

# MB1

Bolt for safety switches



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**Described product**

MB1

**Manufacturer**

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**Original document**

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### 1 About this document

#### 1.1 Purpose of this document

These operating instructions contain the information required during the life cycle of the bolt for safety switches.

These operating instructions must be made available to everyone who works with the bolt.

#### 1.2 Scope

These operating instructions apply only to the bolt for the MB1 safety switch.

This document is included with the following SICK part numbers (this document in all available language versions):

8023330

#### 1.3 Target groups and structure of these operating instructions

These operating instructions are intended for the following target groups: project team members (planners, developers, designers), installers, safety experts (such as CE authorized representatives, compliance officers, people who test and approve the application), operators, and maintenance personnel.

The structure of these operating instructions is based on the life cycle phases of the bolt for safety switches: project planning, mounting, commissioning, operation, and maintenance.

#### 1.4 Further information

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

The following information is available via the Internet:

- This document in other languages
- Data sheets and application examples
- CAD files and dimensional drawings
- Guide for Safe Machinery Six Steps to a Safe Machine

#### 1.5 Symbols and document conventions

The following symbols and conventions are used in this document:

##### Safety notes and other notes



##### DANGER

Indicates a situation presenting imminent danger, which will lead to death or serious injuries if not prevented.



##### WARNING

Indicates a situation presenting possible danger, which may lead to death or serious injuries if not prevented.



##### CAUTION

Indicates a situation presenting possible danger, which may lead to moderate or minor injuries if not prevented.

**NOTICE**

Indicates a situation presenting possible danger, which may lead to property damage if not prevented.

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**NOTE**

Indicates useful tips and recommendations.

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**Instructions to action**

- ▶ The arrow denotes instructions to action.
- 1. The sequence of instructions for action is numbered.
- 2. Follow the order in which the numbered instructions are given.
- ✓ The check mark denotes the result of an instruction.

## 2 Safety information

### 2.1 Intended use

The bolt for safety switches is an accessory for safety switches. The bolt protects the installed safety switch by absorbing external forces and guiding the actuator of electro-mechanical safety switches and safety locking devices. If the bolt and the actuator are correctly installed, it is possible to prevent the actuator from being broken and to ensure that the installed safety switch functions correctly.

The bolt for safety switches must only be used within the limits of the prescribed and specified technical data and operating conditions.

Incorrect use or improper modification or manipulation of the bolt for safety switches will invalidate any warranty from SICK AG. In addition, SICK AG will not accept any responsibility or liability for damage or secondary damage caused as a result.

### 2.2 Improper use

If the bolt for safety switches is not combined with a safety switch, it is **not** a safety component and **cannot** bring the dangerous state of a machine to an end.

### 2.3 Requirements for the qualification of personnel

The safety switch must be configured, mounted, connected, commissioned, and serviced by qualified safety personnel only.

#### **Project planning**

For project planning, a person is considered competent when he/she has expertise and experience in the selection and use of protective devices on machines and is familiar with the relevant technical rules and national work safety regulations.

#### **Mechanical mounting and commissioning**

A person is considered qualified for the task when he/she has the expertise and experience in the relevant field and is sufficiently familiar with the application of the protective device on the machine to be able to assess whether it is in an operationally safe state.

#### **Operation and maintenance**

For operation and maintenance, a person is considered competent when he/she has the expertise and experience in the relevant field and is sufficiently familiar with the application of the protective device on the machine and has been instructed by the machine operator in its operation.

### 3 Product description

#### 3.1 Structure and function

##### Description of operation

The bolt for safety switches is an accessory that is combined with a safety switch (with or without a locking device).

The safety switch is mounted on the frame plate. The actuator of the safety switch is mounted on the door bolt unit. If the door bolt unit is moved into the locked position, the actuator moves with it and operates the safety switch.

#### 3.2 Product characteristics

##### 3.2.1 Device overview

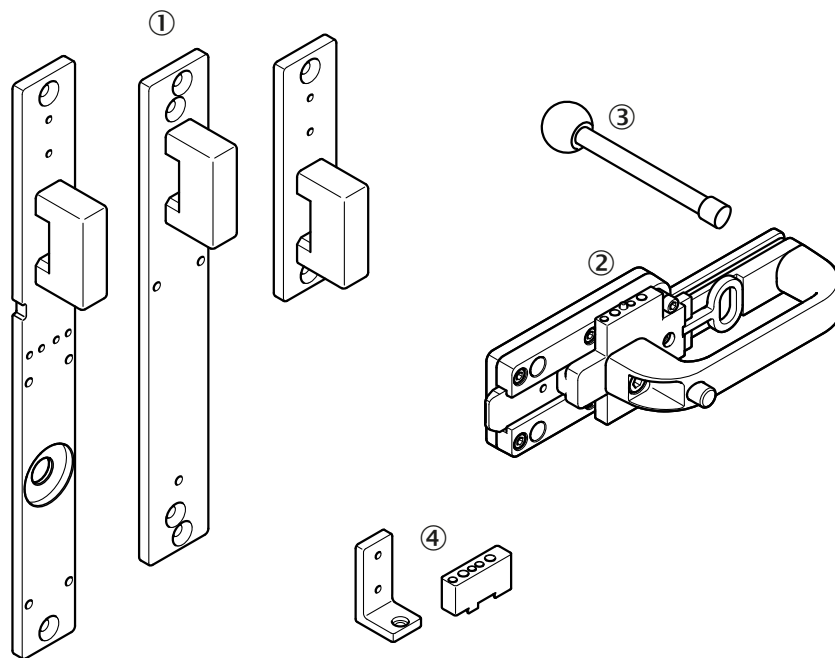


Figure 1: Device overview

- ① Frame plate (differs depending on the variant)
- ② Door bolt unit with sliding carriage
- ③ Escape release
- ④ Adapter for the actuator

##### 3.2.2 Product variants

##### Distinguishing features

Different variants of the bolt for safety switches are available. Below is an overview of the main distinguishing features of the variants.

