | 2 channels, 3-wire | 1 channel, 2-wire
- Safety relay for ESPE
 - Type 4
 - Type 2
- Safety relay for safety mats and safety edges

Functions, optional

Start behaviour

Optionally with automatic or manual start (monitored)

LED

Visual status indication via LED, fault indication by flashing LED

Special characteristics

Monitoring of external contactors

Ambient temperature

0°C to +55°C

Switching capacity

4x 400 mA, 24 V DC

Operating voltages

24 V DC ± 20 %

Power consumption

Approx. 3 W (idle)

Fallback time

20 ms

(Direct contacts)

250 ms - only ESPE type 2

Housing (W x H x D)

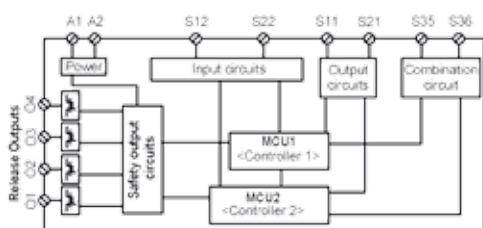
18 x 90 x 58 mm

The SAFE G1 is an inexpensive variant with a fixed output configuration of 3 normally opened / 1 normally closed function.

Art. no.

45337

NEW



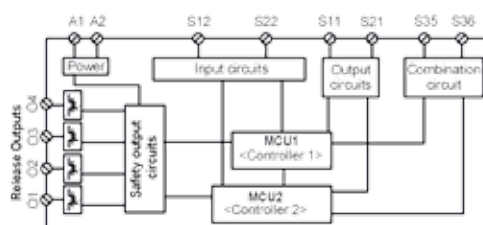
SAFE G2

Application	Multi-functional safety relay with choosable properties
Approval	SIL3, SIL _{CL} 3, PLe, Cat. 4, EN ISO 13849, EN 62061, EN 61508, MTTFD=2403 years; PFH=1.89 E-09 1/h;
Outputs	4 OSSDs (safety semiconductor outputs), short-circuit proof <ul style="list-style-type: none"> • 4 normally open direct • Emergency stop and safety gate monitoring relay <ul style="list-style-type: none"> - 2 channels, 4-wire 2 channels, 3-wire 1 channel, 2-wire • Safety relay for ESPE <ul style="list-style-type: none"> - Type 4 - Type 2 • Safety relay for safety mats and safety edges
Functions, optional	Optionally with automatic or manual start (monitored)
Start behaviour	Visual status indication via LED, fault indication by flashing LED
LED	Monitoring of external contactors
Special characteristics	0°C to +55°C
Ambient temperature	4x 400 mA, 24 V DC
Switching capacity	24 V DC ± 20 %
Operating voltages	Approx. 3 W (idle)
Power consumption	20 ms
Fallback time	250 ms - only ESPE type 2
(Direct contacts)	18x90x58 mm
Housing (W x H x D)	

The SAFE G2 is an inexpensive variant with a fixed output configuration of 4 normally opened function.

Art. no.	45338
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NEW



SAFE GT

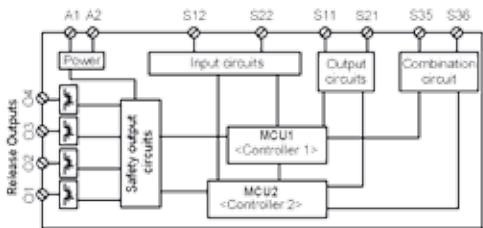
Application	Multi-functional safety relay with optional properties, optional output configuration and adjustable switch-off delay time
Approval	SIL3, SIL _{CL} 3, PLe, Cat. 4, EN ISO 13849, EN 62061, EN 61508, MTTFD=2403 years; PFH=1.89 E-09 1/h;
Outputs	4 OSSDs (safety semiconductor outputs), short-circuit proof, choosable <ul style="list-style-type: none"> • 3 normally open direct, 1 normally closed direct • 4 normally open direct • 2 normally open direct, 2 normally open delayed, adj. 0.1 s to 30 s • Emergency stop and safety gate monitoring relay <ul style="list-style-type: none"> - 2 channels, 4-wire 2 channels, 3-wire 1 channel, 2-wire • Safety relay for ESPE <ul style="list-style-type: none"> - Type 4 - Type 2 • Safety relay for safety mats and safety edges
Functions, optional	Optionally with automatic or manual start (monitored)
Start behaviour	Visual status indication via LED, fault indication by flashing LED
LED	Monitoring of external contactors
Special characteristics	0°C to +55°C
Ambient temperature	4x 400 mA, 24 V DC
Switching capacity	24 V DC ± 20 %
Operating voltages	Approx. 3 W (idle)
Power consumption	20 ms
Fallback time	250 ms - only ESPE type 2
(Direct contacts)	18x90x58 mm
Housing (W x H x D)	

The SAFE GT is the variant with a hex switch, which can be used to set numerous options for the output configuration. Various delay times from 0.1 - 30 s can be set.

Art. no.	45336
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3 | Safety relays for safety mats and safety edges

NEW

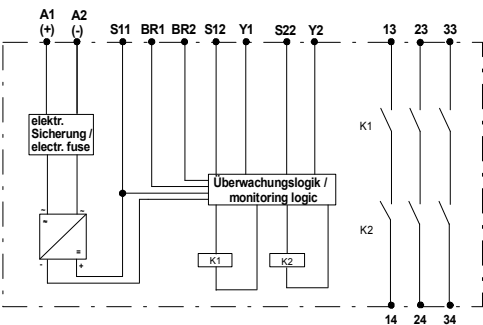


SAFE GL

Application	Multi-functional safety relay with optional properties for lift applications according to EN81
Approval	SIL3, SIL _{cat} 3, PLe, Cat. 4, EN81-20, EN81-50, EN ISO 13849, EN 61508, EN 62061, MTTFd=1268 years; PFH=3.58 E-09 1/h;
Outputs	4 OSSDs (safety semiconductor outputs), short-circuit proof <ul style="list-style-type: none">• 3 normally open direct, 1 normally closed direct
Functions, optional	<ul style="list-style-type: none">• Emergency stop and safety gate monitoring relay<ul style="list-style-type: none">- 2 channels, 4-wire 2 channels, 3-wire 1 channel, 2-wire• Safety relay for ESPE<ul style="list-style-type: none">- Type 4- Type 2• Safety relay for safety mats and safety edges
Start behaviour	Optionally with automatic or manual start (monitored)
LED	Visual status indication via LED, fault indication by flashing LED
Special characteristics	Monitoring of external contactors
Ambient temperature	0°C to +65°C
Switching capacity	4x 400 mA, 24 V DC
Operating voltages	24 V DC ±20 %
Power consumption	Approx. 3 W (idle)
Fallback time (Direct contacts)	20 ms 250 ms - only ESPE type 2
Housing (W x H x D)	18 x 90 x 58 mm

The SAFE GL is the variant with lift approval according to EN81.

