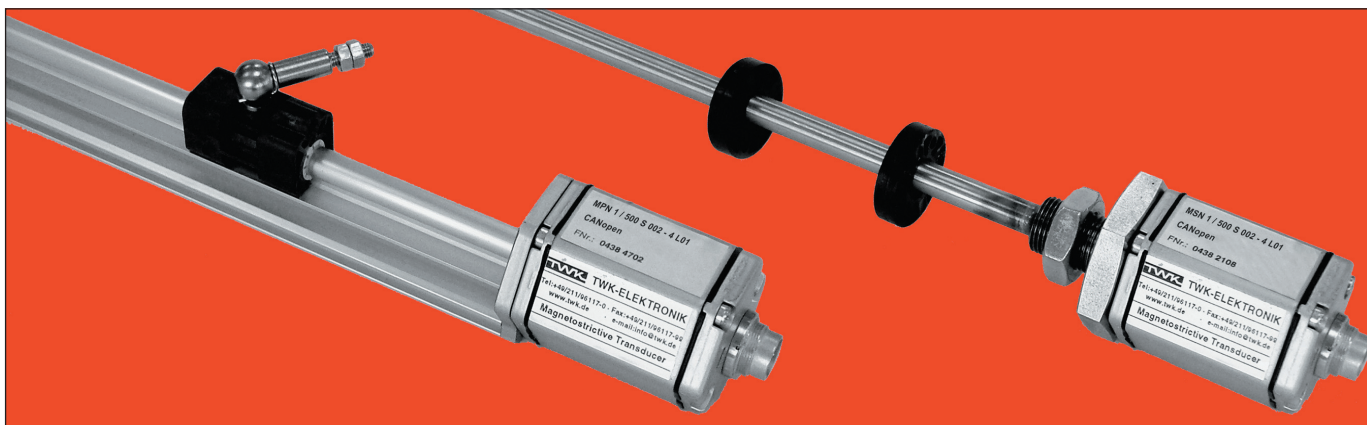


- **Model MPN: Profile version**
- **Model MSN: Rod version**
- **Measuring strokes from 25 to 7600 mm**
- **Contactless, robust system**
- **Resolution up to 2 μ m**
- **Linearity better than 0.01 %**
- **4 positions measurable simultaneously**
- **CANopen interface according to encoder profile DS-406/3.1**
- **Transmission rate up to 1 Mbaud**
- **Parameterisable via the bus**
- **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 a 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.

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: MPN)
- Up to 7600 mm in 250 mm steps (rod version: MSN)

Characteristics of CANopen

The MXN magnetostrictive displacement transducers correspond to encoder profile DS-406/3.1 (CANopen standard DS-301/3.0) and can be connected directly to the field bus. Their measured data are converted to displacement-proportionate, bus-capable output signals in the sensor and are transmitted directly to the CANopen master.

Properties from CANopen

The CAN interface is designed for serial data transmission of max. 1 Mbaud according to CAN standard ISO 11898. In addition to useful data transmission via PDO (Process Data Object), the CANopen protocol supports extensive monitoring and diagnostic functions via SDO (Service Data Object), which can be configured via the EDS file on installation.

Displacement transducer output data

The displacement transducer supplies a freely-configurable data block (PDO) of max. 8 bytes. This provides the following data as default:

- Position (32-bit integer value)
- Speed (16-bit integer value)
- Status of the 4 limit values (1 byte)

Each displacement transducer provides four PDOs. PDO1 to PDO4 correspond to magnets 1 to 4.

Selectable parameters per magnet

- Preset
- Operating range
- 4 limit values

Operating modes

Like programming the parameters, the operating modes are selected via the SDOs. The following settings are possible:

Asynchronous: Independent data transfer in a selectable cycle from 1 - 65535 ms

Synchronous: Data transfer following request (SYNC message) by the control system

Node address and baud rate setting

Each Magnosens with CANopen interface has an LMT address, via which clear assignment in the CAN network is guaranteed. This is comprised of the TWK manufacturer ID, the product ID and the serial number. The node address and baud rate are set via the LMT service. The default settings are:

- Baud rate: 125 kBaud
- Node address: 127

EDS file

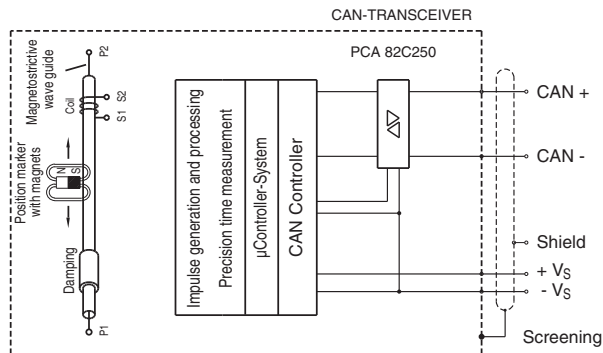
The EDS file - for integrating the sensor into CANopen project planning software - and the CANopen manual in PDF format are contained on the enclosed diskette.

