

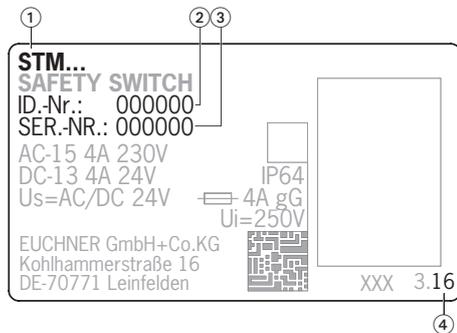
Scope

These operating instructions are valid for all STM.... These operating instructions, the document *Safety information* and any available data sheet form the complete user information for your device.

Important!

Make sure to use the operating instructions valid for your product version. The version numbers can be found on the type label of your product. Please contact the EUCHNER service team if you have any questions.

Safety switch type label



- ① Item designation
- ② Item number
- ③ Serial number
- ④ Year of manufacture

Supplementary documents

The overall documentation for this device consists of the following documents:

| Document title (document number) | Contents | |
|---|--|--|
| Safety information (2525460) | Basic safety information | |
| Operating instructions (2096302) | (this document) | |
| Declaration of conformity | Declaration of conformity | |
| Any additions to the operating instructions | Take any associated additions to the operating instructions or data sheets into account. | |

Important!

Always read all documents to gain a complete overview of safe installation, setup and use of the device. The documents can be downloaded from www.euchner.com. For this purpose, enter the doc. no. or the order number for the device in the search box.

Correct use

Safety switches series STM are interlocking devices with guard locking solenoid (type 2). The actuator has a low coding level. In combination with a movable guard and the machine control, this safety component prevents the guard from being opened while a dangerous machine function is being performed. This means:

- ▶ Starting commands that cause a dangerous machine function must become active only when the guard is closed and locked.
- ▶ Guard locking must not be released until the dangerous machine function has ended.
- ▶ Closing and locking a guard must not cause automatic starting of a dangerous machine function. A separate start command must be issued. For exceptions, refer to EN ISO 12100 or relevant C-standards.

Devices from this series are also suitable for process protection.

Before the device is used, a risk assessment must be performed on the machine, e.g. in accordance with the following standards:

- ▶ EN ISO 13849-1
- ▶ EN ISO 12100
- ▶ EN IEC 62061

Correct use includes observing the relevant requirements for installation and operation, particularly based on the following standards:

- ▶ EN ISO 13849-1
- ▶ EN ISO 14119
- ▶ EN IEC 60204-1

Important!

- ▶ The user is responsible for the proper integration of the device into a safe overall system. For this purpose, the overall system must be validated, e.g. in accordance with EN ISO 13849-1.
- ▶ If the simplified method according to section 6.2.3 of EN ISO 13849-1:2023 is used for determining the Performance Level (PL), the PL might be reduced if several devices are connected in series.
- ▶ The logical series connection of safe contacts may limit the achievable Performance Level (PL) in certain circumstances. More information about this is available in EN ISO 14119:2025, section 9.4.
- ▶ If a data sheet is included with the product, the information on the data sheet applies in case of discrepancies with the operating instructions.

Safety precautions

⚠ WARNING

Danger to life due to improper installation or due to bypassing (tampering). Safety components fulfill a personnel protection function.

- ▶ Safety components must not be bypassed, turned away, removed or otherwise rendered ineffective. On this topic pay attention in particular to the measures for reducing the possibility of bypassing according to EN ISO 14119:2025, section 8.
- ▶ The switching operation must be activated only by actuators designated for this purpose.
- ▶ Prevent bypassing by means of replacement actuators. For this purpose, restrict access to actuators and to keys for releases, for example.
- ▶ Mounting, electrical connection and setup only by authorized personnel possessing special knowledge about handling safety components.

⚠ CAUTION

Danger due to high housing temperature at ambient temperatures above 40 °C.

- ▶ Protect switch against touching by personnel or contact with flammable material.

