



## MB1

MECHANICAL BOLT FOR RUGGED DOOR SAFEGUARDING  
AND HIGH MACHINE UPTIME

Mechanical bolts for safety switches

**SICK**  
Sensor Intelligence.

## COST-OPTIMIZED RELIABILITY

When it comes to the issue of operator safety, applications with full body access to the hazardous area can pose a significant challenge in many industries. The usually large doors, for example of machinery rooms, require rugged locks to guarantee continuous operation even with vibrations or door misalignment. These door locking solutions must function reliably while still being easy to install and operate. That's a lot of requirements, but help is at hand: an MB1 mechanical bolt from SICK combined with a safety switch offers an ideal and smart solution.

### + Efficient – thanks to its sophisticated design and durability



The rugged design of the MB1 and precise guidance of the actuator ensure long-lasting protection from damage to the attached safety switch, even in the case of door misalignment. This enables the MB1 to reduce downtimes, lower costs, and significantly improve the productivity of the plant.

### + Safe – by combining different technologies



The MB1 can be combined with a wide variety of safety switches. The interplay of a mechanical bolt and an electro-mechanical safety switch, with or without a locking feature, prevents breakage of the actuator and increases the performance level (up to PL d). By using different sensor technologies in combination (non-contact, electromechanical), it is even possible to achieve the highest performance level (PL e).



The MB1 comes with a door handle, thereby saving costs for additional parts



The standardized mounting holes, and suitable adapters for the various safety switches from SICK guarantee fast and easy installation of all bolt variants



The simple variant of the bolt provides a tongue padlock receptacle as the locking feature

### + Innovative – with ANSI-compliant locking mechanism



The MB1 is characterized by its ingenious, ANSI-compliant locking mechanism. The user-friendly system is based on a mechanical lock with padlock receptacle into which a padlock can be inserted in an easily accessible manner. That prevents the door from being closed and a person being inadvertently locked in the hazardous area in the event of an unexpected startup of the machine.



### + Time-saving and versatile – thanks to simple and flexible mounting options



The 8 available variants of the MB1 offer a range of mounting options to meet a wide variety of requirements. The MB1 is suitable for every door opening direction. It also tolerates a horizontal separation of up to 30 mm between the frame plate and bolt unit with no loss of function. The standardized, pre-drilled mounting holes save time when installing a wide variety of safety switches.

To select the right variant for your needs, → [see page 4](#)



The variants with a catch release button ensure the bolt cannot slip out of place when the operator closes the door, thereby preventing damage



The variants with an ANSI-compliant locking mechanism provide a user-friendly means of locking the bolt to safeguard persons against being inadvertently locked in the hazardous area



Variants with an escape release feature a handle attached directly to the bolt. This handle allows the door to be opened from the inside at any time.

## THE OPTIMAL VARIANT FOR EVERY APPLICATION

The following diagram will quickly help you decide whether the simple variant or the ANSI-compliant variant with or without an escape release is the right solution for your requirements. It will also suggest the optimal safety switch to implement a smart complete solution.

### Risk assessment for the application

→ [www.sick.com/risk\\_assessment](http://www.sick.com/risk_assessment)



Safety locking function required?

Yes

ANSI-compliant locking mechanism and/or catch release button required?

Yes

No<sup>1</sup>

No

ANSI-compliant locking mechanism and/or catch release button required?

