

## Coded magnetic switches

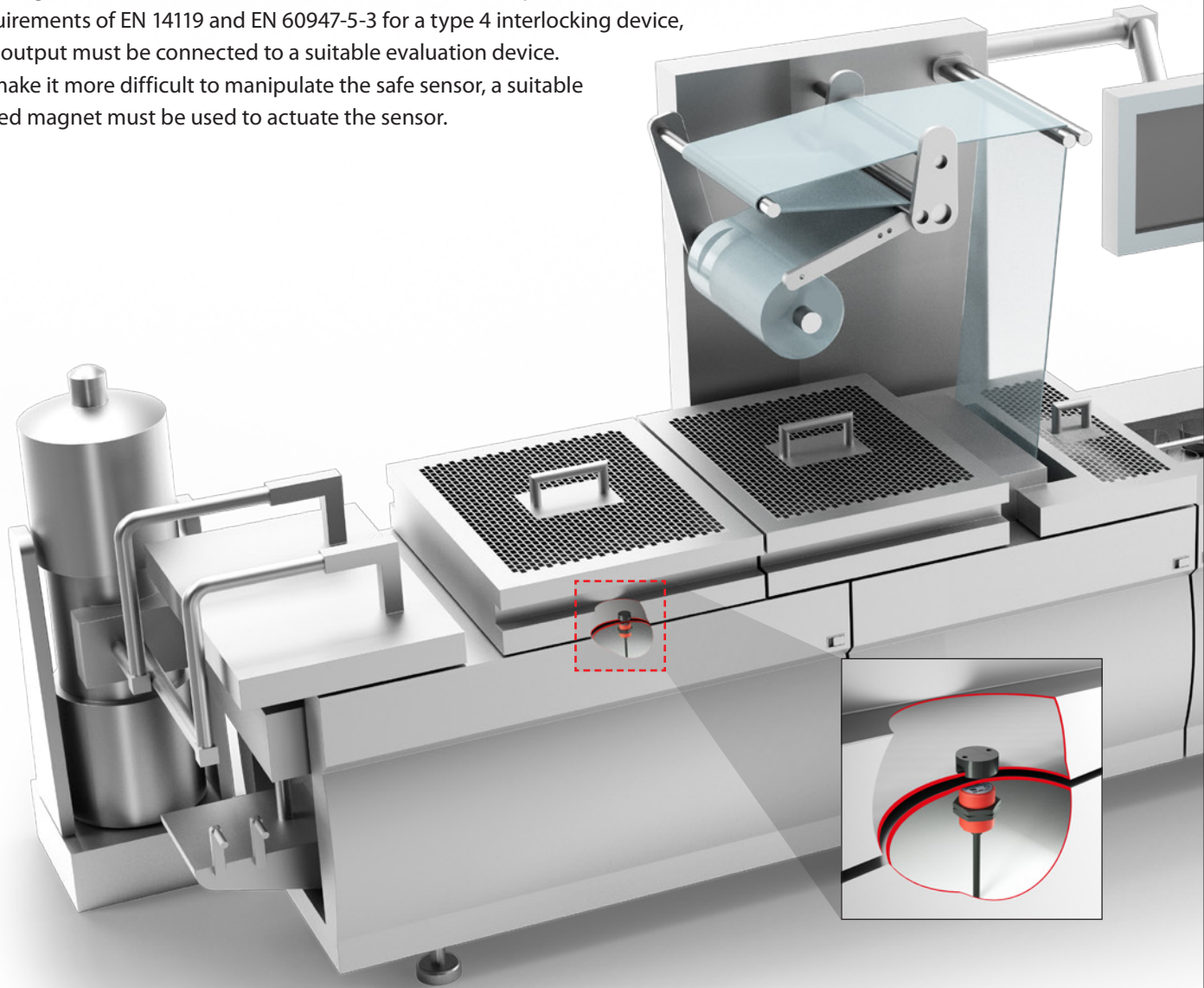
Safely monitor doors, flaps and hoods

# Coded magnetic switches for various applications

Safety switches are usually used for the safety-related monitoring of doors, hoods and flaps. But due to other requirements, such as environmental conditions or the complexity of the application, it may be necessary to switch from a mechanical safety switch to another technology, such as coded magnetic switches.

