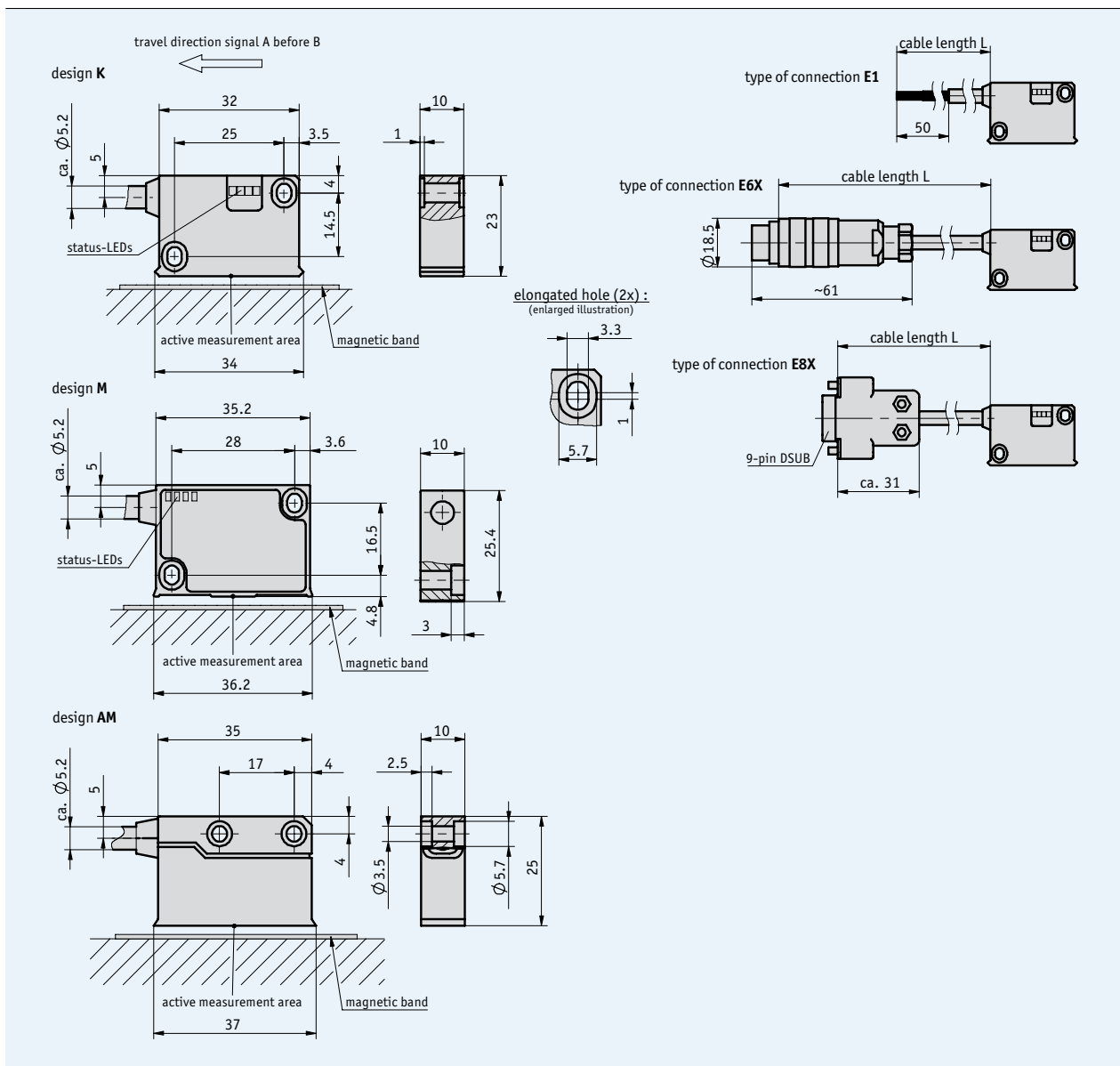


### Profile

- Max. resolution up to 262 500 pulses/revolution in combination with MR500 and MBR500 (188 poles)
- Max. 800 000 increments/revolution with 4-fold evaluation for MR500 and MBR500 (188 poles)
- Repeat accuracy of  $\pm 1$  increment
- Status LED display