Art. no.	45335
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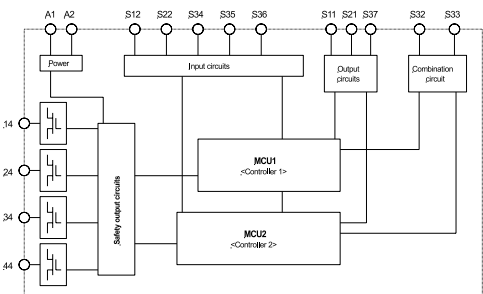


SAFE L.2

Application	Safety relay for safety light barriers, safety light curtains or similar (type 4 only)
Approval	TÜV, UL, C-UL
Contacts	3 normally open
Special characteristics	No cross-circuit protection Monitoring of the START button choosable by external bridge
LED	Power, channel 1, channel 2 and restart interlock (protection); indicating the state of the relay
Ambient temperature	-25°C to +55°C
Switching capacity	1500 W (resistive load)
Contact fuse	6.3 A fast or 4 A slow
Operating voltages	24 V DC (electronic fuse)
Power consumption	Approx. 2.5 W
Fallback time	<30 ms
Contact ratings (max.)	6 A, 250 V AC, 24 V DC
Contact rating (min.)	10 mA

Safety relay for safety light barriers/curtains with/without monitored start (manual or automatic start behaviour).
EN ISO 13849-1: PL_e, Cat. 4 | MTTf_d: 36 years/high | DC: 99 %/high | CCF: achieved

Art. no.	45058
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SAFE CL

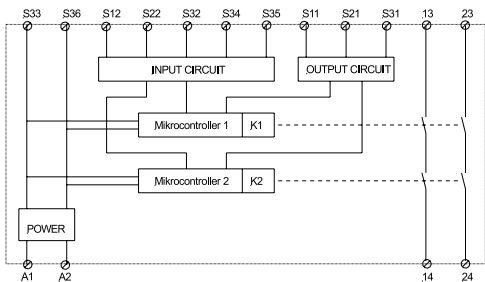
Application	Safety relay for ESPE type 2 and type 4, with wear-free safety semiconductor outputs and logical links
Approval	TÜV, UL, C-UL
Contacts	4 safety semiconductor outputs (OSSD)
Special characteristics	Wear-free safety semiconductor outputs, "AND" linkage between all devices from the SAFE C family possible, automatic start possible
LED	Power, channel 1 and channel 2 + flashing codes for diagnostics
Ambient temperature	-25°C to +55°C
Switching capacity	Up to 43 W
Contact fuse	Short-circuit proof
Operating voltages	24 V DC (+ 25 - 20 %) overvoltage protection
Power consumption	Approx. 3 W
Fallback time / Recovery time	<30 ms / 0,5 s
Contact rating (max.)	Total current up to 1.8 A
Contact rating (min.)	Unlimited

Safety relays for ESPE type 2 and type 4. The device features 4 wear-free semiconductor outputs. As a result, the device is suitable for applications with high frequent actuations. Control relay functions can be realized with the additional AND linkage; choosable with manual or automatic start.

EN ISO 13849: PL_e, Cat. 4 | MTTf_d: 163 years/high | DC: 99 %
Supplementary information as per EN 61508: SIL3 | PFH: 2.87*10⁻⁹ 1/h | PFD: 2.01*10⁻⁶ 1/h | SFF: 95.73 %

Art. no.	45328
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4 | Safety relays for ESPEs



SAFE FLEX

Application	Safety relay with choosable function variants
Approval	TÜV, UL, C-UL
Contacts	2 normally open, 1 auxiliary output (PNP)
Special characteristics	Choosable monitored and non-monitored start
LED	Power, channel 1 IN / OUT, channel 2 IN / OUT, fault indicating the state of the relay
Ambient temperature	-25°C to +55°C
Switching capacity	1500 VA
Contact fuse	6.3 A fast or 4 A slow
Operating voltages	24 V DC (+ 20 – 25 %) overvoltage protection
Power consumption	<3 W
Fallback time	<=30 ms depending on the choosen functionality
Contact ratings (max.)	6 A, 250 V AC, 250 V DC
Contact rating (min.)	5 mA

By wiring one of the following functionalities is choosable:

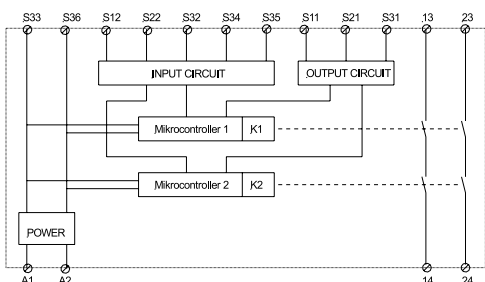
- Emergency stop Cat. 4
- Safety gate monitoring Cat. 4
- Two hand control type IIc Cat. 4
- ESPE safety (light barriers and curtains) type 4 and type 2
- Single channel safety devices with cyclic testing Cat. 4

Wiring changes during operation are not allowed and lead to a failure.

