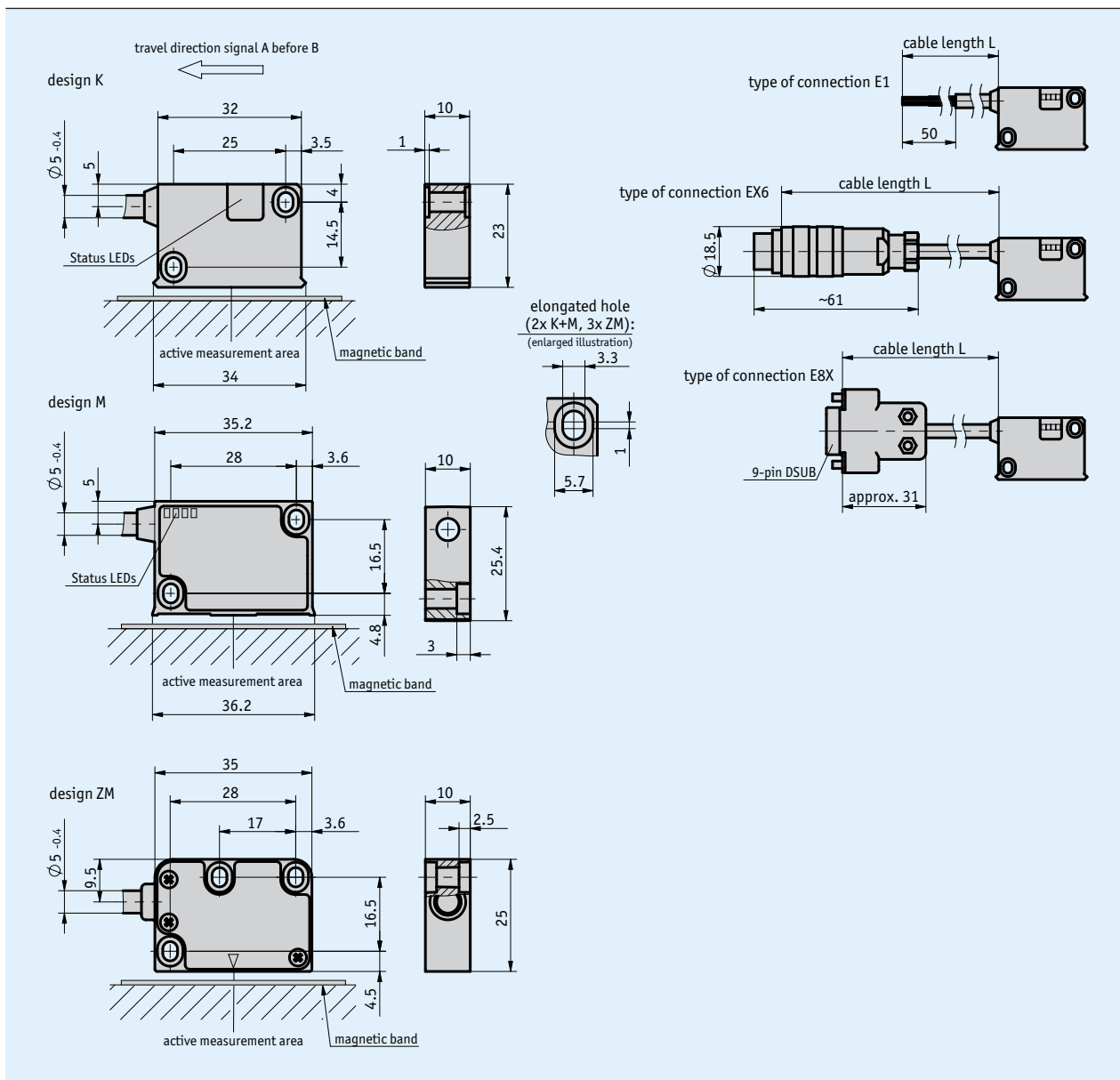


## Profile

- Max. resolution 1  $\mu\text{m}$
- Repeat accuracy  $\pm 0.01\text{ mm}$
- Repeat accuracy of  $\pm 1$  increment
- Status LED display
- Works with magnetic tape MB500/1, MR500, MBR500
- Reading distance  $\leq 2\text{ mm}$
- Max. 200000 pulses/revolution in combination with MR500 or MBR500 (160 poles)
- Optionally with reference point R or flexible reference marks FR



### Mechanical data

Feature	Technical data	Additional information
Housing	synthetic material ABS black	K design
	zinc die-cast/aluminum	M design, aluminum front cover
	zinc die-cast	ZM design
Sensor/band reading distance	0.1 ... 2 mm	0, I reference signals
	0.1 ... 1.5 mm	R reference signal
	0.4 ... 1 mm	FR reference signal
Sensor/ring reading distance	0.1 ... 2 mm	0, I reference signals
	0.1 ... 1.5 mm	R reference signal
Cable sheath	PUR, suitable for drag-chain use	6, 8-wire ø5 <sub>-0,4</sub> mm
Cable bending radius	5x cable diameter	static
	7.5x cable diameter	dynamic
Service life of cable	>5 million cycles	under the following test conditions: travel range 4.5 m travel speed 3 m/s acceleration 5 m/s <sup>2</sup> ambient temperature 20 °C ±5 °C