Our magnetic switches are sensors with a two-channel output. In order to meet the requirements of EN 14119 and EN 60947-5-3 for a type 4 interlocking device, this output must be connected to a suitable evaluation device.

To make it more difficult to manipulate the safe sensor, a suitable coded magnet must be used to actuate the sensor.



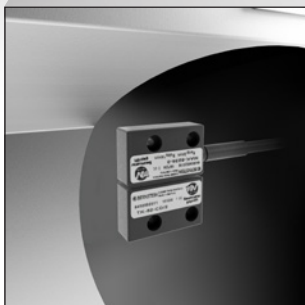
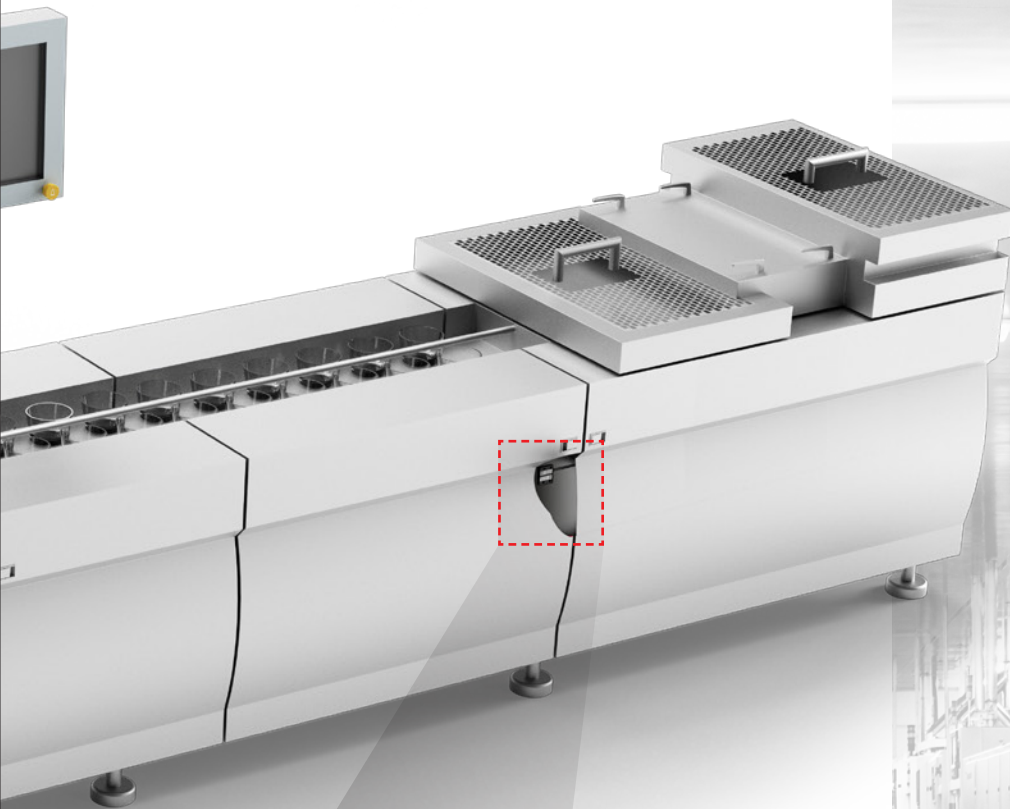
BERNSTEIN AG offers a comprehensive range of coded magnetic switches.

The three different designs offer optimum integration in applications in which, for example, position sensing on doors, flaps and hoods must be implemented.

Due to the coding of the sensors, it is not possible to operate the sensors with standard magnets.

