

# Bearingless encoders

|   |                              |                          |
|---|------------------------------|--------------------------|
| <b>Incremental, large hollow shaft reference signal, magnetic</b> | <b>RLI500 (hollow shaft)</b> | <b>Push-pull / RS422</b> |
|---|------------------------------|--------------------------|



Thanks to its installation depth of min. 10 mm, the bearingless magnetic rotary encoder RLI500, 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 RLI200, a single reference signal is also implemented here.

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.

This bearingless encoder can be mounted on shafts with a diameter up to max. 350 mm.



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.

## Order code

RLI500

|                 |                  |                |               |
|-----------------|------------------|----------------|---------------|
| <b>8.RLI500</b> | <b>. XX 1 XX</b> | <b>. XXXXX</b> | <b>. 0700</b> |
| Type            | a b c d          | e              | f             |

### a Magnetic ring mounting method

- 1 = Press fit <sup>1)</sup>
- 2 = Hub screw
- 3 = Screwed flange <sup>1)</sup>

### b Model

- 1 = IP67, standard
- 2 = IP68 / IP69k and humidity tested acc. to EN 60068-3-38, EN 60068-3-78

### c Output circuit / Supply voltage

- 1 = RS422 / 4.8 ... 26 V DC
- 2 = Push-pull / 4.8 ... 30 V DC

### d Type of connection

- 1 = radial cable, 2 m [6.56'] PUR
- A = radial cable, special length PUR \*)

\*) Available special lengths <sup>2)</sup> (connection type A):  
3, 5, 8, 10, 15, 20 m [9.84, 16.40, 26.25, 32.80, 49.21, 65.62']  
order code expansion .XXXX = length in dm  
ex.: 8.RLI500.2112A.04096.0700.0030 (for cable length 3 m)

### e Pulses per revolution

- 2048, 3200, 4096, 6400 (for hollow shaft ø 70 mm)  
(e.g.: 2048 pulses => 02048)

### f Hollow shaft diameter

- 0700 = 70 mm [2.76"] <sup>3)</sup>

### Optional on request

- other pulse rates
- other hollow shaft diameter (up to max. 350 mm)

## Press fit



## Hub screw



## Screwed flange



1) On request.

2) Cable lengths >10 m only possible with supply voltage >10 V.

3) With magnetic ring mounting method 1 or 3 on request.

# Bearingless encoders

**Incremental, large hollow shaft  
reference signal, magnetic**

**RLI500 (hollow shaft)**

**Push-pull / RS422**

## Accessories / Displays

### Codix 560, preset counter 6-digit



- Counter, tachometer, time counter and position display in one device
- Scalable display
- Readable via RS232/485 interface or configurable via MODBUS or CR/LF protocol

**Order no.**  
**6.560.010.XXX**

[Details s. datasheet >](#)

### 571T touch, multifunction preset counters 8-digit



- Measuring function for RPM, speed, speed from elapsed time, machine cycle time, throughput time (reciprocal rotary speed), as well as numerous count functions such as position display
- Fast counting input (250 kHz/HTL, 1 MHz/RS422)
- 4 switching outputs as limit values (response time < 1 ms)
- Scalable analog output (response time < 150 ms), resolution 16 bit
- Serial interface RS232 or RS485 for reading in and out the data

**Order no.**  
**6.571T.01X.XXX**

[Details s. datasheet >](#)

Further Kübler accessories can be found at: [kuebler.com/accessories](http://kuebler.com/accessories)

Further Kübler cables and connectors can be found at: [kuebler.com/connection-technology](http://kuebler.com/connection-technology)

## Technical data

### Mechanical characteristics

|                              |         |  |
|------------------------------|---------|--|
| <b>Maximum speed</b>         |         | 12000 min <sup>-1</sup>  |
| <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>Working temperature</b>   |         | -20 °C ... +80 °C [-4 °F ... +176 °F]  |
| <b>Shock resistance</b>      |         | 5000 m/s <sup>2</sup> , 1 ms   |
| <b>Vibration resistance</b>  |         | 300 m/s <sup>2</sup> , 10 ... 2000 Hz  |
| <b>Pole gap</b>              |         | 5 mm from pole to pole   |
| <b>Housing (sensor head)</b> |         | aluminum   |
| <b>Cable</b>                 |         | 2 m [6.56'] , PUR 8 x 0.14 mm <sup>2</sup> [AWG 26], shielded, may be used in trailing cable installations |
| <b>Status LED</b>            | green   | pulse index  |
|                              | red     | error; speed too high or magnetic fields too weak  |

