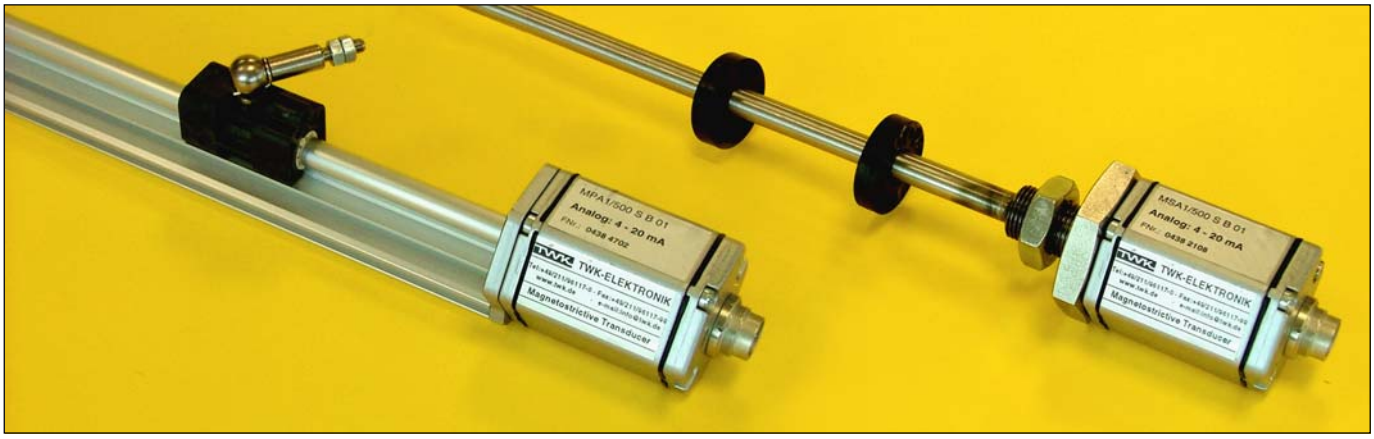
- **MPA model: Profile version**
- **MSA model: Rod version**
- **Measuring strokes from 50 to 7600 mm**
- **Contactless, robust system**
- **Resolution 0.0015% (16-bit)**
- **Linearity 0.01%**
- **Option: 2 position magnets or speed signal**
- **Measurement signals 0(4) ... 20 mA, 0 ... 10 V or ± 10V**
- **Protection types up to IP 68**
- **Operating temperature range - 40 °C ... + 75 °C**
- **Rod version pressure stability up to 350 bar**



Structure and operation

The displacement transducers operate according to the principle of run time measurement between two points of a magnetostrictive waveguide. One point is determined by a moveable position magnet, whose distance from the null point corresponds to the section to be measured. The run time of an emitted impulse is directly proportionate to this section. Conversion to an analogue measuring signal takes place in the downstream electronics.

The waveguide is housed in a pressure-resistant stainless steel tube or extruded profile. To the rear of this is a die-cast aluminium housing containing the electronics in SMD technology. Electrical connection is implemented via a circular connector.

In the rod version, the position magnet is located in a ring, which is guided over the rod without contact. In the profile version, it is located either in a slider, which is linked to the moving part of the machine via a ball joint, or it moves as a liftable position magnet, without wear, over the profile.

Standard measuring strokes:

- ☐ Up to 1000 mm in 50 mm steps
- ☐ Up to 5000 mm in 250 mm steps (profile version: MPA)
- ☐ Up to 7600 mm in 250 mm steps (rod version: MSA)

Standard measuring strokes

Output signal	Mid-point at
0 - 20 mA	10 mA
4 - 20 mA	12 mA
0 - 10 V	5 V
± 10 V	0 V

Programming

For adaptation to measuring tasks, the Magnosens can be easily adjusted within the ordered measuring range in terms of measuring length (minimum: 25 mm) and measuring direction. Adjustment is carried out via the connection cable by means of the programming device PMA-01 for (data sheet 11443).

