

Coded magnetic switches

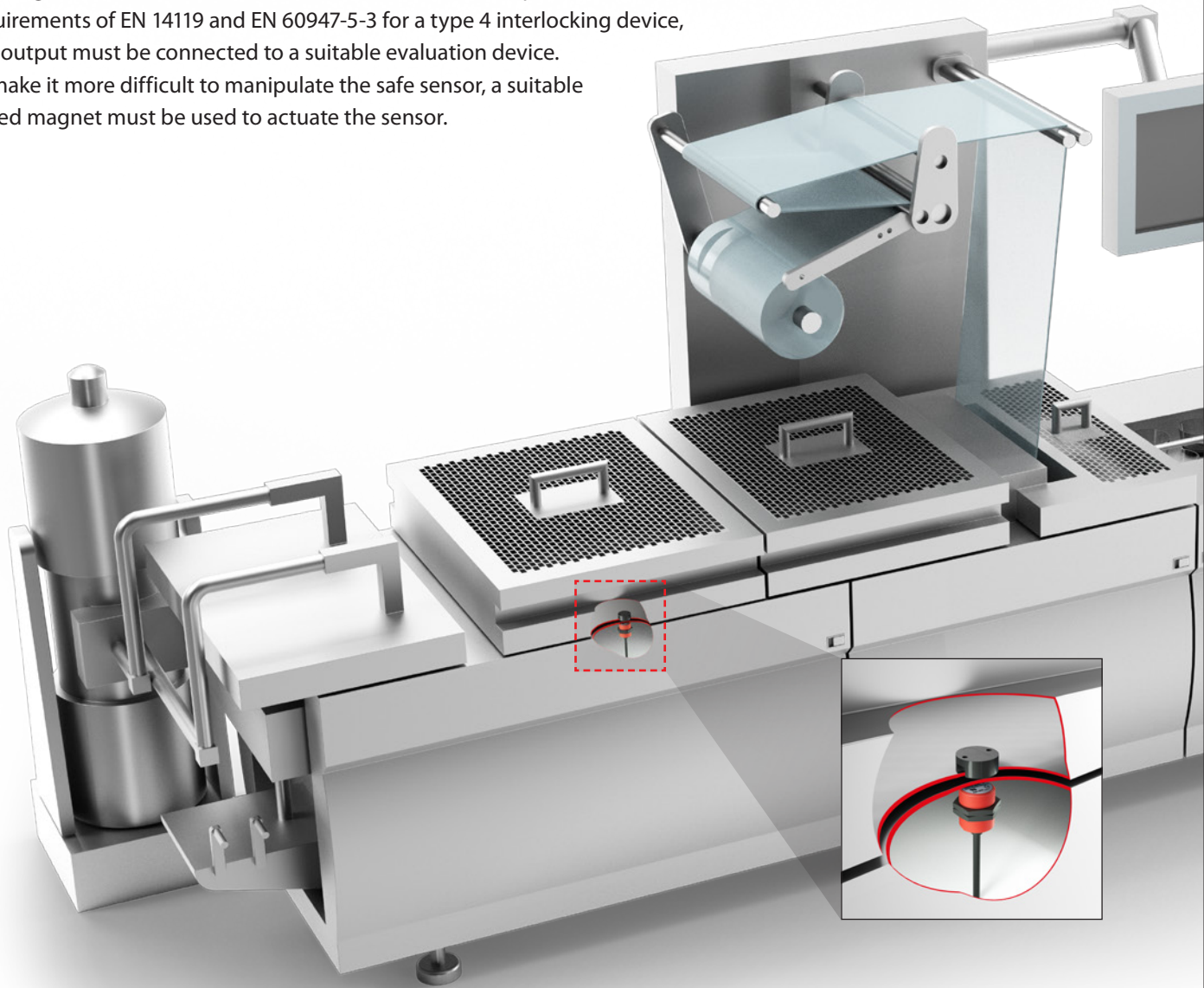
Safely monitor doors, flaps and hoods

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.



