



Superior Clamping and Gripping



## Product Information

Programmable magnetic switches MMS 22-PI1

# Programmable. Precise. Easy assembly.

## Programmable magnetic switch MMS 22-PI1

A magnetic switch is used to monitor the status of automation components. They detect the approach of a magnet without contact and above a certain switching value, they put out a digital value. The switching value can be programmed.

### Field of application

Used for monitoring gripping and rotary modules, as well as linear modules, and robot accessories. Magnetic switches from SCHUNK detect magnets without contact or wear, and are resistant to vibrations, dust and humidity. Magnetic switches are installed in slots, and thus do not produce any additional interfering contours. For connection with a digital input module (utilization categorie DC-12).

### Advantages – Your benefits

**Individual switching point – without interfering contours**

The magnetic switch can be completely inserted, which means that no interfering contours arise due to overhanging sensor systems

**Programmable within no time** due to non-contact adjustment of the switching points and hysteresis

**Adjustable hysteresis** for precise position monitoring – even at very low strokes

**Suitable for narrow installation spaces** due to wired teaching with TeachTool plug

**Version with LED display** for control of the switching position directly at the sensor

**Version with standard plug connector** for fast and easy exchangeability of the extension cable

**Very flexible cable in PUR version** for a long service life

**Installation into the sensor groove** for space-saving, easy, and fast assembly on the product



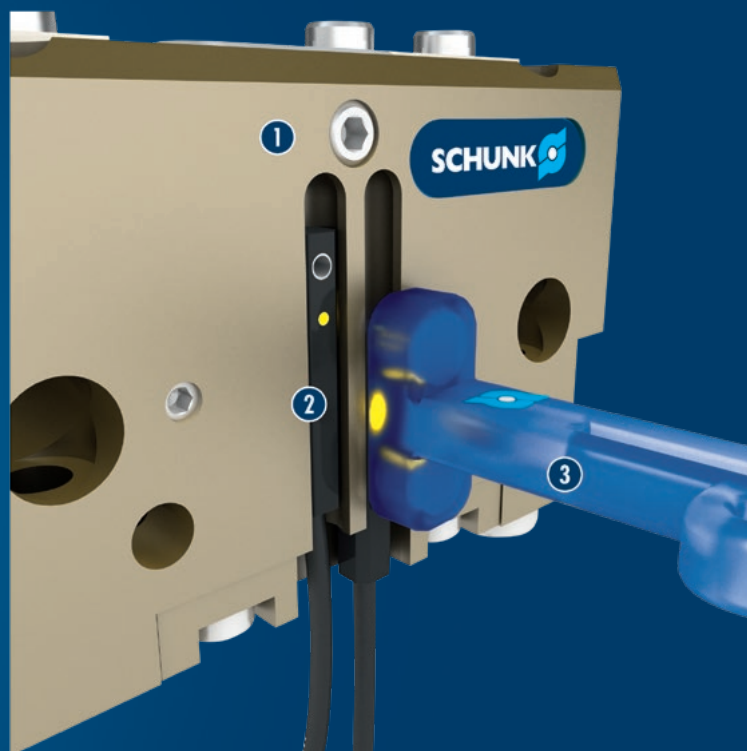
### Options and special information

**High protection class:** IP67 when plugged in, for use in clean or dusty environments or in case of contact with water. Operability in case of contact with other media (coolant, acids, bases, etc.) is often given, however cannot be guaranteed by SCHUNK.

**Power supply:** 10 – 30 V DC at < 10% residual ripple

**Sources of interference:** Sensors can be influenced by other magnetic fields in the immediate vicinity. Disturbing magnetic fields can be generated by motors, electric welders, permanent magnets or magnetized material (so-called soft magnets) such as hexagon socket wrenches, chips, etc.

## Application example



① Actuator

② MMS 22-PI1 C-slot sensor

③ MT magnet teaching tool

### SCHUNK offers more ...

The following components make the product even more productive – the suitable addition for the highest functionality, flexibility, reliability, and controlled production.



Plug teaching tool



Sensor cables



Sensor distributor



SST sensor tester

① For more information on these products can be found on the following product pages or at [schunk.com](http://schunk.com).