Our magnetic switches are designed with two channels as standard. One channel is usually equipped with a normally open contact, and one channel with a normally closed contact.

This reduces the risk that an external influence will lead to the same error and thus the failure of both safety circuits. For variants with two normally open contacts, special attention must be paid to the errors that may occur.



## Product features

- Compact
- No external moving parts
- Low susceptibility to non-metallic dust, liquids
- Easy to clean
- Low coded
- Conditional tolerance to misalignment of the guard

# MAK 42 ...

## Sensors

Article number	Description	Contact configuration safety contacts	Signalling contacts	Connection	Reference magnet No.
6490642318	MAK-4236-BCD-3	1NC / 1 NO	–	3 meter cable, right	1 or 2
6490642319	MAK-4236-BCD-6	1NC / 1 NO	–	6 meter cable, right	1 or 2
6490642320	MAK-4236-BCD-9	1NC / 1 NO	–	9 meter cable, right	1 or 2
6490642321	MAK-4236-BCD-M8	1NC / 1 NO	–	4 pin M8 connector, right	1 or 2
6490642315	MAK-4236-3 TÜV	1NC / 1 NO	–	3 meter cable, right	4
6490642046	MAK-4256-3	2 NO	1 NC	3 meter cable, right	3
6490642047	MAK-4256-6	2 NO	1 NO	6 meter cable, right	3

Other cable lengths are available on request

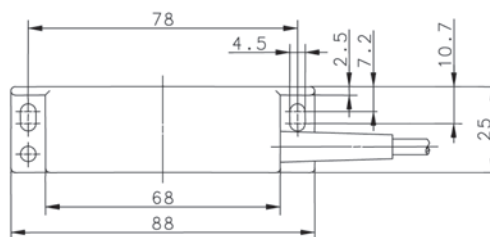
\*Only valid in connection with the MÜZ evaluation unit

## Magnets

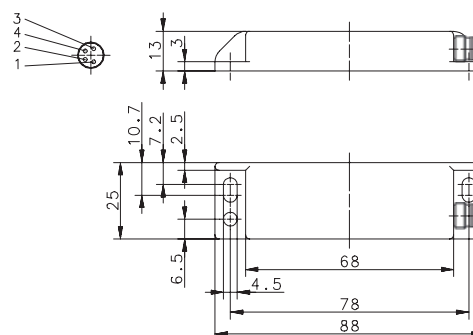
Magnet No.	Article number	Description	Sao (Definition, see page 10)	Sar (Definition, see page 10)	Approval	Dimension drawing No.
1	6402042068	TK-42-CD/2	≥ 4	≤ 17	UL	3
2	6402042082	TK-42-CD/2-SN8	≥ 8	≤ 17	UL	3
3	6402042053	TK-42-CD/2	≥ 4	≤ 17		3
4	6402042310	TK-42-CD	≥ 5	≤ 14	TÜV*	3

## Dimension drawings

### 1) MAK 42 sensor, cable on the right



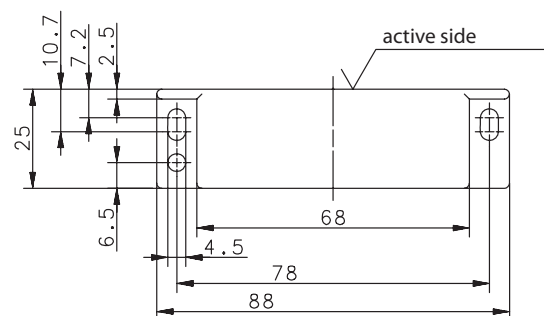
### 2) MAK 42 sensor, 4 pin M8 connector on the right



Approval	Technical data No. (see page 10)	Dimension drawing No.
UL	1	1
UL	1	1
UL	1	1
UL	3	2
TÜV*	6	1
	5	1
	5	1