Function

The safety switch permits the locking of movable guards.

In the switch head, there is a rotating cam that is blocked/released by the guard locking pin.

The guard locking pin is moved on the insertion/removal of the actuator and on the activation/release of the guard locking. During this process, the switching contacts are actuated.

If the cam is blocked (guard locking active), the actuator cannot be pulled out of the switch head. For design reasons, guard locking can be activated only when the guard is closed (prevention of inadvertent locking position (faulty closure protection)).

Position monitoring of the guard and monitoring of interlocking are performed via two separate switching elements (see Fig. 1).

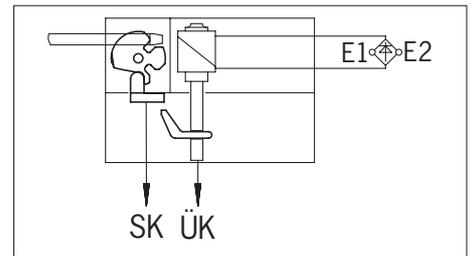


Fig. 1: Function of safety switch STM

The safety switch is designed so that fault exclusions for internal faults in accordance with EN ISO 13849-2:2013, Table A4, can be assumed.

Guard lock monitoring (ÜK)

All versions feature at least one safe contact for monitoring guard locking. The contacts are opened when guard locking is released.

Door monitoring contact (SK)

All versions additionally feature at least one door monitoring contact. Depending on the switching element, the door monitoring contacts can be either positively driven (contacts) or not positively driven.

The door monitoring contacts are actuated when the guard is opened.

Version STM1

(guard locking actuated by spring force and released by power-ON)

- ▶ Activating guard locking: close guard, disconnect voltage from the solenoid.
- ▶ Releasing guard locking: apply voltage to the solenoid.

The spring-operated guard locking functions in accordance with the closed-circuit current principle. If the voltage is interrupted at the solenoid, guard locking remains active and the guard cannot be opened directly.

If the guard is open when the power supply is interrupted and is then closed, guard locking is activated. This can lead to persons being locked in unintentionally.

Version STM2

(guard locking actuated by power-ON and released by spring force)

Important!

- ▶ Guard locking devices according to the open-circuit current principle are not intended for protecting personnel.
- ▶ Use as guard locking for personnel protection is possible only in special cases, after strict assessment of the accident risk (see EN ISO 14119:2025, section 6.6.1!)

- ▶ Activating guard locking: close guard, apply voltage to the solenoid
- ▶ Releasing guard locking: disconnect voltage from the solenoid.

The magnetically actuated guard locking operates in accordance with the open-circuit current principle. If the voltage is interrupted at the solenoid, the guard locking is released and the guard can be opened directly.

Switching states

The detailed switching states for your switch can be found in Fig. 4. All available switching elements are described there.

Guard open

STM1 and STM2:
The safety contacts \ominus and \boxplus are open.

Guard closed and not locked

STM1 and STM2:
The safety contacts \ominus are closed. The safety contacts \boxplus are open.

Guard closed and locked

STM1 and STM2:
The safety contacts \ominus and \boxplus are closed.

Selection of the actuator

NOTICE

- ▶ Damage to the device due to unsuitable actuator. Make sure to select the correct actuator (see table in Fig. 6).
- ▶ Additionally pay attention to the door radius and the mounting options (see Fig. 5).

The following versions are available:

- ▶ Actuator S-...-SN for safety switches without insertion funnel.
- ▶ Actuator S-...-LN for safety switches with insertion funnel.

Manual release

Some situations require guard locking to be released manually (e.g. malfunctions or an emergency). A function test should be performed after release.

Further information on this topic can be found in the standard EN ISO 14119:2025, section 7.2.3. The device can feature the following release functions:

Auxiliary release

In the event of malfunctions, the guard locking can be released with the auxiliary release irrespective of the state of the solenoid.

