

Bearingless encoders

**Incremental, standard
zero pulse, magnetic**

RI50 / Limes LI50 (hollow shaft)

Push-pull / RS422



Thanks to its installation depth of only 16 mm, the bearingless magnetic rotary encoder RI50 / Limes LI50, comprising a magnetic ring and sensor head, is ideally suited for plants and machinery where space is very tight. The non-contact measuring principle allows for error-free use even under harsh environmental conditions, as well as ensuring a long service life. In contrast to our measuring system RI20 / Limes LI20, a single zero pulse is also implemented here.

For outdoor use with extremely sturdy aluminum housing and stainless steel cover, wide temperature range as well as a UV-resistant cable. IP68 / IP69k protection, special encapsulation technology and tested resistance to cyclic humidity and damp heat offer the highest levels of reliability, even in exposed outdoor use.



High rotational speed



High protection level



Shock / vibration resistant



Reverse polarity protection

Hard-wearing and robust

- High shock and vibration resistance.
- Sturdy housing with IP67 protection. Option: special housing for maximum resistance against condensation (IP68 / IP69k, resistance to cyclic humidity acc. to EN 60068-3-38 as well as damp heat acc. to EN 60068-3-78).
- Non-contact measuring system, free from wear, ensures a long service life.

Fast start-up

- Function display via LED.
- Large mounting tolerance between magnetic band and sensor head.
- Requires very little installation space.
- Slotted hole fixing ensures simple alignment.

Selection guide magnetic ring RI50 / Limes LI50

| Pulse per revolution ¹⁾ | Order code magnetic ring RI50 | Order code sensor head Limes LI50 | Max. rotational speed min ⁻¹ (electronic) ²⁾ | |
|------------------------------------|----------------------------------|--------------------------------------|--|--------------------|
| | | | without using index signal | using index signal |
| 1000 | 8.RI50.031.XXXX.112 | 8.LI50.11X1.1050 | 9000 | 3000 |
| 2000 | 8.RI50.031.XXXX.112 | 8.LI50.11X1.1100 | 4000 | 3000 |
| 1024 | 8.RI50.048.XXXX.112 | 8.LI50.11X1.1032 | 9000 | 2000 |
| 2048 | 8.RI50.048.XXXX.112 | 8.LI50.11X1.1064 | 4000 | 2000 |
| 3600 | 8.RI50.055.XXXX.112 | 8.LI50.11X1.1100 | 2500 | 1700 |

**Order code
Magnetic ring RI50**

8.RI50 . XXX . XXXX . 112
Type a b

Min. order quantity for non-stock types: 10 pieces

a Outer diameter

031 = 31 mm [1.22"]
048 = 48.3 mm [1.90"]
055 = 54.7 mm [2.15"]

b Bore diameter

0600 = 6 mm [0.24"] 1500 = 15 mm [0.59"] 3500 = 35 mm [1.34"] ⁴⁾
0800 = 8 mm [0.32"] 2000 = 20 mm [0.79"]
1000 = 10 mm [0.39"] 2500 = 25 mm [0.98"] ³⁾ 1587 = 5/8"
1200 = 12 mm [0.47"] 3000 = 30 mm [1.18"] ³⁾ 2540 = 1" ³⁾

Stock types

8.RI50.048.2000.112

1) The pulse rate (ppr) results from the combination of the magnetic sensor with the various outer diameters.

2) With an input frequency of the evaluation unit of 250 kHz.

3) Only possible for outer diameters 048 and 055.

4) Only possible for outer diameter 055.

Bearingless encoders

| | | |
|---|---|--------------------------|
| Incremental, standard zero pulse, magnetic | RI50 / Limes LI50 (hollow shaft) | Push-pull / RS422 |
|---|---|--------------------------|