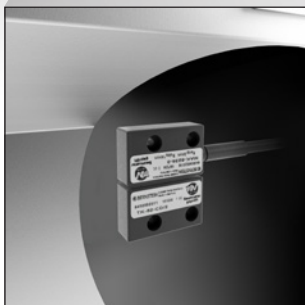
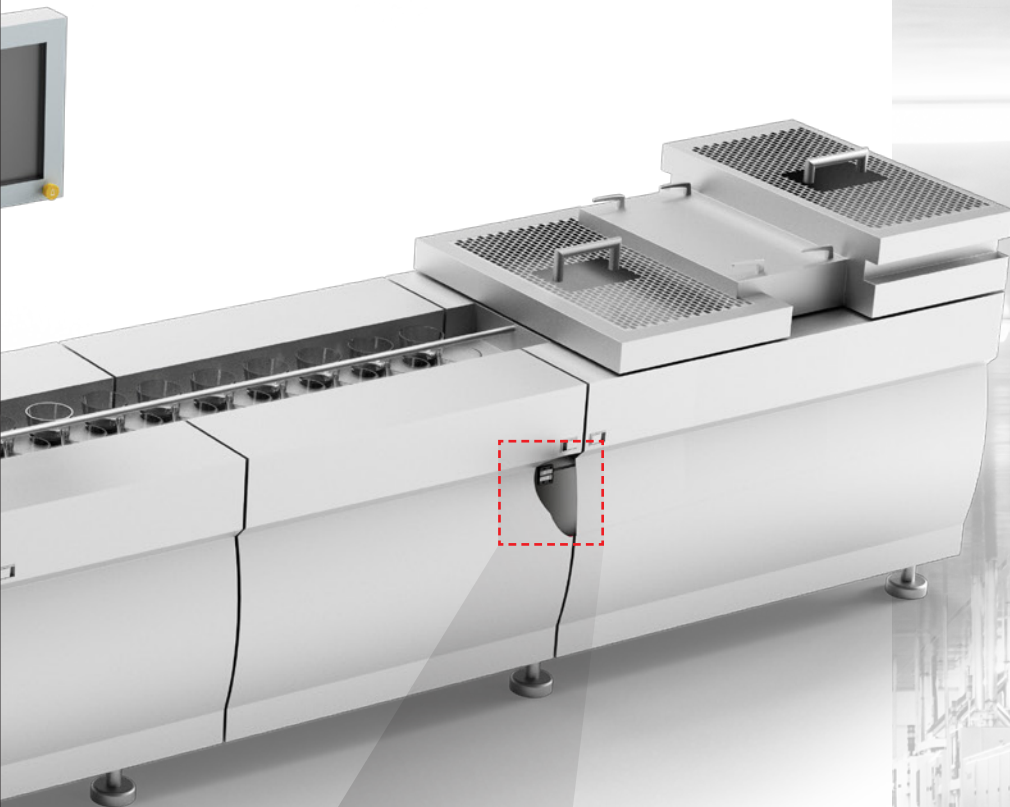
BERNSTEIN AG offers a comprehensive range of coded magnetic switches.

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

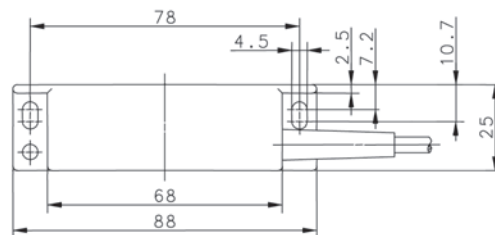
*Only valid in connection with the MÜZ evaluation unit

Magnets

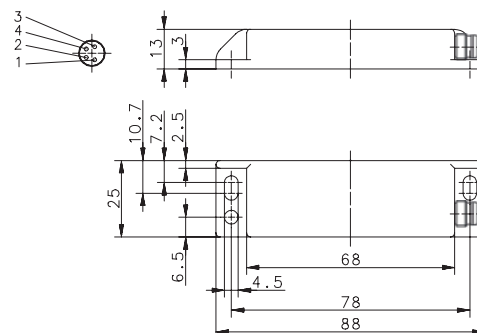
| Magnet No. | Article number | Description | Sao (Definition, see page 10) | Sar | Approval | Dimension drawing No. |
|------------|----------------|----------------|----------------------------------|------|----------|--------------------------|
| 1 | 6402042068 | TK-42-CD/2 | ≥ 4 | ≤ 17 | UL | 3 |
| 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



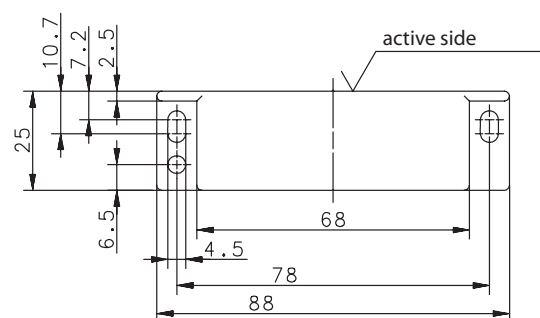
2) MAK 42 sensor, 4 pin M8 connector on the right



| 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

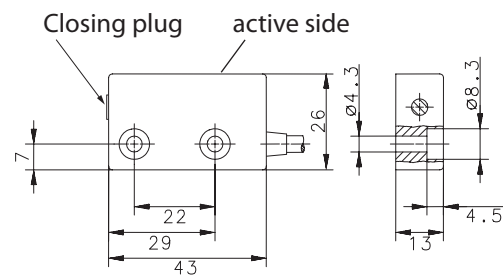
*Only valid in connection with the MÜZ evaluation unit

