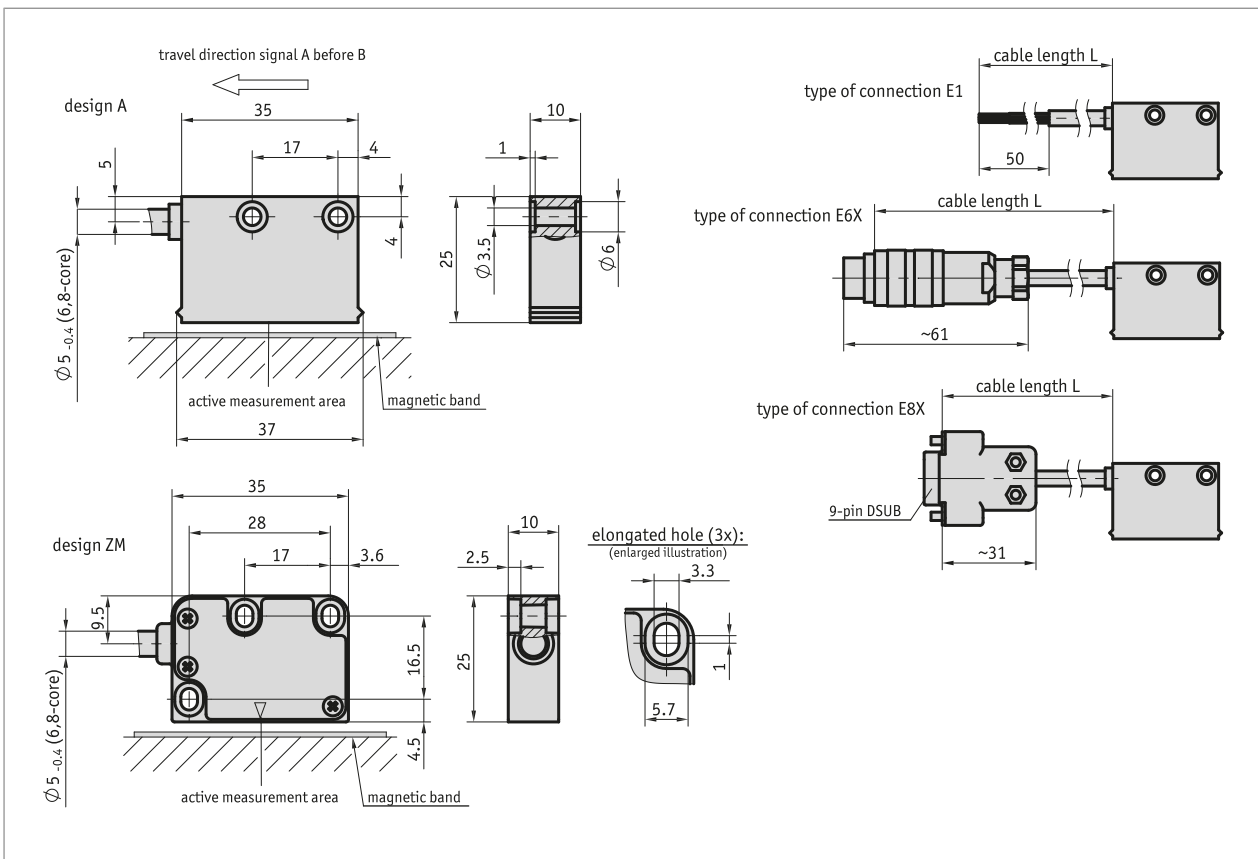
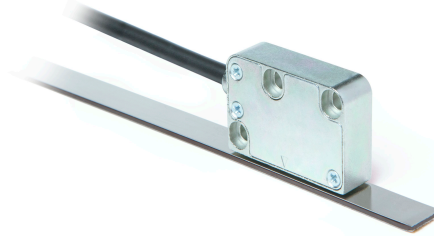