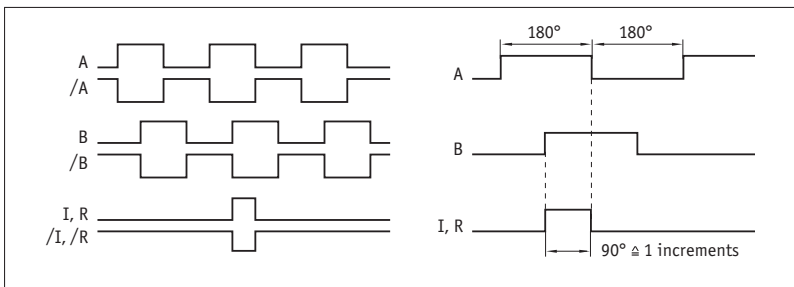
### Travel/circumferential speed

Resolution/ Scaling factor	Travel/circumferential speed Vmax [m/s]										
	4.00	3.20	1.60	0.80	0.32	0.20	0.10	0.05	0.03	0.01	
0.001/12-50	20.00	16.00	8.00	4.00	1.60	1.00	0.50	0.25	0.13	0.06	
	25.00	25.00	16.00	8.00	3.20	2.00	1.00	0.50	0.25	0.12	
	25.00	25.00	25.00	20.00	8.00	5.00	2.50	1.25	0.63	0.30	
	25.00	25.00	25.00	25.00	16.00	10.00	5.00	2.50	1.25	0.61	
	25.00	25.00	25.00	25.00	25.00	20.00	10.00	5.00	2.50	1.21	
Pulse interval [μs]	0.20	0.25	0.50	1.00	2.50	4.00	8.00	16.00	32.00	66.00	
Counting frequency [kHz]	1250.00	1000.00	500.00	250.00	100.00	62.50	31.25	15.63	7.81	3.79	

### Electrical data

Feature	Technical data	Additional information
Operating voltage	6.5 ... 30 V DC	reverse polarity protected
	4.75 ... 6 V DC	without reverse polarity protection
Current consumption	<25 mA	at 24 V DC, unloaded
	<75 mA	loaded
Output circuit	PP, LD (RS422)	
Output signals	A, /A, B, /B, I, /I, R, /R, FR, /FR	
Output signal level high	>UB - 2.5 V	PP
	>2.5 V	LD
Output signal level low	<0.8 V	
Pulse width of reference signal	1 or 4 increment(s)	
Real-time requirement	speed-proportional signal output	
Type of connection	open cable end	
	plug connector	7/8-pole
	D-Sub	9-pole

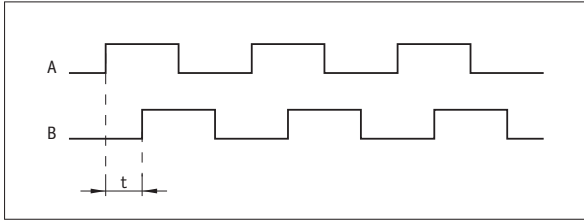
### Signal pattern



**!** The logical condition of signals A and B is not defined in reference to the index signal I or the reference signal R. It can deviate from the signal form.

**!** Reference or index signal with 4 increments (360°) signal length is only valid from the 5th counting step onwards. A corresponding delay should be taken into consideration after switching on the operating voltage.

### ■ Pulse interval



#### Example: Pulse interval $t = 1 \mu\text{s}$

(i. e., the downstream unit must be able to process 250 kHz)

$$\text{Formula for counting frequency} = \frac{1}{1 \mu\text{s} \times 4} = 250 \text{ kHz}$$

### System data

Feature	Technical data	Additional information
Resolution	0.001, 0.005, 0.01, 0.025, 0.05, 0.1 mm	
Scaling factor	12.5, 25, 50, 125, 250, 1250	
System accuracy	$\pm (0.025 + 0.01 \times L)$ mm, L in m	at $T_{0} = 20 \text{ }^{\circ}\text{C}$
	$\pm 0.1^{\circ}$	at $T_{0} = 20 \text{ }^{\circ}\text{C}$
Repeat accuracy	$\pm 10 \mu\text{m}$	
Measuring range	$\infty$	
Circumferential speed	depending on scaling factor and pulse interval	see table
Travel speed	depending on resolution and pulse interval	see table

### Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	-10 ... 70 °C	
Storage temperature	-30 ... 80 °C	
Relative humidity	100 %	condensation admissible
EMC	EN 61000-6-2	interference resistance / immission
	EN 61000-6-4	emitted interference / emission
Protection category	IP67	EN 60529
Shock resistance	500 m/s <sup>2</sup> , 11 ms	EN 60068-2-27
Vibration resistance	100 m/s <sup>2</sup> , 5 ... 150 Hz	EN 60068-2-6