EN ISO 13849: PLe, Cat. 4 | MTTFd: >100 years / high | DC: 99 % / high
Supplementary information as per EN 61508: SIL3 | PFH: 2.15*10⁻⁹ 1/h | SSF: 94.65 %

Art. no.	45332
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NEW



SAFE FLEX L

Application	Safety relay for actuating e.g. proximity switches/distance sensors (ultrasonic, capacitive, inductive, tof)
Approval	TÜV, (UL, C-UL requested)
Contacts	2 normally open, 1 auxiliary output
Special characteristics	Non-monitored start
LED	Power, channel 1 IN / OUT, channel 2 IN / OUT, fault indicating the state of the relay
Ambient temperature	-25°C to +55°C
Switching capacity	1500 VA
Contact fuse	6.3 A fast or 4 A slow
Operating voltages	24 V DC (+ 20 - 25 %) overvoltage protection
Power consumption	<3 W
Fallback time	Typical: <20 ms / during testing: <220 ms
Contact ratings (max.)	6 A, 250 V AC, 250 V DC
Contact rating (min.)	5 mA

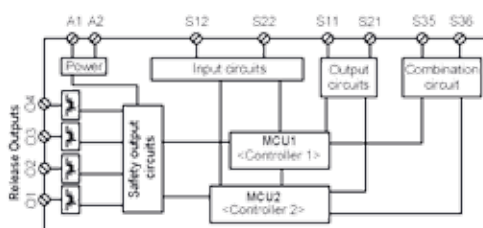
Safety relay for testable electro-sensitive protective equipment (ESPE; type 2).
Cascading is possible (reaction time of the entire cascade: 200 µs - 50 ms)

Up to two external ESPEs can be supplied (max. power consumption of the ESPEs: 50 mA)

EN ISO 13849: PLe, Cat. 4 | MTTFd: >100 years / high | DC: 99 % / high
Supplementary information as per EN 61508: SIL3 | PFH: 2.15*10⁻⁹ 1/h | SSF: 94.65 %

Art. no.	45364
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NEW



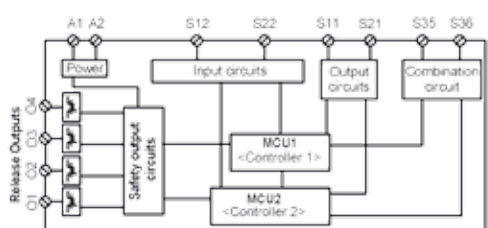
SAFE G1

Application	Multi-functional safety relay with choosable properties
Approval	SIL3, SIL _{CL} 3, PLe, Cat. 4, EN ISO 13849, EN 62061, EN 61508, MTTFd=2403 years; PFH=1.89 E-09 1/h;
Outputs	4 OSSDs (safety semiconductor outputs), short-circuit proof • 3 normally open direct, 1 normally closed direct • Emergency stop and safety gate monitoring relay - 2 channels, 4-wire 2 channels, 3-wire 1 channel, 2-wire • Safety relay for ESPE - Type 4 - Type 2 • Safety relay for safety mats and safety edges
Functions, optional	Optionally with automatic or manual start (monitored)
Start behaviour	Visual status indication via LED, fault indication by flashing LED
LED	Monitoring of external contactors
Special characteristics	0°C to +55°C
Ambient temperature	4x 400 mA, 24 V DC
Switching capacity	24 V DC ± 20 %
Operating voltages	Approx. 3 W (idle)
Power consumption	20 ms
Fallback time	250 ms - only ESPE type 2
(Direct contacts)	18x90x58 mm
Housing (W x H x D)	

The SAFE G1 is an inexpensive variant with a fixed output configuration of 3 normally opened/1 normally closed function.

Art. no.	45337
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NEW



SAFE G2

Application	Multi-functional safety relay with choosable properties
Approval	SIL3, SIL _{CL} 3, PLe, Cat. 4, EN ISO 13849, EN 62061, EN 61508, MTTFd=2403 years; PFH=1.89 E-09 1/h;
Outputs	4 OSSDs (safety semiconductor outputs), short-circuit proof • 4 normally open direct • Emergency stop and safety gate monitoring relay - 2 channels, 4-wire 2 channels, 3-wire 1 channel, 2-wire • Safety relay for ESPE - Type 4 - Type 2 • Safety relay for safety mats and safety edges
Functions, optional	Optionally with automatic or manual start (monitored)
Start behaviour	Visual status indication via LED, fault indication by flashing LED
LED	Monitoring of external contactors
Special characteristics	0°C to +55°C
Ambient temperature	4x 400 mA, 24 V DC
Switching capacity	24 V DC ± 20 %
Operating voltages	Approx. 3 W (idle)
Power consumption	20 ms
Fallback time	250 ms - only ESPE type 2
(Direct contacts)	18x90x58 mm
Housing (W x H x D)	

The SAFE G2 is an inexpensive variant with a fixed output configuration of 4 normally opened function.

Art. no.	45338
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4 | Safety relays for ESPEs

NEW



SAFE GT

Application

Approval

Outputs

Functions, optional

Start behaviour

LED

Special characteristics

Ambient temperature

Switching capacity

Operating voltages

Power consumption

Fallback time

(Direct contacts)

Housing (W x H x D)

Multi-functional safety relay with optional properties, optional output configuration and adjustable switch-off delay time

SIL3, SIL_{PL}3, PL_e, Cat. 4, EN ISO 13849, EN 62061, EN 61508, MTTFd=2403 years; PFH=1.89 E-09 1/h;

4 OSSDs (safety semiconductor outputs), short-circuit proof, choosable

- 3 normally open direct, 1 normally closed direct
- 4 normally open direct
- 2 normally open direct, 2 normally open delayed, adj. 0.1 s to 30 s

- Emergency stop and safety gate monitoring relay
 - 2 channels, 4-wire | 2 channels, 3-wire | 1 channel, 2-wire
- Safety relay for ESPE
 - Type 4
 - Type 2
- Safety relay for safety mats and safety edges

Optionally with automatic or manual start (monitored)

Visual status indication via LED, fault indication by flashing LED

Monitoring of external contactors

0°C to +55°C

4x 400 mA, 24 V DC

24 V DC ± 20 %

Approx. 3 W (idle)

20 ms

250 ms - only ESPE type 2

18x90x58 mm

The SAFE GT is the variant with a hex switch, which can be used to set numerous options for the output configuration. Various delay times from 0.1 - 30 s can be set.

Art. no.