Yes

No<sup>1</sup>



You will find suitable safety switches and safe control solutions in the

→ Product overview: Safety switches

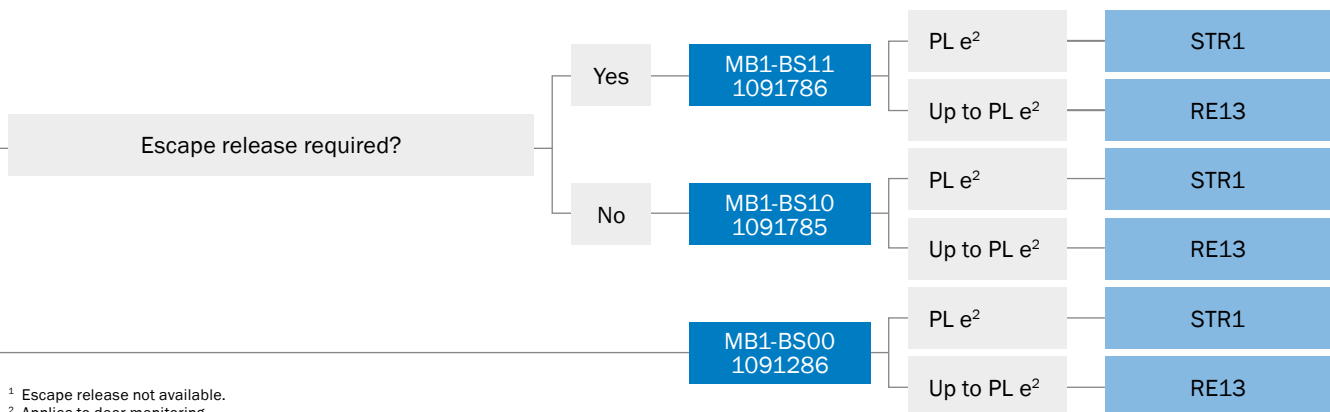
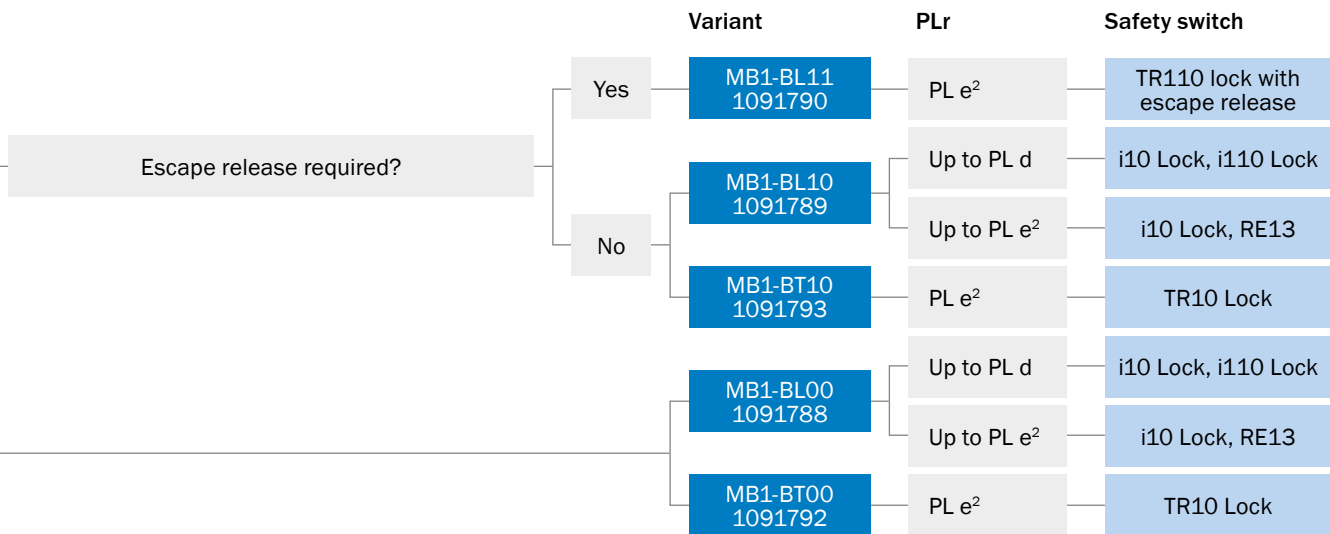
→ Product overview: Safe control solutions



For big machines with blind spots, like calendering machines, an ANSI-compliant locking mechanism can prevent operators from being inadvertently locked in the hazardous area



Protection of access doors to a shape molding machine

<sup>1</sup> Escape release not available.<sup>2</sup> Applies to door monitoring.

