OPERATING INSTRUCTIONS

# i110H

## Safety Hinge Switch

SICK
Sensor Intelligence.

### Described product

i110H

### Manufacturer

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### Original document

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# Contents


1 Scope ..... 4

2 On safety ..... 5

2.1 Qualified safety personnel ..... 5

2.2 Applications of the safety switch ..... 5

2.3 Correct use ..... 5

2.4 General protective notes and protective measures ..... 6

3 Mounting ..... 7

3.1 Adjusting the switching angle ..... 8

3.2 Protection against surroundings ..... 8

4 Electrical installation ..... 9

5 Commissioning ..... 10

5.1 Tests before the first commissioning ..... 10

5.2 Periodic technical inspections ..... 10

6 Disposal ..... 11

7 Technical data ..... 12

7.1 General specifications ..... 12

7.2 Dimensional drawings ..... 13

8 Annex ..... 16

8.1 Conformities and certificates ..... 16

# 1 Scope

These operating instructions are applicable to the i110H safety hinge switch.

These operating instructions are original operating instructions.

# 2 On safety

This chapter deals with your own safety and the safety of the equipment operators.

▶ Please read this chapter carefully before working with the i110H or with machines protected by the i110H.

The national/international rules and regulations apply to the installation, commissioning, use and periodic technical inspections of the safety switches, in particular

- the Machinery Directive,
- the Low Voltage Directive,
- the Work Equipment Directive,
- the safety regulations as well as
- the work safety regulations/safety rules.

Manufacturers and operators of the machine on which the protective devices are used are responsible for obtaining and observing all applicable safety regulations and rules.

## 2.1 Qualified safety personnel

Only qualified safety personnel are authorised to mount, install and commission the safety switch i110H. Qualified safety personnel are defined as persons who

- have undergone the appropriate technical training

and

- have been instructed by the responsible machine owner in the operation of the machine and the current valid safety guidelines

and

- who have access to these operating instructions.

## 2.2 Applications of the safety switch

Safety switches of the i110H series are electromechanical safety interlocks.

They are fitted at the hinge point of swivelling guard doors and secure movable safety guards so that

- the dangerous state of the machine can only be enabled when the safety guard is closed,
- a STOP signal is generated when the safety guard opens while the machine is operating.

For the control system this means that

- activation commands leading to dangerous states are allowed to become effective only when the safety guard is in the protective position and dangerous states must no longer exist when the safety guard opens.

Before installation of safety switches a risk assessment should be performed.

## 2.3 Correct use

The i110H safety switch must be used only as defined in section 2.2 “Applications of the safety switches”.The safety switch must be used only on the machine where it has been mounted, installed and initialized by qualified safety personnel in accordance with these operating instructions.

All warranty claims against SICK AG are forfeited in the case of any other use, or alterations being made to the safety switch, even as part of its mounting or installation.

Correct use includes the regular inspection of the protective device by qualified safety personnel in accordance with section 5.2.

## 2.4 General protective notes and protective measures

Safety switches serve the purpose of protecting individuals. Tampering or incorrect installation may result in severe personal injury.

**WARNING**
Do not override safety switches (by bridging contacts), turn them from their protective position, remove them or defeat them in any other way.

# 3 Mounting

**WARNING**
Mounting is only allowed to be performed by qualified safety personnel.

▶ Pay attention to EN ISO 14119 on mounting the safety switch.

Mount the safety switch such that

- It is difficult for operators to access.
- it can be inspected and replaced.

