# Assembly and Operating Manual
# MMS 22-PI2 / MMSK 22-PI2
## Magnetic switch

Translation of Original Operating Manual

Hand in hand for tomorrow

# Imprint



**Technical changes:**
We reserve the right to make alterations for the purpose of technical improvement.

**Document number:** 1566687

**Version:** 02.00 | 18/08/2025 | en

Dear Customer,

Thank you for trusting our products and our family-owned company, the leading technology supplier of robots and production machines.

Our team is always available to answer any questions on this product and other solutions. Ask us questions and challenge us. We will find a solution!

Best regards,

Your SCHUNK team

Customer Management
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cmg@de.schunk.com

**Please read the operating manual in full and keep it close to the product.**

# 1 General

## 1.1 About this manual

This manual contains important information for a safe and appropriate use of the product.

This manual is an integral part of the product and must be kept accessible for the personnel at all times.

Before starting work, the personnel must have read and understood this operating manual. Prerequisite for safe working is the observance of all safety instructions in this manual.

### 1.1.1 Presentation of Warning Labels

To make risks clear, the following signal words and symbols are used for safety notes.

***NOTICE***

**Material damage!**

Information about avoiding material damage.

### 1.1.2 Applicable documents

- General terms of business *
- Catalog data sheet of the purchased product *
- Assembly- and Operating Manual of the SCHUNK-module, on which the sensor is mounted *

The documents labeled with an asterisk (*) can be downloaded from **schunk.com/downloads**.

### 1.1.3 Variants

This operating manual applies to the following variations:

- MMS 22-PI2 / MMSK 22-PI2
- MMS 22-PI2 / MMSK 22-PI2 -SA, with lateral cable outlet
- MMS 22-PI2 / MMSK 22-PI2 -HD, with stainless steel housing

## 1.2 Warranty

If the product is used as intended, the warranty is valid for 24 months from the ex-works delivery date under the following conditions:

- Observe the applicable documents, ▸ 1.1.2 [🗋 3]
- Observe the ambient conditions and operating conditions, ▸ 2.3 [🗋 5]

## 1.3 Scope of delivery

The scope of delivery includes

- Magnetic switch MMS 22-PI2 / MMSK 22-PI2 in the version ordered
- Assembly and Operating Manual
- Magnetic teaching tool, ID 301030

# 2 Basic safety notes

## 2.1 Intended use

The sensor is used for sensing two positions of a SCHUNK product via a magnetic control cam or a specific magnetic field.

- The product is intended for installation in a machine/ automated system. The applicable guidelines for the machine/ automated system must be observed and complied with.
- The product may only be used within the scope of its technical data, ▸ 3 [🗋 7].

## 2.2 Inappropriate use

The product is not a safety component in accordance with the EC Machine Directive 2006/42/EC and must not be used in safety-relevant parts of machine control units.

## 2.3 Environmental and operating conditions

**Required ambient conditions and operating conditions**

Incorrect ambient and operating conditions can make the product unsafe, leading to the risk of serious injuries, considerable material damage and/or a significant reduction to the product's life span.

- Make sure that the product is used only in the context of its defined application parameters, ▸ 3 [🗋 7].
- Make sure that the environment is free from splash water and vapors as well as from abrasion or processing dust. Exceptions are products that are designed especially for contaminated environments.

## 2.4 Constructional changes

**Implementation of structural changes**

Modifications, changes or reworking, e.g. additional threads, holes, or safety devices, can damage the product or impair its functionality or safety.

- Structural changes should only be made with the written approval of SCHUNK.

## 2.5 Personnel qualification

**Inadequate qualifications of the personnel**

If the personnel working with the product is not sufficiently qualified, the result may be serious injuries and significant property damage.

- All work may only be performed by qualified personnel.
- Before working with the product, the personnel must have read and understood the complete assembly and operating manual.
- Observe the national safety regulations and rules and general safety instructions.