### 3) MAK 42 magnet





# MAK 52 ...

## Sensors

Article number	Description	Contact configuration safety contacts	Signalling contacts	Connection	Reference magnet No.
6490652327	MAK-5236-BCD-3	1NC / 1 NO	–	3 meter cable, left	1 and 2
6490652328	MAK-5236-BCD-6	1NC / 1 NO	–	6 meter cable, left	1 and 2
6490652329	MAK-5236-BCD-9	1NC / 1 NO	–	9 meter cable, left	1 and 2
6490652322	MAK-5236-BCD-M8	1NC / 1 NO	–	4 pin M8 connector, left	1 and 2
6490652334	MAK-5236-CD-2S-1,5	2 NO	–	1,5 meter cable, on the side	1 and 2
6490652335	MAK-5236-CD-2S-1,5	2 NO	–	1,5 meter cable, right	1 and 2
6490652333	MAK-5236-3-2S	2 NO	–	3 meter cable, left	3 and 4
6490652316	MAK-5236-3 TÜV	1NC / 1 NO	–	3 meter cable, left	5

Other cable lengths are available on request

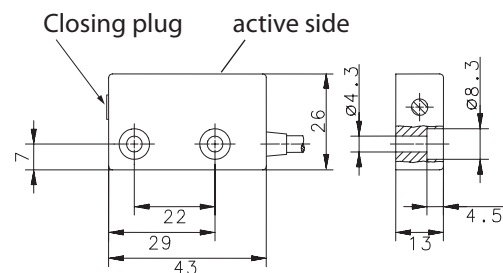
\*Only valid in connection with the MÜZ evaluation unit

## Magnets

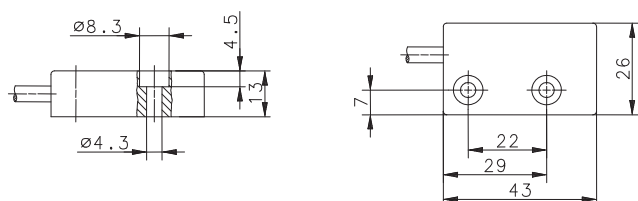
Magnet No.	Article number	Description	Sao (Definition, see page 10)	Sar	Approval	Dimension drawing No.
1	6402052067	TK-52-CD/2	$\geq 3$	$\leq 14$	UL	8
2	6402052075	TK-52-CD/2 SN8	$\geq 8$	$\leq 17$	UL	8
3	6402052307	TK-52-CD/2	$\geq 3$	$\leq 9$		8
4	6402052066	TK-52-CD/2 SN8	$\geq 8$	$\leq 17$		8
5	6402052311	TK-52-CD/2 TÜV	$\geq 3$	$\leq 14$	TÜV*	8

## Dimension drawings

### 4) MAK 52 sensor, cable on the right



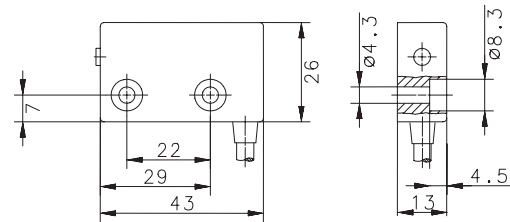
### 5) MAK 52 sensor, cable on the left



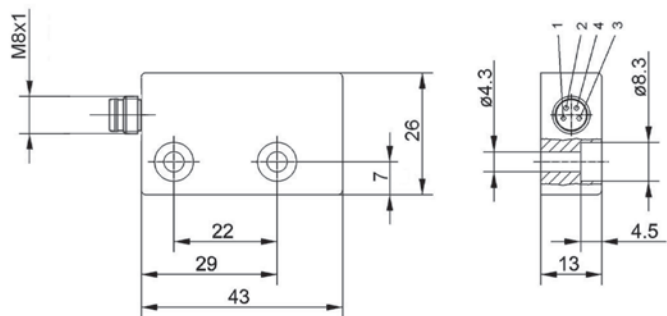
Approval	Technical data No. (see page 10)	Dimension drawing No.
UL	1	5
UL	1	5
UL	1	5
UL	3	7
UL	2	6
UL	2	4
	4	5
TÜV*	6	5



