

i110P, i110R

Safety position switch



Described product

i110P, i110R

Manufacturer

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Original document

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1 Scope

These operating instructions are applicable to the i110R and i110P safety position switches.

These operating instructions are original operating instructions.

2 On safety

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

- These operating instructions are applicable to the i110R and i110P safety position switches.

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 position switch i110R/i110P. 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 switches

Safety position switches of type series i110R/i110P are position switches with forced opening that are activated by roller levers (R) or roller tappets (P). They meet the requirements according to EN 60947-5-1.

- the dangerous state of the machine can only be switched on when the guard is closed,
- a STOP command is triggered if the protective device is opened while the machine is operating.

For the control this means that

- activation commands that cause dangerous conditions, may only become active when the guard is in the protective position and the dangerous conditions have been terminated before the protective position is cancelled.

Prior to the use of safety switches, a risk assessment must be performed on the machine.

2.3 Correct use

Safety position switch i110R/i110P must only be applied as defined in section 2.2 "Applications of the safety position switch". The safety position switch must only be used on the machine where it has been fitted, installed and by qualified safety personnel and in compliance with these operating instructions.

If the device is used for any other purposes or modified in any way – also during mounting and installation – any warranty claim against SICK AG shall become void.

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



WARNING

Do not override safety position 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 position switch such that

- It is difficult to access by operating personnel when the protective equipment is open.
- it can be inspected and replaced.

**WARNING**

Do not use the safety position switch as a mechanical stop.

**WARNING**

The safety position switch must be adequately secured against movement.

In order to meet these requirements,

- the mounting components must be reliable and require a tool to be released,
 - the use of elongated holes must be restricted to the initial settings,
 - the roller lever must be mounted on the motor shaft with a positive fit.
- ▶ Assemble safety switch with 2 bolts M4 and tighten screws at 2.5–3 Nm.
 - ▶ Take note of the data in the switch-path diagram when mounting the radial cam.

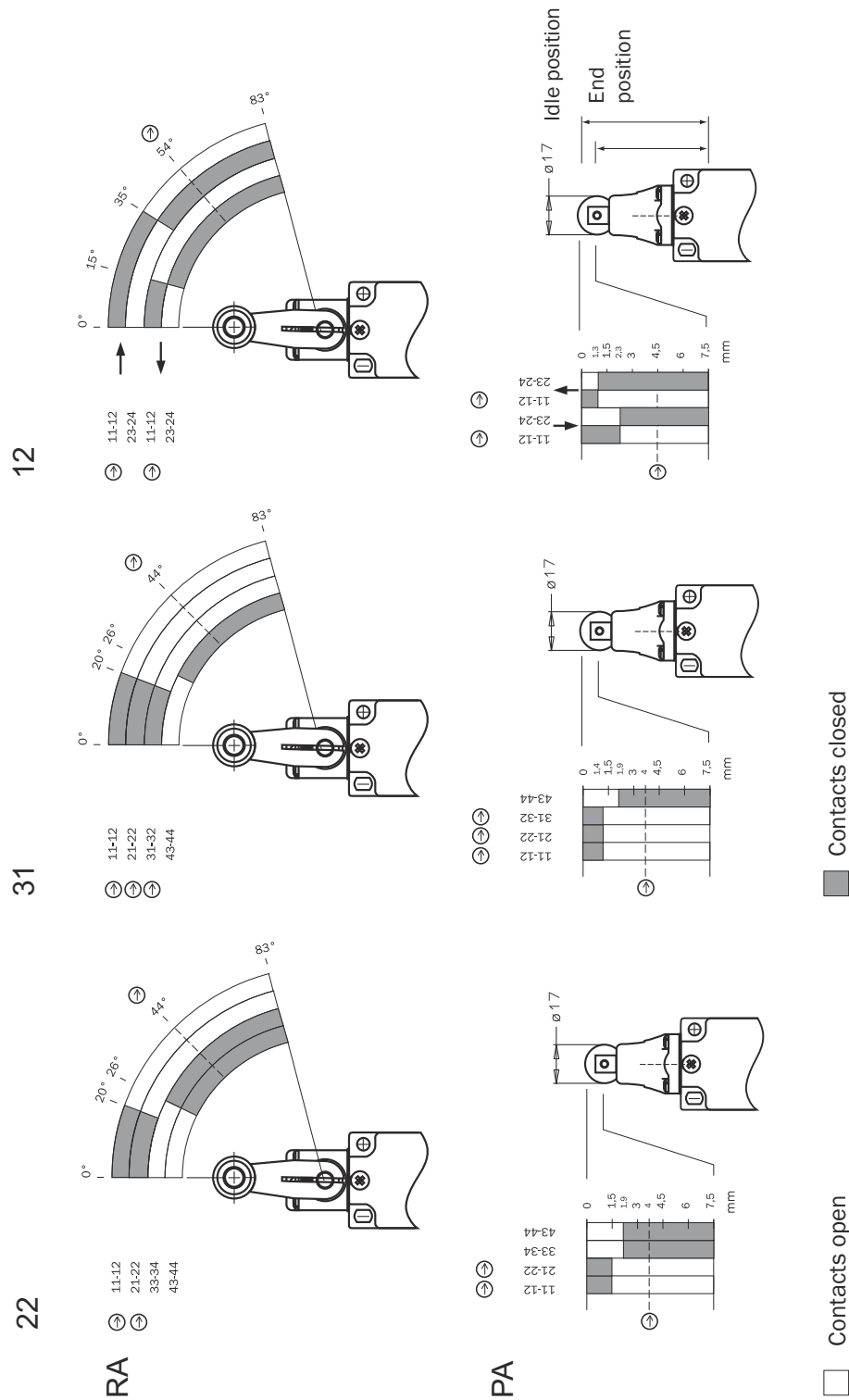


Figure 1: Switching position diagram (RA = roller lever, PA = roller tappet)