**NOTICE**
The safety switch and cams must be adequately secured against movement and correctly keyed to each other.

To satisfy this requirement

- the mounting method must be secure and require a tool for removal,

1. Remove cover,
2. Mount safety switch with 2 screws M4 and tighten to 5.0 Nm,

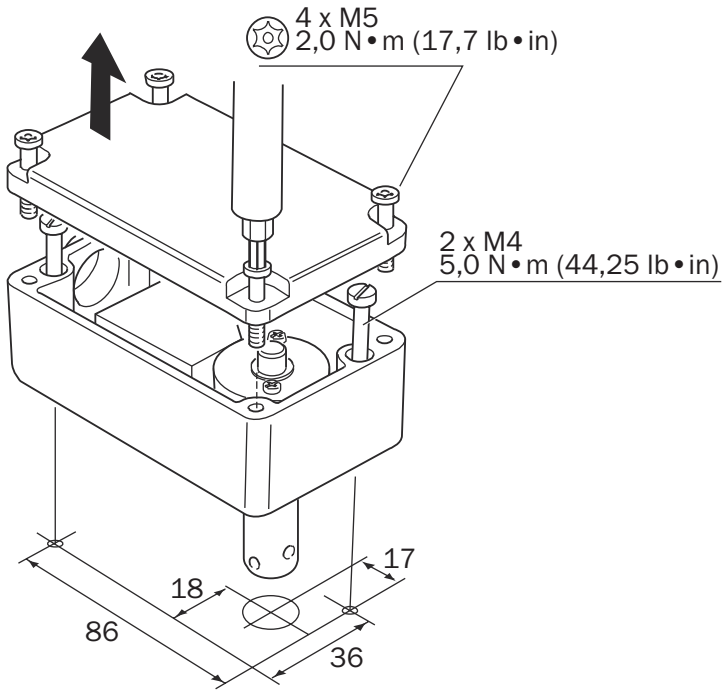



*Figure 1: Mounting*

3. Secure cam and hinge pin with a key (to ensure the actuator connection)

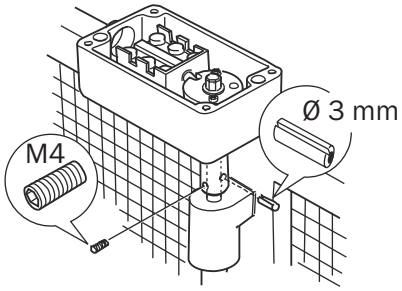



*Figure 2: ensure the actuator connection*

## 3.1 Adjusting the switching angle

1. Undo fixing screws on the cam.
2. Adjust cam for switching angle of 5° to 11° and pin cam after checking operation to EN 294 (to ensure the actuator connection),

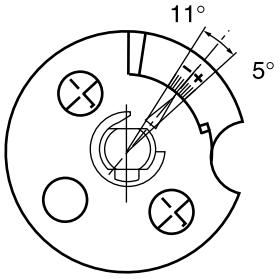



*Figure 3: Adjusting the switching angle*

3. Make hole for locking pin Ø 3 mm, 12 mm deep,
4. Fit locking pin.

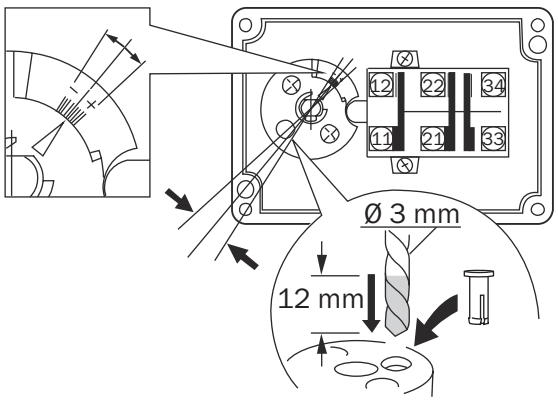



*Figure 4: Fit locking pin*

## 3.2 Protection against surroundings

A precondition for a durable and perfect safety function is the protection of the actuating head against penetration by foreign matter such as shavings, sand, abrasive materials etc.

Cover the control slot, the actuator and the type label when painting.

# 4 Electrical installation

**WARNING**
The electrical connection is only allowed to be made by qualified safety personnel.

1. Install cable connector M20 with the required IP protection.
2. Connection diagram, see figure 5, page 9.
3. Operate all contact pairs within the same voltage range.
4. Connect all live parts on one side of the contact block.