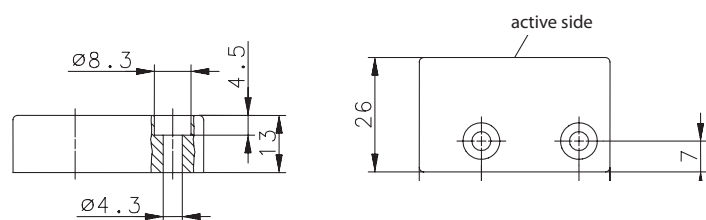
6) MAK 52 sensor, cable on the side



7) MAK 52 sensor, 4 pin M8 connector on the left



8) MAK 52 magnet



# MAK 53 ...

## Sensors

Article number	Description	Contact configuration safety contacts	Signalling contacts	Connection	Reference magnet No.
6490653323	MAK-5336-BCD-3	1NC / 1 NO	–	3 meter cable, on the back	1 or 2
6490653324	MAK-5336-BCD-6	1NC / 1 NO	–	6 meter cable, on the back	1 or 2
6490653325	MAK-5336-BCD-9	1NC / 1 NO	–	9 meter cable, on the back	1 or 2
6490653326	MAK-5336-BCD-M12	1NC / 1 NO	–	4 pin M12 connector, on the back	1 or 2
6490653317	MAK-5336-3	1NC / 1 NO	–	3 meter cable, on the back	3

Other cable lengths are available on request

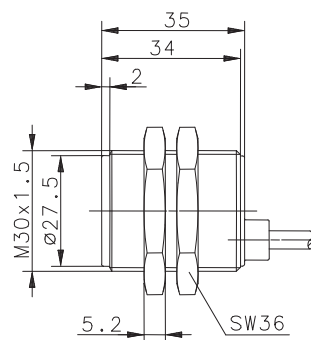
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## Magnets

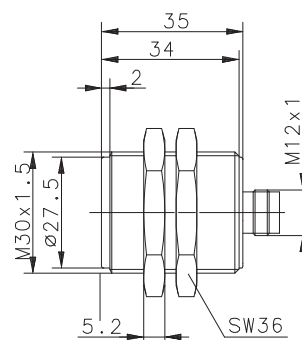
Magnet No.	Article number	Description	Sao (Definition, see page 10)	Sar (Definition, see page 10)	Approval	Dimension drawing No.
1	6402043069	TK-43-CD/2	≥ 5	≤ 14	UL	11
2	6408043070	TN-43-CD/2	≥ 5	≤ 14	UL	12
3	6402043312	TK-43-CD	≥ 3	≤ 14	TÜV*	11