- Can be combined with one or two safety switches
- Compatible with specific SICK safety switches (with and without a locking device)

- Door bolt unit:
  - MB1-Bx00: simple bolt unit with tongue padlock receptacle (1)
  - MB1-Bx10: bolt unit with catch release button (3) and mechanical lock with padlock receptacle (2)
  - MB1-Bx11: bolt unit with catch release button (3), mechanical lock with padlock receptacle (2), and escape release (4)

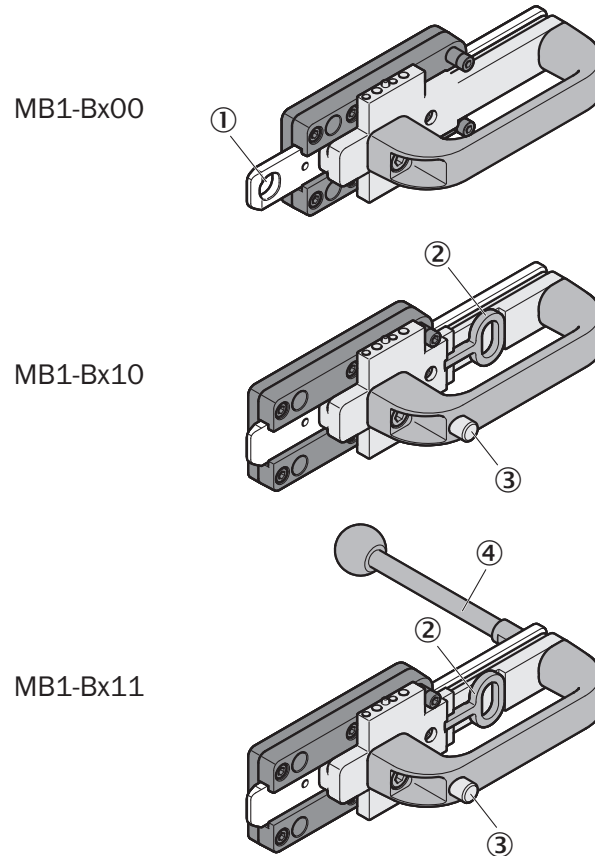


Figure 2: Overview of the variants of the bolt unit

- ① Tongue padlock receptacle
- ② Mechanical lock with padlock receptacle
- ③ Catch release button
- ④ Escape release

#### Further topics

- [see "Ordering information", page 25](#)

#### 3.2.3 Blocking option

If the movable physical guard is open, the door bolt unit can be blocked so that it cannot be closed. The movable physical guard can then no longer be closed. This ensures that people in the hazardous area cannot be locked in. Some variants of the bolt for safety switches do not have the blocking option.



### 3.2.4 Escape release

**DANGER**

If a safety locking device without an escape release is used, the escape release function is not available.

People who are locked inside the hazardous area will not be able to escape.

- Ensure that the safety locking device has an escape release.

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The escape release enables the movable physical guard to be opened from within the hazardous area.

### 3.2.5 Catch release button

In the case of variants with a catch release button, the sliding carriage of the door bolt unit is fixed in the open position. The catch release button must be pressed to move the sliding carriage.

