

# 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.

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## Selection guide magnetic ring RI50 / Limes LI50

Pulse per revolution <sup>1)</sup>	Order code magnetic ring RI50	Order code sensor head Limes LI50	Max. rotational speed min <sup>-1</sup> (electronic) <sup>2)</sup>	
			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"] <sup>4)</sup>  
0800 = 8 mm [0.32"]    2000 = 20 mm [0.79"]  
1000 = 10 mm [0.39"]    2500 = 25 mm [0.98"] <sup>3)</sup>    1587 = 5/8"  
1200 = 12 mm [0.47"]    3000 = 30 mm [1.18"] <sup>3)</sup>    2540 = 1" <sup>3)</sup>

**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.

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<b>Order code</b> <b>Sensor head Limes LI50</b>	<b>8.LI50</b> Type	<b>. X 1 X X . 1 XXX</b> a b c d e	
<b>a Model</b> 1 = IP67, standard 2 = IP68 / IP69k and humidity tested acc. to EN 60068-3-38, EN 60068-3-78	<b>c Type of connection</b> 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)	<b>d Reference signal</b> 1 = separate index signal (linked with A and B)	<b>Stock types</b> 8.LI50.1121.1032
<b>b Output circuit / Power supply</b> 1 = RS422 / 4.8 ... 26 V DC 2 = Push-pull / 4.8 ... 30 V DC		<b>e Interpolation factor</b> 032, 050, 064, 100	

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

Further accessories can be found in the accessories section or in the accessories area of our website at: [www.kuebler.com/accessories](http://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](http://www.kuebler.com/connection_technology)

## Technical data

Mechanical characteristics		Electrical characteristics	
<b>Maximum speed</b>	12000 min <sup>-1</sup>	<b>Output circuit</b>	<b>RS422</b> <b>Push-Pull</b>
<b>Protection</b>	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	<b>Power supply</b>	4.8 ... 26 V DC      4.8 ... 30 V DC
<b>Working temperature</b>	-20°C ... +80°C [-4°F ... +176°F]	<b>Power consumption (no load)</b>	typ. 25 mA      typ. 25 mA max. 60 mA      max. 60 mA
<b>Shock resistance</b>	5000 m/s <sup>2</sup> , 1 ms	<b>Permissible load/channel</b>	120 ohm      +/- 20 mA
<b>Vibration resistance</b>	300 m/s <sup>2</sup> , 10 ... 2000 Hz	<b>Min. pulse edge interval</b>	1 µs      1 µs
<b>Pole gap</b>	5 mm from pole to pole	<b>Signal level</b>	HIGH min. 2.5 V      min. +V - 2.0 V LOW max. 0.5 V      max. 0.5 V
<b>Housing (sensor head)</b>	aluminum	<b>Reference signal</b>	1 x per revolution
<b>Cable</b>	2 m [6.56'] long, PUR 8 x 0.14 mm <sup>2</sup> [AWG 26], shielded, may be used in trailing cable installations	<b>System accuracy</b>	typ. 0.3° with shaft tolerance g6
<b>Status LED</b>	green pulse index red error; speed too high or magnetic fields too weak (8.LI50.XXXX.X050 and 8.LI50.XXXX.X250)		
<b>CE compliant acc. to</b>	EMC guideline 2014/30/EU RoHS guideline 2011/65/EU		

## Terminal assignment

Output circuit	Type of connection	Cable (isolate unused wires individually before initial start-up)									
1, 2	1, A	Signal:	0 V	+V	A	$\bar{A}$	B	$\bar{B}$	0	$\bar{0}$	$\perp$
		Cable color:	WH	BN	GN	YE	GY	PK	BU	RD	shield <sup>1)</sup>

+V: Encoder power supply +V DC  
0 V: Encoder power supply ground GND (0 V)  
A,  $\bar{A}$ : Incremental output channel A / sine signal  
B,  $\bar{B}$ : Incremental output channel B / cosine signal  
0,  $\bar{0}$ : Reference signal  
 $\perp$ : Plug connector housing (shield)

<sup>1)</sup> Shield is attached to connector housing.

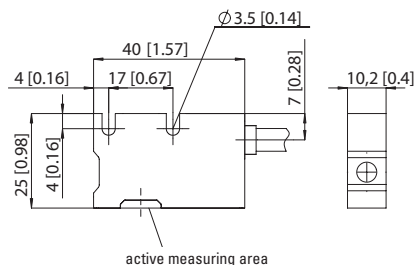
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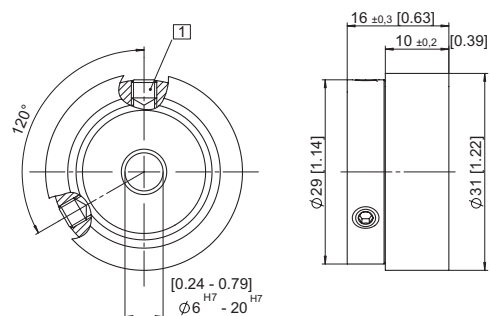
## Dimensions

Dimensions in mm [inch]

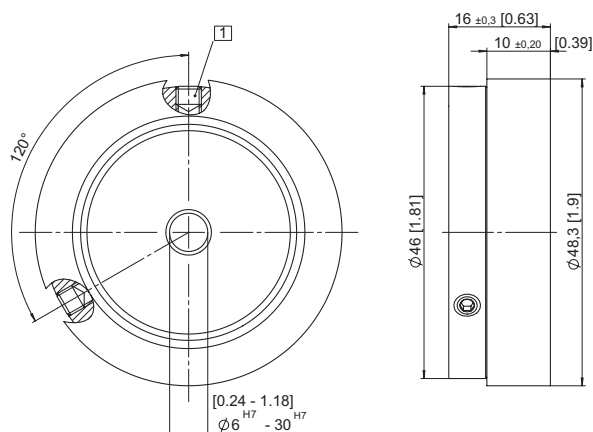
### Sensor head Limes LI50



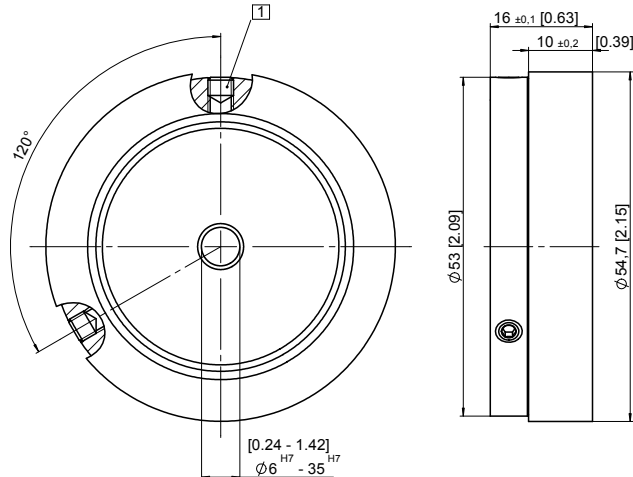
### Magnetic ring, ø 31 [1.22], 8.RI50.031.XXXX.112



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



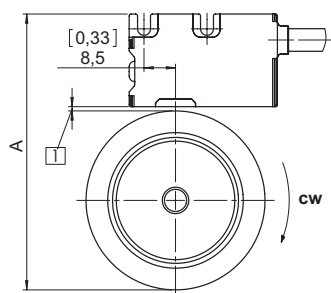
### Magnetic ring, ø 54.7 [2.15], 8.RI50.055.XXXX.112



1 M4 Set screw

## 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!**