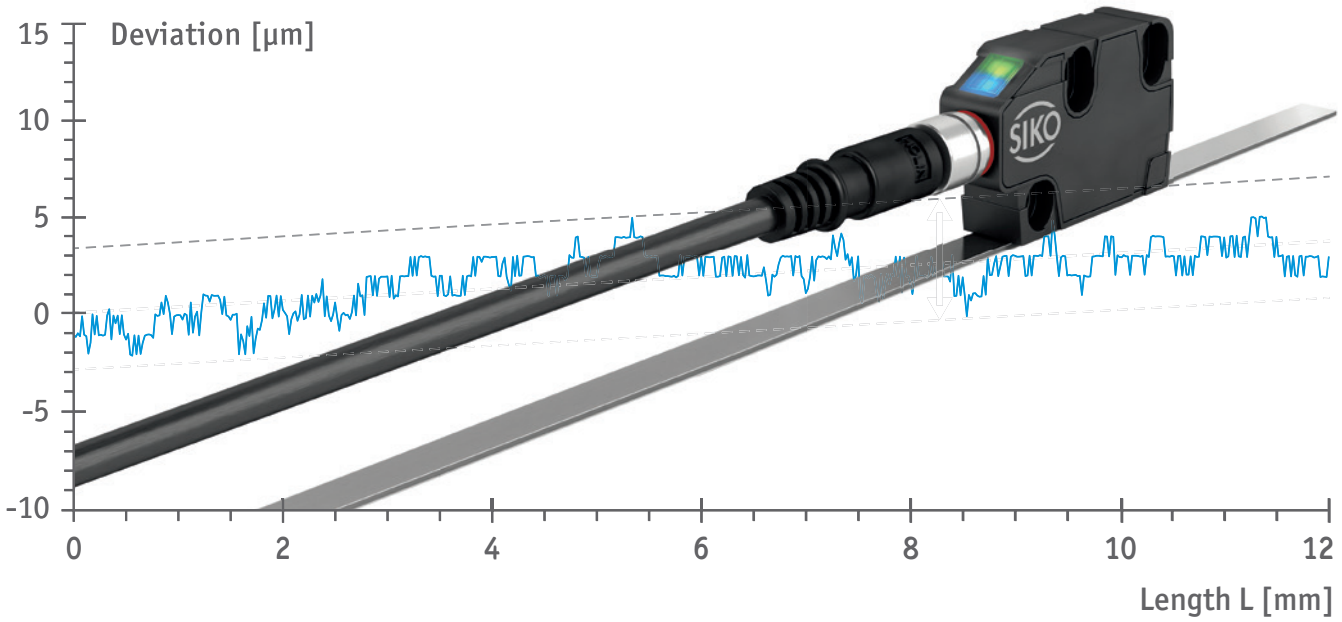
MAGLINE

ACCURACY SPECIFICATIONS



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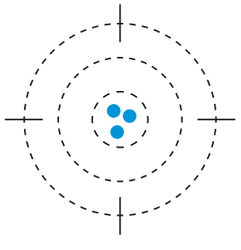
ACCURACY SPECIFICATIONS

Repeat accuracy

The deviation measured by repeated approach to a defined position is called repeat accuracy. When the defined position is approached from one direction, it is called „unidirectional“, when it is approached from both directions, it is called „bi-directional“. The SIKO repeat accuracy is documented unidirectional in each encoder data sheet.
Example: ±1 µm for MSK1000.



Linearity deviation

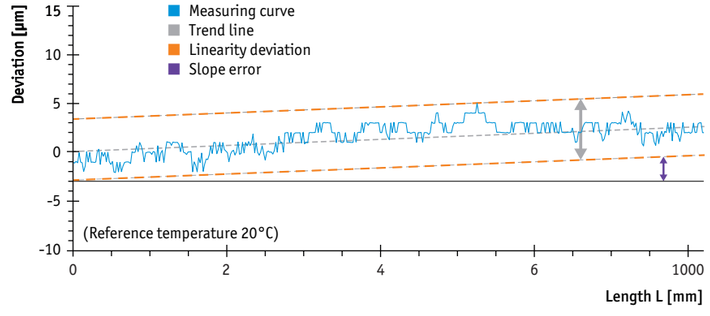
The maximum deviation of a measuring line, related to its reference line, is the linearity deviation. This refers to any meter within the entire measuring length. The **linearity deviation X of the encoder** is the result of an accuracy measurement over several magnetic poles.