# 3 Technical data

| Designation | MMS 22-PI2 / MMSK 22-PI2 |
|---|---|
| Ambient temperature [°C]<br>Min.<br>Max. | <br>- 20<br>+ 80 |
| Nominal voltage [VDC]<br>Min.<br>Max. | 24<br>10<br>30 |
| IP rating | 67 |

More technical data is included in the catalog data sheet. Whichever is the latest version.

# 4 Assembly and settings

## 4.1 Mechanical connection

**NOTICE**

**Material damage due to incorrect bending radii!**

The product may get damaged if the bending radius of the cable is less than the minimum.

- See catalog datasheet for corresponding details.

**NOTICE**

**Risk of damage to the sensor during assembly!**

- Observe the maximal tightening torque.

Ferromagnetic components change the sensor's switching positions, e. g. adapter plate made of construction steel. For ferromagnetic adapter plates:

- First, install the module on the adapter plate.
- Then adjust the switching position of the sensor.

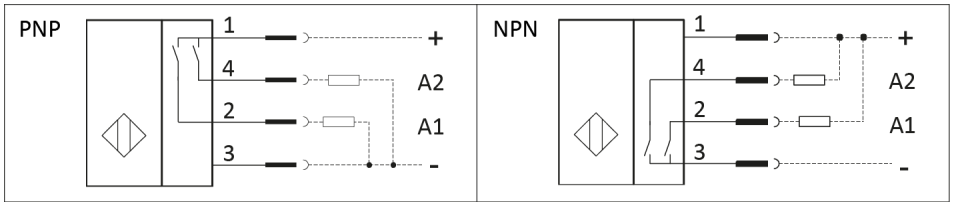
**NOTE**

- Do not use the sensor as a safety component.
- Do not pull on the cable of the sensor.
- Secure the cable and connection plug so that they are not taught and cannot move during operation.
- Do not exceed the permitted bending radius of the cable.
- Do not allow the sensor to come into contact with hard objects and chemicals (e. g., nitric acid, chromic acid and sulfuric acid).

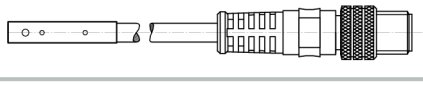
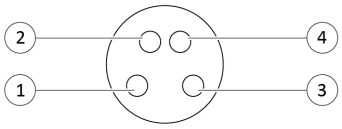
The sensor is an electronic component that can be sensitive to high-frequency interference or electromagnetic fields.

- Check whether there is sufficient distance between the sensor and sources of interference and their supply cables.

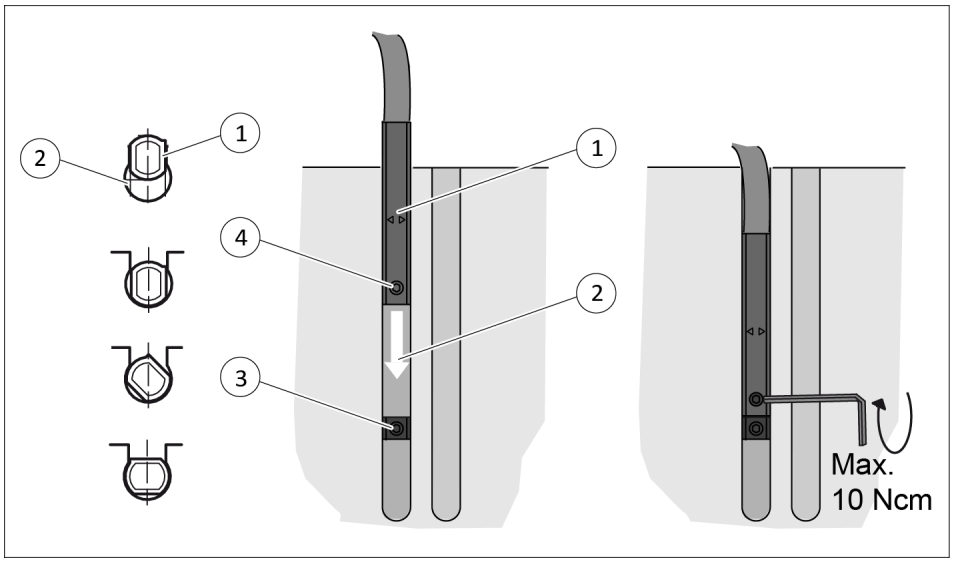
## 4.2 Electrical connection




| |
|---|
| **Type of switching:** PNP or NPN |
| **Switching function:** Closer |