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	On	Magnet not detected or incorrect number of magnets
Off	On	Initialisation error
Flashing	Flashing	Operating voltage not in the specified range

Blockdiagram



Technical data

- Supply voltage range V_S : 24 VDC (+20 / -15%)
Polarity reversal protection
- Supply current I_S : 90 mA (typical)
- Resolution:

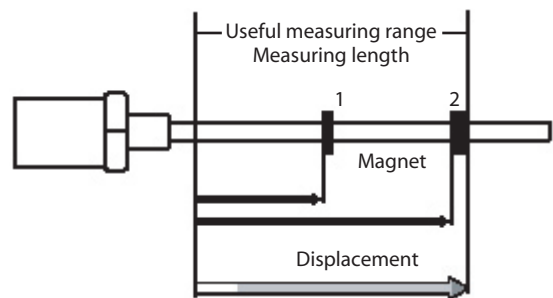
Displacement in μm	2	5
Speed in mm/s	0.2	0.5

- Linearity: 0.01% (min. 40 μm)
- Repeatability: < 0.001% (min. 2.5 μm)
- Hysteresis: < 4 μm
- Temperature drift: < 15 ppm / °C
- Meas. cycle time (appr.): 1 ms to 2400 mm
2 ms to 4800 mm
4 ms to 7600 mm meas. length

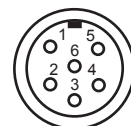
- Op. temperature range: - 40 °C to + 75 °C
- Dew point, humidity: 90% rel. humidity, no condensation
- Shock test: 100 g to IEC Standard 68-2-27
- Vibration test: 15 g / 10 to 2000 Hz to IEC Standard 68-2-6
- Protection type
 - Profile IP 65
 - Rod IP 67, IP 68 with cable outlet
- Op. pressure for rod: Max. 350 bar
- EMC test: EN 50081-1, EN 50082-2, EN 61000-4-2/3/4/6
- **Output:**
 - Interface: CAN to ISO-DIS 11898
 - Protocol: CANopen (encoder profile)
 - Signal transmission: Differential signal as per RS485
 - Transmission rate: Max. 1 MBit/s
 - Default address: 127
 - Default baud rate: 125 kBaud
- **Mating connector:**
 - Connection type: 6-pin connector M16
 - Housing: Nickel-plated die-cast zinc (straight or angled 90°)
 - Contacts: Socket, Ag
 - Wire connection: Soldering
 - Wire cross-section: Max. 0.75 mm²
 - Cable strain relief: Pg 7 or Pg 9
 - Max. cable diameter: 6 mm (Pg 7), 8 mm (Pg 9)
 - Protection type: IP 67

Multi-magnet measurement

CANopen sensor MXN enables 4 positions to be measured simultaneously. Please note that the distance between the individual magnets must be at least 75 mm in this case.



Electrical connections



Socket

Mating connector on soldered connection side

Pin	Wire	Signal
1	gray	CAN -
2	pink	CAN +
3		not connected
4		not connected
5	brown	+ V_S (+ 24 VDC)
6	white	- V_S (0 VDC)

