

magnetic linear measurement system MW10

Devices for operating voltage 24V DC for scanning a magnetic strip without reference point

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1. Warranty information

In order to carry out installation correctly, we strongly recommend this document is read very carefully. This will ensure your own safety and the operating reliability of the device.

Your device has been quality controlled, tested and is ready for use. Please observe all warnings and information which are marked either directly on the device or specified in this document.

Warranty can only be claimed for components supplied by ipf electronic gmbh. If the system is used together with other products, there is no warranty for the complete system.

Repairs should be carried out only at our works. For further questions don't hesitate to contact the ipf electronic gmbh.

2. Identification

magnetic strip: The standard magnetic strip with a width of 10mm has the article no. AM000049.

magnetic sensor: The label shows the device type with article number, which clearly identifies the device.

3. Mechanical mounting

For mounting, the degree of protection specified must be observed. If necessary, protect the unit against environmental influences such as sprayed water, dust, knocks, vibrations and extreme temperatures.

3.1 Mounting of the magnetic strip

The mounting surface / measuring track must be flat. Buckles or bumps will lead to measuring inaccuracies.

For technical reasons the strip should be approx. 57mm longer than the actual measuring distance.

If suitable mounting of the magnetic strip is not possible due to insufficient fastening possibilities, you can mount the magnetic strip into the **profile rail** AM000050, which is available as accessory.

Attention! To guarantee optimal adhesion oil, grease dust etc. must be removed by using cleansing agents



which evaporate without leaving residues. Suitable cleansing agents are e.g. ketones (acetone) or alcohols; the companies Loctite and 3M can both supply such cleansing liquid. Make sure that the surface to be glued is dry and apply the strip with maximum pressure. Glueing should preferably be undertaken at temperatures between 20°C to 30°C and in dry atmosphere.

Advice! When applying long pieces of magnetic strip do not immediately remove the complete protective foil, but rather peel back a short part from the end sufficient to fix the strip. Now align the strip. The protective strip can then be peeled back and put out from the side while pressing the tape firmly onto the mounting surface. A wall paper roller wheel could be used to assist in applying pressure onto the magnetic strip when fixing it in position.

Mounting steps (Fig.1)

- Clean mounting surface (1) carefully.
- Remove protective film (2) of the adhesive strip (3).
- Stick down the magnetic strip (4).
- Clean the surface of the magnetic strip carefully.
- Remove the protective strip (6) of the cover strip (5).
- Fix cover strip (both ends should slightly overlap).
- Also fix strip's ends to avoid unintentional peeling.

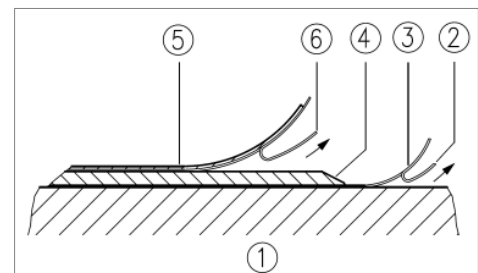


Fig. 1: Mounting of the magnetic strip

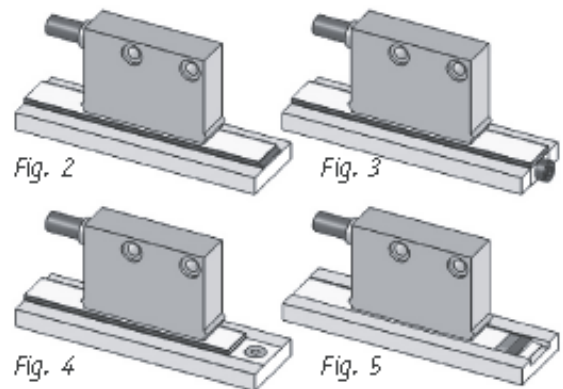
Attention! Do not expose the system to magnetic fields. Any direct contact of the magnetic strip with magnetic fields (e.g. adhesive magnets or other permanent magnets) is to be avoided. Sensor movements during power loss are not captured by the subsequent electronics.



Mounting examples

The simple mounting procedure by means of a beveled magnetic strip as shown in Fig. 2 can only be recommended for very protected environments. In a non-protected environment there is the danger of peeling off. Mounting approaches as shown in Fig. 3 and Fig. 4 are more suitable in such cases.

Optimum protection is provided by mounting in a groove as shown in Fig. 5. The groove should be deep enough so that the complete magnetic strip will be embedded in it.



3.2 Mounting of the magnetic sensor

The magnetic sensor can be fastened by using two bolts M3 over the $\varnothing 3.5\text{mm}$ through holes. We recommend to use the enclosed fixing screws and washer springs (fastening torque 0.25Nm!)