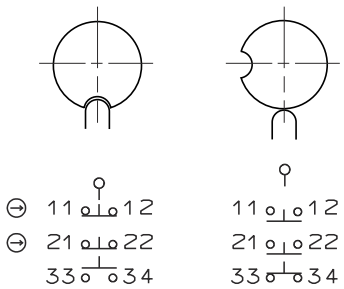



*Figure 5: Switching elements and switch functions*

5. Tighten clamping screws to 1.0 Nm.
6. Check sealing at conduit entry.
7. Close switch lid and tighten screws.

# 5 Commissioning

## 5.1 Tests before the first commissioning

- Mechanical function test

▶ Open and close safety guard to check that it is moving smoothly.

- Electrical function test

▶ Close safety guard.
▶ Turn on machine.

**WARNING**
Check whether opening the safety guard stops the machine.

▶ Turn off machine.
▶ Open safety guard.

**WARNING**
Machine must not start while safety guard is open!

## 5.2 Periodic technical inspections

To ensure correct function over the long term, regular checks are necessary.

Daily or prior to the start of the shift the operator must check for:

- correct function
- no visible evidence of tampering

Regularly according to the machine maintenance schedule by qualified safety personnel:

- correct switching function
- safe mounting of the modules
- deposits and wear and tear
- correct sealing of the cable entry or plug connection
- loose cable connections or plug connectors

**DANGER**
The entire switch and actuator must be replaced in the case of damage or wear and tear. It is not permitted to exchange individual components or modules!

Safety switches must be completely replaced after 1 million switching operations.

# 6 Disposal



Always dispose of serviceableness devices in compliance with local/ national rules and regulations with respect to waste disposal.

# 7 Technical data

## 7.1 General specifications

| | |
|---|---|
| **Housing material** | Die-cast light alloy |
| **Shaft material** | Stainless steel |
| **Environmental protection to IEC 60529** | IP66 |
| **Mechanical service life** | 1 × $10^6$ switching operations |
| **$B_{10D}$ (EN ISO 13849-1)** | 2 × $10^6$ switching operations with low load |
| **Type** | Type 1 (EN ISO 14119) |
| **Actuator coding level** | Uncoded (EN ISO 14119) |
| **Ambient temperature (operation)** | –25 ... +80 °C |
| **Connection type** | 1 × M20 |
| **Frequency of use (maximum)** | 3600/h |
| **Min. actuation torque** | 0,12 Nm |
| **Switching angle** | 5° ... 11° adjustable |
| **Contact elements positively guided NC contacts/NO contacts** | 2/1 |
| **Max. surge voltage $U_{imp}$** | 2500 V |
| **Rated insulation voltage $U_i$** | 250 V |
| **Utilisation category to IEC 60947-5-1** | AC-15: 240 V/3 A<br>DC-13: 24 V/2 A |
| **Switching voltage (minimum)** | DC 5 V |
| **Switching current (minimum) at 5 V DC** | 5 mA |
| **Wire cross-section** | 1 × 1,5 $mm^2$ |
| **Short-circuit protection (control circuit fuse EN 60269)** | T6 |
| **Breakaway torque for screws** | |
| **Mounting screws housing**<br>**Cover screws**<br>**Jam screws contacts** | 5,0 Nm<br>2,0 Nm<br>1,0 Nm |