## Dimension drawings

### 9) MAK 53 sensor, cable on the back



### 10) MAK 53 sensor, 4 pin M12 connector on the back

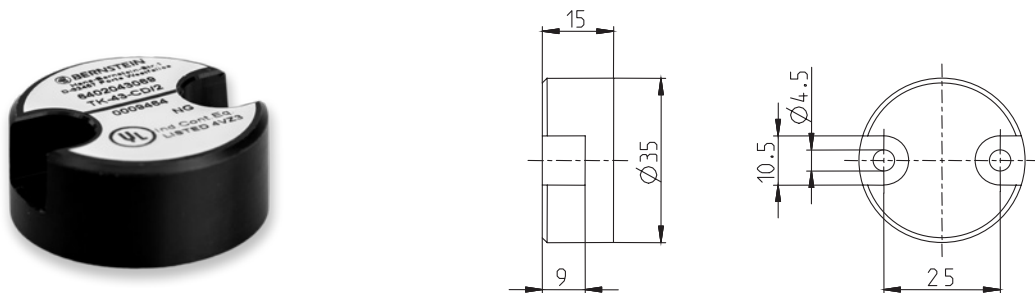




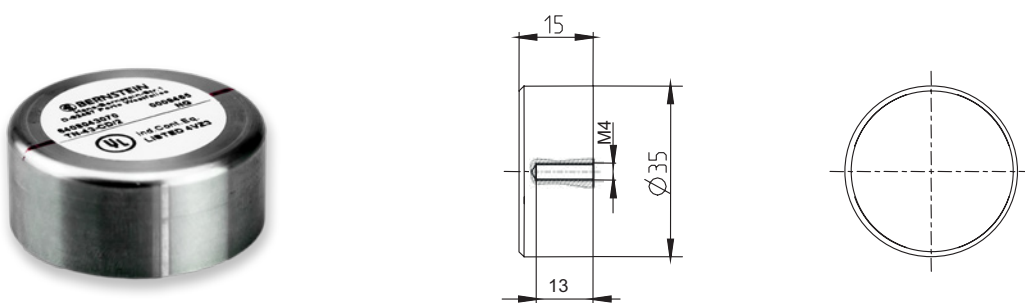
Approval	Technical data No. (see page 10)	Dimension drawing No.
UL	1	9
UL	1	9
UL	1	9
UL	3	10
TÜV*	6	9