| M8 connector | | | | | |
|---|---|---|---|---|---|
|  | | |  | | |
| 2 m cable, open wire strand | | | | | |
|  | | | | | |
| 1 | Brown | + 10 to 30 V DC | 3 | Blue | GND |
| 2 | White | Output 1 | 4 | Black | Output 2 |

## 4.3 Installing and connecting the sensor




*Mechanical connection*

1. Turn the sensor (1) into the groove (2)
   **Or:** Push the sensor (1) into the groove (2) until it reaches the clamping stop.
2. Secure the sensor (1) using the set-screw.
   ⇨ Observe the maximum tightening torque of 10 Ncm.
3. Connect the sensor (1) and fasten the cable.

## 4.4 Adjusting the sensor

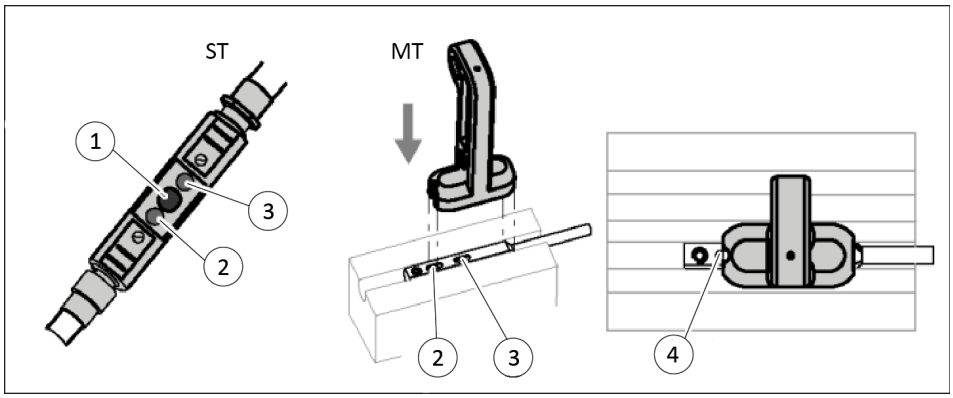
### Adjusting switching points in teach mode

**NOTE**
The difference between the teach and operating temperatures must not exceed 30 K.

1. Place the module in switching position.
2. Place the magnet teach tool (MT) on the sensor (4) for at least 2 s
   **Or:** Press the button (1) on the connector teach tool (ST) for at least 2 s.

⇨ The LED (2) flashes after 2 s.

3. Remove the MT
   **Or:** Release the button (1) on the ST.
   For switching point 1: Continue with the next step.
   For switching point 2: Wait 10 s until the LED (3) flashes, then continue with the next step.
4. Place the MT back on the sensor for at least 0.3 s, then remove it.
   **Or:** Press the button (1) on the ST for at least 0.3 s and then release it.
5. Wait 2 s.
   ⇨ The LED (2) or LED (3) lights up continuously




| | | | |
|---|---|---|---|
| ST | Plug teaching tool | MT | Magnet teaching tool |

**NOTE**

The setting procedure is canceled after 30 s if the MT is not placed on the sensor again or the button (1) on the ST is not pressed. The LED (2) flashes at 2 s intervals if the magnetic field is too large or too small. If there is a duplicate or unsuitable switching point, the sensor (4) should be moved by 2 mm and taught again.

### Setting the hysteresis

The switch-off point of the end position can be manually adjusted by adjusting the hysteresis.