Diagnosis

The LEDs (green/red) in the sensor head are used for adjustment and additionally provide information on the sensor status.

Green	Red	Meaning
On	Off	Normal function
On	Flashing	Magnet not in the set range
On	On	No magnet
Flashing	On	Setting mode

Technical data

- Supply voltage range V_S: 24 VDC (+20 / -15%)
- Supply current I_S: 100 mA typical
- Resolution: 16-bit; 0.0015% (min. 1 µm)
- Linearity: < ± 0.01% (min. ± 50 µm)
- Repeatability: < ± 0.001% (min. ± 1 µm)
- Hysteresis: < 4 µm
- Measuring frequency: 500 to 2000 Hz depending on measuring length
- Temperature drift: < 30 ppm / °C
- Operating temperature range: - 40 °C to + 75 °C
- Shock test: 100 g to IEC Standard 68-2-27
- Vibration test: 15 g / 10 to 2000 Hz to IEC Standard 68-2-6
- Protection type:
  - ☐ Profile: IP 65
  - ☐ Rod: IP 67, IP 68 for cable outlet

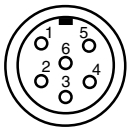
- **Current output:**
- Output signal: 0...20 mA or: 4...20 mA
- Apparent ohmic resistance: 0 - 500 Ω

- **Voltage output:**
- Output signal: 0...10 VDC or ± 10 VDC
- Permissible load: ≥ 5 kΩ

- **Mating connector:**
- Connection type: 6-pin connector M16
- Housing: Die-cast zinc, nickel-plated (straight or angled 90°)
- Contacts: Socket, Ag
- Wire connection: Soldering
- Connection cross-section: Max. 0.75 mm²
- Cable strain relief: M12
- Max. cable diameter: 6 mm
- Protection type: IP 67

- **Cable outlet:**
- Cable type: PVC cable 3 x 2 x 0.14 mm²
- Bending radius: Min. 50 mm if routed firmly

Electrical connections



Soldered connection side of mating connector

Pin	Wire	Signal
1	Grey	Output 1 (position) (0)4 - 20 mA / 0 … 10 V / ± 10 V
2	Pink	Bridged with 6
3	Yellow	Output 2 optional (2nd position or speed)
4	Green	Bridged with 6
5	Brown	+V_S (+24 VDC)
6	White	-V_S (0 VDC)

Order code format

- Displacement transducer

MPA 1 / 1000 S A 01

- 01 — Electrical and mechanical variants*
- A — Output signals
  A = 0 - 20 mA
  B = 4 - 20 mA
  C = 0 - 10 VDC
  D = ± 10 VDC
- S — Signal curve:
  S = Positively ascending on movement from the flange towards rod end
  N = Descending on movement from the flange towards rod end
- 1000 — Measuring stroke in mm
- 1 — **Design**

  MSA (rod):
  1 = With threaded connection M 18 x 1.5
  2 = With threaded connection 16 UNF ¾ "

  MPA (profile):
  1 = Position slider central ball joint
  2 = Position slider front ball joint
  3 = Liftable position magnet
- MPA — Model:
  MPA = Profile version
  MSA = Rod version

Versions for several positions and speed signal or cable outlet on request.

* The basic versions according to the data sheet bear the number 01. Deviations are identified with a variant number and are documented in the factory.