### 11) TK 43 magnet, plastic



### 12) TN 43 magnet, stainless steel



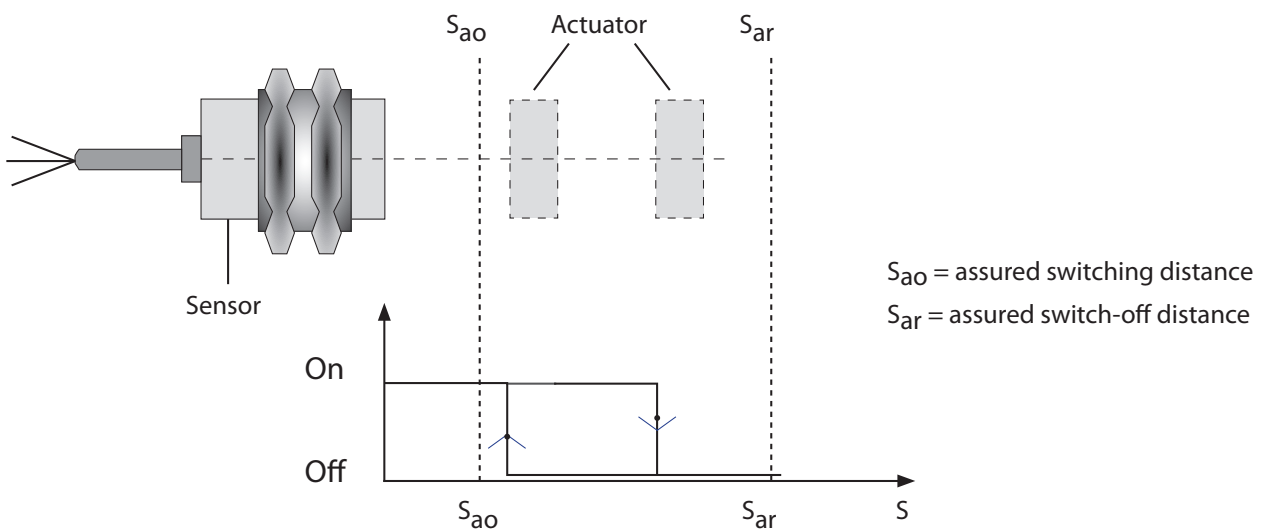
# Technical details

## Technical data – magnetic switches

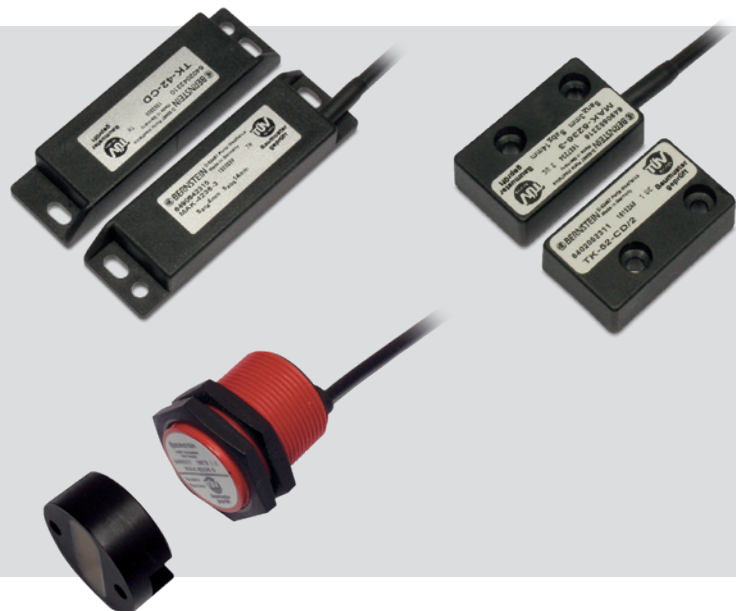
	maximum switching voltage	maximum switching current	maximum switching power	Temperature with movable cable	Temperature with fixed cable	Protection class
1	30 V DC	80 mA	0,25 W	- 10 up to +105 °C	- 30 up to +105 °C	IP67
2	30 V DC	250 mA	5 W	- 10 up to +105 °C	- 30 up to +105 °C	IP67
3	30 V DC	80 mA	0,25 W	- 5 up to +70 °C	-	IP67
4	30 V DC	180 mA	5 W	- 5 up to +70 °C	- 25 up to +70 °C	IP67
5	120 V DC	180 mA	5 W	- 5 up to +70 °C	- 30 up to +80 °C	IP67
6	30 V DC	80 mA	0,25 W	- 5 up to +70 °C	- 25 up to +70 °C	IP67

Coding of all sensors      Low coding level according to DIN EN 14119

## Explanation of the switching distances of magnetic switches



Magnetic switches are particularly suitable for systems where high demands are placed on cleanability.



# Safety evaluation MÜZ

To achieve a PL or SIL value with the safety sensors from the MAK family, it is necessary to connect them to a safety evaluation system.

The evaluation system (BERNSTEIN designation: MÜZ) monitors the correct switching of the two magnetic switch channels within a defined time window in which both channels must have switched. With the combination of MAK and MÜZ, PL d and a SIL 3 can be achieved. In addition to the three different designs of magnetic safety switches, BERNSTEIN offers two different evaluation systems.

Through the combination of one of the two evaluation systems shown below and a magnetic switch marked with TÜV approval, the requirements of DIN EN 60947-5-3 are met and an EC type-tested system for the safe monitoring of movable guards is achievable.

Note: Only magnetic switches with a contact configuration of 1NO/1NC can be connected to these evaluation systems.



Type designation	MÜZ-102/D24-FL-DA	MÜZ-202/D24-FL
<b>Article number</b>	<b>6392701306</b>	<b>6392702307</b>
max. connectable magnetic switches	1	2
Safety output, NO contact	●	●
Enabling paths	1	1
Feedback circuit	yes	no
Data output (NC contact)	●	–
Message output	1	
<b>Technical data</b>		
Operating voltage	24 V DC	24 V DC
Operating current	60 mA	60 mA
Switching voltage	AC 250 V	AC 250 V
Switching current	8 A	8 A
Switching power	1700 VA	1700 VA
Temperature range	0°C/+55 °C	0°C/+55 °C
Protection class (to IEC 529, EN 60529)	IP20	IP20
Enclosure material	PC	PC
Mounting system (DIN 50022)	TS 35	TS 35
Type of connection: Terminal block	max. 2,5 mm <sup>2</sup>	max. 2,5 mm <sup>2</sup>





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