45336

NEW



SAFE GL

Application

Approval

Outputs

Functions, optional

Start behaviour

LED

Special characteristics

Ambient temperature

Switching capacity

Operating voltages

Power consumption

Fallback time

(Direct contacts)

Housing (W x H x D)

Multi-functional safety relay with optional properties for lift applications according to EN81

SIL3, SIL_{PL}3, PL_e, Cat. 4, EN81-20, EN81-50, EN ISO 13849, EN 61508, EN 62061, MTTFd=1268 years; PFH=3.58 E-09 1/h;

4 OSSDs (safety semiconductor outputs), short-circuit proof

- 3 normally open direct, 1 normally closed direct
- Emergency stop and safety gate monitoring relay
 - 2 channels, 4-wire | 2 channels, 3-wire | 1 channel, 2-wire
- Safety relay for ESPE
 - Type 4
 - Type 2
- Safety relay for safety mats and safety edges

Optionally with automatic or manual start (monitored)

Visual status indication via LED, fault indication by flashing LED

Monitoring of external contactors

0°C to +65°C

4x 400 mA, 24 V DC

24 V DC ± 20 %

Approx. 3 W (idle)

20 ms

250 ms - only ESPE type 2

18x90x58 mm

The SAFE GL is the variant with lift approval according to EN81.

Art. no.

45335

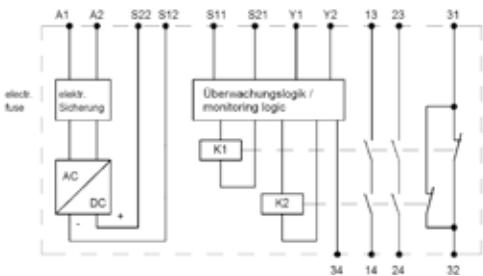
SAFE Z.2



Application	Two hand relay for type I to IIIc, many voltage variants (with AC supply)
Approval	TÜV, UL, C-UL
Contacts	2 normally open, 1 normally closed, 1 auxiliary output
Special characteristics	Two-hand control device acc. to ZH1 / 456 and DIN EN 574
LED	Power, channel 1 and channel 2 indicating the state of the relay
Ambient temperature	-25°C to +55°C
Switching capacity	1500 W (resistive load)
Contact fuse	6.3 A fast or 4 A slow
Operating voltages	24 V AC/DC (electronic fuse) 48, 115, 230 V AC (galvanic isolation/transformer)
Power consumption	Approx. 2 VA
Fallback time	<25 ms
Contact ratings (max.)	6 A, 250 V AC, 24 V DC
Contact rating (min.)	10 mA

The safety relay for two-hand circuits from type I to III c is available in many voltage variants.

EN ISO 13849-1: PLe, Cat. 4 | MTTFd: 36.45 years /high, DC: 99 % /high | CCF: achieved



Operating voltages	24 V AC/DC	48 V AC	110-127 V AC	230 V AC
Art. no.	45062	45305	45307	45068

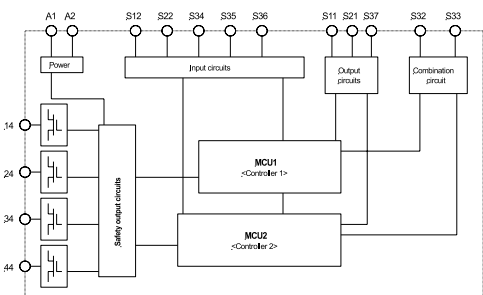
SAFE CZ



Application	Two hand relay for type II or IIIc, with wear-free safety semiconductor outputs and logical links
Approval	TÜV, UL, C-UL
Contacts	4 safety semiconductor outputs (OSSD)
Special characteristics	Wear-free safety semiconductor outputs, "AND" linkage between multiple devices from the SAFE C family possible, automatic start possible
LED	Power, channel 1 and channel 2+ flashing codes for diagnostics
Ambient temperature	-25°C to +55°C
Switching capacity	Up to 43 W
Contact fuse	Short-circuit proof
Operating voltages	24 V DC (+ 25 - 20 %) overvoltage protection
Power consumption	Approx. 3 W
Fallback time / Recovery time	<= 30 ms / <0,5 s
Contact rating (max.)	Total current up to 1.8 A (individual or in total)
Contact rating (min.)	Unlimited

Safety relay for two-hand applications for type II or III c with wear-free semiconductor outputs (OSSD). As a result, the device is suitable for applications with frequent actuations. Control relay functions can be assumed with the additional AND linkage; choosable manual or automatic start.

EN ISO 13849: PLe, Cat. 4 | MTTFd: 163 years /high | DC: 99 %
Supplementary information as per EN 61508: SIL3 | PFH: 2.87*10⁻⁹ 1/h | PFD: 2.01*10⁻⁶ 1/h | SFF: 95.73%



Art. no.	45072
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SAFE FLEX

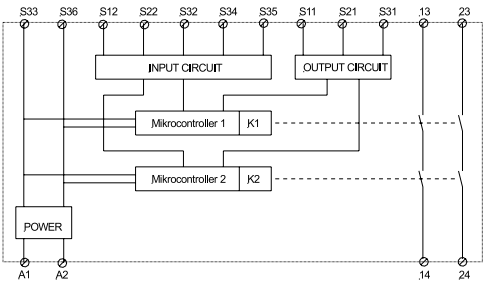
Application	Safety relay with choosable function variants
Approval	TÜV, UL, C-UL
Contacts	2 normally open, 1 auxiliary output (PNP)
Special characteristics	Choosable monitored and non-monitored start
LED	Power, channel 1 IN / OUT, channel 2 IN / OUT, fault indicating the state of the relay
Ambient temperature	-25°C to +55°C
Switching capacity	1500 VA
Contact fuse	6.3 A fast or 4 A slow
Operating voltages	24 V DC (+ 20 – 25 %) overvoltage protection
Power consumption	<3 W
Fallback time	<=30 ms depending on the choosen functionality
Contact ratings (max.)	6 A, 250 V AC, 250 V DC
Contact rating (min.)	5 mA

By wiring one of the following functionalities is choosable:

- Emergency stop Cat. 4
- Safety gate monitoring Cat. 4
- Two hand control type IIc Cat. 4
- ESPE safety (light barriers and curtains) type 4 and type 2
- Single channel safety devices with cyclic testing Cat. 4

Wiring changes during operation are not allowed and lead to a failure.