Locking solution for PCB conveyor



Protection of access doors in robot-assisted applications



# MECHANICAL BOLT FOR RUGGED DOOR SAFEGUARDING AND HIGH MACHINE UPTIME



## Product description

The MB1 mechanical bolt is the ideal addition to non-contact safety switches and safety locking devices from SICK. Precise guiding of the actuator increases the tolerance to door offset and ensures correct functioning of an installed safety switch at all times. In addition, a mechanical bolt effectively

prevents actuator breakage. The fault exclusion realized in this way enables a high performance level for the overall structure. Additional options such as a mechanical lock with padlock receptacle or an escape release reliably protect maintenance staff from accidental entrapment.

## At a glance

- Rugged design
- Variants with ANSI-compliant locking mechanism
- Standardized frame plates suitable for many safety switches from SICK
- Horizontal installation tolerance of 27 mm
- Compensation of vertical door offset up to  $\pm 7$  mm
- Variants with catch release button and escape release

## Your benefits

- Reliable and cost-optimized solution for door locking
- Increased productivity thanks to the rugged design and protection of the sensor
- High performance level due to fault exclusion, prevents actuator breakage
- Flexible mounting: Bolt can be used for right- or left-hinged doors
- Protection of employees from accidental entrapment thanks to locking function with padlock
- Protection from unwanted actuation for variants with catch release button

## Additional information

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→ [www.sick.com/MB1](http://www.sick.com/MB1)

For more information, simply enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples, and much more.



## Detailed technical data

More detailed data can be found in the operating instructions. Download → [www.sick.com/MB1](http://www.sick.com/MB1)

## Features

|   | MB1-BSxx                              | MB1-BLxx   | MB1-BTxx                        |
|---|---------------------------------------|--|---------------------------------|
| <b>Installation tolerance (horizontal)</b>                | 3 mm ... 30 mm                        |  |                                 |
| <b>Model</b>  |                                       |  |                                 |
| Catch release button/<br>ANSI-compliant locking mechanism | - / ✓ (depending on type)             |  |                                 |
| Escape release  | - / ✓ (depending on type)             |  | -                               |
| <b>Suitable for</b>                                       | RE1, STR1 non-contact safety switches | i10 Lock, i110 Lock, TR110 Lock safety locking devices<br>Also possible: RE1, STR1 non-contact safety switches | TR10 Lock safety locking device |

## Mechanical data

|   |   |  |  |
|---|---|--|--|
| <b>Weight</b>                             | 1.357 kg ... 1.701 kg (depending on type) |  |  |
| <b>Material</b>                           |   |  |  |
| Handle                                    | VISTAL®                                   |  |  |
| Bolt unit                                 | Steel, zinc coated                        |  |  |
| Sliding carriage, base plate, frame plate | Aluminum (coated)<br>UHMW-PE              |  |  |

## Ordering information

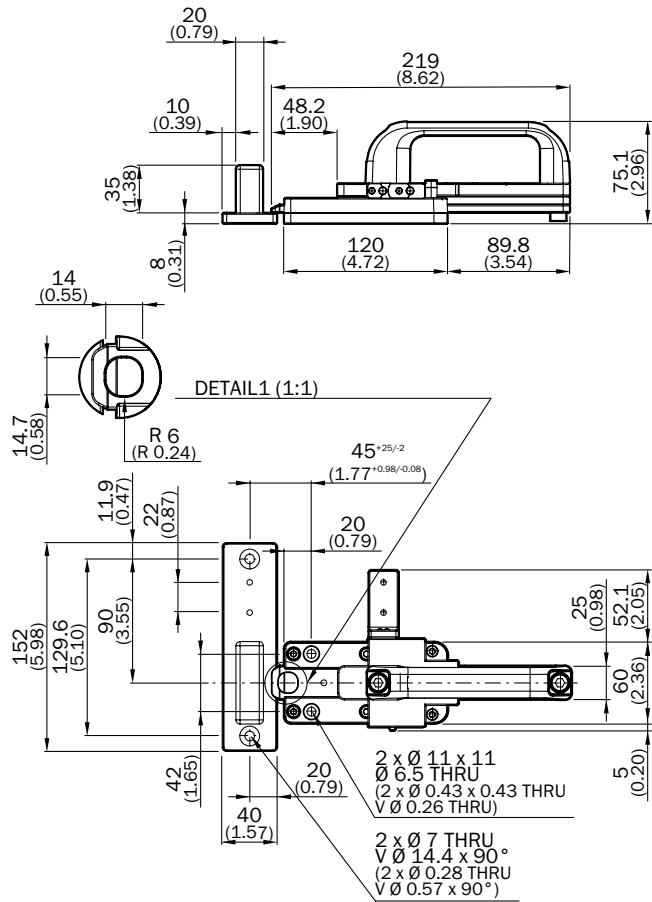
Items supplied MB1:

- Bolt unit
- Frame plate
- Adapters for actuator mounting
- Safety screws for installing provided adapters
- Mounting instructions
- Escape release (only for variants MB1-BS11 and MB1-BL11)

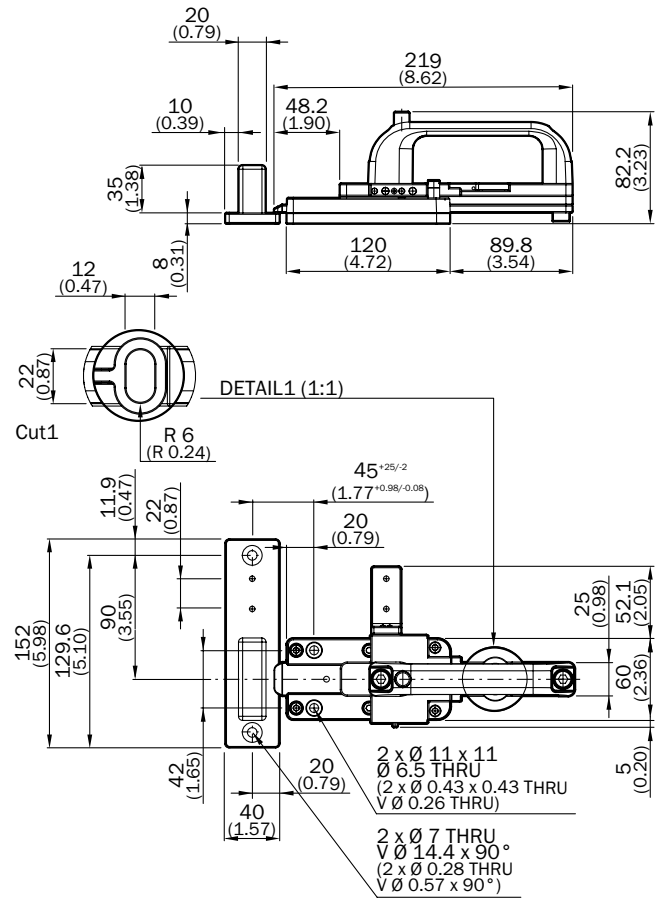
| Description  | Catch release button/<br>ANSI-compliant locking mechanism | Escape release | Type     | Part no. |
|--|---|----------------|----------|----------|
| Complete set consisting of bolt unit with short frame plate and adapters for actuators         | -   | -              | MB1-BS00 | 1091286  |
|  | ✓   | -              | MB1-BS10 | 1091785  |
|  |   | ✓              | MB1-BS11 | 1091786  |
| Complete set consisting of bolt unit with long frame plate and adapters for actuators          | -   | -              | MB1-BL00 | 1091788  |
|  | ✓   | -              | MB1-BL10 | 1091789  |
|  |   | ✓              | MB1-BL11 | 1091790  |
| Complete set consisting of bolt unit with frame plate for TR10 Lock and adapters for actuators | -   | -              | MB1-BT00 | 1091792  |
|  | ✓   | -              | MB1-BT10 | 1091793  |