The contacts \boxplus are opened when the auxiliary release is actuated. A stop command must be generated with these contacts.

Actuating auxiliary release

1. Unscrew locking screw.
 2. Using a screwdriver, turn the auxiliary release to \odot in the direction of the arrow.
- ➔ Guard locking is released.

Important!

- ▶ The actuator must not be under tensile stress during manual release.
- ▶ To prevent tampering, the auxiliary release must be sealed (with sealing lacquer, for example) before the switch is set up.
- ▶ The locking screw must be screwed back in and sealed (with sealing lacquer, for example) after mounting and after every use of the auxiliary release. Tightening torque 0.5 Nm.

Auxiliary release with triangular wedge

Function as for auxiliary release.

Important!

- ▶ The actuator must not be under tensile stress during manual release.

Mounting

NOTICE

Device damage due to improper mounting and unsuitable ambient conditions.

- ▶ Safety switches and actuators must not be used as an end stop.
- ▶ Observe EN ISO 14119:2025, sections 6.2 and 6.3, for information about mounting the safety switch and the actuator.
- ▶ Observe EN ISO 14119:2025, section 8, for information about reducing the possibilities for bypassing an interlocking device.
- ▶ Protect the switch head against damage, as well as penetrating foreign objects such as swarf, sand and blasting shot, etc.
- ▶ The specified IP degree of protection is applicable only if the housing screws, cable entries and plug connectors are properly tightened. Observe the tightening torques.
- ▶ The locking screw of the auxiliary release must be sealed prior to setup (with sealing lacquer, for example).

Changing the actuating direction

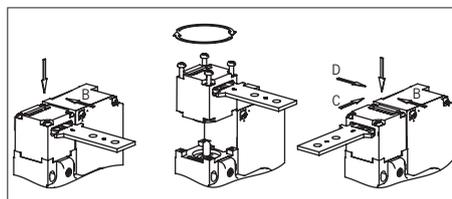


Fig. 2: Changing the actuating direction

1. Ensure a de-energized state.
 2. Insert the actuator into the actuating head.
 3. Remove the screws from the actuating head.
 4. Set the required direction.
 5. Tighten the screws with a torque of 0.6 Nm.
 6. Remove actuator.
- Only for STM1:
- 6a. Connect voltage to the solenoid and remove actuator.
- or
- 6b. ① Open cover.
 - ② Press armature down.
 - ③ Remove actuator.
7. Cover the unused actuating slot with the enclosed slot cover.

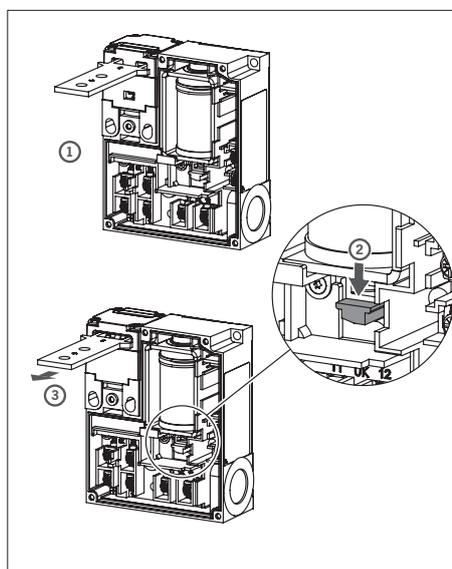


Fig. 3: Removing actuator

Electrical connection

⚠ WARNING

Loss of the safety function due to incorrect connection.

- ▶ Use only safe contacts (\ominus and \boxplus) for safety functions.
- ▶ When choosing the insulation material and wires for the connections, pay attention to the required temperature resistance and the max. mechanical load.
- ▶ Strip the insulation from the ends of the individual wires over a length of $6^{\pm 1}$ mm to ensure a safe contact.

Use of the safety switch as guard locking for personnel protection

At least one contact \boxplus must be used. It signals the guard locking state (for terminal assignment, see Fig. 4).