- Cables should be layed in such a way that there is no danger of damaging. Provide tension relief and drag chain or casing, if necessary.
- Observe the correct alignment with regard to the counting direction (fig. 6). This does not apply if the counting direction can be reversed in the electronic interpretation.
- The tolerance and gap measures must be observed over the whole measuring length (Fig.6).

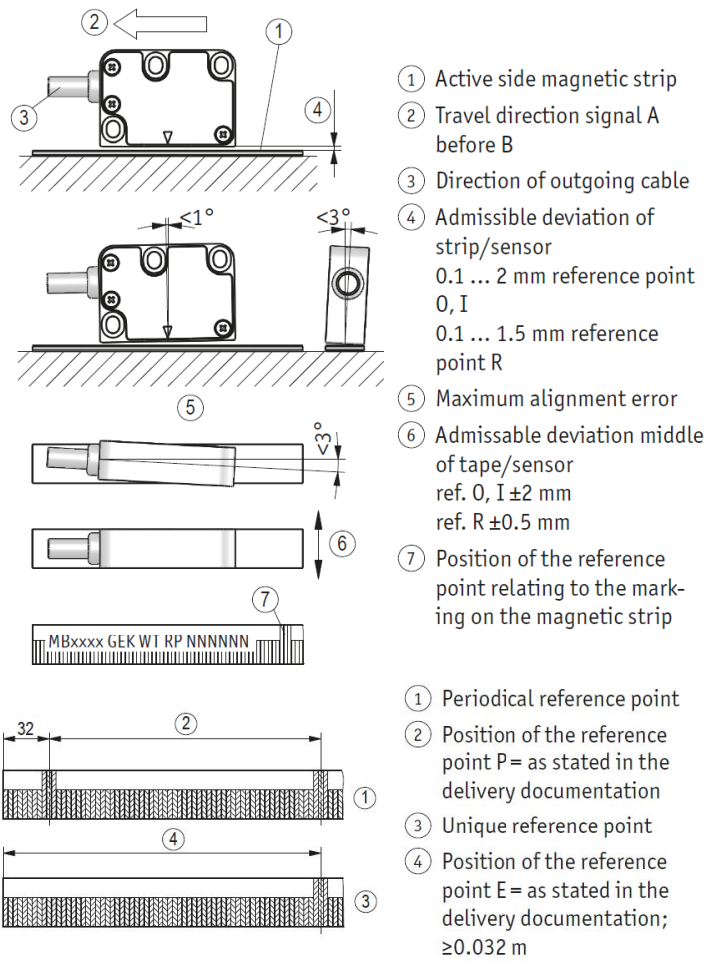


Fig 6: Definition of counting direction / mounting / tolerances

4. Electrical connection

- Wiring must only be carried out with power off!
- Check all lines and connections before switching on the equipment!
- Don't use tin-plated strands in connection with screw terminals!

Interference and distortion

Basically, all connections are protected against external interference. Choose a place of operation that excludes inductive or capacitive interference influences on the magnetic sensor. When mounting the system keep a maximum possible distance from lines loaded with interference.

Necessary measures:

- Only screened cable should be used. Wire cross section is to be at least 0.14mm², max. 0.5mm².
- Wiring to the screen and ground (0V) must be star-shaped and across an extensive area. Ensure that the connection of the screen and earth is made to a large surface area with a sound connection to minimise impedance.
- The system should be positioned well away from cables with interference; if necessary a protective screen or metal housing must be provided. The running of wiring parallel to the mains supply should be avoided.
- Contactor coils must be linked with spark suppression.

Supply voltage

The voltages depend on the sensor designs; they are to be taken from the delivery documentation and the identification plate (e.g. UB=24V DC ±20%).

5. Maintenance

We recommend cleaning the magnetic strip's surface from time to time with a soft cloth.

6. Trouble shooting

Below are some typical errors which may occur during installation and operation:

- Magnetic strip incorrectly mounted (active surface must be mounted towards the sensor)(see chapter 3.1).
- The masking tape provided was not used for protecting the magnetic strip. The masking tape must not be magnetizable.
- Sensor not or incorrectly connected (pin assignment see chapter 7).
- Tolerance for the gap between magnetic sensor and magnetic strip not observed over the total travel distance. Sensor touches strip (fig. 6).
- Cable squeezed / interrupted / cut by sharp edges.
- Sensor's active side not mounted towards the magnetic strip (see fig. 6). The active side is marked by the label "Bandseite" (strip side).
- Sensor has not been aligned according to fig. 6