## 4 Mounting

### 4.1 Mounting the actuator

#### MB1-BS

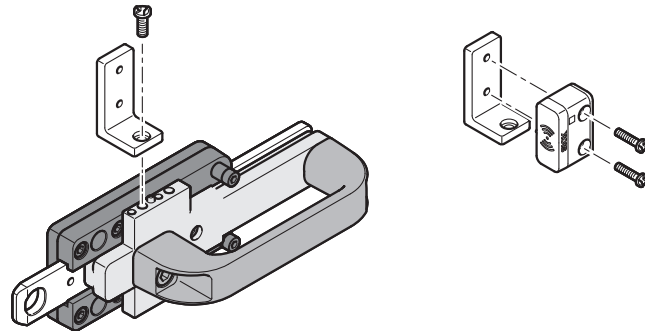


Figure 3: MB1-BS – Mounting the actuator

1. Mount the L adapter on the sliding carriage using a screw.
2. Mount the actuator on the L adapter using 2 screws.

#### MB1-BL

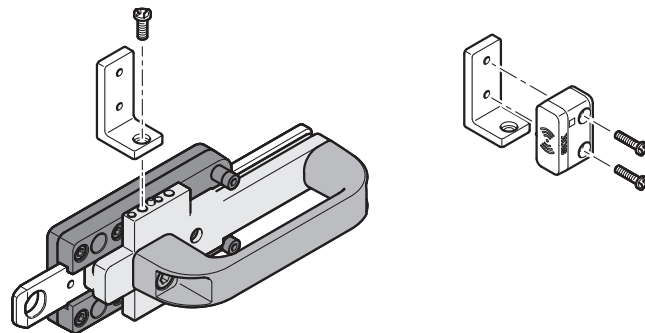


Figure 4: MB1-BL – Mounting the actuator for the safety switch

1. Mount the L adapter on the sliding carriage using a screw.
2. Mount the actuator on the L adapter using 2 screws.

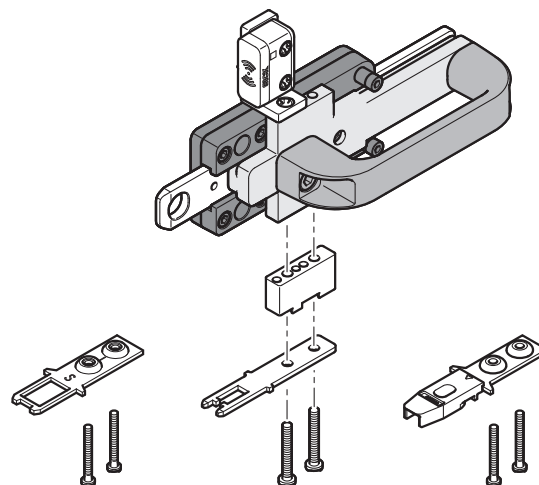


Figure 5: MB1-BL – Mounting the actuator for the safety locking device

3. Mount the adapter and the appropriate actuator using 2 screws.

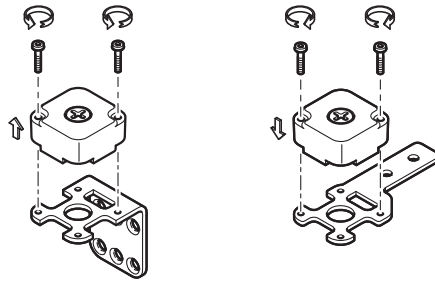
**MB1-BT**

Figure 6: MB1-BT – Mounting the actuator in advance

1. Remove the actuator.
2. Mount the actuator on the fixing plate.

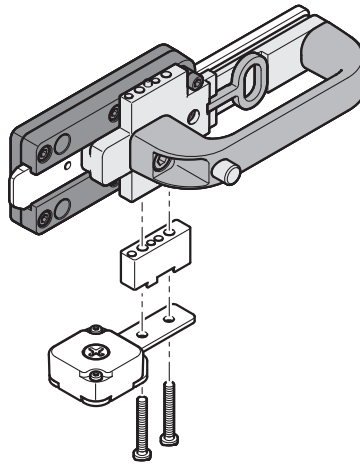


Figure 7: MB1-BT – Mounting the actuator

3. Mount the adapter and the actuator using 2 screws.

## 4.2 Mounting the door bolt unit

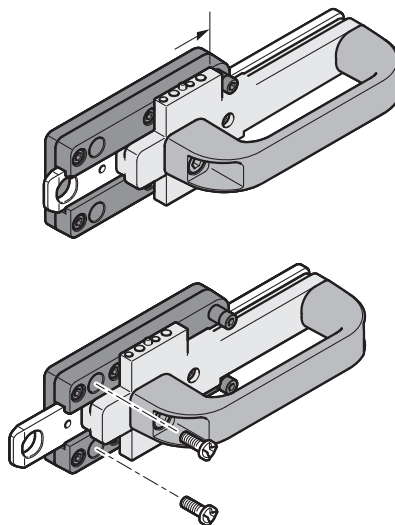


Figure 8: Mounting the door bolt unit

1. Open the bolt.
- ✓ This makes the holes in the base plate accessible.
2. Mount the bolt unit on the door using 2 screws.

### 4.3 Mounting the optional escape release

#### Prerequisites

- A slot is available for the escape release.

#### Approach

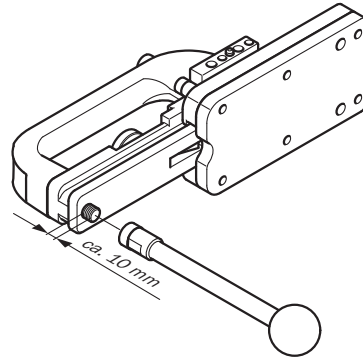


Figure 9: Mounting the optional escape release

1. Mount the escape release on the fixed screw. The fixed screw protrudes by around 10 mm.
2. We recommend securing the screw connection with locking varnish.
3. Check that the escape release is working correctly.

### 4.4 Mounting the frame plate

#### Overview

- The BS and BL frame plates are designed to be flush-mounted on both sides of 40-mm frames.
- The BT frame plate has two locating holes offset in pairs for door hinges on the right or left. This allows the frame plate (which is 45 mm wide) to be flush-mounted on a 40-mm frame.

#### Important information



#### CAUTION

Protruding components can cause injuries.

- Mount the frame plate in such a way that there is no risk of it causing an injury.

#### Prerequisites

- There should be no protruding components or sharp edges on the door side.
- Ensure that the gap between the door bolt unit and the frame plate corresponds with the dimensional drawing.