## Dimensional drawings (Dimensions in mm (inch))

MB1-BS00

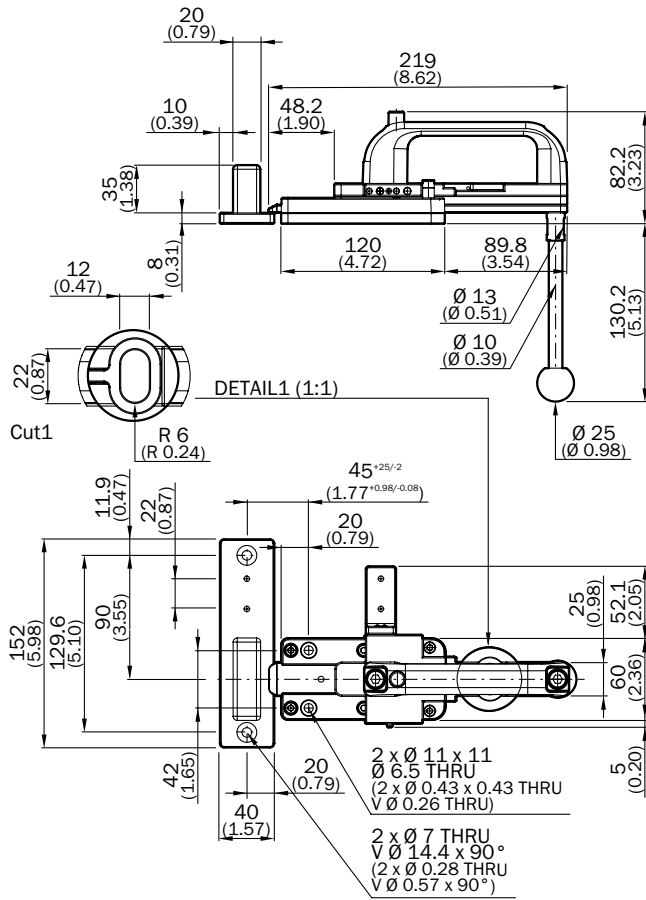


MB1-BS10

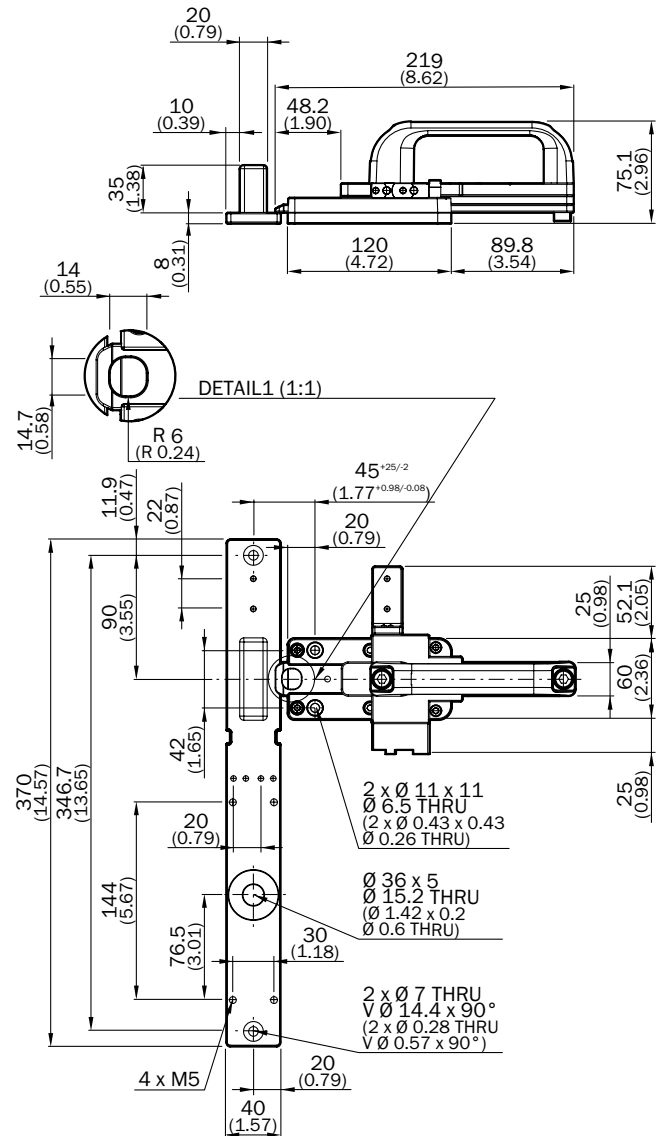




MB1-BS11

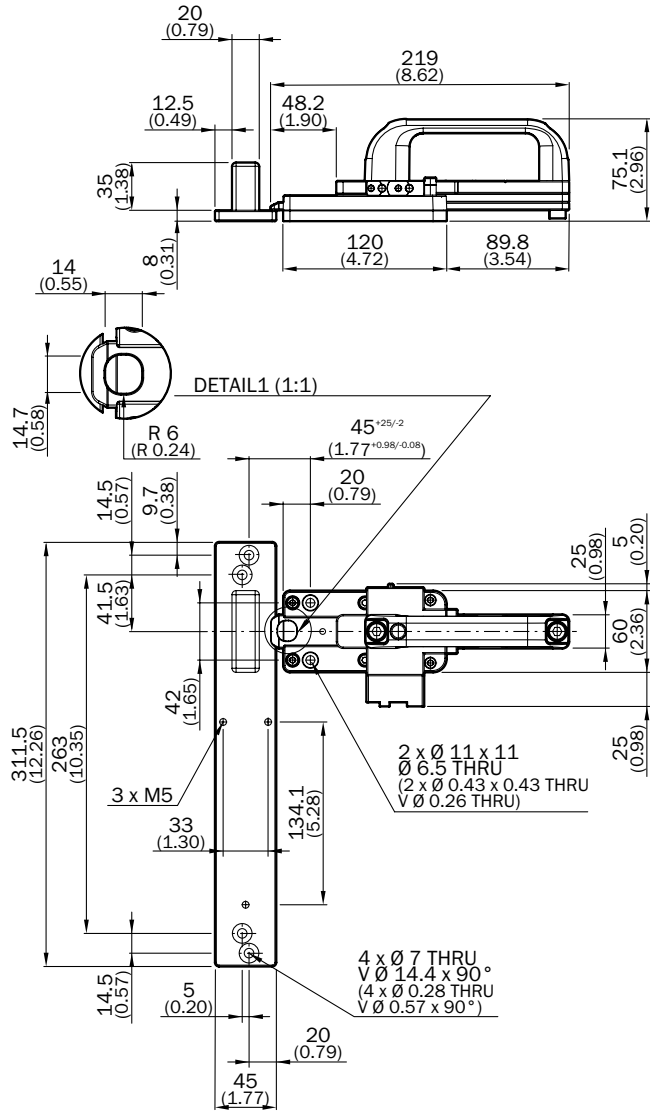


MB1-BL00

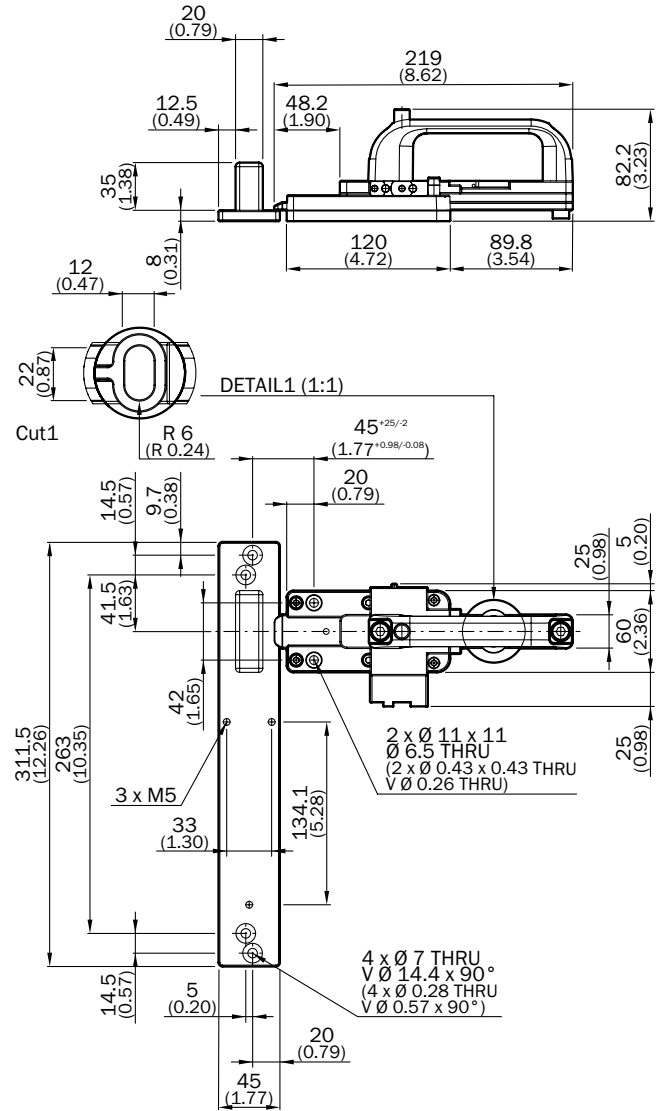




MB1-BT00



MB1-BT10



## Accessories required for commissioning

- For mounting of safety locking devices

| Description   | Number  | Items supplied | Further information                                      |
|---|---------|----------------|--|
| Adapters for mounting the actuators used  | 1 ... 2 | ✓              | –  |
| Safety screws for mounting the mounting adapters  | 1 ... 3 | ✓              | –  |
| M6 x 16 safety screws for installation of the bolt unit   | 2       | –              | → Nuts and screws  |
| M6 screws, 90° countersunk head for mounting the frame plate  | 2       | –              | –  |
| Safety locking device, compatible for the frame plate used  | 1       | –              | → Safety locking devices                                 |
| Screws (M5 x 38) for installation of the safety locking device i10 Lock, i110 Lock or TR110 Lock on the frame plate | 4       | –              | –  |
| Screws (M5 x 16) for installation of the TR10 Lock safety locking device on the frame plate                         | 3       | –              | –  |
