

# Bearingless encoders

<b>Absolut, standard singleturn, magnetic</b>	<b>RLA50 (hollow shaft)</b>	<b>SSI / CANopen</b>
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Thanks to its installation depth of only 20 mm, the bearingless magnetic rotary encoder RLA50, 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.

This bearingless encoder can be mounted on shafts with a diameter of 30 mm.



High rotational speed	Protection level <b>IP50</b>	Shock / vibration resistant	Reverse polarity protection	Temperature range <b>-10°...+70°C</b>

### Powerful

- High shock and vibration resistance.
- Non-contact measuring system, free from wear, ensures a long service life.
- High resolution, 16,000 measuring steps/revolution.
- Direct measurement on shaft or axis.

### Fast start-up

- Distance monitoring by LED.
- Large mounting tolerance between magnetic band and sensor head.
- Requires very little installation space.
- Connection by M12 connector.

<b>Order code</b>	<b>8.RLA50</b> <small>Type</small>	<b>. 1 3 1 X 2 .</b> <small>a b c d e</small>	<b>16000</b> <small>f</small>	<b>. 0300</b> <small>g</small>
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**a** *Magnetic ring mounting method*  
1 = Press fit

**b** *Model*  
3 = IP50

**c** *Number of poles*  
1 = 32 pols, pole length 5 mm [0.2"]

**d** *Interface*  
1 = SSI  
3 = CANopen

**e** *Type of connection*  
2 = M12 connector, 12-pin

**f** *Measuring steps per revolution*  
16000

**g** *Bore diameter*  
0300 = 30 mm

*Optional on request*  
- other bore diameters  
- other number of measuring steps  
- additional incremental signals (HTL, TTL or SinCos)

Connection technology		Order no.
<b>Connector, self-assembly (straight)</b>	M12 female connector with coupling nut, 12 pin, A coded	<b>8.0000.5162.0000</b>
<b>Cordset, pre-assembled</b>	M12 female connector with coupling nut, 12 pin, 5 m [16.4'] PUR cable 6 x 2 x 0.14 mm <sup>2</sup> [AWG 26]	<b>05.00.60B1.B211.005M</b>

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).

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## Technical data

Mechanical characteristics	
<b>Maximum speed</b>	1000 min <sup>-1</sup>
<b>Working temperature</b>	-10°C ... +70°C [+14°F ... +158°F] (non condensing)
<b>Storage temperature</b>	-25°C ... +85°C [-13°F ... +185°F]
<b>Protection acc. to EN 60529</b>	IP50
<b>Housing</b>	zinc die-cast
<b>Shock resistance acc. to EN 60068-2-27</b>	5000 m/s <sup>2</sup> , 1 ms
<b>Vibration resistance acc. to EN 60068-2-6</b>	300 m/s <sup>2</sup> , 10 ... 2000 Hz
<b>Distance sensor head / magnetic band</b>	0.5 ... 1.0 mm (recommended 0.8 mm)
<b>Type of connection (standard)</b>	M12 connector, 12-pin

Electrical characteristics	
<b>Power supply</b>	10 ... 30 V DC ±10 %
<b>Residual ripple</b>	< 10 %
<b>Current consumption</b>	max. 150 mA
<b>Reverse polarity protection</b>	yes
<b>Short circuit proof</b>	yes
<b>CE compliant acc. to</b>	EMC guideline 2014/30/EU RoHS guideline 2011/65/EU

Accuracy	
<b>Measuring principle</b>	absolute
<b>System accuracy at 20°C [+68°F]</b>	±0.35°
<b>Repeat accuracy</b>	±1 increment
<b>Resolution</b>	0.0225°
<b>LED, red</b>	lights up when distance too large

SSI interface	
<b>Output driver</b>	RS485 transceiver type
<b>Permissible load / channel</b>	max. ±20 mA
<b>Signal level</b>	HIGH typ. 3.8 V LOW at I <sub>Load</sub> = 20 mA typ. 1.3 V
<b>Clock rate</b>	25 bit (24 + 1 failurebit for distance)
<b>Code</b>	binary / gray (default) switchable
<b>SSI clock rate</b>	80 kHz ... 0.4 MHz
<b>Monoflop time</b>	≤ 40 μs
<b>Data refresh rate</b>	≤ 250 μs

CANopen interface	
<b>Interface</b>	CAN High-Speed acc. to ISO 11898, Basic and Full CAN, CAN specification 2.0 B
<b>Protocol</b>	CANopen
<b>Baud rate</b>	250 kbit/s; 125 ... 1000 kbit/s configurable
<b>Termination</b>	software configurable
<b>Node address</b>	1 ... 15 configurable (default 1)
<b>LSS protocol</b>	CIA LSS protocol DS305 global command support for node address and baud rate selective commands via attributes of the identity object

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### Terminal assignment sensor head

Interface	Type of connection	M12 connector, 12-pin													
1	2	Signal:	0 V	+V	C+	C-	D+	D-	-	-	-	-	-	-	-
		Pin:	1	2	3	4	5	6	7	8	9	10	11	12	
Interface	Type of connection	M12 connector, 12-pin													
3	2	Signal:	0 V	+V	CAN_L	CAN_H	-	-	-	-	-	-	-	-	-
		Pin:	1	2	3	4	5	6	7	8	9	10	11	12	

- +V: Encoder power supply +V DC
- 0 V: Encoder power supply ground GND (0 V)
- C+, C-: Clock signal
- D+, D-: Data signal