A minimum and maximum hysteresis is defined based on the magnetic field. This defines the distance between the switch-on and switch-off point. The sensor prevents a hysteresis that is too low when the hysteresis is adjusted. If the switch-off point is taught too far away from the switch-on point, the switch-off position close to the switch-on point is automatically used. The switch-off point must then be taught closer to the switch-on point.

1. Place the module in *Switch-off point* position.

2. Place the MT on the sensor (4) for at least 5 s
   **Or:** Press the button (1) on the ST for at least 5 s.
   ⇨ The LED (2) flashes after 2 to 5 s and goes out.
3. Quickly remove the MT
   **Or:** Release the button (1) on the ST.
   ⇨ The LED (2) lights up to show the current switching point, otherwise the LED (2) flashes.
   For switch-off point 1: Continue with the next step.
   For switch-off point 2: Wait 10 s until the LED (3) lights up to display the current switching point, otherwise the LED (3) flashes, then continue with the next step.
4. Place the MT back on the sensor (4) for at least 0.3 s, then quickly remove it
   **Or:** Press the button (1) on the ST for at least 0.3 s.
5. Wait 2 s. After approximately 2 s, the LED (2) flashes twice if the field is not too large, otherwise it flashes at 2 s intervals.

**NOTE**

A minimum and maximum hysteresis is defined based on the magnetic field. This defines the distance between the switch-on and switch-off point. If the switch-off point is taught too far away from the switch-on point, the switch-off position close to the switch-on point is automatically used. In this case, the switch-off point closer to the switch-on point must be taught.

# 5 Troubleshooting

## 5.1 Sensor not operating

1. Check whether the sensor cable is broken.
2. Check whether the voltage at the sensor is within the permitted range, ▶ 3 [🗋 7].
3. Check whether the LED lights up at the position to be sensed and that the sensor is operating.

**NOTE**
If the LED does not light up or the sensor is not operating, contact SCHUNK Service.

## 5.2 Sensor is operating, but not as desired

| Possible cause | Sources of interference | Corrective action |
|---|---|---|
| The sensor is interfered with or influenced by external magnetic or soft magnetic materials (Fe). | Motors (coils) | Increase the distance between the sensor and sources of interference (until the sensor operates correctly). |
| | Relays | |
| | Linear motors | |
| | Electrical welding | |
| | Magnetized workpieces (workpieces made of iron (Fe) or similar materials) | Use finger attachments made of aluminum. |
| | Magnetized components and tools made of iron (adapter plates made, screws or hexagon socket keys, etc.) | Use components containing aluminum. V4A screws are recommended. |
| The sensor is influenced by a different sensor. | Same or similar product | Increase the distance between the sensors to at least 2 mm. |
| The sensor is affected by deposits of magnetic chips in the vicinity (in the air gap). | Liquids with magnetic chips or the like. | Regularly clean the immediate environment of the sensor. (The higher the exposure to such fluids, the more often it needs to be cleaned.) |
| The sensor is affected by the directly adjacent module. | Built-in magnets in the piston of the adjacent module | Increase the distance to the adjacent module to at least 10 mm. |

**NOTE**
If these steps do not eliminate the problem, contact SCHUNK Service for troubleshooting.

# 6 EU Declaration of Conformity

| | |
|---|---|
| Manufacturer/<br>Distributor | SCHUNK SE & Co. KG<br>Spanntechnik \| Greiftechnik \| Automatisierungstechnik<br>Bahnhofstr. 106 – 134<br>D-74348 Lauffen/Neckar |
| Product designation: | Magnetic switch MMS 22-PI2 / MMSK 22-PI2 |
| ID number | 0301130, 0301131, 0301132, 0301133, 0301180, 0301181, 0301182, 0301183, 0301186, 0301187, 0301188, 0301189 |

We hereby declare on our sole authority that the product meets the requirements of the following directives at the time of the declaration.
The declaration is rendered invalid if modifications are made to the product.