Use of the safety switch as guard locking for process protection

At least one contact \ominus must be used. Contacts with the \boxplus symbol can also be used (for terminal assignment, see Fig. 4).

The following information applies to devices with cable entry:

1. Use a suitable tool to open the desired insertion opening.
2. Fit the cable gland with the appropriate degree of protection.
3. Connect and tighten terminals with 0.5 Nm (for terminal assignment, see Fig. 4).
4. Check that the cable entry is sealed.
5. Close the switch cover and screw in place (tightening torque 0.5 Nm).

Function test

⚠ WARNING

Fatal injury due to faults during the function test.

- ▶ Before carrying out the function test, make sure that there are no persons in the danger area.
- ▶ Observe the valid accident prevention regulations.

Check the device for correct function after installation and after every fault.

Proceed as follows:

Mechanical function test

The actuator must slide easily into the actuating head. Close the guard several times to check the function. The function of any manual releases (except for the auxiliary release) must also be tested.

Electrical function test

1. Switch on operating voltage.
 2. Close all guards and activate guard locking.
 - ➔ The machine must not start automatically.
 - ➔ It must not be possible to open the guard.
 3. Start the machine function.
 - ➔ It must not be possible to release guard locking as long as the dangerous machine function is active.
 4. Stop the machine function and release guard locking.
 - ➔ The guard must remain locked until there is no longer any risk of injury (e.g. due to movements with overtravel).
 - ➔ It must not be possible to start the machine function as long as guard locking is released.
- Repeat steps 2 - 4 for each guard.

Inspection and service

⚠ WARNING

Danger of severe injuries due to the loss of the safety function.

- ▶ If damage or wear is found, the complete switch and actuator assembly must be replaced. Replacement of individual parts or assemblies is not permitted.
- ▶ Check the device for proper function at regular intervals and after every fault. For information about possible time intervals, refer to EN ISO 14119:2025, section 9.2.1.

Inspection of the following is necessary to ensure trouble-free long-term operation:

- ▶ Correct switching function
- ▶ Secure mounting of all components
- ▶ Damage, heavy contamination, dirt and wear
- ▶ Sealing of cable entry
- ▶ Loose cable connections or plug connectors.

Info: The year of manufacture can be seen in the bottom right corner of the type label.

Exclusion of liability and warranty

In case of failure to comply with the conditions for correct use stated above, or if the safety regulations are not followed, or if any servicing is not performed as required, liability will be excluded and the warranty void.

Notes about UL

This device shall be used with a suitable isolating source in conjunction with a fuse in accordance with UL248.

As per the requirements of UL ¹⁾, this fuse must be rated as follows:

- ▶ Max. 5 A at a secondary voltage between 0 V and 20 V DC (0 V - 28.3 V AC peak)
- ▶ Or the power in the secondary circuit must not exceed 100 VA at a secondary voltage of 20 V - 30 V DC (28.3 V - 42.4 V AC peak).

Please note the connection ratings for your device (refer to the technical data).

1) Note on the scope of the UL approval: the devices have been tested as per the requirements of UL508 and CSA/C22.2 no. 14 (protection against electric shock and fire).

Declaration of conformity

The product complies with the requirements according to

- ▶ Machinery Directive 2006/42/EC
- ▶ Machinery Regulation (EU) 2023/1230 (from January 20, 2027)

The EU declaration of conformity can be found at www.euchner.com. Enter the order number of your device in the search box. The document is available under *Downloads*.