EN ISO 13849: PLe, Cat. 4 | MTTFd: >100 years / high | DC: 99 % / high
Supplementary information as per EN 61508: SIL3 | PFH: 2.15*10⁻⁹ 1/h | SSF: 94.65 %



Art. no.	45332
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6 | Expansion modules

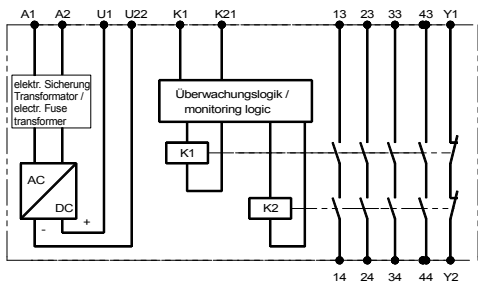


SAFE X4 / SAFE X4.1

Application	Safety expansion module
Approval	TÜV, UL, C-UL
Contacts	4 normally open, 1 normally closed (feedback)
Special characteristics	With (SAFE X4) and without (SAFE X4.1) cross-circuit protection Easy way to increase the number of available contacts
LED	Channel 1, channel 2 and fault indicating the state of the relay
Ambient temperature	-25°C to +55°C
Switching capacity	1500 W (resistive load)
Contact fuse	10 A fast
Operating voltages	48, 115, 230 V AC (galvanic isolation/transformer), 24 V AC/DC (no galvanic isolation/with electr. fuse),
Power consumption	Approx. 4 VA
Fallback time	<15 ms
Contact ratings (max.)	6 A, 250 V AC, 24 V DC, total current <16 A
Contact rating (min.)	10 mA

Expansion module for all safety relays (including SAFE C and SAFE G types). For safe contact expansion, two contacts are required. Note that this increases the fallback time.

EN ISO 13849-1: PLe, Cat. 4 | MTTFd: 37 years/high | DC: 99 %/high | CCF: achieved



SAFE X4

Operating voltages	24 V AC/DC	48 V AC	110-127 V AC	230 V AC
Art. no.	45019	453195	45197	45201

SAFE X4.1

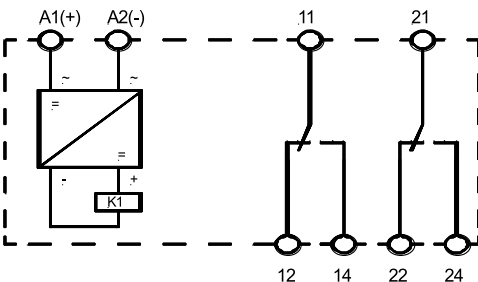
Operating voltages	24 V AC/DC	48 V AC	110-127 V AC	230 V AC
Art. no.	45021	45196	45200	45203

SAFE IRZ.2



Application	Industrial relay with two positively guided change-over
Special characteristics	Initiator connection
LED	Power
Ambient temperature	-25°C to +55°C
Switching capacity	1250 VA
Contact fuse	5 A fast
Operating voltages	24 V AC/DC
Power consumption	1 W, 1 VA
Fallback time	<25 ms
Contact ratings (max.)	5 A, 250 V AC, 24 V DC
Contact rating (min.)	100 mA

Industrial relay with two with two positive guided contacts.



Art. no.	45013
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7 | Emergency stop, safety gate, light barrier and two-hand applications

SAFE FLEX



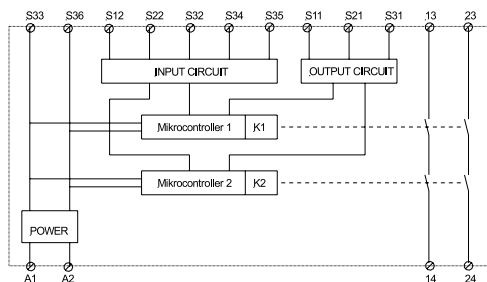
Application	Safety relay with choosable function variants
Approval	TÜV, UL, C-UL
Contacts	2 normally open, 1 auxiliary output (PNP)
Special characteristics	Choosable monitored and non-monitored start
LED	Power, channel 1 IN / OUT, channel 2 IN / OUT, fault indicating the state of the relay
Ambient temperature	-25°C to +55°C
Switching capacity	1500 VA
Contact fuse	6.3 A fast or 4 A slow
Operating voltages	24 V DC (+ 20 – 25 %) overvoltage protection
Power consumption	<3 W
Fallback time	<=30 ms depending on the choosen functionality
Contact ratings (max.)	6 A, 250 V AC, 250 V DC
Contact rating (min.)	5 mA

By wiring one of the following functionalities is choosable:

- Emergency stop Cat. 4
- Safety gate monitoring Cat. 4
- Two hand control type IIc Cat. 4
- ESPE safety (light barriers and curtains) type 4 and type 2
- Single channel safety devices with cyclic testing Cat. 4

Wiring changes during operation are not allowed and lead to a failure.

EN ISO 13849: PLe, Cat. 4 | MTTFd: >100 years / high | DC: 99 % / high
Supplementary information as per EN 61508: SIL3 | PFH: $2.15 \cdot 10^{-9}$ 1/h | SSF: 94.65 %



Art. no.

45332

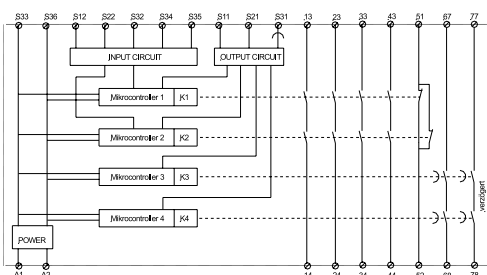
SAFE FLEXT (outlook)



Application	Safety relay with choosable multi functions and adjustable time delay
Approval	TÜV (UL, C-UL requested)
Contacts	4 normally open (1x basic isolation), 2 normally open delayed, 1 normally closed (basic isolation), 1 auxiliary output (PNP) delayed
Special characteristics	Autostart possible
LED	POWER, channel 1 and 2, channel 1 and 2 delayed, fault; indicating the state of the relay
Ambient temperature	-25°C to +55°C
Switching capacity	-
Contact fuse	6.3 A fast or 4 A slow
Operating voltages	24 V DC (+ 20 - 25 %) overvoltage protection
Power consumption	-
Pick-up/reverse delay	-
Contact rating (max.)	-
Contact rating (min.)	5 mA

The relay works the same than the SAFE FLEX, but with an additional switch-off delay.