7. Technical data and list of articles

7.1 Sensors

article numbers**	MW100100 MW100101 MW100102 MW100103	MW100400 MW100402
operating voltage	24V DC ± 20%	24V DC ± 20%
current consumption (w/o load)	< 20mA	< 20mA
type of output	Push/Pull	Push/Pull
output signals	A / B	A / B and A / B inverted
output current (max. load)	2 x 20mA	4 x 20mA
max. linear traverse speed	< 25m/s	< 25m/s
resolution (at 4-fold evaluation)	0.1mm	0.1mm
system accuracy*	± (0.1+0.01*L)mm	± (0.1+0.01*L)mm
repeat accuracy	± 1 increment	± 1 increment
distance sensor - strip	0,1 ... 2mm	0,1 ... 2mm
temperature (operating)	-10 ... +70°C	-10 ... +70°C
temperature (storage)	-30 ... +80°C	-30 ... +80°C
air humidity	100% rF, condensation permitted	100% rF, condensation permitted
protection class (acc. EN 60529)	IP 67	IP 67
vibration resistance	10g/50Hz	10g/50Hz
material (housing)	plastic	plastic
connection	cable PUR, 4-wire	cable PUR, 6-wire
mounting accessories	2x M3x14mm hex.	2x M3x14mm hex.

* L = length of magnetic strip in m

** The length of the connection cables can be deduced from the article numbers:

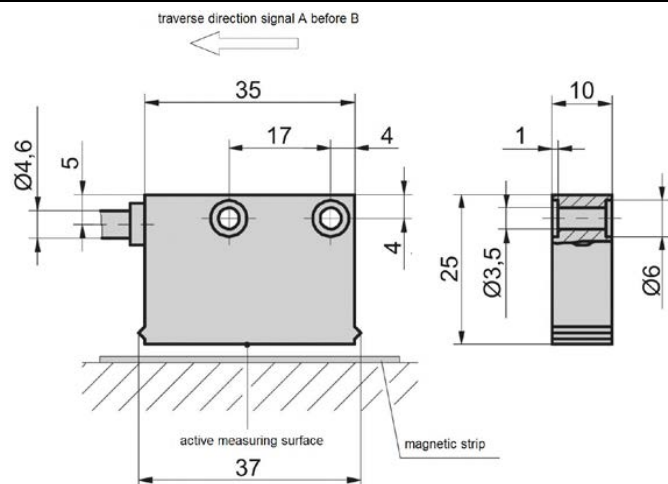
last digit	cable length
0	2m
1	5m
2	10m
3	20m

connection

wire allocation	color
+UB	brown
GND	black
A	red
A invers*	yellow
B	orange
B invers*	green

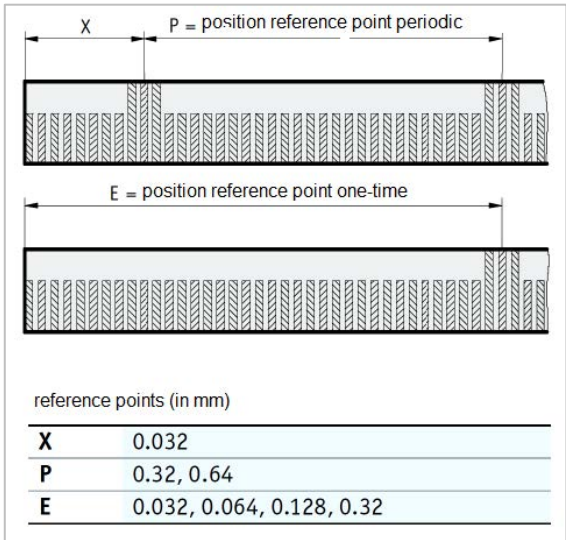
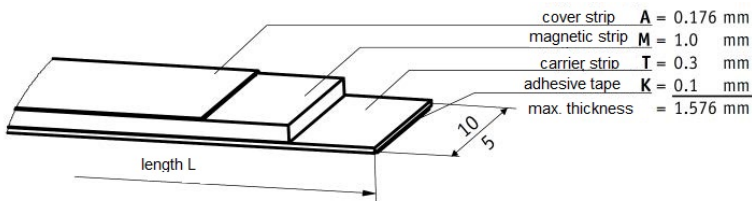
* only MW1004xx

dimensional drawing



7.2 Magnetic strip AM000049

pole length	3.2mm
strip length	arbitrary
band width	10mm
thickness	1.4mm without cover strip
temperature (operating)	-20 ... +70 °C
temperature (storage)	-40 ... +70 °C
temperature coefficient	$(11\pm 1)\times 10^{-6} / K$
air humidity	100 % rF, condensation permitted
mounting	adhesive bond, pre-mounted double-sided adhesive tape
material cover strip	stainless steel



Warning: Never use these articles in applications where the safety of a person depends on their functionality.