Magnetic encoder	Pole length	Temperature	Linearity deviation
MSK1000	1 mm	20°C	±2 µm
LEC160	1,6 mm	20°C	±3 µm
MSK200/1	2 mm	20°C	±5 µm
MSK320	3,2 mm	20°C	±30 µm
MSK5000, MSC500	5 mm	20°C	±20 µm
MSA213C	2 mm	20°C	±10 µm

The result of the accuracy measurements of the magnetic band under consideration of the regression line related to 1 m results in the **linearity deviation R of the magnetic band**. This is indicated without slope error.

Magnetic band	Pole length	Temperature	Linearity deviation
MB100/1	1 mm	20°C	±8 µm / ±20 µm
MB160	1,6 mm	20°C	±15 µm / ±25 µm
MB200/1	2 mm	20°C	±20 µm
MB320/1	3,2 mm	20°C	±50 µm
MB500/1	5 mm	20°C	±35 µm / ±50 µm
MBA213	2 mm	20°C	±30 µm

Example:
Linearity Deviation (symbolic)



Linearity deviation Z of the system

X

Linearity deviation encoder
(6 pole measurement)

R

Linearity deviation magnetic band over one meter

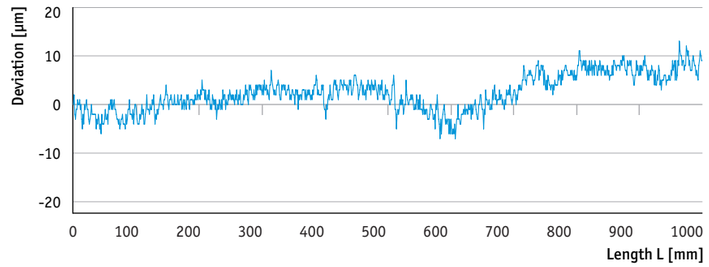
Z = X + R

Z = ±2 µm + ±8 µm = ±10 µm

Example: Encoder MSK1000 and magnetic band MB100/1

Measuring curve

- MSK1000 ±2 µm
- MB100/1 ±8 µm



Overall accuracy

For overall accuracy G over the entire measuring length L of the application, the slope error S must be added.

S = (L – 1m) * s

- Pole lengths 1 mm and 1.6 mm with high accuracy: s = ±1 µm/m
- All pole lengths and standard accuracy: s = ±10 µm/m

Calculation of overall accuracy G:

G = Z + S

G = ±10 µm + 4,5 m * ±1 µm/m
= ±14,5 µm

Explanation: Measuring length 5.5 m with components from example above (linearity deviation Z over 1 m and additional slope error S over 4.5 m)

Influence of the temperature on the linearity deviation

Changing ambient temperature influences the linearity deviation by the length of the magnetic band that is glued on a steel carrier that has 11 µm/m/K.

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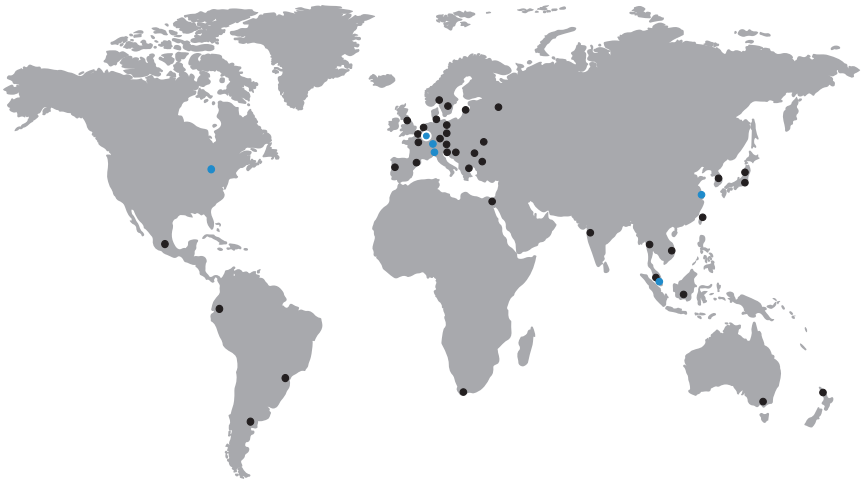

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