Magnetic linear measurement sensor MW10

Devices for operating voltage 5V DC for scanning a magnetic tape without reference point

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1. Warranty information

Read this document carefully before installation and commissioning. For your own safety and operational reliability, observe all warnings and instructions.

Your product has left our factory in a tested and operational condition. The specifications given and the information on the type plate apply as a condition for operation.

Warranty claims only apply to products of ipf electronic gmbh. When used in conjunction with third-party products, there is no warranty claim for the entire system.

Repairs may only be carried out at the plant. If you have any further questions, please do not hesitate to contact ipf electronic gmbh.

2. Identification

Magnetic type: The standard magnetic tape has a width of 10mm and bears the item number **AM000049**.

Magnetic sensor: The label shows the device type with article number that uniquely identifies the device.

3. Mechanical Mounting

The installation may only be carried out in accordance with the specified IP protection class. If necessary, the system must be additionally protected against harmful environmental influences, e.g. splash water, solvents, dust, impacts, vibrations, strong temperature fluctuations.

3.1 Mounting of the magnetic type

The mounting must be flat to the mounting surface or the distance to be measured. Waviness always reduces the measuring accuracy.

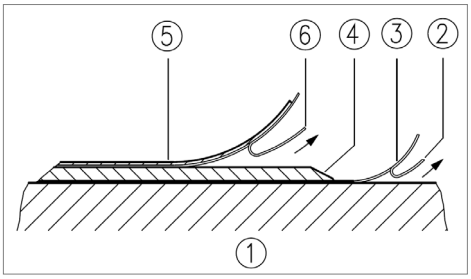
For technical reasons, an allowance of 57mm must be considered for the length in relation to the measuring section.

Wherever it is not possible to mount the no suitable mounting of the magnetic tape is possible due to insufficient fastening possibilities, the magnetic tape can be mounted in a **profile rail** (AM000050) available as an **accessory**. This creates a compact magnetic tape unit.

Attention! To achieve **optimum adhesion**, all anti-adhesive foreign substances (oil, grease, dust, etc.) must be removed by cleaning agents that evaporate as far as possible without leaving any residue. Suitable cleaning agents include ketones (acetone) or alcohols, which are offered as quick cleaners by the companies Loctite and 3M, among others. The surfaces to be glued must be dry and the highest possible contact pressure must be applied. The optimal gluing temperature is between 20°C and 30°C in dry rooms.

Tip: When gluing long tapes, the protective film of the tape should be peeled off over a quick section to fix the tape. The belt is then aligned. Now the protective film can be pulled out sideways over the remaining length while pressing on the tape at the same time. (a wallpaper pressure roller can be used as an aid).

Mounting step



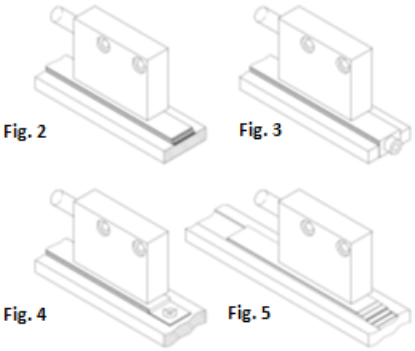
- Clean the mounting surface (1) carefully.
- Remove the protective film (2) of the adhesive tape (3) from the magnetic tape.
- Stick on the magnetic tape (4).
- Reinigen Sie die Magnetbandoberfläche sorgfältig.
- Remove the protective film (6) of the adhesive tape from the cover tape (5).
- Stick on the masking tape (let it overlap slightly at both ends).
- Secure the overlapping ends of the masking tape against detachment

Attention! Avoid the influence of magnetic fields. In particular, no magnetic fields (e.g. holding magnets or other permanent magnets) may come into direct contact with the magnetic tape.
In de-energized state, movements or adjustments of the magnetic sensor are not detected and registered by the subsequent electronics.

Mounting examples

The simple mounting method, using a bevelled protective tape (Fig. 2), is only recommended in a very protected environment. In unprotected environments there is a risk of peeling. In such cases, mounting methods as shown in figs. 3 and 4 are more suitable.