Baud rates and cable lengths

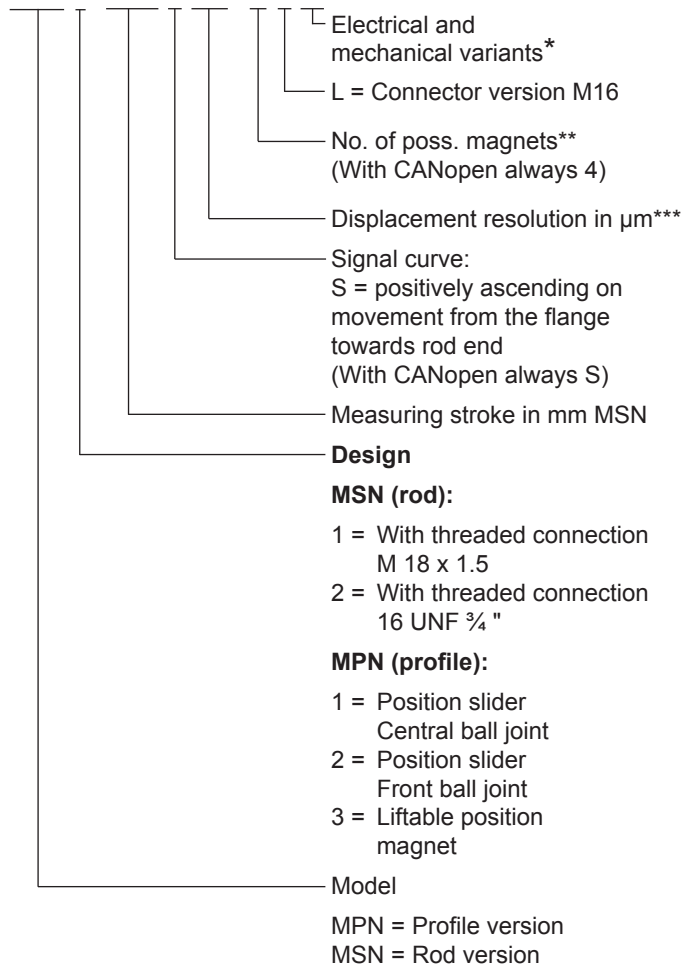
Baud rate [kBaud]	10	20	50	125	250
Cable length max. [m]	5000	2500	1000	500	250

Baud rate [kBaud]	500	800	1000
Cable length max. [m]	100	50	25

Order code format

■ Displacement transducer

MPN 1 / 1000 S 002 - 4 L 01



* 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.

** Magnosens with CANopen interface are basically designed for measuring 4 positions. However, they may also be operated with one magnet.

*** The displacement and speed resolutions cannot be set via CANopen. The resolution desired for displacement must be specified on ordering and therefore also determines the resolution for speed.

Cable outlet and version with two M16 connectors or 2 x 5 pin M12 + 4 pin M8 - connectors on request.

Scope of delivery:

Rod: Sensor, nut (order magnet separately)

Profile: Sensor, 1 position magnet, 2 mounting clamps up to 1250 mm + 1 clamp for each additional 500 mm.

The scope of delivery includes a CD with the EDS file and a CANopen manual in PDF format.

Accessories

■ Position magnets for MSN

- PR02** Standard position ring (ø 33 mm)
- PR03** Lifiable position magnet

■ Position magnets for MPN

- PS01** Position slider, central ball joint
- PS02** Position slider, front ball joint
- PR03** Lifiable position magnet

■ Straight mating connector, order separately

- STK6GS42** Pg 7
- STK6GS47** Pg 9

■ 90° angled mating connector, order separately

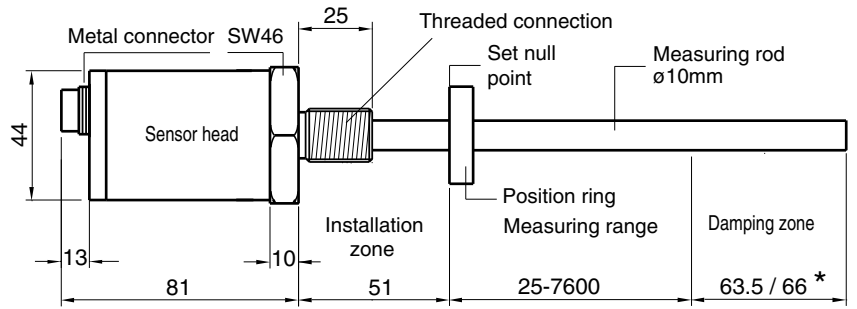
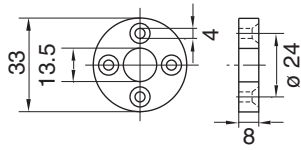
- STK6WS43** Pg 7
- STK6WS51** Pg 9

■ Installation material

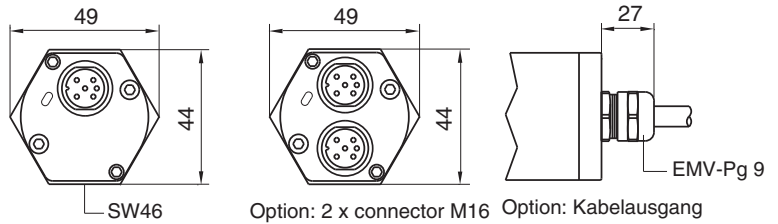
- MB-MP-01** Mounting clamps for profile version
- NT-MP-01** M5 sliding block for profile version