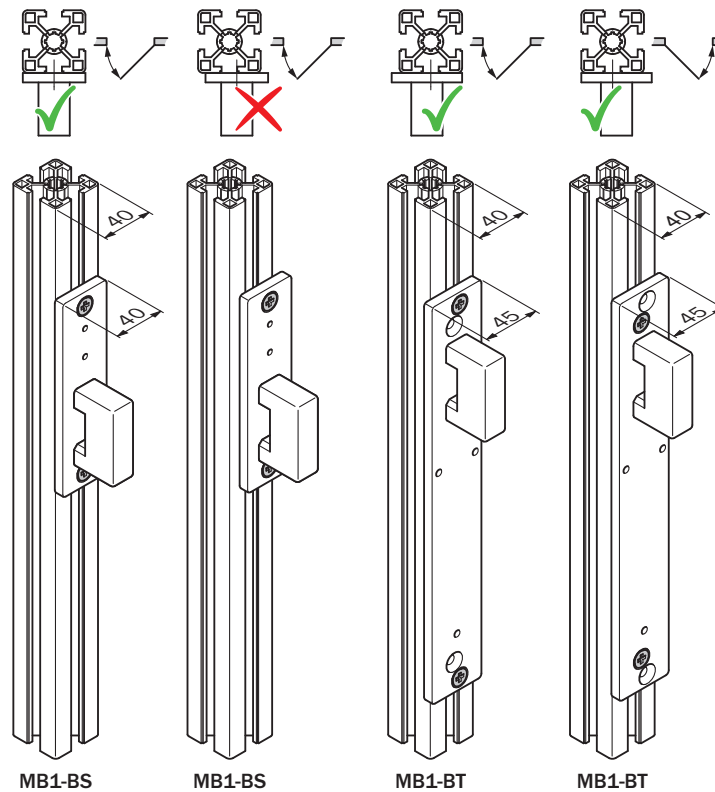
**Approach**

Figure 10: Mounting the frame plate

1. Mount the frame plate on the side of the frame using 2 M6 countersunk screws (not included with delivery).

**Further topics**

- ["Dimensional drawings", page 17](#)

## 4.5 Mounting the safety switch and/or safety locking device

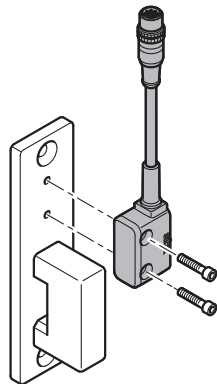
**MB1-BS**

Figure 11: Mounting the safety switch

1. Select a screw length that is suitable for the thickness of the frame plate and safety switch.
  - STR1: M4 x 18–20
  - RE1: M4 x 12–15

2. Mount the safety switch on the frame plate.

### MB1-BL

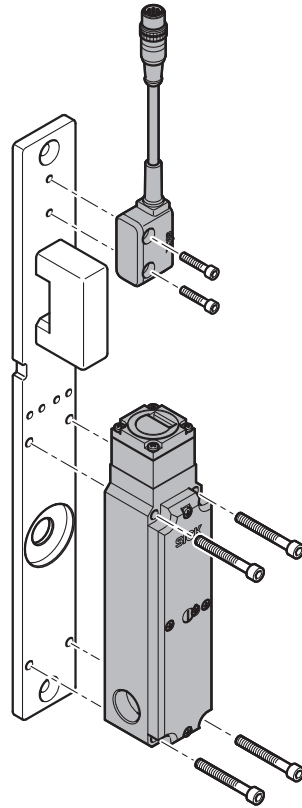


Figure 12: Mounting the safety switch and safety locking device

1. Select a screw length that is suitable for the thickness of the frame plate and safety switch or the frame plate and safety locking device.
  - STR1: M4 x 18–20
  - RE1: M4 x 12–15
  - i10, i110, TR110 Lock: M5 x 36–40
2. Mount the safety switch on the frame plate.
3. Mount the safety locking device on the frame plate.

## MB1-BT

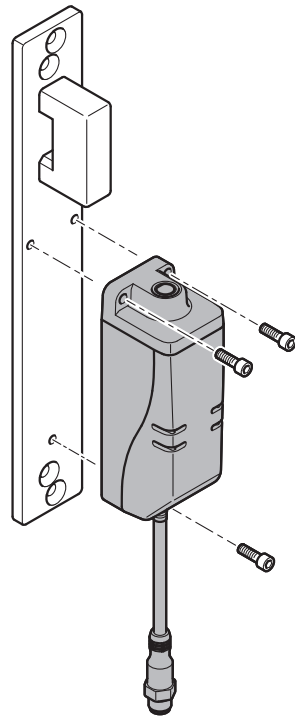


Figure 13: Mounting the safety locking device

1. Select a screw length that is suitable for the thickness of the frame plate and safety locking device.
  - TR10 Lock: M5 x 14–18
2. Mount the safety locking device on the frame plate.

## 4.6 Checking the mounting

To ensure that the bolt is functioning correctly after mounting, carry out the following checks.

1. When closing the bolt, check that it runs straight and does not hit the upper or lower edge of the keeper.
2. Check that the actuator of the electro-mechanical safety switch is straight when it moves into the locked position.
3. For variants with the escape release, check that the bolt can be opened using the escape release when the safety locking device is not locked.