Optimum protection is provided by mounting in a groove (Fig. 5), which should be deep enough for the magnetic tape to be completely embedded in it.



3.2 Mounting the magnetic sensor

The magnetic sensor can be mounted by using 2 M3 screws via the ø3.5mm through holes. It is recommended to use the enclosed fixing screws and spring washers. The maximum tightening torque is 0.25Nm!

- Cables must be laid in such a way that there is no risk of damage from draught or other machine parts. If necessary, use a drag chain or protective hose and provide strain relief.
- Ensure correct alignment about the counting direction (Fig. 6). This is irrelevant if the counting direction can be reversed in the electronic evaluation.
- Observe the distance dimensions between sensor and magnetic tape as well as the angle tolerances, these must be maintained over the entire measuring distance! (Fig. 6)

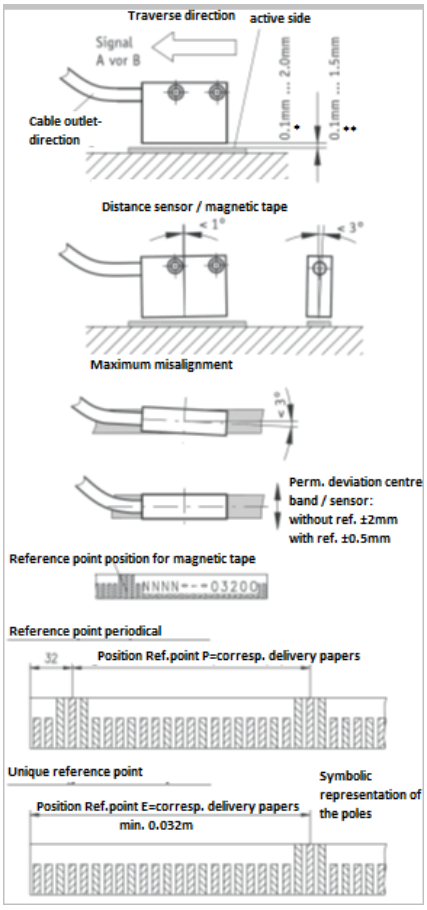


Fig. 6: Definition of counting direction / mounting / tolerances

** without reference point*
*** with reference point*

4. Electrical connection

- Wiring work must only be carried out without voltage!
- Before switching on, check all line connections and plug connections.
- Tin-plated stranded wires must not be used in conjunction with screw terminal connections.

Notes on interference immunity

All connections are protected against external interference. However, the place of use must be chosen in such a way that inductive or capacitive interference cannot affect the sensor or its connecting cable! Interference (e.g. from switching power supplies, motors, clocked controllers or contactors) can be reduced by suitable cable routing and wiring.

Necessary measures:

- Only use shielded cable. Apply the cable shield on both sides. Wire cross-section of the cables min. 0.14mm², max. 0.5mm².
- The shielding and earth (0V) must be wired in a star configuration and over a large area. The connection of the shielding to the equipotential bonding must be made over a large area (low impedance).
- The system must be installed as far away as possible from lines that are subject to interference; if necessary, provide for this. Avoid routing cables parallel to power lines.
- Contactor coils must be wired with spark suppressors.

Power supply

The voltage values depend on the sensor version and can be found in the delivery papers and on the type plate. (e.g.: U_B = 5V DC ± 5%)

5. Maintenance

Clean the surface of the magnetic tape from time to time with a soft cloth if it is heavily soiled by dust, chips, moisture, etc.

6. Error handling

Typical errors that occur during installation and operation:

- The magnetic tape was mounted incorrectly /active side down (chap. 3.1).
- The cover tape supplied was not used to protect the magnetic tape. The masking tape does not have to be magnetisable.
- The sensor is not connected or not connected correctly (connection diagram chap. 7).
- The distance tolerance between the sensor and the magnetic tape was not maintained over the entire measuring distance, the sensor grazes on the magnetic tape (Fig. 6).
- Cable interruption / disconnection due to sharp edges / crushing.
- The sensor is mounted with the active side facing away from the belt (Fig. 6). The active side is additionally marked with the sticker "belt side".
- The sensor has not been adjusted according to Fig. 6.

