Assembly and Operating Manual
MMS 22-A / MMSK 22-A
Magnetic switch

Translation of Original Operating Manual

Hand in hand for tomorrow

Imprint

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

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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.

Table of Contents

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.

CAUTION

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**.

The software can be downloaded from **schunk.com/software**.

- Assembly and operating manual for the SCHUNK module on which the FPS is used *

1.1.3 Variants

This operating manual applies to the following variations:

- MMS 22-A / MMSK 22-A
- MMS 22-A / MMSK 22-A -SA, with lateral cable outlet
- MMS 22-A / MMSK 22-A -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 [🗋 4]
- Observe the ambient conditions and operating conditions, ▸ 2.3 [🗋 6]

1.3 Scope of delivery

The scope of delivery includes

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

1.4 Accessories

The following accessories, which must be ordered separately, are required for the product:

- FPS-F5 evaluation electronics (only when using the MMS-A on the FPS system)
- Attachment kit, see catalog or operating manual for the gripper

For information regarding which accessory articles can be used with the corresponding product variants, see catalog data sheet.

2 Basic safety notes

2.1 Intended use

The sensor is used for sensing a position of a SCHUNK product via a magnetic control cam.

- 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 [🗋 8].

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 [🗋 8].
- 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-A / MMSK 22-A	
	5 V	10 V
Ambient temperature [°C]		
Min.	+ 5	
Max.	+ 55	
Nominal voltage [VDC]	5 +/-10%	24
Min.	4.5	10
Max.	5.5	30
IP rating	67	

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

4 Assembly and settings

NOTE

The assembly instructions in this chapter are generally applicable.

Module-specific assembly instructions for the sensor can be found in the Assembly and Operating Manual for the module, which can be downloaded at schunk.com

4.1 Mechanical connection

CAUTION

Property damage due to incorrect bending radius!

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

- **Static:** 10 times the cable diameter.
- **Dynamic:** 15 times the cable diameter.

CAUTION

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.

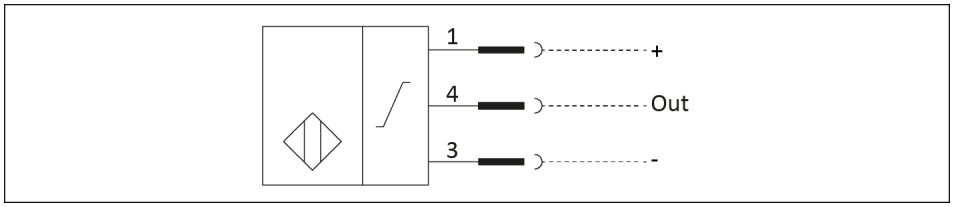
NOTE

- 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.

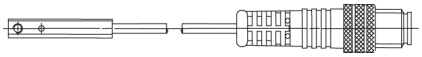
- Check whether there is sufficient distance between the sensor and sources of interference and their supply cables.

4.2 Electrical connection

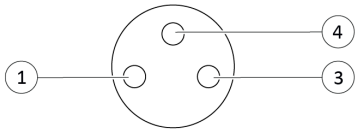


Type of switching: Analog

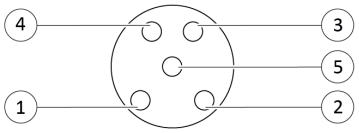
M8 socket for 5 V
Connection plug M8/M12 at 10 V