## 5 Operation

### 5.1 Using the blocking option

If the movable physical guard is open, the door bolt unit can be blocked so that it cannot be closed. The movable physical guard can then no longer be closed. This ensures that people in the hazardous area cannot be locked in. Some variants of the bolt for safety switches do not have the blocking option.

#### Variant with tongue padlock receptacle

- ▶ Insert the padlock into the tongue padlock receptacle.
- ✓ The bolt can no longer be closed.

#### Variant with mechanical lock with padlock receptacle

1. Open the mechanical lock with padlock receptacle.
  2. Insert the padlock into the mechanical lock.
- ✓ The sliding carriage is fixed in the open position and the bolt can no longer be closed.

### 5.2 Actuating the escape release

#### Prerequisites

- If a safety locking device is installed, this must be unlocked first. It must be possible to unlock it from inside the hazardous area.

#### Approach

- ▶ Push the escape release toward the door hinge.
- ✓ The movable physical guard can now be opened.

### 5.3 Operating the catch release button

#### Approach

1. Press the catch release button and close the door bolt unit.
  2. Release the catch release button.
- ✓ The door bolt unit is in the closed state.

#### Complementary information

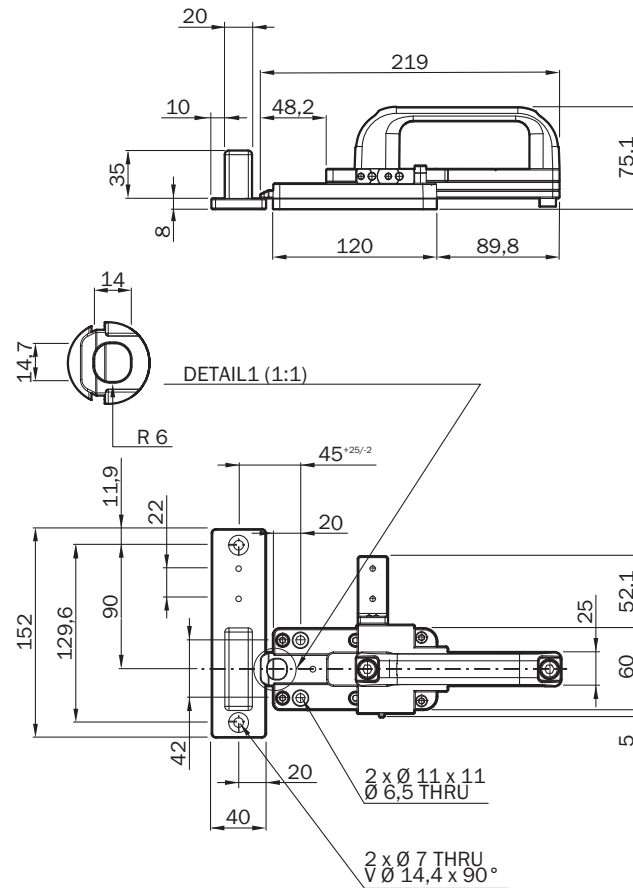
- You do not need to press the catch release button to open the door bolt unit.