| | | | | | | | | | |
|---|---|-------|--------|-------|-------|--|---|-----|-----|
| Order code | 8.LI50.X1XX.1XXX | | | | | | | | |
| Sensor head Limes LI50 | <table border="1" style="width: 100%; text-align: center; font-size: small;"> <tr> <td style="width: 15%;">Type</td> <td style="width: 15%;">8.LI50</td> <td style="width: 15%;">.X1XX</td> <td style="width: 15%;">.1XXX</td> </tr> <tr> <td></td> <td style="font-size: x-small;">a</td> <td style="font-size: x-small;">b c</td> <td style="font-size: x-small;">d e</td> </tr> </table> | Type | 8.LI50 | .X1XX | .1XXX | | a | b c | d e |
| Type | 8.LI50 | .X1XX | .1XXX | | | | | | |
| | a | b c | d e | | | | | | |
| a Model 1 = IP67, standard 2 = IP68 / IP69k and humidity tested acc. to EN 60068-3-38, EN 60068-3-78 b Output circuit / Power supply 1 = RS422 / 4.8 ... 26 V DC 2 = Push-pull / 4.8 ... 30 V DC | c Type of connection 1 = radial cable, 2 m [6.56'] PUR A = radial cable, special length PUR *) *) Available special lengths (connection type A): 3, 5, 8, 10, 15 m [9.84, 16.40, 26.25, 32.80, 49.21'] order code expansion .XXXX = length in dm ex.: 8.LI50.111A.1032.0030 (for cable length 3 m) | | | | | | | | |
| | d Reference signal 1 = separate index signal (linked with A and B) e Interpolation factor 032, 050, 064, 100 | | | | | | | | |
| | Stock types 8.LI50.1121.1032 | | | | | | | | |

| Accessories / Display type 572 | Order no. |
|----------------------------------|---|
| Position display, 6-digit | with 4 fast switch outputs and serial interface 6.572.0116.D05 |
| | with 4 fast switch outputs and serial interface and scalable analog output 6.572.0116.D95 |
| Position display, 8-digit | with 4 fast switch outputs and serial interface 6.572.0118.D05 |
| | with 4 fast switch outputs and serial interface and scalable analog output 6.572.0118.D95 |

Further accessories can be found in the accessories section or in the accessories area of our website at: www.kuebler.com/accessories
 Additional connectors can be found in the connection technology section or in the connection technology area of our website at: www.kuebler.com/connection_technology

Technical data

| Mechanical characteristics | |
|------------------------------|--|
| Maximum speed | 12000 min ⁻¹ |
| Protection | model 1 IP67 acc. to EN 60529 model 2 IP68 / IP69k acc. to EN 60529, DIN 40050-9 and humidity tested acc. to EN 60068-3-38, EN 60068-3-78 |
| Working temperature | -20°C ... +80°C [-4°F ... +176°F] |
| Shock resistance | 5000 m/s ² , 1 ms |
| Vibration resistance | 300 m/s ² , 10 ... 2000 Hz |
| Pole gap | 5 mm from pole to pole |
| Housing (sensor head) | aluminum |
| Cable | 2 m [6.56'] long, PUR 8 x 0.14 mm ² [AWG 26], shielded, may be used in trailing cable installations |
| Status LED | green pulse index red error; speed too high or magnetic fields too weak (8.LI50.XXXX.X050 and 8.LI50.XXXX.X250) |
| CE compliant acc. to | EMC guideline 2014/30/EU RoHS guideline 2011/65/EU |

| Electrical characteristics | | |
|------------------------------------|-----------------------------------|-------------------------------|
| Output circuit | RS422 | Push-Pull |
| Power supply | 4.8 ... 26 V DC | 4.8 ... 30 V DC |
| Power consumption (no load) | typ. 25 mA max. 60 mA | typ. 25 mA max. 60 mA |
| Permissible load/channel | 120 ohm | +/- 20 mA |
| Min. pulse edge interval | 1 µs | 1 µs |
| Signal level | HIGH min. 2.5 V LOW max. 0.5 V | min. +V - 2.0 V max. 0.5 V |
| Reference signal | 1 x per revolution | |
| System accuracy | typ. 0.3° with shaft tolerance g6 | |

Terminal assignment

| Output circuit | Type of connection | Cable (isolate unused cores individually before initial start-up) | | | | | | | | | |
|----------------|--------------------|---|-----|----|----|----|----|----|----|----|-----------|
| 1, 2 | 1, A | Signal: | 0 V | +V | A | Ā | B | B̄ | 0 | 0̄ | ⊥ |
| | | Core color: | WH | BN | GN | YE | GY | PK | BU | RD | shield 1) |

- +V: Encoder power supply +V DC
- 0 V: Encoder power supply ground GND (0 V)
- A, Ā: Incremental output channel A / sine signal
- B, B̄: Incremental output channel B / cosine signal
- 0, 0̄: Reference signal
- ⊥: Plug connector housing (shield)

1) Shield is attached to connector housing.

