Bearingless Magnetic | **RI20 / Limes LI20 (Hollow shaft)** | **Push-Pull / RS422**

Thanks to its installation depth of only 16 mm, the bearingless magnetic rotary encoder RI20 / LI20, 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.

NEW: Version for outdoor use with extremely sturdy aluminium 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

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

Selection guide magnetic ring RI20 / Limes LI20

Pulse rates / PPR [1] (further PPR on request)	Order code Magnetic ring RI20	Order code Magnetic sensor Limes LI20	Max. rotational speed RPM [2]
250	8.RI20.031.XXXX.111	8.LI20.11X1.2005	12000
1000	8.RI20.031.XXXX.111	8.LI20.11X1.2020	2400
2500	8.RI20.031.XXXX.111	8.LI20.11X1.2050	3900
1024	8.RI20.041.XXXX.111	8.LI20.11X1.2016	7000
360	8.RI20.045.XXXX.111	8.LI20.11X1.2005	12000
3600	8.RI20.045.XXXX.111	8.LI20.11X1.2050	2700

Order code Magnetic ring RI20

8.RI20 . XXX (a) . XXXX (b) . 111

Type

a *Outer diameter*
031 = 31 mm [1.22“]
041 = 41.2 mm [1.62“]
045 = 45 mm [1.77“]

b *Bore diameter*
0800 = 8 mm [0.32“]
1000 = 10 mm [0.39“]
1200 = 12 mm [0.47“]
1500 = 15 mm [0.59“]
1800 = 18 mm [0.71“]
2000 = 20 mm [0.79“]
2500 = 25 mm [0.98“] [2]
3000 = 30 mm [1.18“] [2]
0952 = 3/8“
1587 = 5/8“
2540 = 1“ [2]

Stock types

8.RI20.031.0800.111	8.RI20.045.0800.111
8.RI20.031.1000.111	8.RI20.045.0952.111
8.RI20.031.1200.111	8.RI20.045.1200.111
8.RI20.031.1587.111	8.RI20.045.1500.111
8.RI20.041.0800.111	8.RI20.045.2500.111

Order code Magnetic sensor Limes LI20

8.LI20 . X (a) 1 X (b) 1 (c) . 2 (d) XXX (e)

Type

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 = cable PUR, 2 m [6.56‘] length

d *Reference signal*
2 = Index periodical

e *Interpolation factor* [3]
005, 016, 020, 050

Stock types

8.LI20.1111.2005	8.LI20.1121.2005
8.LI20.1111.2020	8.LI20.1121.2020
8.LI20.1111.2050	8.LI20.1121.2050

1) The pulse rate (ppr) results from the combination of the magnetic sensor with the various outer diameters.
2) Only possible for outer diameters 041 and 045
3) With an input frequency of the evaluation unit of 250 kHz

Bearingless Magnetic	RI20 / Limes LI20 (Hollow shaft)	Push-Pull / RS422

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 analogue 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 analogue 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

Speed		max. 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 [2] ... +176°F]
Shock resistance		500 g / 1 ms
Vibration resistance		30 g / 10…2000 Hz
Pole gap		2 mm from pole to pole
Housing (Sensor)		aluminium
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.LI20.XXXX.X050 and 8.LI20.XXXX.X250)
CE compliant acc. to		EMC guideline 2004/108/EC
RoHS compliant acc. to		guideline 2002/95/EC

Electrical characteristics

		RS422	Push-Pull
Output circuit		**RS422**	**Push-Pull**
Power supply		4.8…26 VDC	4.8…30 VDC
Power consumption (no load)		typ 25 mA, max. 60 mA	
Permissible load/channel		120 Ohm	±20 mA
Min. pulse edge interval		1 µs	
Signal level	HIGH	min. 2.5 V	min. +V - 2.0 V
	LOW	max. 0.5 V	max. 0.5 V
Reference signal		Index periodical	
System accuracy		typ 0.3° with shaft tolerance g6	

Terminal assignment

Output circuit	Type of connection	Cable (isolate unused wires individually before initial start-up)									
1, 2	1	Signal:	0 V	+V	A	$\overline{A}$	B	$\overline{B}$	0	$\overline{0}$	⏚
		Cable colour:	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, $\overline{A}$: Incremental output channel A / cosine signal
B, $\overline{B}$: Incremental output channel B / sine signal
0, $\overline{0}$: Reference signal
⏚: Plug connector housing (Shield)