# MMS 22-PI1

Programmable magnetic switches

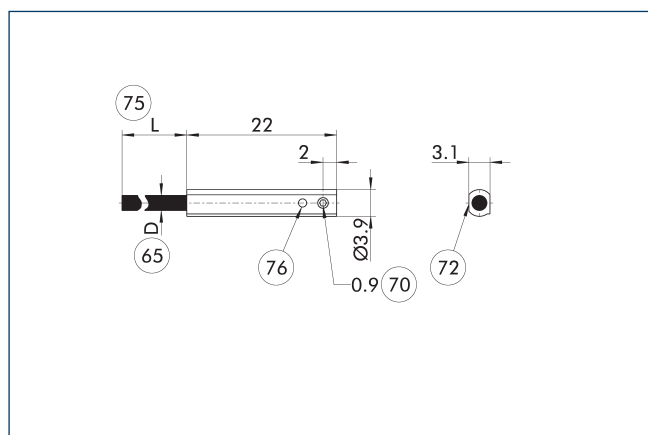


## Technical data

| Description   |      | MMS 22-PI1-S-M8-PNP      | MMS 22-PI1-S-M8-NPN      | MMSK 22-PI1-S-PNP      | MMSK 22-PI1-S-NPN      |
|---|------|--------------------------|--------------------------|------------------------|------------------------|
| ID  |      | 0301160                  | 0301161                  | 0301162                | 0301163                |
| <b>Principle of function</b>                        |      |                          |                          |                        |                        |
| Measuring principle                                 |      | magnetic                 | magnetic                 | magnetic               | magnetic               |
| Switching function                                  |      | Closer                   | Closer                   | Closer                 | Closer                 |
| Type of switching                                   |      | PNP                      | NPN                      | PNP                    | NPN                    |
| Number of switching points                          |      | 1                        | 1                        | 1                      | 1                      |
| Teach function                                      |      | yes                      | yes                      | yes                    | yes                    |
| <b>General data</b>                                 |      |                          |                          |                        |                        |
| typical switching time                              | [s]  | 0.001                    | 0.001                    | 0.001                  | 0.001                  |
| Max. switching frequency                            | [Hz] | 1000                     | 1000                     | 1000                   | 1000                   |
| Min./max. ambient temperature                       | [°C] | -20/80                   | -20/80                   | -20/80                 | -20/80                 |
| LED display in sensor                               |      | yes                      | yes                      | yes                    | yes                    |
| <b>Electrical operating data</b>                    |      |                          |                          |                        |                        |
| Type of voltage                                     |      | DC                       | DC                       | DC                     | DC                     |
| Nominal voltage                                     | [V]  | 24                       | 24                       | 24                     | 24                     |
| Min./max. operating voltage                         | [V]  | 10/30                    | 10/30                    | 10/30                  | 10/30                  |
| Voltage drop  | [V]  | 1.5                      | 1.5                      | 1.5                    | 1.5                    |
| Max. switching current                              | [A]  | 0.05                     | 0.05                     | 0.05                   | 0.05                   |
| Short circuit protection                            |      | yes                      | yes                      | yes                    | yes                    |
| Protected against polarity reversal                 |      | yes                      | yes                      | yes                    | yes                    |
| <b>Mechanical operating data</b>                    |      |                          |                          |                        |                        |
| Housing material                                    |      | PA                       | PA                       | PA                     | PA                     |
| Cable connector/cable end                           |      | M8, 3-pin Male Connector | M8, 3-pin Male Connector | open wire strands      | open wire strands      |
| Cable length L                                      | [cm] | 30                       | 30                       | 200                    | 200                    |
| Cable diameter D                                    | [mm] | 2.2                      | 2.2                      | 2.2                    | 2.2                    |
| Cable design (wire cross section / number of wires) |      | 3x 0,05mm <sup>2</sup>   | 3x 0,05mm <sup>2</sup>   | 3x 0,05mm <sup>2</sup> | 3x 0,05mm <sup>2</sup> |
| Cable sheath material                               |      | PUR                      | PUR                      | PUR                    | PUR                    |
| Min. bending radius (dynamic)                       | [mm] | 22                       | 22                       | 22                     | 22                     |
| Min. bending radius (static)                        | [mm] | 11                       | 11                       | 11                     | 11                     |
| Weight  | [kg] | 0.01                     | 0.01                     | 0.02                   | 0.02                   |
| Protection class IP (sensor, plugged)               |      | 67                       | 67                       | 67                     | 67                     |
| Protection class                                    |      | III                      | III                      | III                    | III                    |
| Drilling emulsion resistance *                      |      | yes                      | yes                      | yes                    | yes                    |
| <b>Options and their characteristics</b>            |      |                          |                          |                        |                        |
| Version with lateral cable outlet                   |      | MMS 22-PI1-S-M8-PNP-SA   | MMS 22-PI1-S-M8-NPN-SA   | MMSK 22-PI1-S-PNP-SA   | MMSK 22-PI1-S-NPN-SA   |
| ID  |      | 0301166                  | 0301167                  | 0301168                | 0301169                |
| LED display in sensor                               |      | yes                      | yes                      | yes                    | yes                    |
| Heavy duty version                                  |      | MMS 22-PI1-S-M8-PNP-HD   | MMS 22-PI1-S-M8-NPN-HD   | MMSK 22-PI1-S-PNP-HD   | MMSK 22-PI1-S-NPN-HD   |
| ID  |      | 0301110                  | 0301111                  | 0301112                | 0301113                |
| Housing material                                    |      | stainless steel          | stainless steel          | stainless steel        | stainless steel        |
| Drilling emulsion resistance *                      |      | yes                      | yes                      | yes                    | yes                    |