| Actuator, suitable for selected safety locking device   | 1       | –              | → Safety locking devices                                 |
| Safety screws for mounting the actuator of the safety locking device  | 2       | ✓              | –  |
| Mounting instructions   | 1       | ✓              | → <a href="http://www.sick.com/MB1">www.sick.com/MB1</a> |








- For mounting of non-contact safety switches

| Description   | Number  | Items supplied | Further information                                      |
|---|---------|----------------|--|
| Adapters for mounting the actuators used  | 1 ... 2 | ✓              | –  |
| Safety screws for mounting the mounting adapters  | 1 ... 3 | ✓              | –  |
| M6 x 16 safety screws for installation of the bolt unit   | 2       | –              | → Nuts and screws  |
| M6 screws, 90° countersunk head for mounting the frame plate  | 2       | –              | –  |
| Non-contact safety switch, compatible for the frame plate used  | 1       | –              | → Non-contact safety switches                            |
| Screws for installation of the non-contact safety switch on the frame plate (RE1: M4 x 14; STR1: M4 x 18)     | 2       | –              | –  |
| Actuator, suitable for selected safety switch   | 1       | –              | → Non-contact safety switches                            |
| Safety screws for installation of the actuator of the non-contact safety switch (RE1: M4 x 14; STR1: M4 x 18) | 2       | –              | → Nuts and screws  |
| Mounting instructions   | 1       | ✓              | → <a href="http://www.sick.com/MB1">www.sick.com/MB1</a> |

## Accessories


## Mounting systems

## Mounting brackets and plates

| Figure  | Description  | Type     | Part no. |
|---|--|----------|----------|
|    | Long frame plate   | MB1-BPLO | 1097495  |
|    | Short frame plate  | MB1-BPSH | 1097494  |
|    | Frame plate for TR10 Lock  | MB1-BPTR | 1097496  |
|    | Adapter for mounting the i12SB actuator,<br>Includes safety screws for fastening                             | MB1-BREM | 1091795  |
|    | Adapter for mounting the i10 Lock / i110 Lock / TR110 Lock actuator,<br>Includes safety screws for fastening | MB1-BRLK | 1097769  |
|    | Adapter for mounting the RE1 / STR1 actuator,<br>Includes safety screws for fastening                        | MB1-BRNC | 1091794  |
|  | Adapter for mounting the TR10 Lock actuator,<br>Includes safety screws for fastening                         | MB1-BRTR | 1091796  |