### Pin assignment

#### ■ Inverted without reference signal

Signal	E1	E6X	E8X
A	red	1	1
B	orange	2	2
nc		3	3
+UB	brown	4	4
GND	black	5	5
/A	yellow	6	6
/B	green	7	7
nc		8	8
nc		9	9

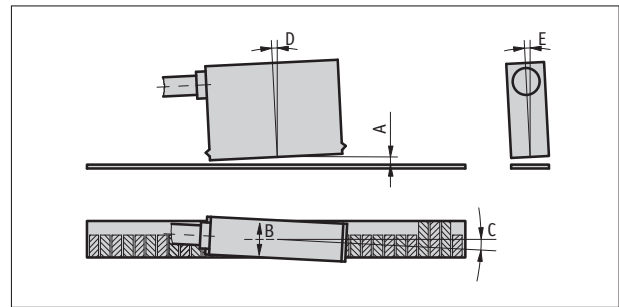
#### ■ Inverted with reference signal

Signal	E1	E6X	E8X
A	red	1	1
B	orange	2	2
I,R	blue	3	3
+UB	brown	4	4
GND	black	5	5
/A	yellow	6	6
/B	green	7	7
/I, /R	violet	8	8
nc		9	9

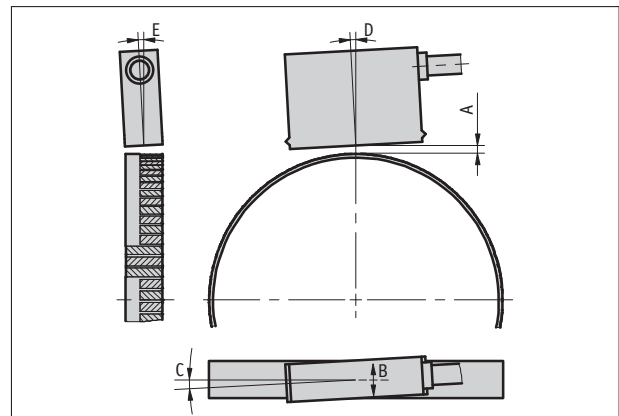
## Hint for mounting

For systems with reference points on the magnetic tape please take care that sensor and strip are correctly aligned (see picture).

Reference signal	O, I	R	FR
A, Sensor/tape reading distance	$\leq 2 \text{ mm}$	$\leq 1.5 \text{ mm}$	0.4 ... 1.0 mm
B, Lateral offset	$\pm 2 \text{ mm}$	$\pm 0.5 \text{ mm}$	$\pm 0.5 \text{ mm}$
C, Alignment error	$\pm 3^\circ$	$\pm 3^\circ$	$\pm 3^\circ$
D, Longitudinal inclination	$\pm 1^\circ$	$\pm 1^\circ$	$\pm 1^\circ$
E, Lateral inclination	$\pm 3^\circ$	$\pm 3^\circ$	$\pm 3^\circ$



Symbolic representation



symbolic sensor representation

### Order

#### Ordering information

One or more system components are required:

Magnetic band MB500/1

[www.siko-global.com](http://www.siko-global.com)

Magnetic ring MR500

[www.siko-global.com](http://www.siko-global.com)

Magnetic band ring MBR500

[www.siko-global.com](http://www.siko-global.com)

#### Ordering table

Feature	Ordering data	Specification	Additional information
Operating voltage	10	6.5 ... 30 V DC	
	11	4.75 ... 6 V DC	
Design	K	plastic housing	
	M	metal housing with status LEDs	
	ZM	metal housing without status LEDs	not for operating voltage 4 and output circuit LD
Type of connection	E1	open cable end	
	E6X	bullet connector without mating connector	
	E8X	D-SUB 9-pin without mating connector	
		extension cables on request	
Cable length	...	01.0 ... 20 m, in steps of 1 m	
		others on request	
Output circuit	PP	push-pull	
	LD	Line Driver	
Reference signal	O	without	
	I	periodic index	index signal every 5 mm
	R	fixed reference	
	FR	flexible reference	only for ZM design and MB500/1 magnetic tape
Linear resolution/ radial scaling factor	...	0.001/1250, 0.005/250, 0.010/125, 0.025/50, 0.050/25, 0.1/12.5	
		others on request	
Pulse interval	...	0.2, 0.25, 0.5, 1, 2.5, 4, 8, 16, 32, 64	

#### Order key

MSK5000 -  -  -  -  -  -  -  -

A      B      C      D      E      F      G      H

**Scope of delivery:** MSK5000, Mounting instructions, Fastening set

#### Accessories:

Installation aid ZB3054

Flexible reference mark

[www.siko-global.com](http://www.siko-global.com)

Order key 88436