Service

If servicing is required, please contact:

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Technical data

| Parameter | Value | |
|--|--|-----------------|
| Housing material | Reinforced thermoplastic | |
| Degree of protection | IP67 | |
| Mechanical life | 2 x 10 ⁶ operating cycles | |
| Ambient temperature | -20 ... +55 °C | |
| Degree of contamination | 3 (industrial) | |
| Installation position | Any | |
| Approach speed, max. | 20 m/min | |
| Extraction force (not locked) | 30 N | |
| Actuating force, max., at 20 °C | 35 N | |
| Actuation frequency | 1,200/h | |
| Switching principle | Slow-action switching contact | |
| Contact material | Silver alloy, gold flashed | |
| Connection | Cable entry M20 x 1.5 | |
| Conductor cross-section (flexible/rigid) | 0.34 ... 1.5 mm ² | |
| Rated insulation voltage | U _i = 250 V | |
| Rated impulse withstand voltage | U _{imp} = 2.5 kV | |
| Conditional short-circuit current | 100 A | |
| Switching voltage, min., at 10 mA | 12 V | |
| Utilization category | AC-15 4 A 230 V / DC-13 4 A 24 V | |
| Switching current, min., at 24 V | 1 mA | |
| Short circuit protection (control circuit fuse) | 4 A gG | |
| Convent. thermal current I _{th} | 4 A | |
| Solenoid operating voltage/ solenoid power consumption | AC/DC 24 V (+10%/-15%) 6 W AC 230 V (+10%/-15%) 6 W | |
| Duty cycle | 100% | |
| Locking force | F _{max} | F _{zh} |
| STM.N | | |
| - ACTUATOR S-..., HINGED ACTUATOR S-... | 1,000 N | 700 N |
| STM.A | | |
| - ACTUATOR S-G-..., HINGED ACTUATOR S-..., ACTUATOR S-WQ-... | 2,000 N | 1,500 N |
| - ACTUATOR S-W-... | 1,500 N | 1,100 N |
| - ACTUATOR S-WT-..., ACTUATOR S-WQT-... | 1,000 N | 700 N |
| Characteristics acc. to EN ISO 13849-1 | | |
| Monitoring of guard locking and the guard position | | |
| B _{10D} at DC-13 100 mA/24 V | 2 x 10 ⁶ | |