Scope of delivery:

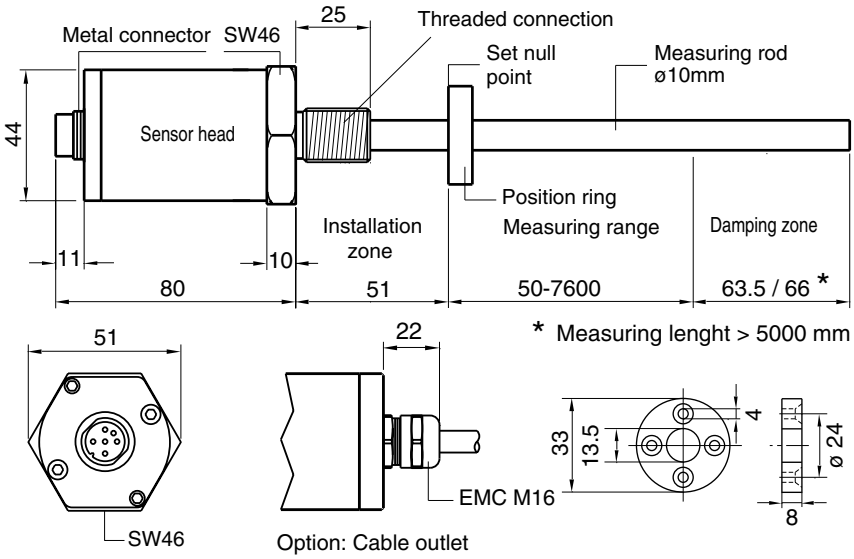
Rod: Sensor, nut (order position magnet separately)
Profile: Sensor, 1 position magnet, 2 mounting clamps up to 1250 mm + 1 clamp for each additional 500 mm.

Accessories:

- Position magnets for MSA
  PR02 Standard position ring (∅ 33 mm)
  PR03 Liftable position magnet
- Position magnets for MPA
  PS01 Position slider, central ball joint
  PS02 Position slider, front ball joint
  PR03 Liftable position magnet
- Additional position magnets see datasheet 11469
- Mating connector (order separately)
  STK6GS42 Straight
  STK6WS43 Angled 90°
- Installation material
  MB-MP-01 Mounting clamps for profile version
  NT-MP-01 M5 sliding block for profile version
- Programming devices
  PMA-01 Analogue manual programming device (data sheet 11443)

Dimensions in mm

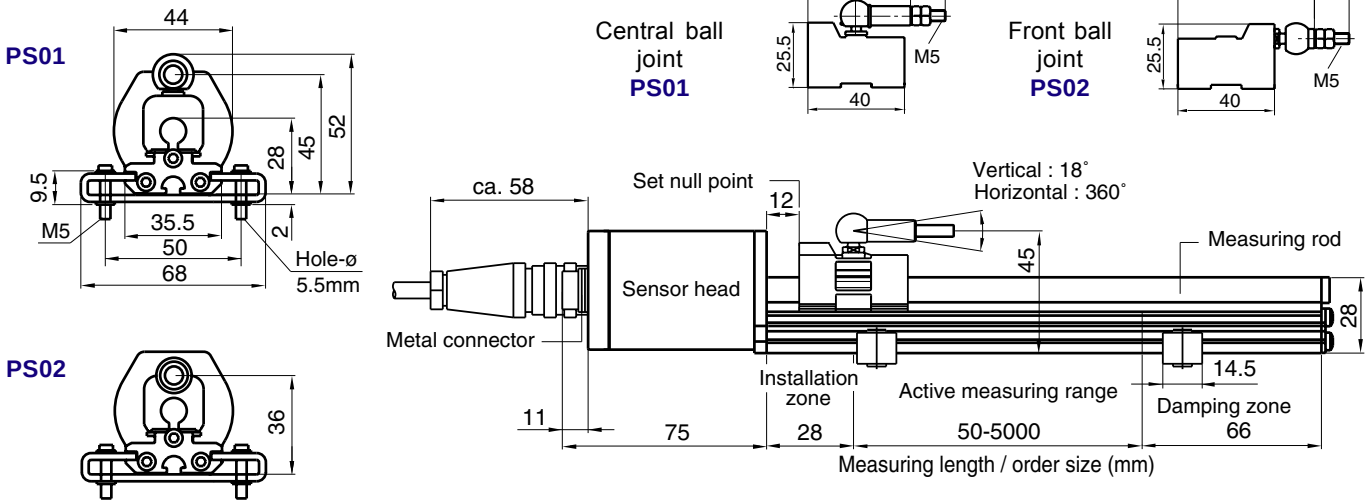
Model: MSA (rod version)