Profile

- Max. resolution 0.4 μm
- Works with MB200/1 magnetic tape, MR200 magnetic ring, MBR200 magnetic tape ring
- Reading distance $\leq 1\text{ mm}$
- IP67 protection class
- optionally with reference point R or flexible reference marks FR
- Interface LD
- Interface RS485 with Panasonic or Yaskawa protocol



Mechanical data

Feature	Technical data	Additional information
Housing	green plastic	A design
	zinc die-cast	ZM design
Sensor/band reading distance	0.1 ... 1 mm	O, I reference signals
	0.1 ... 0.5 mm	R reference signal
	0.4 ... 0.5 mm	FR reference signal
Sensor/ring reading distance	0.1 ... 0.8 mm	O, I reference signals
	0.1 ... 0.4 mm	R reference signal
Cable sheath	PUR, suitable for drag-chain use	4-core ø 4.4-0.4 mm; 6, 8-core ø 5.0-0.4 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 4.5 m travel speed 3 m/s acceleration 5 m/s ² ambient temperature 20 °C ±5 °C.

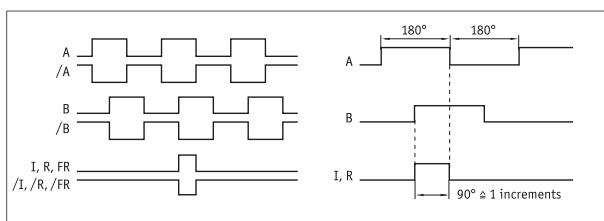
Travel/circumferential speed

Resolution/ Scaling factor	Travel/circumferential speed Vmax [m/s]					
	6.00	2.40	1.20	0.60	0.30	0.15
0.001/500	6.00	2.40	1.20	0.60	0.30	0.15
0.002/250	12.00	4.80	2.40	1.20	0.60	0.30
0.004/125	24.00	9.60	4.80	2.40	1.20	0.60
0.005/100	25.00	12.00	6.00	3.00	1.50	0.75
0.010/50	25.00	24.00	12.00	6.00	3.00	1.50
Pulse interval [μs]	0.10	0.25	0.50	1.00	2.00	4.00
Counting frequency [kHz]	2500.00	1000.00	500.00	250.00	125.00	62.50

Electrical data

Feature	Technical data	Additional information
Operating voltage	24 V DC ±20 %	
	5 V DC ±5 %	
Current consumption	≤100 mA at 24 V DC	
	≤30 mA at 5 V DC	
Output signals	A, /A, B, /B, I, /I, R, /R, FR, /FR	
Latency	1.5 μs	
Interface	LD (RS422)	
	RS485/P (Panasonic)	Minas A5, A6
	RS485/Y (Yaskawa)	SIGMA 7
Real-time requirement	speed-proportional signal output	
Type of connection	open cable end	
	plug connector	7/8-pole
	D-SUB	9-pole

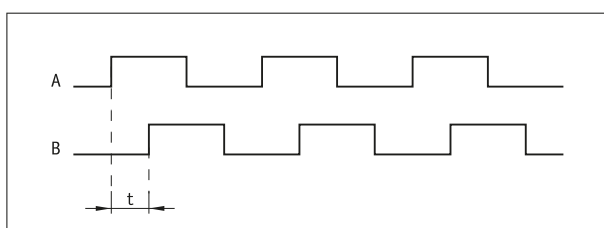
Signal image



! 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, LD output circuit



Example: Pulse interval t = 1 μs

(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	0.0004, 0.0005, 0.001, 0.002, 0.004, 0.005, 0.01, 0.025 mm	
Scaling factor	20, 50, 100, 125, 250, 500, 1000, 1250	
Linearity deviation	$\pm 5 \mu\text{m}$ at $T_{ij} = 20^\circ\text{C}$	
Repeat accuracy	± 1 Increment(s)	
Measuring range	∞	
Circumferential speed	Dependent on resolution and pulse interval $\leq 4.5 \text{ m/s}$	cf. LD table RS485/P, RS485/Y
Travel speed	Dependent on resolution and pulse interval $\leq 4.5 \text{ m/s}$	cf. LD table RS485/P, RS485/Y

Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	$-10 \dots 70^\circ\text{C}$	
Storage temperature	$-30 \dots 80^\circ\text{C}$	
Relative humidity	100 %	condensation admissible
Protection category	IP67	EN 60529

pin assignment

■ inverted without reference signal, LD

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
nc			9

■ inverted with reference signal, LD

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

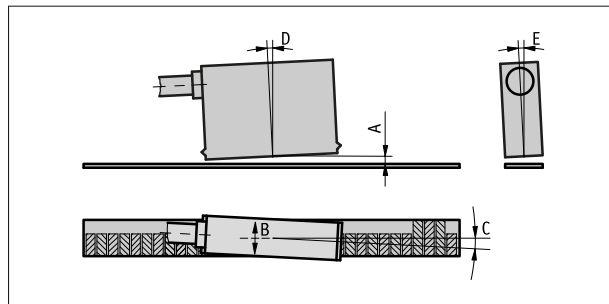
■ RS485/P (Panasonic), RS485/Y (Yaskawa)

Signal	Cable color
A	red
B	orange
+UB	brown
GND	black

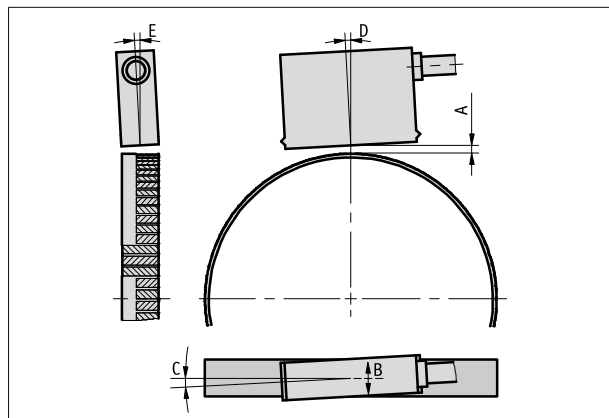
Hint for mounting

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

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



(Sensor representation symbolic)

Order

■ Ordering information

One or more system components are required:

Magnetic tape MB200/1
Magnetic ring MR200
Magnetic band ring MBR200

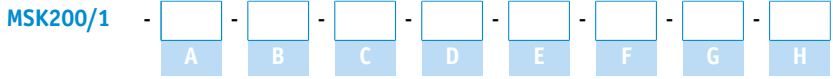
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■ Ordering table


Feature	Ordering data	Spezifikation	Additional information
Operating voltage	A 4 5	24 V DC 5 V DC	A voltage drop is to be expected with increasing cable length. This must be taken into account in the electrical design.
design	B A ZM	rectangular metal housing without status LEDs	
Type of connection	C E1 E6X E8X	open cable end bullet connector without mating connector D-SUB 9-pole without mating connector	
Cable length	D ...	02.0 ... 20 m, in intervals of 1 m others on request	
Interface	E LD RS485/P RS485/Y	Line Driver RS422 Panasonic Yaskawa	only with reference signal 0, Minus A5, A6 only with reference signal 0, SIGMA 7
reference signal	F 0 I R FR	without periodic index fixed reference flexible reference	only for ZM design and with MB200/1 magnetic tape

Feature	Ordering data	Spezifikation	Additional information
linear resolution/ radial scaling factor	G ...	0.01/50, 0.005/100, 0.004/125, 0.002/250, 0.001/500 others on request	
Pulse interval	H ...	0.10, 0.25, 0.50, 1.00, 2.00, 4.00, 8.00	

■ Order key



 **Scope of delivery:**
MSK200/1, Installation Instructions, Sensor fastening set

 **Accessories you can find:**
Installation tool ZB3054
Flexible reference mark

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Subject to technical alterations and errors | 2024/04/29 | 13:32