Magnets

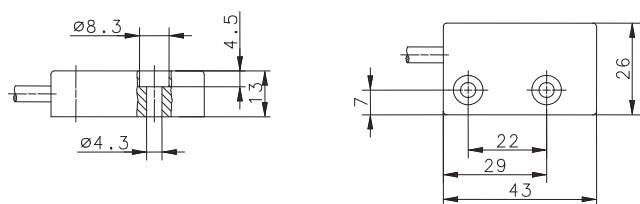
| Magnet No. | Article number | Description | Sao (Definition, see page 10) | Sar | Approval | Dimension drawing No. |
|------------|----------------|----------------|----------------------------------|-----------|----------|--------------------------|
| 1 | 6402052067 | TK-52-CD/2 | ≥ 3 | ≤ 14 | UL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

Dimension drawings

4) MAK 52 sensor, cable on the right



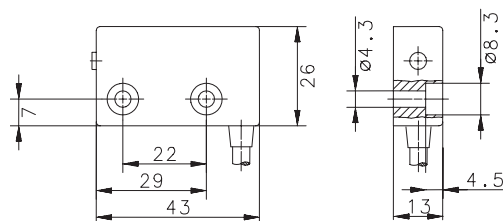
5) MAK 52 sensor, cable on the left



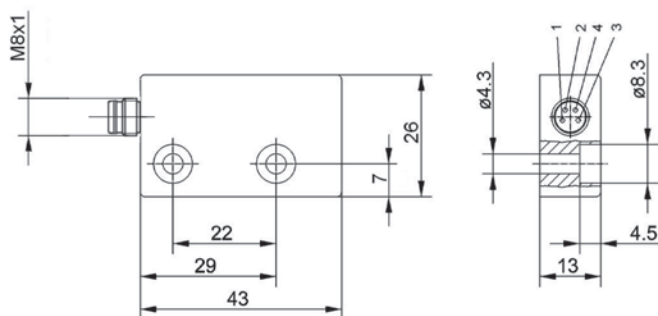
| Approval | Technical data No. (see page 10) | Dimension drawing No. |
|----------|-------------------------------------|--------------------------|
| UL | 1 | 5 |
| UL | 1 | 5 |
| UL | 1 | 5 |
| UL | 3 | 7 |
| UL | 2 | 6 |
| UL | 2 | 4 |
| | 4 | 5 |
| TÜV* | 6 | 5 |



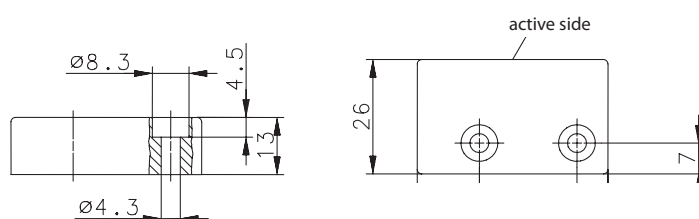
6) MAK 52 sensor, cable on the side



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

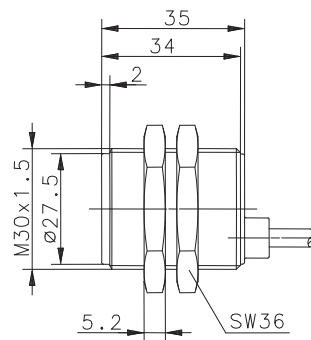
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Magnets

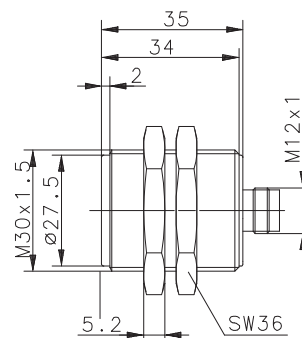
| Magnet No. | Article number | Description | Sao (Definition, see page 10) | Sar (Definition, see page 10) | Approval | Dimension drawing No. |
|------------|----------------|-------------|----------------------------------|----------------------------------|----------|-----------------------|
| 1 | 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



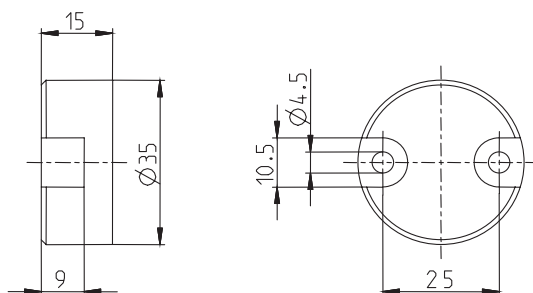
10) MAK 53 sensor, 4 pin M12 connector on the back