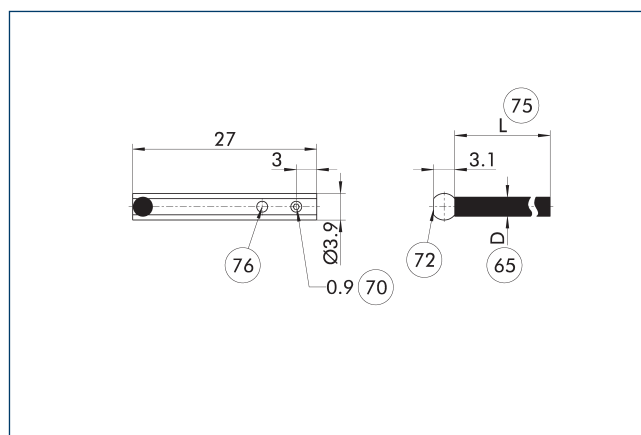
\* Tested cutting emulsions: r.rhenus TU 43P, Motorex Swisscool Magnum UX 550 and Oemeta 760 (1008339).

MMS(K) 22-PI1 main view



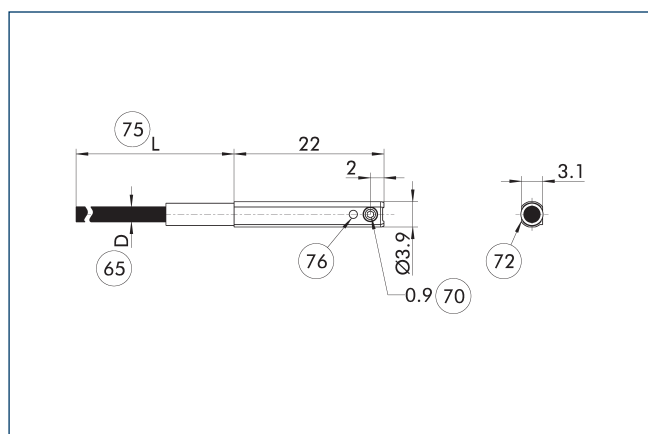
- 65 Cable diameter
- 70 Wrench size
- 72 Active sensor surface
- 75 Cable length
- 76 LED