- **Electromagnetic compatibility (EMC directive) 2014/30/EU**

Applied harmonized standards, especially:

| | |
|---|---|
| EN IEC 61000-6-2:2019 | Electromagnetic compatibility (EMC) – Part 6-2:<br>Generic standards – Immunity standard for industrial environments |
| EN 61000-6-4:2007 +<br>A1:2011 | Electromagnetic compatibility (EMC) – Part 6-4: Generic standards –<br>Emission standard for industrial environments<br>(IEC 61000-6-4:2006 + A1:2010); |
| EN 60947-5-2:2007 +<br>A1:2012 | Low-voltage switchgear and controlgear –<br>part 5-2: circuit devices and switching elements –<br>Proximity switches (IEC 60947-5-2:2007 + A1:2012) |
| EN 61000-4-4: 2013-04 | Electromagnetic compatibility (EMC) – Part 4-4:<br>Testing and measurement techniques – Electrical fast transient/<br>burst immunity test<br>(IEC 61000-4-4:2012) |
| EN 61000-4-6: 2014 | Electromagnetic compatibility (EMC) – Part 4-6:<br>Testing and measurement techniques – Immunity to conducted<br>disturbances induced by radio-frequency fields<br>(IEC 61000-4-6:2013) |

Signed for and on behalf of: SCHUNK SE & Co. KG

Lauffen/Neckar, August 2025

i.V. Nico Peper;
Director Software and Electronics;
Technology & Innovation

# 7 UKCA Declaration of Conformity

| | |
|---|---|
| Manufacturer/<br>Distributor | SCHUNK Intec Limited<br>Clamping and gripping technology<br>3 Drakes Mews, Crownhill<br>MK8 0ER Milton Keynes |
| Product designation: | Magnetic switch MMS 22-PI2 / MMSK 22-PI2 |
| ID number | 0301130, 0301131, 0301132, 0301133, 0301180, 0301181, 0301182, 0301183, 0301186, 0301187, 0301188, 0301189 |

We hereby declare that the product complies with all relevant harmonization legislation of the following directives at the time of declaration.
The declaration is rendered invalid if modifications are made to the product.

- **Electromagnetic Compatibility Regulations 2016**

Applied harmonized standards, especially:

| | |
|---|---|
| EN 60947-5-2:2007 + A1:2012 | Low-voltage switchgear and controlgear - part 5-2: circuit devices and switching elements - Proximity switches (IEC 60947-5-2:2007 + A1:2012) |

Person authorized to compile the technical documentation:
Marcel Machado, address: refer to manufacturer's address

Signed for and on behalf of: SCHUNK SE & Co. KG

Lauffen/Neckar, August 2025

i.V. Nico Peper; Director Software and Electronics;Technology & Innovation

# 8 Information on the RoHS Directive, REACH Regulation and Substances of Very High Concern (SVHC)

### RoHS Directive

SCHUNK products are classified as "large-scale stationary installations" or as "large-scale stationary industrial tools" within the meaning of Directive 2011/65/EU and its extension 2015/863/EU "on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)", or fulfill their intended function only as part of one. Therefore products from SCHUNK do not fall within the scope of the directive at this time.

### REACH Regulation

Products from SCHUNK fully comply with the regulations of Regulation (EC) No. 1907/2006 "concerning the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH)" and its amendment 2022/477. SCHUNK attaches great importance to completely avoiding chemicals of concern to humans and the environment wherever possible.

Only in rare exceptional cases do SCHUNK products contain SVHC substances on the candidate list with a mass content above 0.1%. In accordance with Article. 33 (1) of Regulation (EC) No. 1907/2006, SCHUNK complies with its duty to "communicate information on substances in articles" and lists the components concerned and the substances used in an overview that can be viewed at **schunk.com\SVHC**.

*Signature: see original declaration*

Lauffen/Neckar, August 2025

Dr.-Ing. Manuel Baumeister,
Head of Systems Engineering,
Technology & Innovation

**SCHUNK SE & Co. KG**
**Spanntechnik | Greiftechnik | Automatisierungstechnik**

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