## Mechanical data

| Feature                      | Technical data                           | Additional information                                 |
|------------------------------|--|--|
| Scale embodiment             | MR500<br>MBR500                          |  |
| System accuracy              | ±0.1°                                    |  |
| Repeat accuracy              | max. ±10 µm                              |  |
| Sensor/ring reading distance | 0.1 ... 2 mm<br>0.1 ... 1.5 mm           | with reference signals O, I<br>with reference signal R |
| Circumferential speed        | depends on resolution and pulse interval | see table  |
| Housing                      | plastic, black                           |  |
| Sensor cable                 | PUR                                      | drag chain-compatible                                  |
| Operating temperature        | -10 ... +70°C                            |  |
| Storage temperature          | -30 ... +80°C                            |  |
| Humidity                     | 100 % rh                                 | condensation permitted                                 |
| Protection category          | IP67                                     |  |
| Vibration resistance         | 10 g/50 Hz                               |  |
| Max. measuring length        | infinite                                 |  |

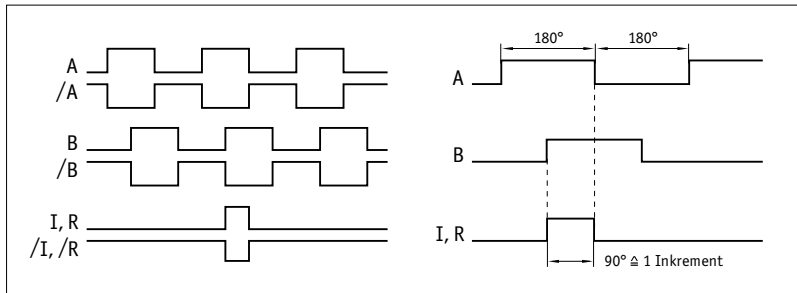
### ■ Circumferential speed

|                          |      | circumferential speed $V_{max}$ (m/s) |        |        |        |       |       |       |       |       |
|--------------------------|------|---------------------------------------|--------|--------|--------|-------|-------|-------|-------|-------|
| Scaling factor           | 1250 | 4.00                                  | 1.60   | 0.80   | 0.32   | 0.20  | 0.10  | 0.05  | 0.03  | 0.01  |
|                          | 250  | 20.00                                 | 8.00   | 4.00   | 1.60   | 1.00  | 0.50  | 0.25  | 0.13  | 0.06  |
|                          | 125  | 25.00                                 | 16.00  | 8.00   | 3.20   | 2.00  | 1.00  | 0.50  | 0.25  | 0.12  |
|                          | 50   | 25.00                                 | 25.00  | 20.00  | 8.00   | 5.00  | 2.50  | 1.25  | 0.63  | 0.30  |
|                          | 25   | 25.00                                 | 25.00  | 25.00  | 16.00  | 10.00 | 5.00  | 2.50  | 1.25  | 0.61  |
|                          | 12.5 | 25.00                                 | 25.00  | 25.00  | 25.00  | 20.00 | 10.00 | 5.00  | 2.50  | 1.21  |
| Pulse interval (µs)      |      | 0.20                                  | 0.50   | 1.00   | 2.50   | 4.00  | 8.00  | 16.00 | 32.00 | 66.00 |
| Counting frequency (kHz) |      | 1250.00                               | 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 V DC ... 30 V DC<br>4.75 V DC ... 6 V DC   | reverse-polarity protection on UB<br>no reverse-polarity protection on UB |
| Current consumption             | <20 mA off-load<br><75 mA loaded               | at 24 V   |
| Type of connection              | flying leads<br>round connector<br>D-SUB 9-pin |   |
| Output circuit                  | PP<br>LD (RS422)                               |   |
| Output signals                  | A, /A, B, /B, option: I, /I or R, /R           |   |
| Max. pulses/revolution          | max. 262500 pulses/revolution                  |   |
| Pulse width of reference signal | 1 or 4 increments                              |   |
| Scaling factor                  | 1250, 250, 125, 50, 25, 12.5                   |   |
| Interference protection class   | 3  | IEC-61000-6-2   |
| Real-time requirement           | real-time signal processing                    |   |
| Signal level high               | >UB - 2.5 V<br>>2.5 V                          | with PP<br>with LD  |
| Signal level low                | <0.8 V   |   |