MMS(K) 22-PI1-SA main view



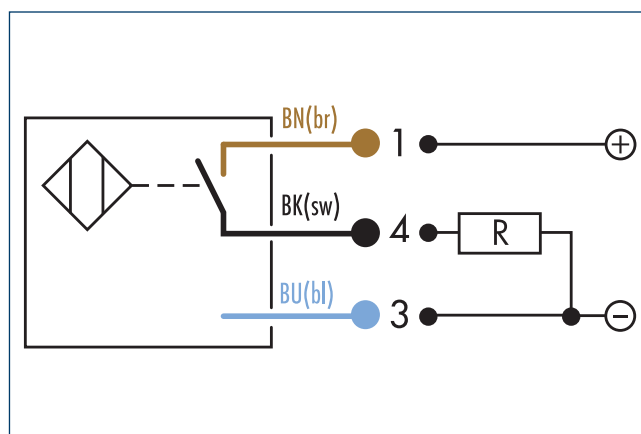
- 65 Cable diameter
- 70 Wrench size
- 72 Active sensor surface
- 75 Cable length
- 76 LED

MMS(K) 22-PI1-HD main view

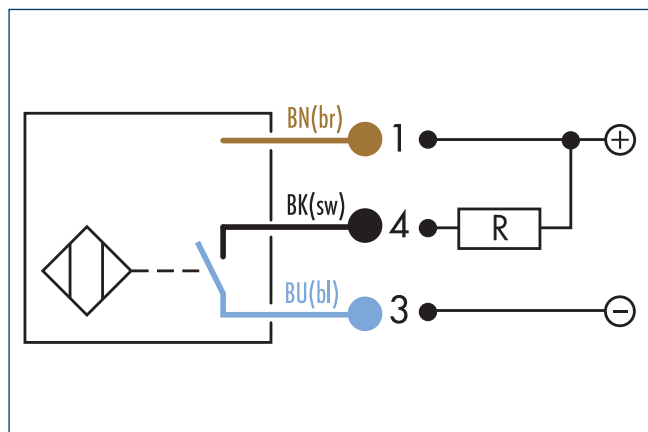


- 65 Cable diameter
- 70 Wrench size
- 72 Active sensor surface
- 75 Cable length
- 76 LED

Wiring diagram closer PNP



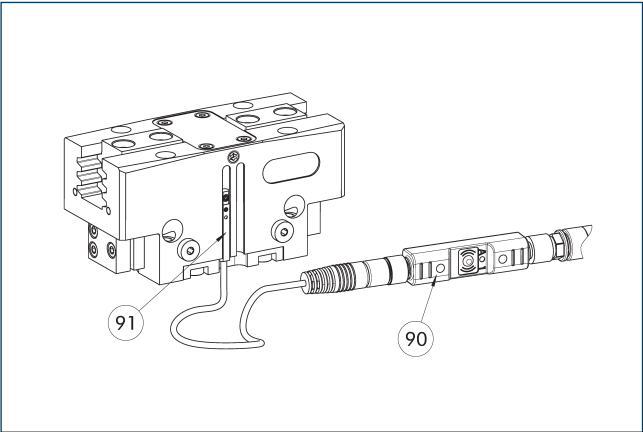
Circuit diagram of NPN closer



# MMS 22-PI1

Programmable magnetic switches

## Pug-in teaching tool ST



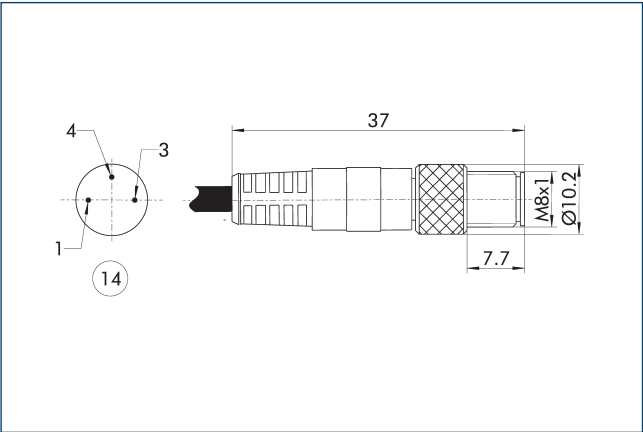
90 Pug-in teaching tool ST      91 Sensor MMS 22-PI...