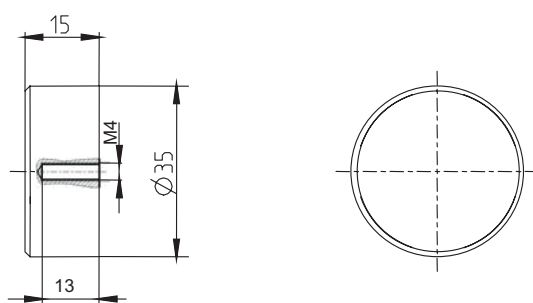
| Approval | Technical data No. (see page 10) | Dimension drawing No. |
|----------|-------------------------------------|--------------------------|
| UL | 1 | 9 |
| UL | 1 | 9 |
| UL | 1 | 9 |
| UL | 3 | 10 |
| TÜV* | 6 | 9 |



11) TK 43 magnet, plastic



12) TN 43 magnet, stainless steel

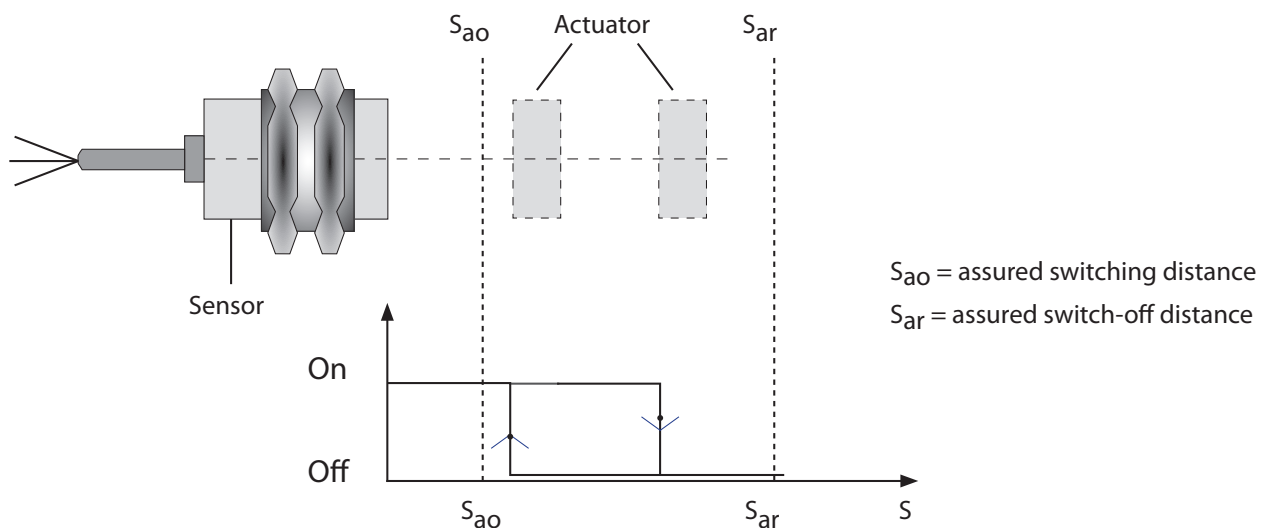


Technical details

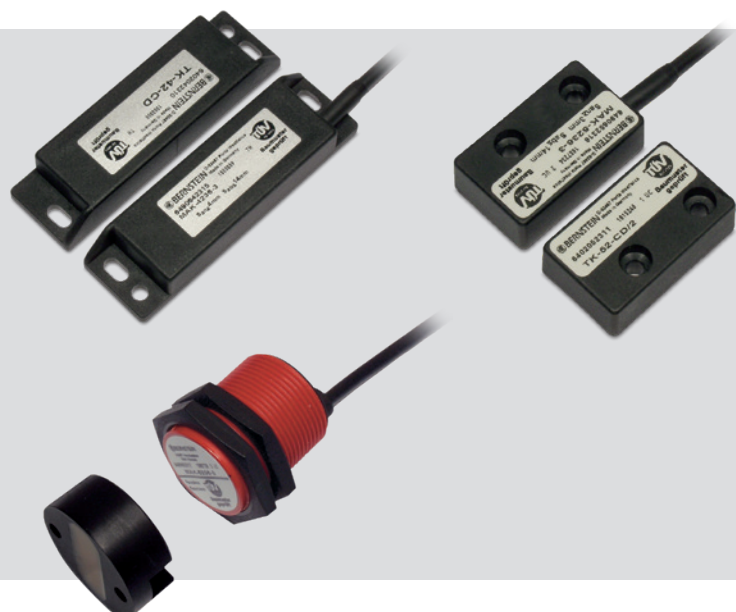
Technical data – magnetic switches

| | 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 |
|---|--------------------------|--------------------------|
| Article number | 6392701306 | 6392702307 |
| 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 | |
| Technical data | | |
| 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 ² | max. 2,5 mm ² |

**DETECT****We make
safety happen.****PROTECT****We keep safe
your visions.**

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