1) Shield is attached to connector housing

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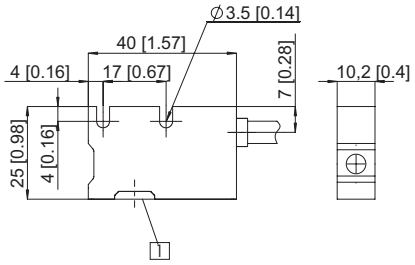
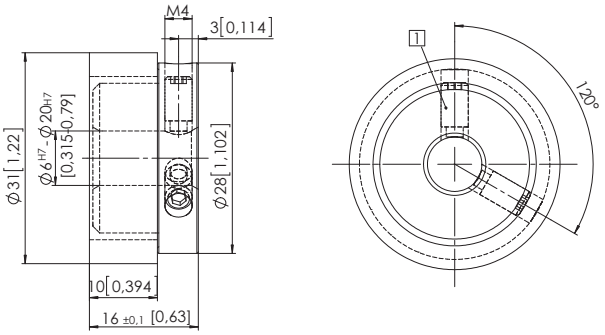
Dimensions

Dimensions in mm [inch]

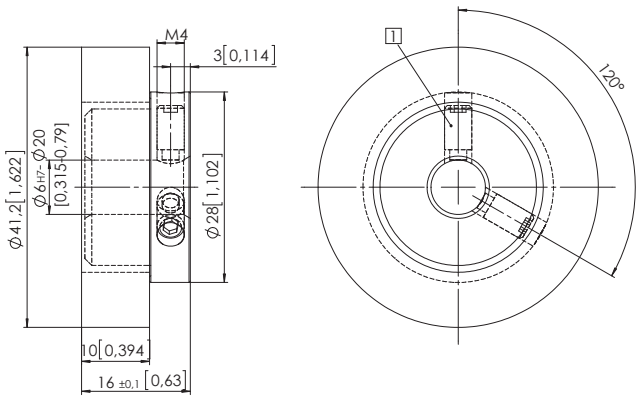
Measuring head Limes LI20



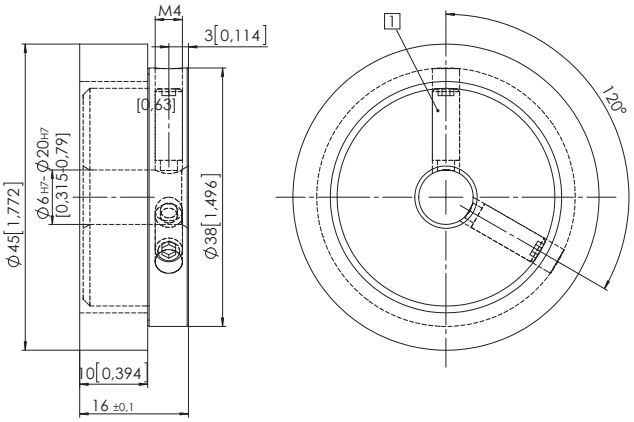
Magnetic ring, ø 31 [1.22], 8.RI20.031.XXXX.111



Magnetic ring, ø 41.2 [1.62], 8.RI20.041.XXXX.111



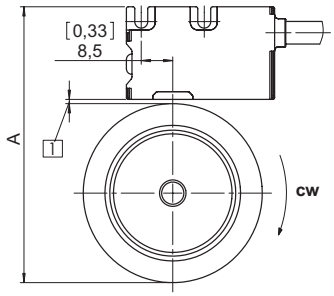
Magnetic ring, ø 45 [1.77], 8.RI20.045.XXXX.111



1 Set screw M4 Recommended tolerance of the drive shaft diameter: g6

Mounting orientation and permissible mounting tolerances

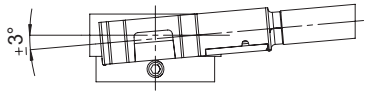
Distances



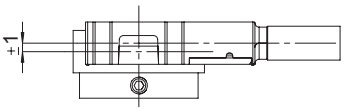
1 Distance Sensor / Magnetic ring:
0.1 ... 1.0 (0.4 [0.02] recommended)

Magnetic ring	A for distance sensor / magnetic ring: = 0.4 [0.02]
8.RI20.031.XXXX.111	56.4 [2.22]
8.RI20.041.XXXX.111	66.6 [2.62]
8.RI20.045.XXXX.111	70.4 [2.77]

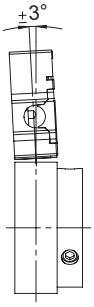
Torsion



Offset



Tilting



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