In addition to the magnetic teach-in tool included in the scope of delivery, the MMS 22-PI sensors can be taught via the plug teach-in tool. The plug teach in tool is inserted into the wiring from sensor to PLC. This makes teaching in possible even in confined spaces on the sensor. The plug teach in tool differs according to the version of the sensor with regard to switching points (1/2) and switching type (PNP / NPN).

| Description        | ID      |  |
|--------------------|---------|--|
| Plug teaching tool |         |  |
| ST-MMS 22-PI1-PNP  | 0301025 |  |

- 1 The plug-in teaching tool is only required for teaching in and can be removed from the cabling again after. The sensor maintains its programming.

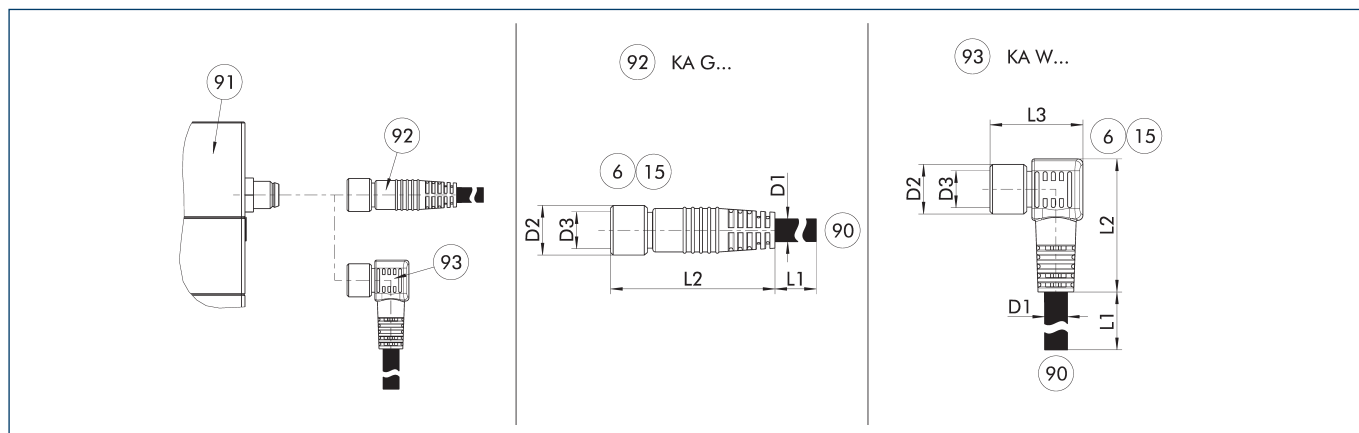
## View of M8 connector (3-pin)



14 Connector

This view shows the plug connector on the cable end of the sensor.

## Connection cables



KA G...

Connection cable with straight socket

KA W...

Connection cable with angular socket

⑥ Connection module side

⑮ Socket

⑨⑩ SAC connection cable with open wire strands

⑨① Connection plug component

⑨② Cable with straight female connector

⑨③ Cable with angled female connector

The connection cable is ideal for connecting the corresponding components to the controller or the power supply unit. The connection cable has a 4-pin M8 socket on one side and an open wire strand on the other side for individual connections. The connection cables are suitable for use both in the cable track as well as in torsion applications.

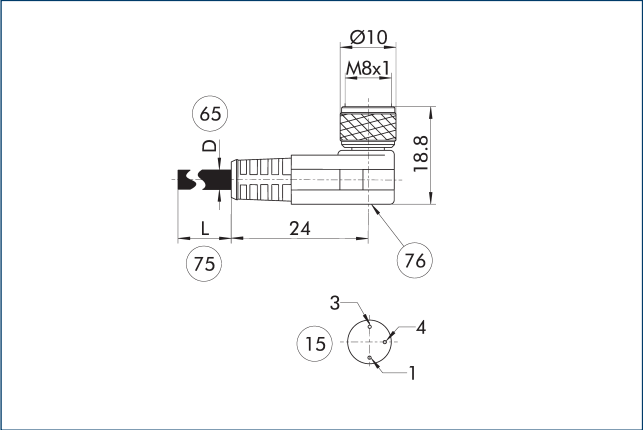
| Description           | ID      | L1<br>[m] | D1<br>[mm] | D3 | Often combined |
|-----------------------|---------|-----------|------------|----|----------------|
| Connection cables     |         |           |            |    |                |
| KA BG08-L 3P-0300-PNP | 0301622 | 3         | 4.5        |    | ●              |
| KA BG08-L 3P-0500-PNP | 0301623 | 5         | 4.5        | M8 |                |
| KA BW08-L 3P-0300-PNP | 0301594 | 3         | 4.5        |    |                |
| KA BW08-L 3P-0500-PNP | 0301502 | 5         | 4.5        | M8 |                |