## 6 Technical data

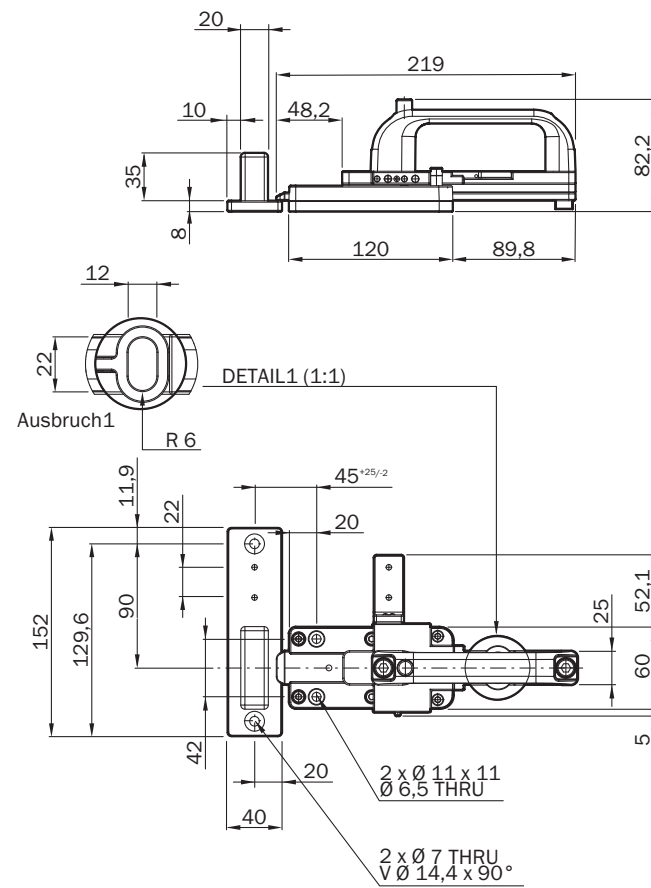
### 6.1 Dimensional drawings

#### MB1-BS00



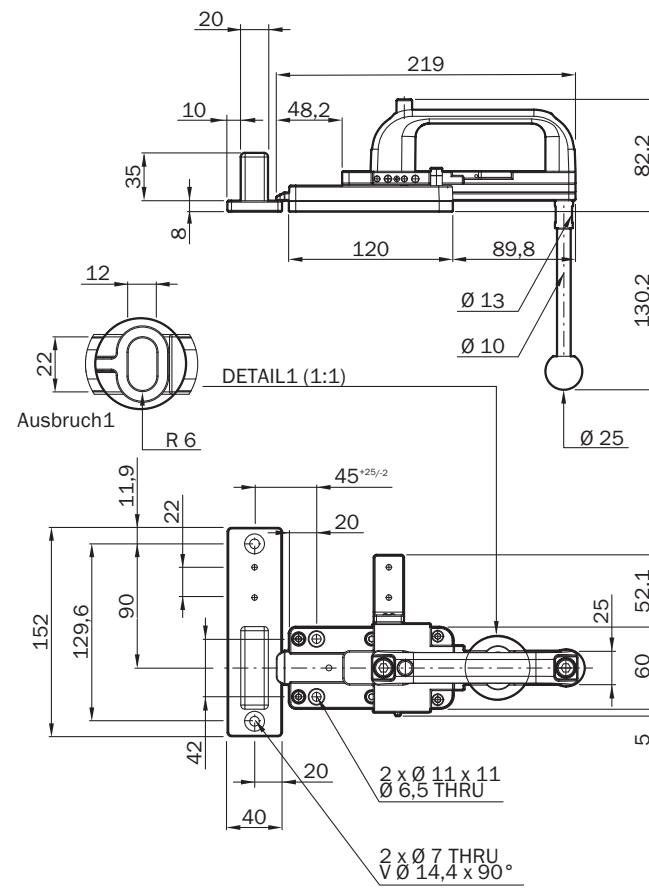
All dimensions in mm.

MB1-BS10



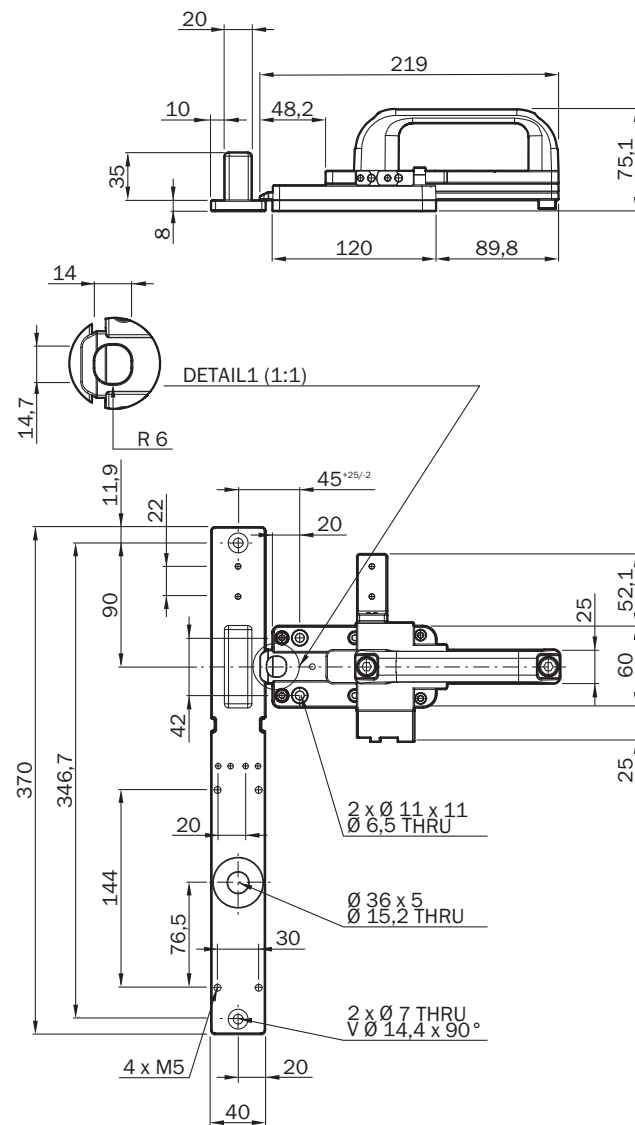
All dimensions in mm.