Bearingless encoders

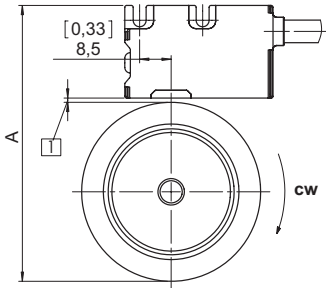
**Incremental, standard
zero pulse, magnetic**

RI50 / Limes LI50 (hollow shaft)

Push-pull / RS422

Mounting orientation and permissible mounting tolerances

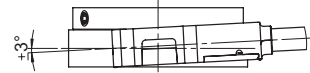
Distances



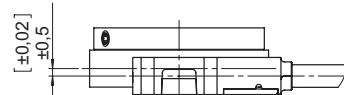
- 1 Distance sensor head / magnetic ring:
0.1 ... 1.5 [0.004 ... 0.06]
(1 [0.04] recommended)

| Magnetic ring | A for distance sensor head / magnetic ring = 1 [0.04] |
|---------------------|---|
| 8.RI50.031.XXXX.112 | 57.0 [2.24] |
| 8.RI50.048.XXXX.112 | 74.3 [2.93] |
| 8.RI50.055.XXXX.112 | 80.7 [3.18] |

Torsion



Offset



Tilting

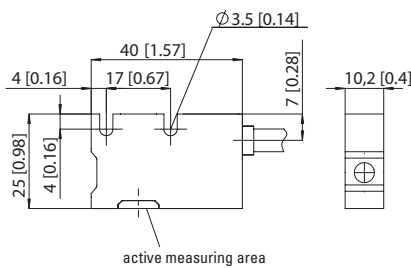


Warning: When mounting the sensor head, please ensure its correct orientation to the magnetic ring!

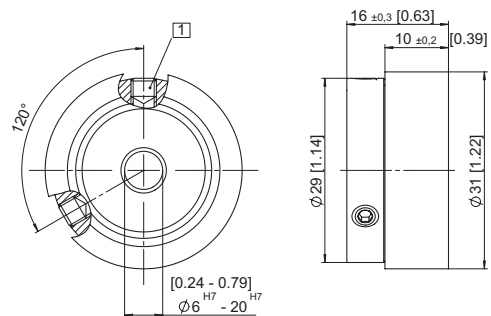
Dimensions

Dimensions in mm [inch]

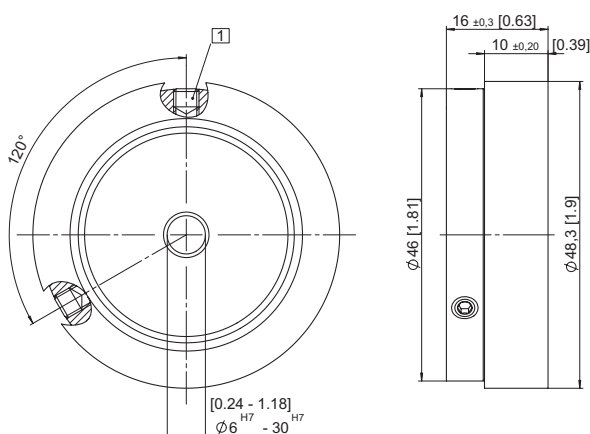
Sensor head Limes LI50



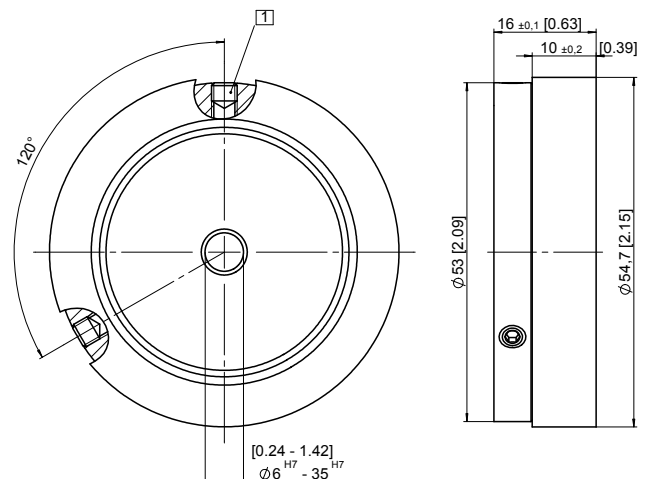
Magnetic ring, ø 31 [1.22], 8.RI50.031.XXXX.112



Magnetic ring, ø 48.3 [1.90], 8.RI50.048.XXXX.112



Magnetic ring, ø 54.7 [2.15], 8.RI50.055.XXXX.112



- 1 M4 Set screw