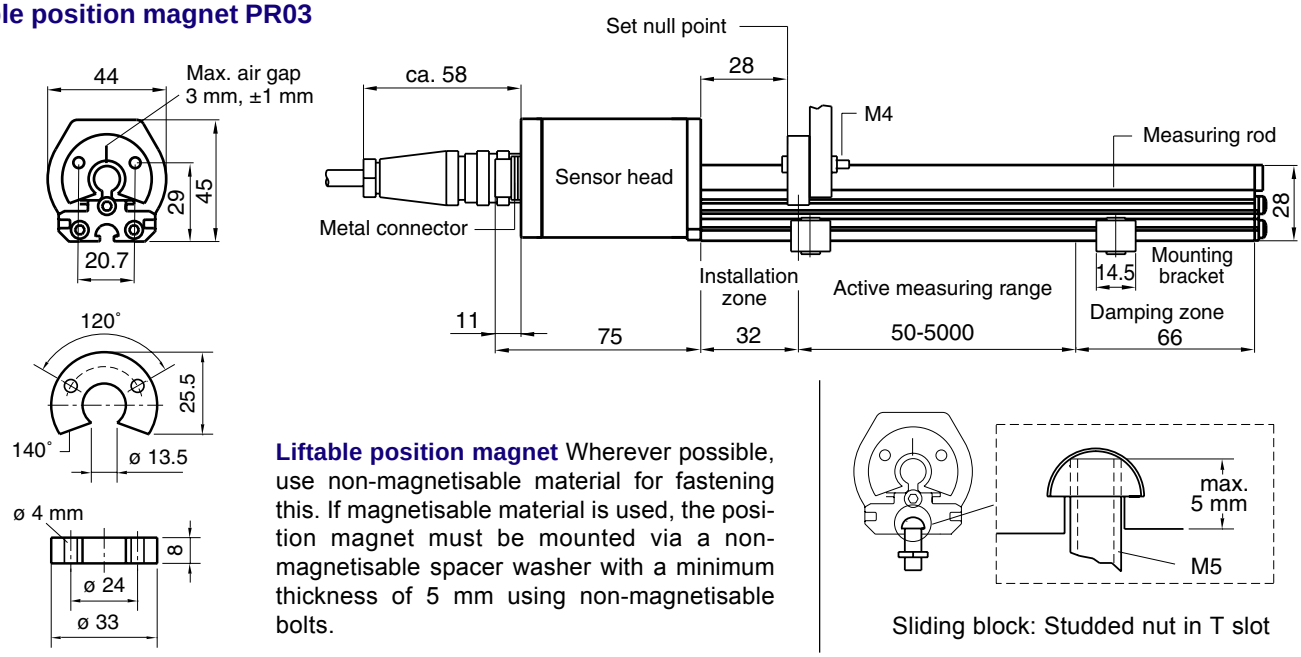
With measuring strokes of 1000 mm and over, mechanical rod support is recommended.

The sensor's fastening should be manufactured from non-magnetic materials (e.g.: brass, plastic). Note installation instruction **MWA10318** on installation in magnetisable materials.

Model: MPA (profile version)



Liftable position magnet PR03



Liftable position magnet Wherever possible, use non-magnetisable material for fastening this. If magnetisable material is used, the position magnet must be mounted via a non-magnetisable spacer washer with a minimum thickness of 5 mm using non-magnetisable bolts.

Sliding block: Studded nut in T slot

Note: On installation of the MAGNOSENS, careful shielding from magnetic and electromagnetic fields must be ensured. The cable shield must be mounted on the connector and connected to ground at the evaluation electronics. All data sheets and manuals are also available in the Internet under **www.twk.de**.