EN ISO 13849-1 / DIN EN 61508 / DIN EN 62061: parameters in preparation



Art. no.

4638X



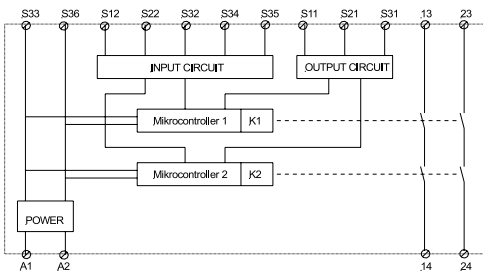
SAFE SM (outlook)

Application	For 2 non-safe sensors on any machine part
Approval	(TÜV, UL, C-UL requested)
Contacts	2 normally open, 1 PLC output (PNP)
LED	Power, channel 1 IN / OUT, channel 2 IN / OUT, fault indicating the state of the relay
Ambient temperature	-25°C to +55°C
Switching capacity	1500 VA
Contact fuse	6 A fast or 4 A flow
Operating voltages	24 V DC (+ 20 - 25 %) overvoltage protection
Power consumption	<3 W
Fallback delay	Frequency-dependent
Contact ratings (max.)	6 A, 250 V AC, 250 V DC
Contact rating (min.)	5 mA

The SAFE SM is a safe standstill monitor. It is designed to monitor safe speeds. Digitally switches e.g. inductive sensors or ESPEs are supported. SAFE SM is a two channel device. Therefore, two digitally switches (not safe!) are necessary. Four safe speeds are monitored: 0.2 Hz, 0.5 Hz, 1.0 Hz and 2.0 Hz, the shifting is done via configuration wirings.

The SAFE SM monitors the speed directly on any part of the machine, means not only the motor is monitored. Even breakages are also detected. Rotational and translational moves are monitored as well.

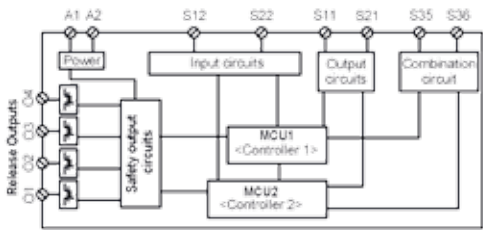
EN ISO 13849-1: PLe, Cat. 4 | parameters in preparation



Art. no.	45293
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9 | Multi-functional safety relay with optional properties for lift applications

NEW



SAFE GL

Application	Multi-functional safety relay with optional properties for lift applications according to EN81
Approval	SIL3, SIL _{cat} 3, PLe, Cat. 4, EN81-20, EN81-50, EN ISO 13849, EN 61508, EN 62061, MTTFd=1268 years; PFH=3.58 E-09 1/h;
Outputs	4 OSSDs (safety semiconductor outputs), short-circuit proof <ul style="list-style-type: none">• 3 normally open direct, 1 normally closed direct
Functions, optional	<ul style="list-style-type: none">• Emergency stop and safety gate monitoring relay<ul style="list-style-type: none">- 2 channels, 4-wire 2 channels, 3-wire 1 channel, 2-wire• Safety relay for ESPE<ul style="list-style-type: none">- Type 4- Type 2• Safety relay for safety mats and safety edges
Start behaviour	Optionally with automatic or manual start (monitored)
LED	Visual status indication via LED, fault indication by flashing LED
Special characteristics	Monitoring of external contactors
Ambient temperature	0°C to +65°C
Switching capacity	4x 400 mA, 24 V DC
Operating voltages	24 V DC ±20 %
Power consumption	Approx. 3 W (idle)
Fallback time (Direct contacts)	20 ms 250 ms - only ESPE type 2
Housing (W x H x D)	18 x 90 x 58 mm

The SAFE GL is the variant with lift approval according to EN81.

Art. no.	45335
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Competence across the entire EMS spectrum

In our development department, we engineer, design, conceptualise and plan the entire range of electronic manufacturing services (EMS).

From conceptualising and planning circuit boards, to prototypes and manufacturing high-quality end products. Our customers also benefit from our comprehensive expertise and experience in the optimisation of existing concepts and consultation for mechanical design.

In developing our products and series, we set great store by their quality, as well as by efficient cost and time management. Customised solutions are our specialty. After all, every project has its own requirements. We flexibly respond to your requests and develop just the right solution for you.

Our experienced experts and competent employees manage projects from various industries: automotive, mechanical engineering, medical technology, industry and sensor systems.

In addition, we can tailor testing equipment to individual customer requirements and requests. Together, we develop testing concepts and finished test adapters that enable inexpensive series testing for our customers.

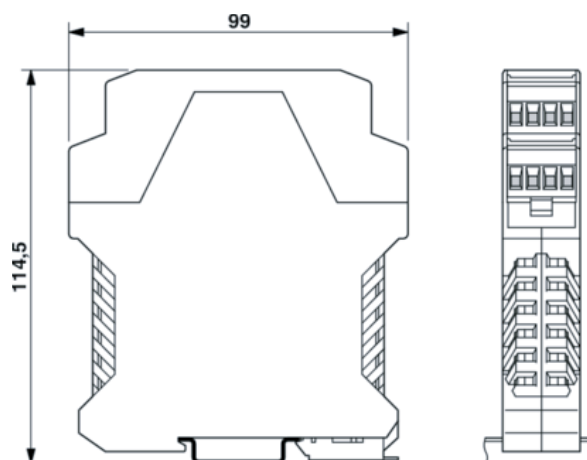
- Software and hardware development in line with the highest safety standards such as SIL3, PLe and EN81
- In-house prototype construction
- In-house test device construction
- Consultation for mechanical constructions (housing, encapsulating receptacle etc.)
- Approvals: TÜV / UL / C-UL