M8

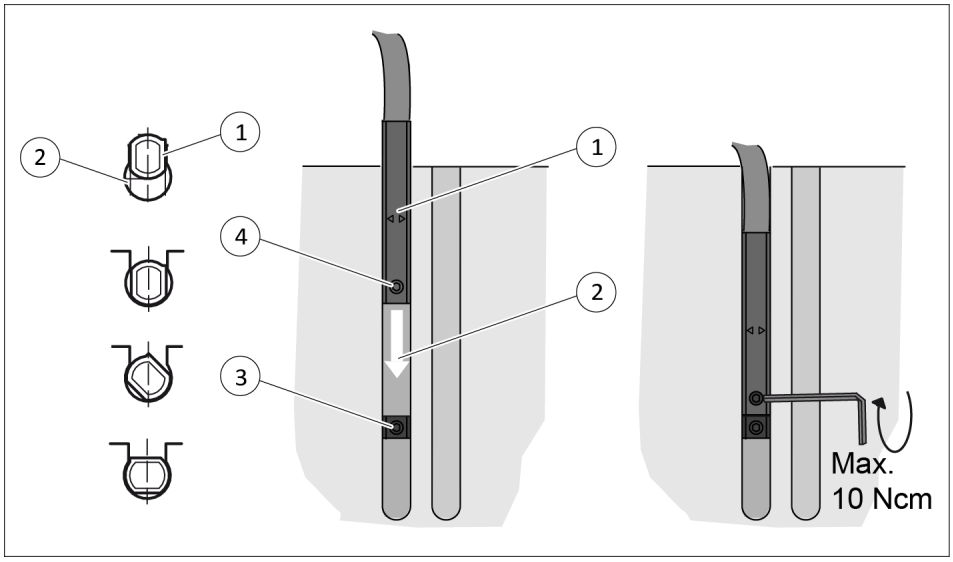


M12



1	Brown	5 VDC for 5 V + 10 to 30 VDC for 10 V	4	Black	Analog output
2		Blind hole	5		Blind hole
3	Blue	GND			

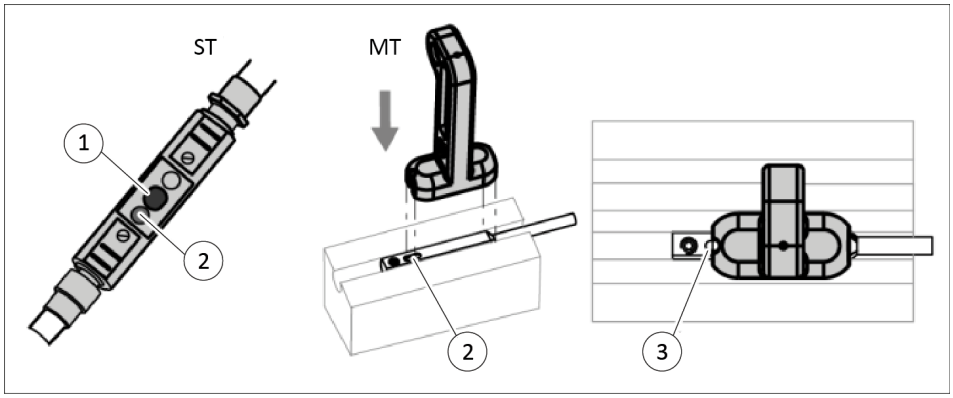
4.3 Installing and connecting the sensor



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



Button on cable teach tool (CT)/Attachment of magnet teach tool (MT)

1. Put module in position 1 in which it is to be set e.g. "Gripper open".
2. Place the magnet teach tool (MT) on the sensor (3) or press the button (1) on the cable teach tool (CT) until the LED goes out.
3. Remove magnet teach tool or let go of button (1) on cable teach tool (CT).
4. Wait for 4 seconds until LED (2) flashes slowly (1 Hz).
5. Put module in position 2 in which it is to be set e.g. "Gripper closed".
6. Wait for 4 seconds until LED (2) flashes slowly (2 Hz).
7. Place the magnet teaching tool (MT) on the sensor (3) or press the button (1) on the cable teaching tool (CT) until the LED (2) flashes very quickly (6 Hz).
8. Remove magnet teaching tool or let go of button (1) on cable teaching tool (CT) and wait 5 s.
   ⇨ The LED (2) lights up continuously.

NOTE

The setting procedure is canceled after 13 seconds if the MT is not reinserted or the button (1) on the CT is not pressed. LED 1 flashes at 2-second intervals if the magnetic field is too large or too small.

If the sensor (3) cannot be taught at the relevant position, the LED lights up continuously, e.g. no magnet is present or the module was not moved. The sensor returns to its state prior to the teach procedure and retains the old settings. The waiting times need to be observed without the module moving.

NOTE

The analog signal is affected if the sensor is operated with a teach tool.

- After adjusting the sensor: Remove the magnet teaching tool (MT) or cable teaching tool (KT).

Operation with evaluation electronics FPS-F5

NOTE

The three workpiece switching points cannot be programmed to one point.

4.5 Addition function 0 field identification

If no magnetic field is present or it is too weak, the output voltage is reduced to 0 V. Operation of the sensor is not possible in this case.

The usable voltage range of the analog output for position detection is between approx. 0.3 and 10.5 V.

5 Troubleshooting

5.1 Sensor not operating

1. Check whether the sensor cable is broken.
2. Check whether the voltage at the sensor is 5 VDC, depending on the version
   Or: between 10 and 30 VDC.

NOTE
If the LED does not light up, 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 Translation of the original declaration of conformity

Manufacturer/ Distributor	SCHUNK SE & Co. KG Spanntechnik | Greiftechnik | Automatisierungstechnik Bahnhofstr. 106 – 134 D–74348 Lauffen/Neckar
Product designation:	Magnetic switch MMS 22-A / MMSK 22-A
ID number	0315805, 0315825, 0315828

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 60947-5-7:2003	Low-voltage switchgear and controlgear – Part 5-7: Control circuit devices and switching elements – Requirements for proximity devices with analogue output (IEC 60947-5-7:2003)

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

Lauffen/Neckar, May 2024

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

7 UKCA Declaration of Conformity

Manufacturer/ Distributor	SCHUNK Intec Limited Clamping and gripping technology 3 Drakes Mews, Crownhill MK8 0ER Milton Keynes
Product designation:	Magnetic switch MMS 22-A / MMSK 22-A
ID number	0315805, 0315825, 0315828

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 60947-5-7:2003	Low-voltage switchgear and controlgear - Part 5-7: Control circuit devices and switching elements - Requirements for proximity devices with analogue output (IEC 60947-5-7:2003)

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, May 2024

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, May 2024

Dr.-Ing. Manuel Baumeister,
Head of Systems Engineering,
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