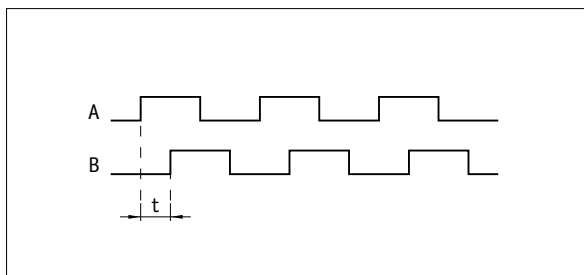
■ Signal forms



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

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

Pin assignment

■ inverted without index signal

| Signal | E1     | E6X | E8X     |
|--------|--------|-----|---------|
| A      | red    | 1   | 1       |
| B      | orange | 2   | 2       |
| +UB    | brown  | 4   | 4       |
| GND    | black  | 5   | 5       |
| /A     | yellow | 6   | 6       |
| /B     | green  | 7   | 7       |
| N.C.   |        | 3   | 3, 8, 9 |

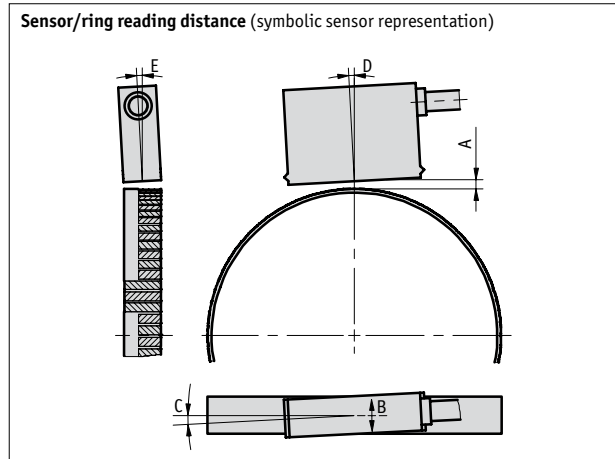
■ inverted with index signal

| 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   |
| N.C.   |        |     | 9   |

### Mounting instruction

On systems with reference points on the magnetic ring, please ensure the correct alignment of the sensor and band.

| Reference signal                | O, I       | R            |
|---------------------------------|------------|--------------|
| A, Sensor/band reading distance | max. 2 mm  | max. 1.5 mm  |
| B, Lateral offset               | max. ±2 mm | max. ±0.5 mm |
| C, Misalignment                 | <±3°       | <±3°         |
| D, Longitudinal tilt            | <±1°       | <±1°         |
| E, Lateral tilt                 | <±3°       | <±3°         |



### Order

#### Order table

| Feature              | Order data | Specifications                            | 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            |                           |
|                      | AM         | metal housing without status LEDs         |                           |
| Type of connection   | E1         | flying leads                              |                           |
|                      | E6X        | round connector without mating connectors |                           |
|                      | E8X        | D-SUB 9-pin without mating connectors     |                           |
|                      |            | cable extensions on request               |                           |
| Cable length L       | ...        | 1 ... 20 m, in steps of 1 m               |                           |
|                      |            | others on request                         |                           |
| Output circuit       | PP         | push-pull                                 | only operating voltage 10 |
|                      | LD         | line driver                               |                           |
| Reference signal     | O          | without                                   |                           |
|                      | I          | index periodic                            |                           |
|                      | R          | fixed reference                           |                           |
| Scaling factor       | ...        | 12.5, 25, 50, 125, 250, 1250              |                           |
|                      |            |   |                           |
| Pulse interval in µs | ...        | 0.2, 0.5, 1, 2.5, 4, 8, 16, 32, 66        |                           |
|                      |            |   |                           |

#### Order code

MSK5000 -  -  -  -  -  -  -  -

A      B      C      D      E      F      G      H

**Scope of delivery:** MSK5000, User information, Allen fastening screws M3 x 14 mm ISO 4762, lock washers M3 DIN 7980, strain relief for sensor cable, distance gage 0.8 mm

#### Additional information:

Short Description, Technical Details  
Product Overview

Page 142 cont.  
Page 4 cont.