3.1 Change actuator entry direction

1. Undo screws on actuating head.
2. Set direction required ($4 \times 90^\circ$).
3. Tighten screws to 1.2 Nm.

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



DANGER

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

- ▶ Install cable connector M20 with the required IP protection.
- ▶ Connection [see figure 2](#)
- ▶ Operate all contact pairs within the same voltage range.
- ▶ Connect all live parts on one side of the contact block.
- ▶ Tighten clamping screws to 0.9 ... 1.0 Nm.
- ▶ Check sealing at conduit entry.
- ▶ Close switch lid and tighten screws.



5 Commissioning

5.1 Tests before the first commissioning

- Mechanical function test
- ▶ Test the movement of the roller lever/roller tappet for smoothness of operation.
- Electrical function test
- ▶ Actuate the roller lever/roller tappet and test the switching function.
- Electrical performance test in safety switching circuits.
- ▶ 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 specifications

7.1 General system data

Housing material housing	Zinc diecasting
Housing material roller plunger roller	Metal
Housing material pivoting lever roller	Plastic
Enclosure rating (IEC 60529)	IP66
Mechanical life	10 × 10 ⁶ switching operations
B1 _{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)
Operating temperature	–25 ... +80 °C
Starting speed min.	0.1 m/min.
Starting speed max.	15 m/min
Type of connection	1 × M20
Switching principle	Contact element (PA31/PA22/RA31/RA22) Snap contact element (PA12/RA12)
Contact elements positively guided NC contacts/NO contacts	3/1 (PA31, RA31), 2/2 (PA22, RA22), 1/1 (PA12, RA12)
Rated impulse withstand voltage U _{imp} contacts referred to housing	2500 V
Rated insulation voltage U _i	250 V
Usage category (IEC 60947-5-1)	AC-15: 240 V/3 A DC-13: 24 V/3 A
Switching voltage min.	5 V DC
Switching current min. at 5 V DC	5 mA
Short-circuit protection	F 15/15 A
Frequency of use (maximum)	6000/h
Connection cross-section	0.75 mm ² ... 2.5 mm ²
Actuation force for i110P	11 N
Actuation torque for i110R	34 Ncm
Torque requirements for screws	
Mounting screws housing	3.0 Nm
Cover screws	1.6 Nm
Jam screws contacts	1.0 Nm
Head screws	1.2 Nm

7.2 Dimensional drawings

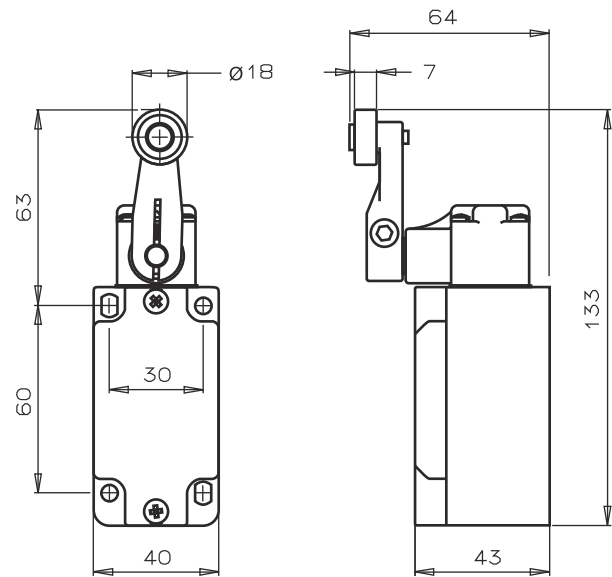


Figure 3: Dimensional drawing i110-R

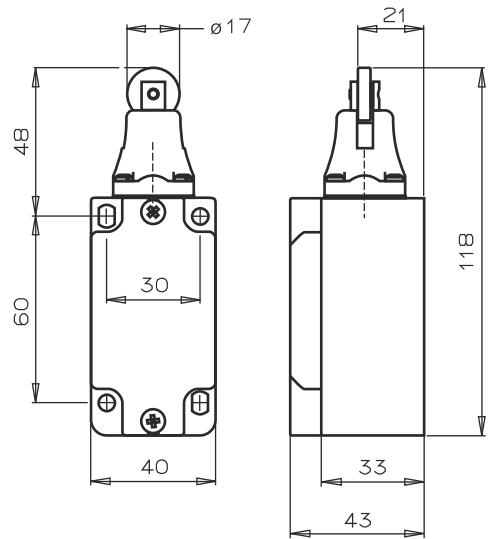


Figure 4: Dimensional drawing i110-P

8 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 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

8.2 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

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