## MB1-BS11



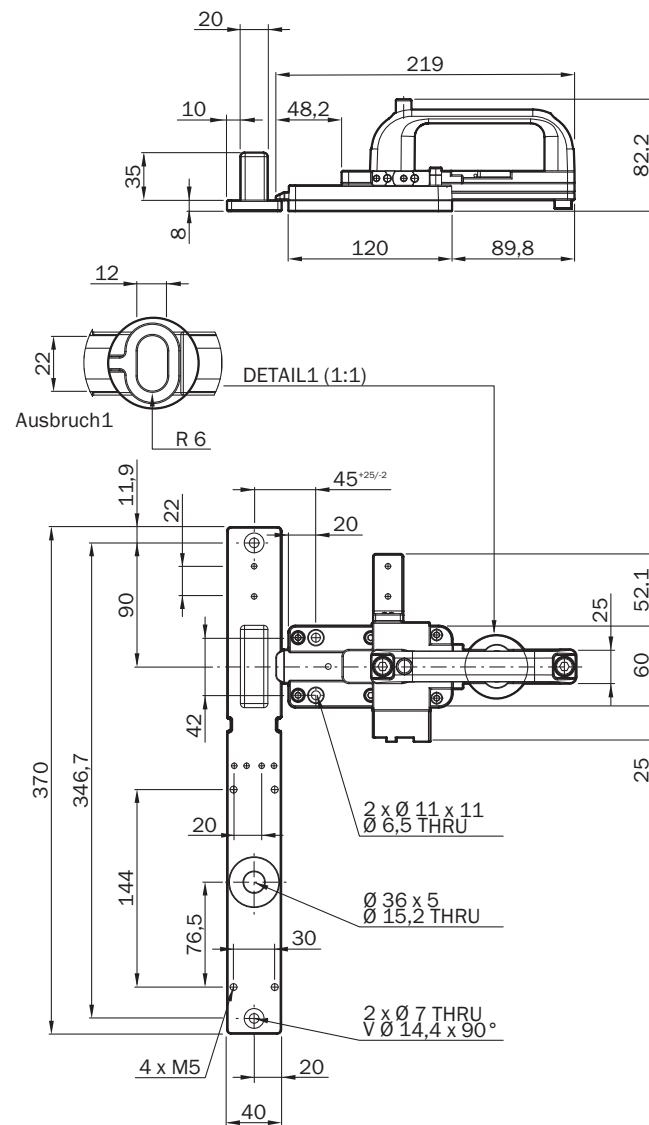
All dimensions in mm.

MB1-BL00



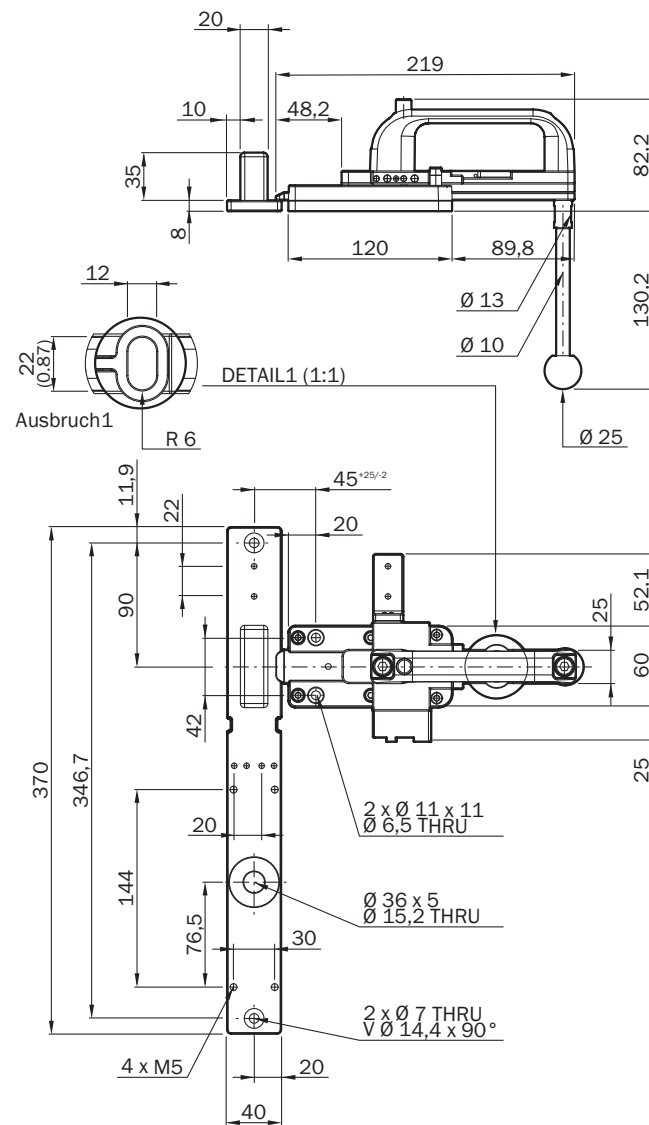
All dimensions in mm.

## MB1-BL10



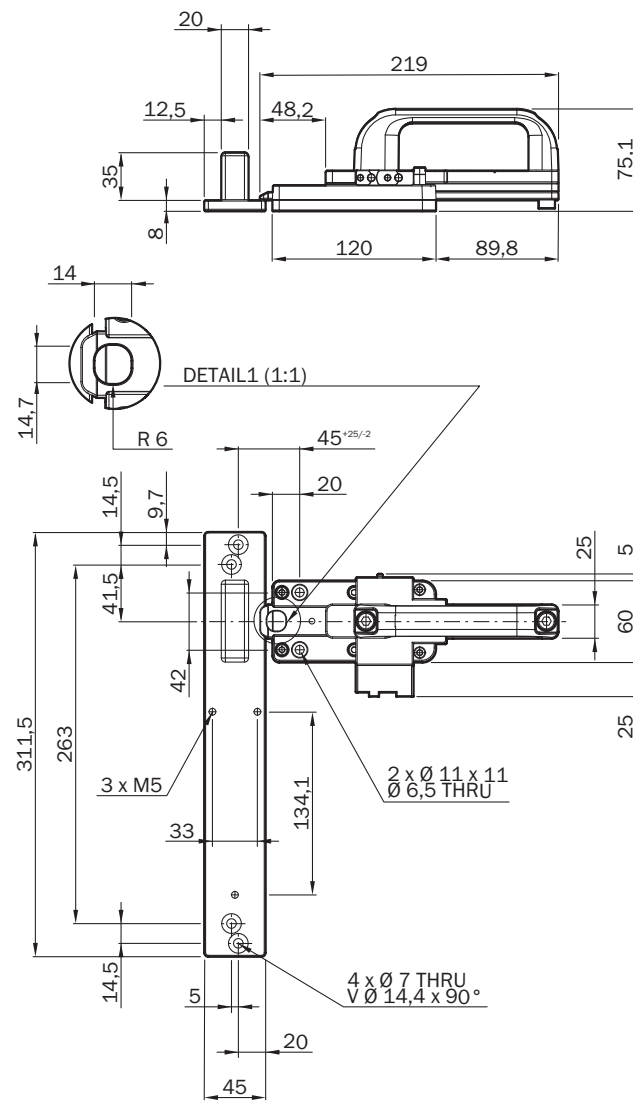
All dimensions in mm.