## Nuts and screws

## Screws

| Figure   | Packing unit | Type                     | Part no. |
|--|--------------|--------------------------|----------|
| <br>Illustration may differ | 10 pieces    | Safety screws<br>M4 x 14 | 5333570  |
|  |              | Safety screws<br>M4 x 18 | 5339775  |
|  |              | Safety screws<br>M6 x 16 | 5339774  |





## Further accessories

## Spare parts



| Figure  | Description                                       | Type    | Part no. |
|---|---|---------|----------|
|  | Door handle without hole for catch release button | MB1-DH0 | 1091797  |
|  | Door handle with hole for catch release button    | MB1-DH1 | 1091798  |
|  | Escape release handle                             | MB1-ER  | 1091799  |

## Compatible safety switches

### Safety locking devices

| Figure  | Description  | Further information  |
|---|--|--|
|  | The TR10 Lock safety locking device unites the high manipulation protection of the RFID technology for monitoring the actuator, the high force and reliability of a mechanical lock and monitored semiconductor outputs (OSSDs).                             | → <a href="http://www.sick.com/TR10_Lock">www.sick.com/TR10_Lock</a>   |
|  | The TR110 Lock safety locking device offers RFID technology for monitoring the actuator, the ruggedness and reliability of a mechanical lock and monitored semiconductor outputs (OSSDs). The TR110 Lock with escape release is also available as an option. | → <a href="http://www.sick.com/TR110_Lock">www.sick.com/TR110_Lock</a> |
|  | The i10 Lock safety locking device is used for keeping guards safely locked until a hazardous area can be entered.   | → <a href="http://www.sick.com/i10_Lock">www.sick.com/i10_Lock</a>     |
|  | The i110 Lock electro-mechanical safety switch offers high locking force and keeps protective devices safely locked until a hazardous area can be entered.   | → <a href="http://www.sick.com/i110_Lock">www.sick.com/i110_Lock</a>   |

### Non-contact safety switches

| Figure  | Description   | Further information  |
|---|---|--|
|   | The STR1 transponder safety switch has monitored semiconductor outputs (OSSDs) and can be safely connected either individually or in series.                              | → <a href="http://www.sick.com/STR1">www.sick.com/STR1</a> |
|  | RE1 magnetic safety switches are equipped with either complementary NC/NO contacts or equivalent N/O contacts which are addressed directly with coded magnetic actuators. | → <a href="http://www.sick.com/RE1">www.sick.com/RE1</a>   |



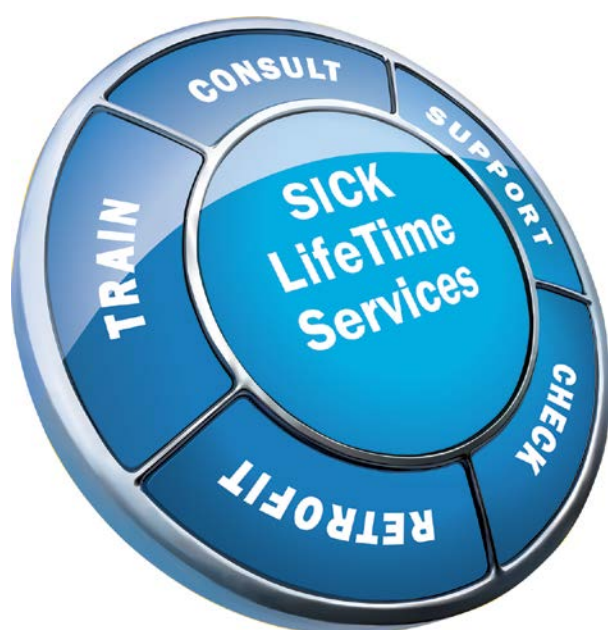
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SICK is a leading manufacturer of intelligent sensors and sensor solutions for industrial applications. With more than 8,000 employees and over 50 subsidiaries and equity investments as well as numerous agencies worldwide, SICK is always close to its customers. A unique range of products and services creates the perfect basis for controlling processes securely and efficiently, protecting individuals from accidents, and preventing damage to the environment.

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Detailed addresses and further locations → [www.sick.com](http://www.sick.com)