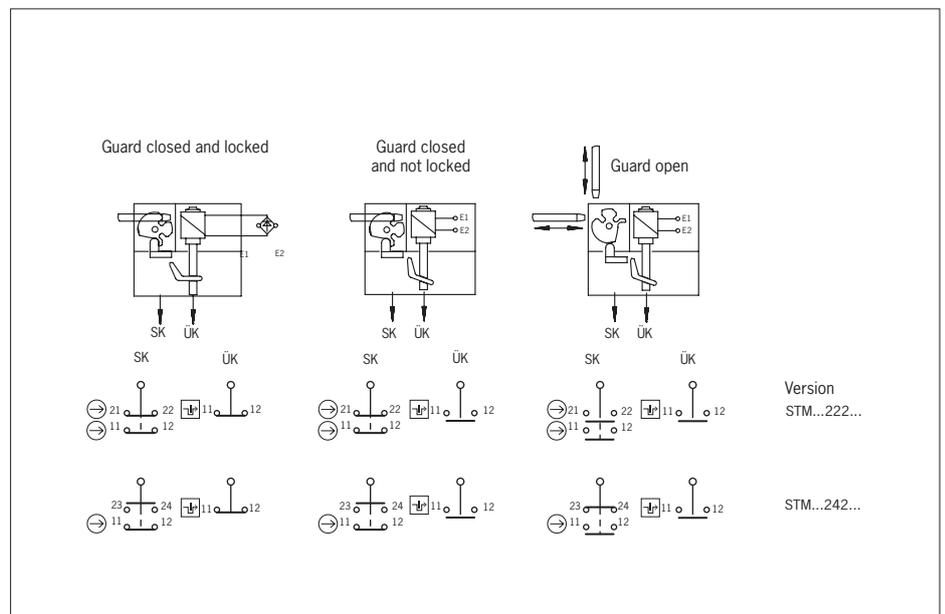


Fig. 4: Switching elements and switching functions

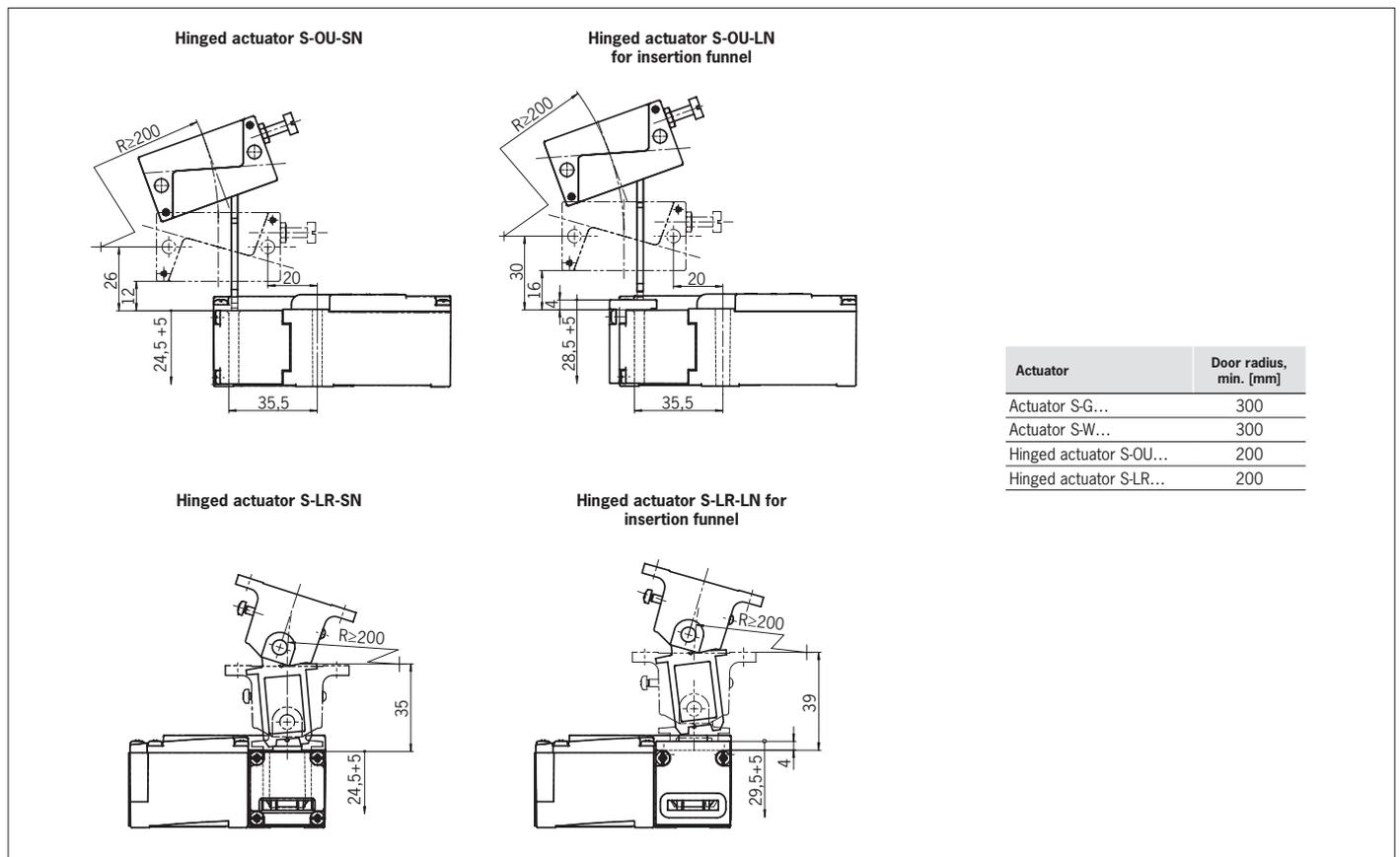