## 7.2 Dimensional drawings

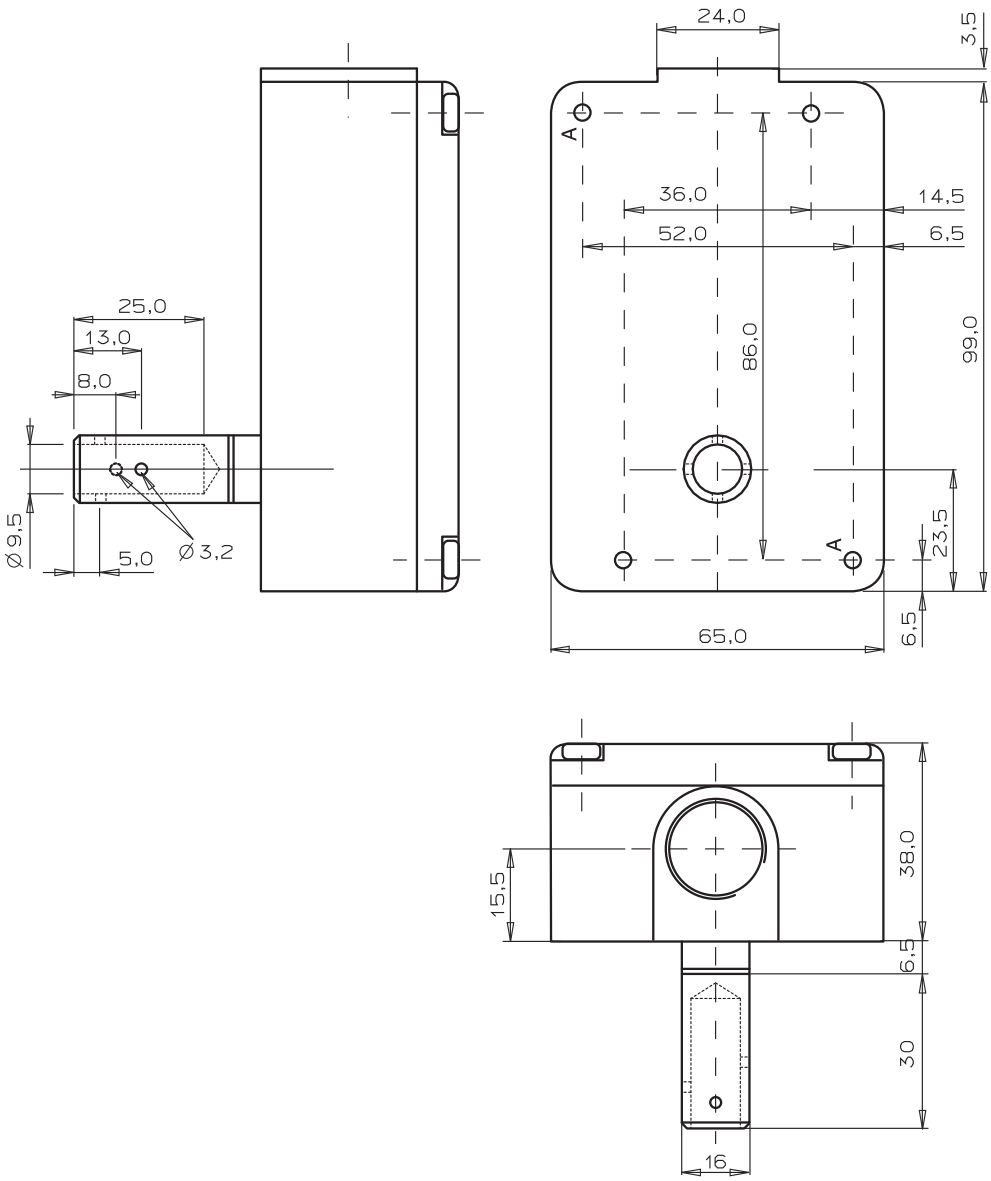



*Figure 6: Dimensional drawing i110H*

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# 8 Annex

## 8.1 Conformities and certificates

You can obtain declarations of conformity, certificates and the current documentation for the product at www.sick.com. To do so, enter the product part number in the search field (part number: see the entry in the “P/N” or “Ident. no.” field on the type label).

### 8.1.1 EU declaration of conformity

**Excerpt**

The undersigned, representing the manufacturer, herewith declares that the product is in conformity with the provisions of the following EU directive(s) (including all applicable amendments), and that the standards and/or technical specifications stated in the EU declaration of conformity have been used as a basis for this.

- ROHS DIRECTIVE 2011/65/EU
- LV DIRECTIVE 2014/35/EU
- MACHINERY DIRECTIVE 2006/42/EC

### 8.1.2 UK declaration of conformity

**Excerpt**

The undersigned, representing the following manufacturer herewith declares that this declaration of conformity is issued under the sole responsibility of the manufacturer. The product of this declaration is in conformity with the provisions of the following relevant UK Statutory Instruments (including all applicable amendments), and the respective standards and/or technical specifications have been used as a basis.

- Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012
- Electrical Equipment (Safety) Regulations 2016
- Supply of Machinery (Safety) Regulations 2008