Dimensions in mm

Modell: MSN (rod version)



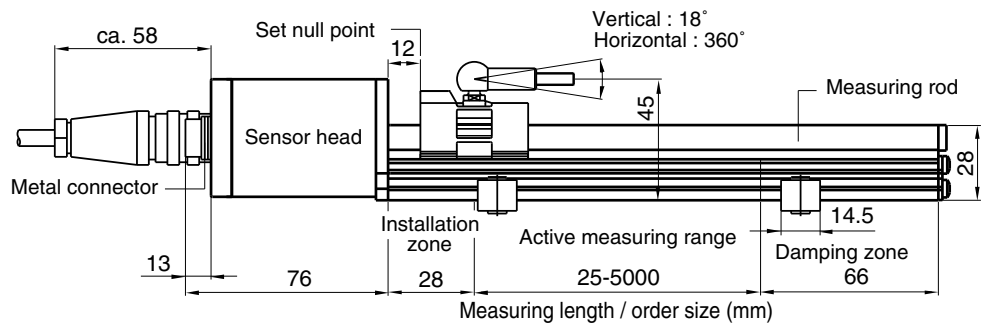
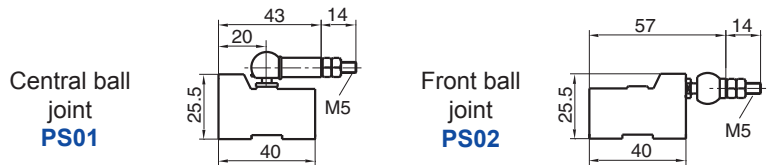
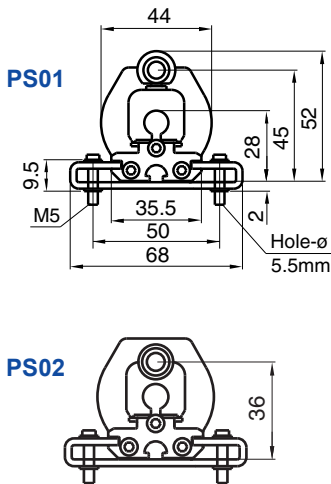
* Measuring length > 5000 mm



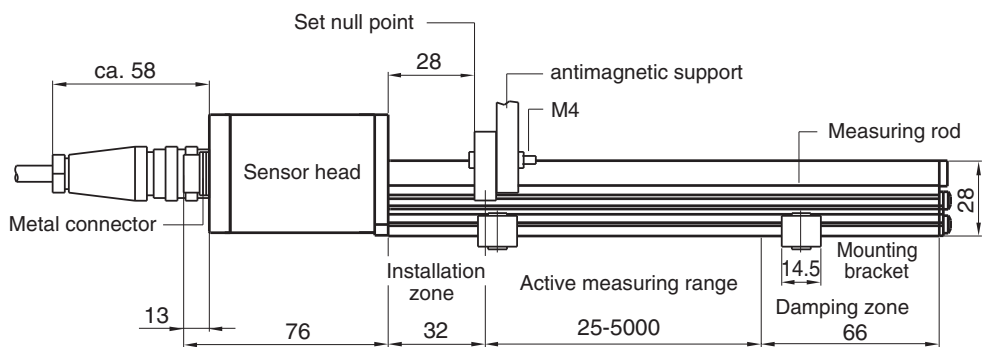
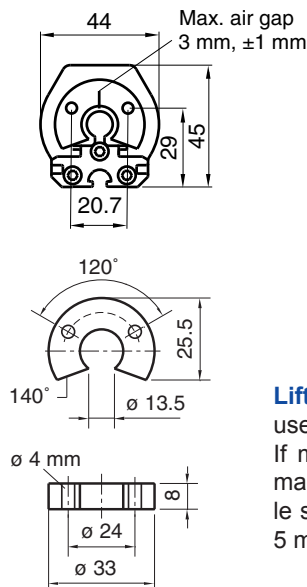
With measuring strokes of 1000 mm and over, mechanical rod support is recommended.

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

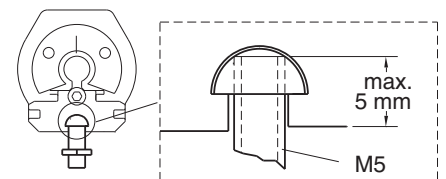
Modell: MPN (profile version)



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