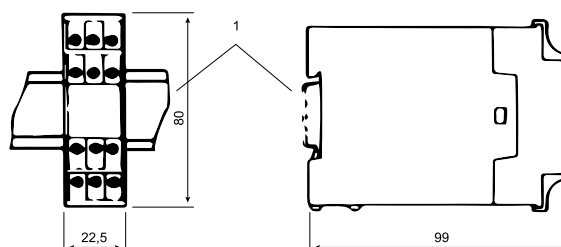
Housing dimensions

Name	B (mm)
SAFE 2.2	22.5
SAFE 4/4.1	22.5
SAFE 4 eco/4.1 eco	22.5
SAFE 4.2 eco/4.3 eco	22.5
SAFE 5/5.1	22.5
SAFE C1/CL/CM/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 L	22.5
SAFE FLEX T	45
SAFE SM	22.5
SAFE T/T ON	35

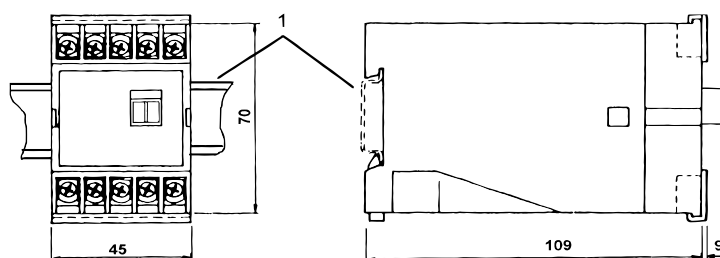
Figure



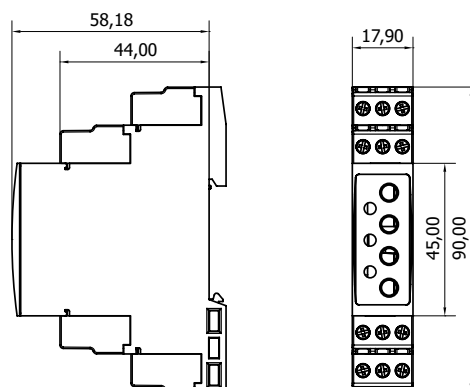
SAFE 1	22.5
SAFE 1.1	22.5
SAFE 2	22.5
SAFE 2.1	22.5
SAFE IRZ.2 (8 terminals)	22.5



SAFE S.6	45
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SAFE G1	17.9
SAFE G2	
SAFE GT	
SAFE GL	



Legend:

1 - hat rail according to DIN 46 277

Print date: 04_2019 | Devices listed in the brochure are subject to change. This brochure replaces all previous brochures.

As the text and images in this brochure only serve illustration purposes, we do not assume liability for any errors.

Product/order numbers – search directory

Name	Voltage	CM art. no.	
SAFE 4	24 V AC/DC	46353	45042
SAFE 4	110 V AC	46355	45045
SAFE 4	230 V AC	46357	45255
SAFE 4.1	24 V AC/DC	46354	45046
SAFE 4.1	110 V AC	46356	45052
SAFE 4.1	230 V AC	46358	45054
SAFE 4.1 eco	24 V AC/DC	45069	
SAFE 4.2 eco	24 V AC/DC	45317	
SAFE 4.2 eco	115 V AC	45318	
SAFE 4.2 eco	230 V AC	45319	
SAFE 4.3 eco	24 V AC/DC	45320	
SAFE 4.3 eco	115 V AC	45321	
SAFE 4.3 eco	230 V AC	45322	
SAFE 5	24 V AC/DC	45228	
SAFE 5.1	24 V AC/DC	45232	
SAFE C1	24 V DC	45327	
SAFE 1	24 V AC/DC	45037	
SAFE 1.1	24 V AC/DC	45036	
SAFE 2	24 V AC/DC	45038	
SAFE 2.1	24 V AC/DC	45039	
SAFE S.6	24 V AC/DC	45244	
SAFE S.6	48 V AC	45035	
SAFE S.6	110-127 V AC	45245	
SAFE S.6	230 V AC	45246	
SAFE G1	24 V DC	45337	
SAFE G2	24 V DC	45338	
SAFE GT	24 V DC	45336	
SAFE GL	24 V DC	45335	