7. Technical data and article overview

7.1 Sensors

Articel-No	MW100105	MW100405
Operating voltage	5V DC ± 5%	5V DC ± 20%
Current consumption (without load)	< 20mA	< 20mA
Output circuit	TTL	TTL
Output signals	A / B	A / B und A / B invertiert
Output current (max. load)	2 x 5mA	4 x 5mA
Max. Traversing speed	< 25m/s	< 25m/s
Resolution (with 4-fold evaluation)	0.1mm	0.1mm
System accuracy *	± (0.1+0.01*L)mm	± (0.1+0.01*L)mm
Repeatability	± 1 inkrement	± 1 inkrement
Distance of the sensor to the tape	0.1 … 2mm	0.1 … 2mm
Temperature (operation)	-10 … +70°C	-10 … +70°C
Temperature (warehouse)	-30 … +80°C	-30 … +80°C
Humidity	100 % rH, condensation permitted	100 % rH, condensation permitted
Protection class (according to EN 60529)	IP 67	IP 67
Vibration resistance	10g/50Hz	10g/50Hz
Housing material	Plastic	Plastic
Connection	Cable PUR, 4-core	Cable PUR, 6-core
Mounting accessories	2x M3x14 allen key	2x M3x14 allen key

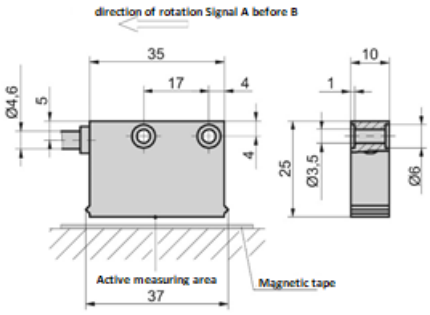
* L = Magnetic tape length in m

Pin assignment

Signal	Color
+UB	brown
GND	black
A	red
A invers*	yellow
B	orange
B invers*	green

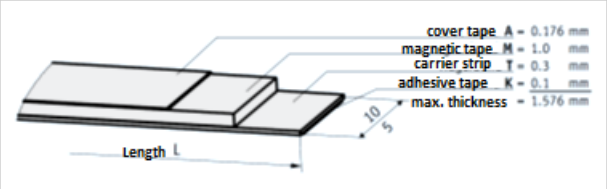
* only with MW100405

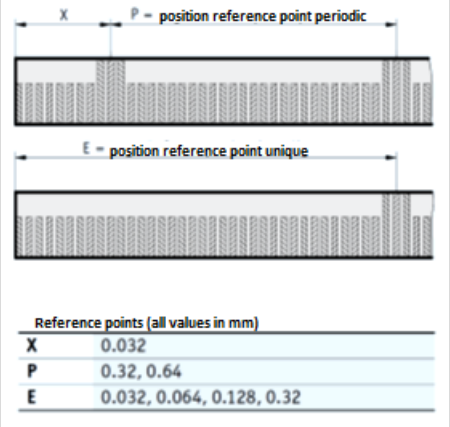
Dimensional drawing



7.2 Magneteic tape AM000049

Pole length	3.2mm
Belt length	any
Bandwidth	10mm
Thickness	1.4mm without cover strip
Operating temperature	-20 ... +70°C
Storage temperature	-40 … +70°C
Temperature coefficient	(11±1) x10^{-6} / K
Humidity	100 % rH, condensation permitted
Mounting type	adhesive bond, pre-assembled double-sided adhesive tape
Covering tape material	stainless steel





Reference points (all values in mm)

X	0.032
P	0.32, 0.64
E	0.032, 0.064, 0.128, 0.32

Safety notice: If there is a direct impact on personal safety, the use of these products is prohibited.