MB1-BL11



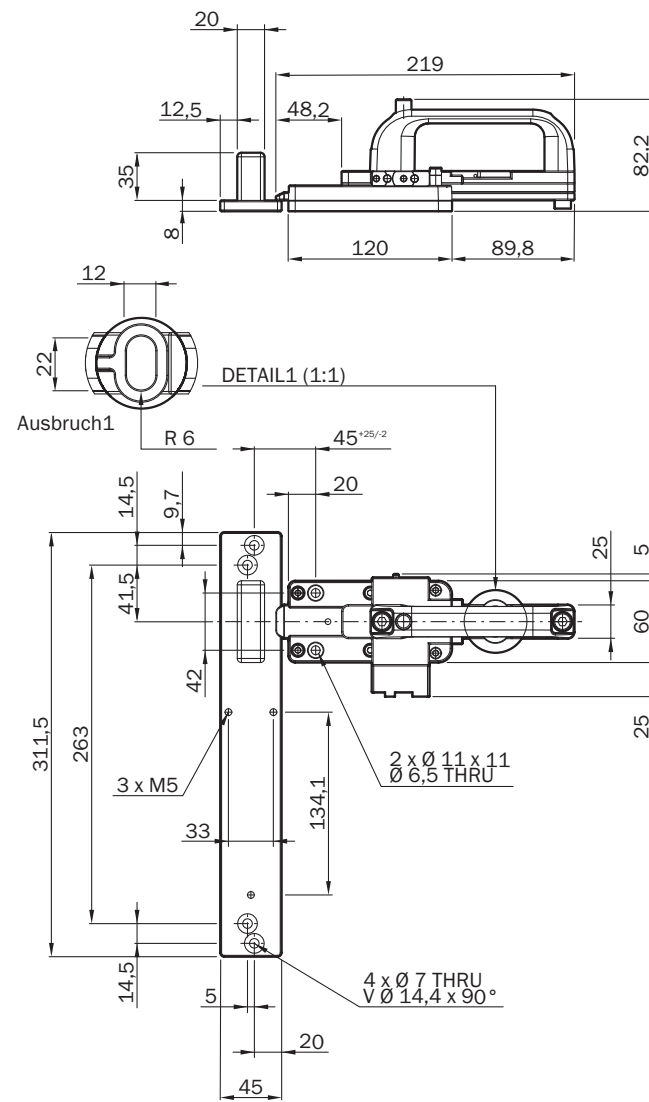
All dimensions in mm.

## MB1-BT00



All dimensions in mm.

MB1-BT10



All dimensions in mm.



## 7 Ordering information

### 7.1 Scope of delivery

Table 1: Scope of delivery, MB1

Component	Variants of the MB1		
	MB1-BS	MB1-BL	MB1-BT
L adapter for RE1 and STR1 actuators	1×	1×	–
Adapter for i10 Lock, i110 Lock, TR10 Lock, and TR110 Lock actuator	–	1×	1×
Fixing plate for TR10 Lock actuator	–	–	1×
16 x M5 one-way screws	1×	1×	–
35 x M4 one-way screws	–	2×	–
35 x M5 one-way screws	–	2×	2×
frame plate	1×		
bolt unit	1×		
Mounting instructions	1×		
Downloadable operating instructions:	<a href="http://www.sick.com">www.sick.com</a>		

### 7.2 Ordering information

Table 2: Ordering information

Suitable for safety switch	Part	Type code	Part number
STR1 or RE1	Simple door bolt unit with tongue padlock receptacle	MB1-BS00	1091286
	Door bolt unit with catch release button and mechanical lock with padlock receptacle	MB1-BS10	1091785
	Door bolt unit with catch release button, mechanical lock with padlock receptacle, and escape release	MB1-BS11	1091786
STR1 or RE1 and i10 Lock or i110 Lock or TR110 Lock or i12-SB	Simple door bolt unit with tongue padlock receptacle	MB1-BL00	1091788
	Door bolt unit with catch release button and mechanical lock with padlock receptacle	MB1-BL10	1091789
STR1 or RE1 and TR110 Lock or i12-SB	Door bolt unit with catch release button, mechanical lock with padlock receptacle, and escape release	MB1-BL11	1091790
TR10 Lock	Simple door bolt unit with tongue padlock receptacle	MB1-BT00	1091792
	Door bolt unit with catch release button and mechanical lock with padlock receptacle	MB1-BT10	1091793





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