① Please observe the min. bending radius for cable track-compatible cables or the max. torsion angle for torsion-compatible cables. These are generally 10 times the cable diameter or +/- 180°/m.

# MMS 22-PI1

Programmable magnetic switches

## KV M8 socket angular

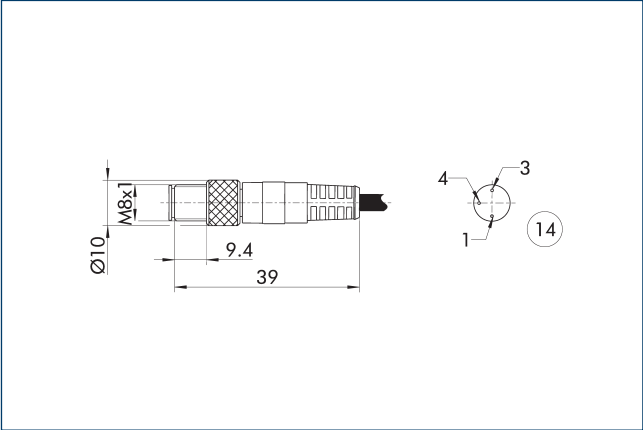


- ①⑤ Socket
- ⑦⑤ Cable length
- ⑥⑤ Cable diameter
- ⑦⑥ LED

The drawing shows the full version of the plug connector.

| Description              | ID      | L1  | Often combined |
|--------------------------|---------|-----|----------------|
|                          |         | [m] |                |
| Cable extension          |         |     |                |
| KV BW08-SG08 3P-0030-PNP | 0301495 | 0.3 |                |
| KV BW08-SG08 3P-0100-PNP | 0301496 | 1   |                |
| KV BW08-SG08 3P-0200-PNP | 0301497 | 2   | ●              |

## KC M8 plug straight

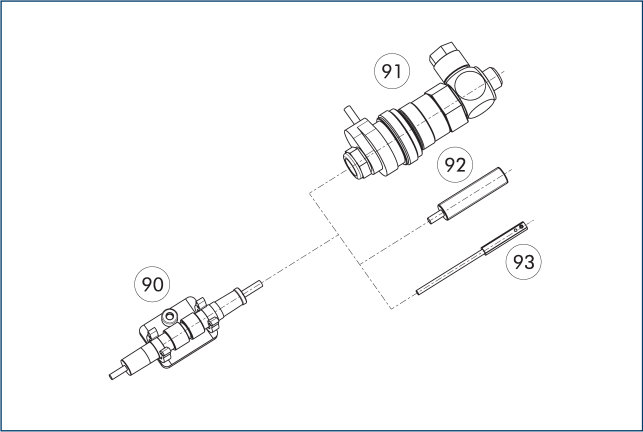


- ①④ Connector

The drawing shows the full version of the plug connector.

| Description              | ID      | L1  | Often combined |
|--------------------------|---------|-----|----------------|
|                          |         | [m] |                |
| Cable extension          |         |     |                |
| KV BW08-SG08 3P-0030-PNP | 0301495 | 0.3 |                |
| KV BW08-SG08 3P-0100-PNP | 0301496 | 1   |                |
| KV BW08-SG08 3P-0200-PNP | 0301497 | 2   | ●              |

## clip for plug/socket



- ⑨① CLI plug bracket
- ⑨② IN proximity switch
- ⑨① MV micro valve
- ⑨③ Magnetic switch MMS

The CLI clip is used for fastening and strain relief for the plug connectors. For example for the sensor and cable extension connection.

| Description          | ID      |  |
|----------------------|---------|--|
| clip for plug/socket |         |  |
| CLI-M8               | 0301463 |  |







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