### Terminal assignment connection cable (accessory)

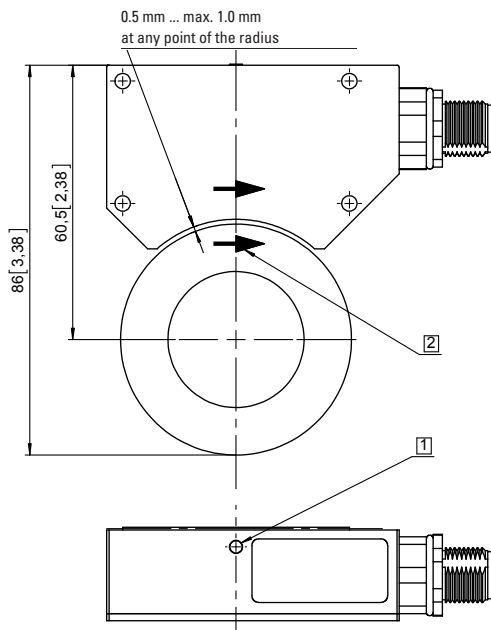
Connection cable color assignment with M12 female connector	Connection cable with M12 connector, 12 pin (accessory) – 05.00.60B1.B211.005M													
	Color:	WH	BN	GN	YE	GY	PK	BU	RD	BK	VT	GY/PK	RD/BU	
Pin:	1	2	3	4	5	6	7	8	9	10	11	12		

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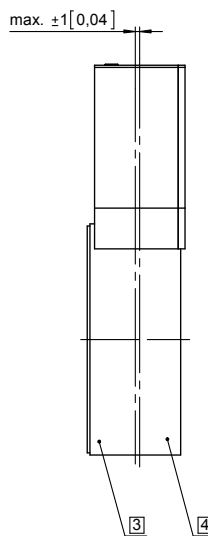
## Mounting position and permissible mounting tolerances

### Sensor distance

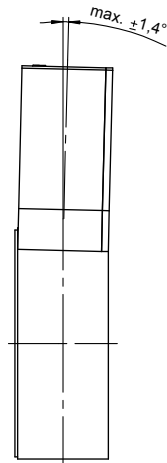


- ① LED for distance monitoring
- ② Direction arrows for the assembly
- ③ Fine interpolation track
- ④ Absolute track

### Offset



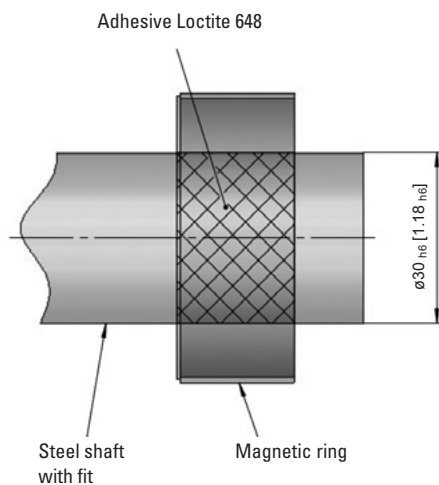
### Tilting



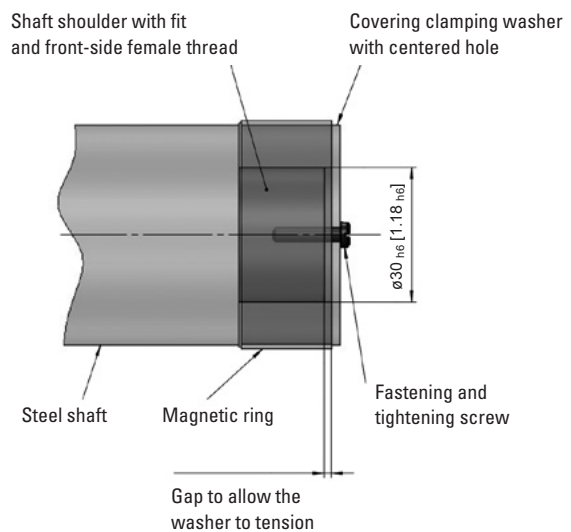
**Caution:** imperatively comply with the mounting position of the sensor head with respect to the magnetic ring!

## Mounting recommendation

### Glued assembly



### Screwed assembly



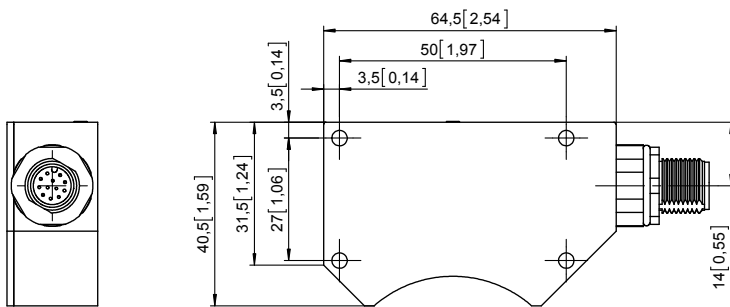
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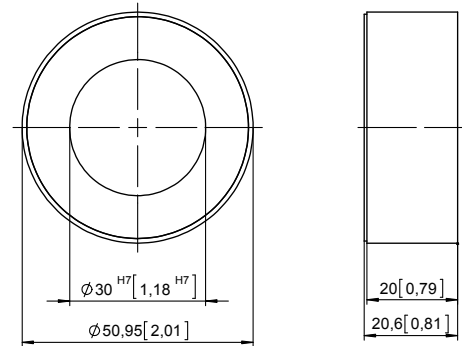
## Dimensions

Dimensions in mm [inch]

### Sensor head



### Magnetic ring



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