Fig. 5: Minimum door radii

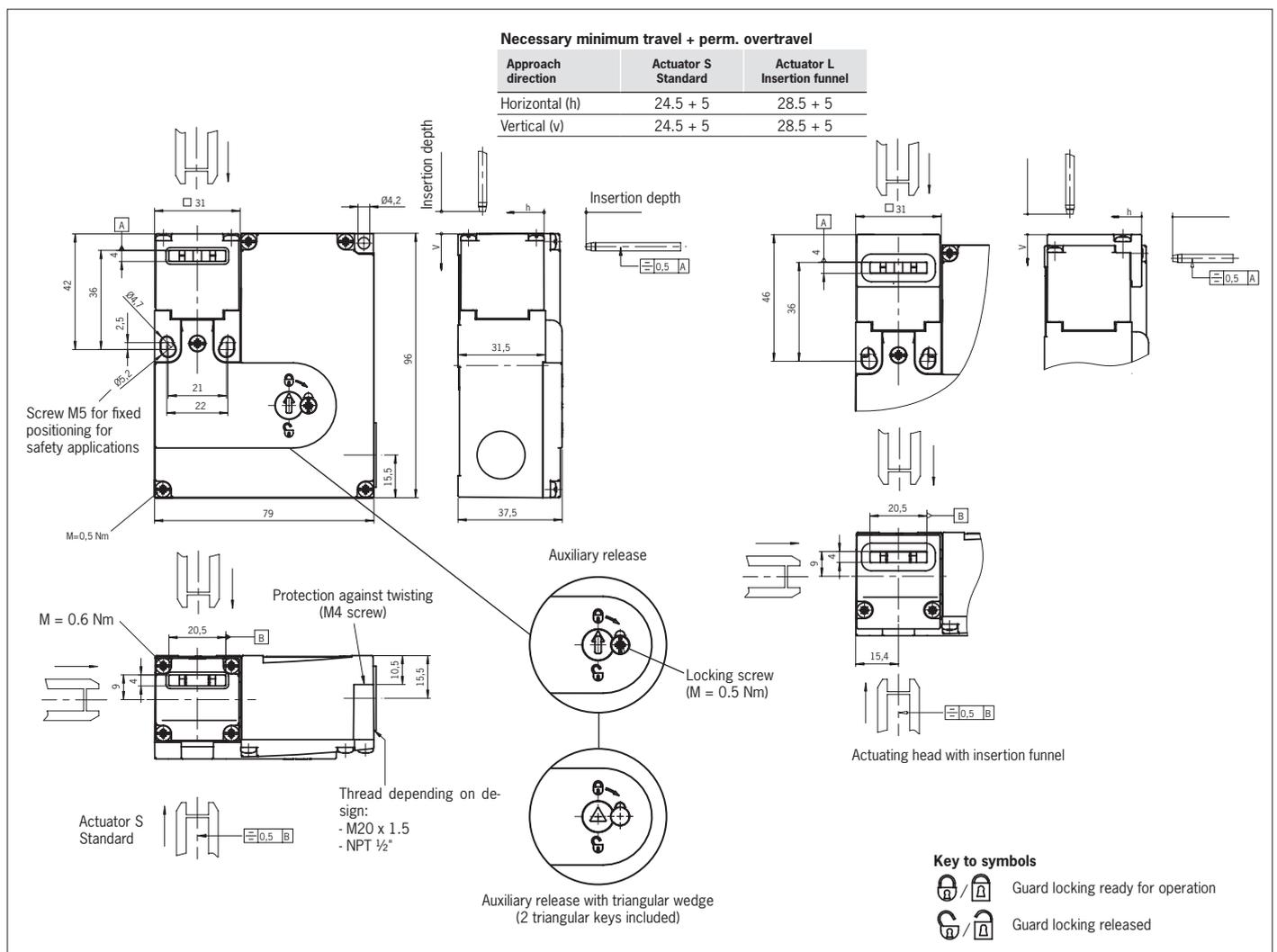


Fig. 6: Dimension drawing for STM... without insertion funnel and STM... with insertion funnel