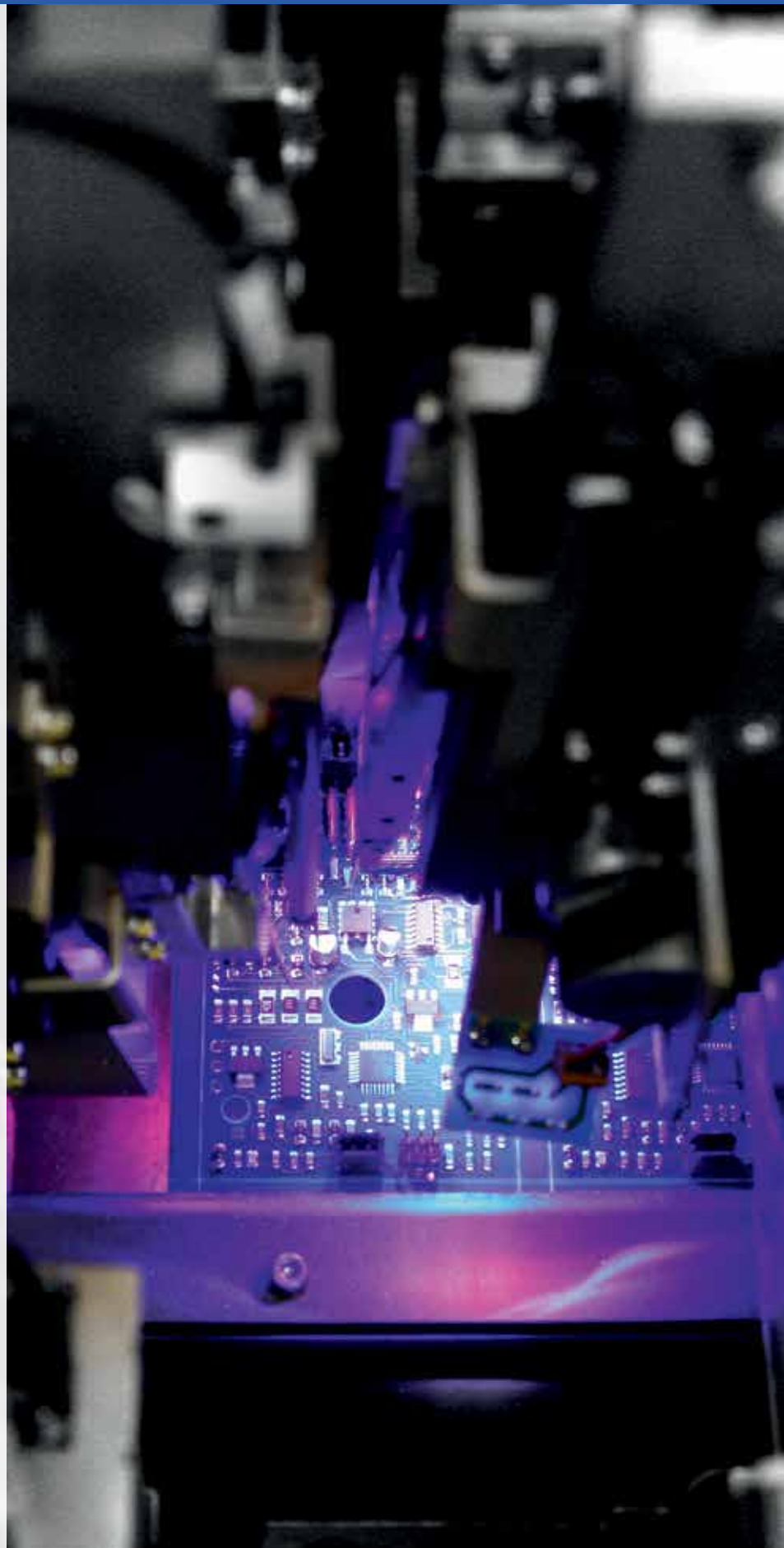
Name	Voltage	CM art. no.	
SAFE TN	24 V AC/DC	45024	
SAFE TA	24 V AC/DC	45025	
SAFE TR	24 V AC/DC	45209	
SAFE TU	24 V AC/DC	45026	
SAFE T ON	24 V AC/DC	45215	
SAFE FLEX T	230 V AC	4638X	
SAFE CM	24 V DC	45071	
SAFE M	24 V AC/DC	46365	45029
SAFE M	115 V AC	46366	45240
SAFE M.1	24 V AC/DC	46367	45034
SAFE 2.2	24 V AC/DC	46387	
SAFE L.2	24 V AC/DC	45058	
SAFE CL	24 V DC	45328	
SAFE Z.2	24 V AC/DC	45062	
SAFE Z.2	48 V AC	45305	
SAFE Z.2	110-127 V AC	45307	
SAFE Z.2	230 V AC	45068	
SAFE CZ	24 V DC	45072	
SAFE X4	24 V AC/DC	45019	
SAFE X4	48 V AC	45195	
SAFE X4	110-127 V AC	45197	
SAFE X4	230 V AC	45201	
SAFE X4.1	24 V AC/DC	45021	
SAFE X4.1	48 V AC	45196	
SAFE X4.1	110-127 V AC	45200	
SAFE X4.1	230 V AC	45203	
SAFE IRZ.2	24 V AC/DC	45013	
SAFE FLEX	24 V DC	45332	
SAFE FLEX L	24 V DC	46364	
SAFE SM	24 V DC	45293	

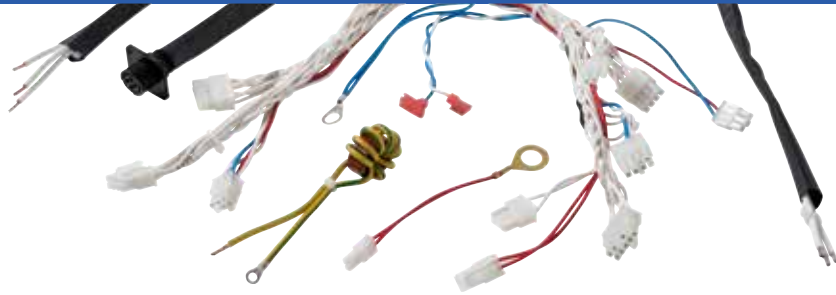
NOTE:

In some cases also possible with hard gilding; price and delivery time on request.

Production

- **SMD soldering**
2 x Siemens SIPLACE CF
(up to design 0201)
2 x Siemens SIPLACE S27
- **Reflow soldering**
2 x SMT Quattro Peak M (N2)
with nitrogen soldering
- **RoHS soldering**
SEHO MaxiWave 2335 C
- **Silkscreen**
2 x EKRA X4
- **THT manual soldering**
- **Automated function test**
Function tester and ICT device
Reinhardt KMFT 470 ICT
- **AOI tester**
ORBOTECH 8-22
VISCOM
ZEISS
- **Automatic tester**
2 x Flying Probe Tester TAKAYA
- **Casting, adhesion, coating etc.**
2 x BARTEC
3 x VIEWEG
- **Labelling and packaging**





Systematic cable assembly!

Our services range from simple cable assembly to complex cable harnesses with plugs, contacts or even cable-end sleeves for virtually all applications.

- Automotive
- Mechanical engineering
- Medical technology
- Industry
- Sensor systems

Whether miniature strands, flat cables or cable kits: profound expertise, flexibility and perfection ensure the highest of quality standards. Modern machinery allows us to offer customised solutions.

Key activities

- Full automation: labelling, stripping, tinning and crimping
- Single strands with crimp technique in various versions
- Flat cable with labelling
- Production of complex cable harnesses
- High-voltage testing with WEETECH W434
- Sensors with casting compound
- Infrared shrinkage
- Packaging in ESD standard
- Customised packaging and labelling





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Certified to DIN EN ISO 9001

Approvals: TÜV/UL/C-UL

TÜV
type-
tested



K-G-001-2019-EN