### Electrical characteristics

| Output circuit                       | RS422                             | Push-pull                     |             |             |
|--------------------------------------|-----------------------------------|-------------------------------|-------------|-------------|
| <b>Supply voltage</b>                | 4.8 ... 26 V DC                   | 4.8 ... 30 V DC               |             |             |
| <b>Power consumption (no load)</b>   | typ. 25 mA<br>max. 60 mA          | typ. 25 mA<br>max. 60 mA      |             |             |
| <b>Permissible load/channel</b>      | 120 ohm                           | +/- 20 mA                     |             |             |
| <b>Min. pulse edge interval</b>      | 1 µs                              | 1 µs                          |             |             |
| <b>Signal level</b>                  | HIGH min. 2.5 V<br>LOW max. 0.5 V | min. +V - 2.0 V<br>max. 0.5 V |             |             |
| <b>Reference signal</b>              | 1 x per revolution                |                               |             |             |
| <b>System accuracy</b>               | typ. 0.3° with shaft tolerance g6 |                               |             |             |
| <b>Pulse rate [ppr]<sup>1)</sup></b> | <b>2048</b>                       | <b>3200</b>                   | <b>4096</b> | <b>6400</b> |
| max. speed min <sup>-1</sup>         | 7300                              | 4600                          | 3600        | 2300        |

## Approvals

**CE compliant** in accordance with

|                |            |
|----------------|------------|
| EMC Directive  | 2014/30/EU |
| RoHS Directive | 2011/65/EU |

## 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  | $\bar{A}$ | B  | $\bar{B}$ | 0  | $\bar{0}$ | $\perp$              |
|                |                    | Core color:   | WH  | BN | GN | YE        | GY | PK        | BU | RD        | shield <sup>2)</sup> |

- +V: Supply voltage encoder +V DC
- 0 V: Supply voltage encoder ground GND (0 V)
- A,  $\bar{A}$ : Incremental output channel A
- B,  $\bar{B}$ : Incremental output channel B
- 0,  $\bar{0}$ : Reference signal
- $\perp$ : Plug connector housing (shield)

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

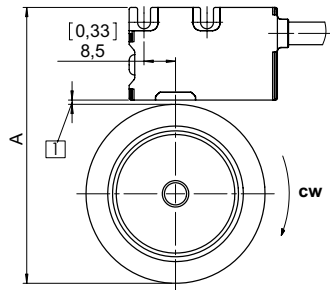
2) Shield is attached to connector housing.

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|---|------------------------------|--------------------------|

## Mounting orientation and permissible mounting tolerances

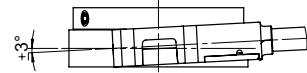
### Distances



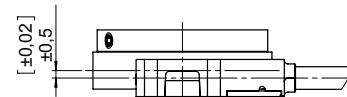
- Distance sensor head / magnetic ring:  
0.1 ... 1.5 [0.004 ... 0.06]  
(1 [0.04] recommended)

| Impulsions per tour    | A<br>for distance sensor head /<br>magnetic ring = 1 mm [0.04] |
|------------------------|--|
| 2048, 3200, 4096, 6400 | 128.0 [5.04]   |

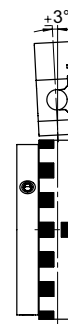
### Torsion



### Offset



### Tilting

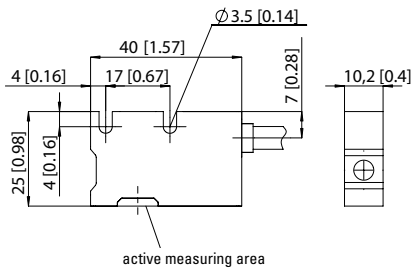


**Warning: When mounting the sensor head, please ensure its correct orientation to the magnetic ring!**

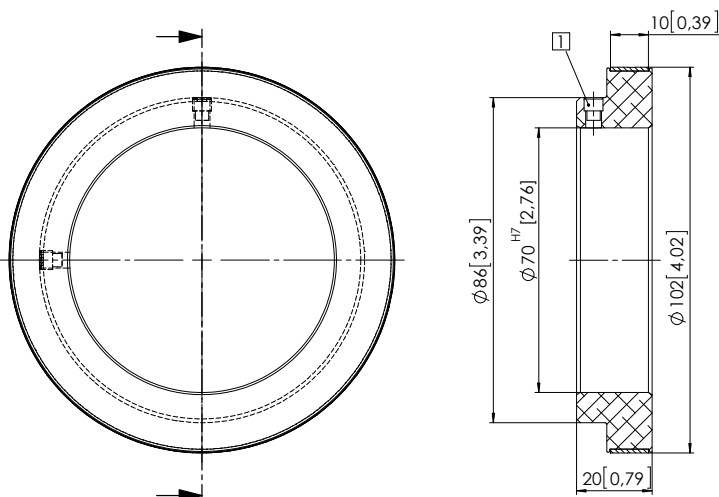
## Dimensions

Dimensions in mm [inch]

### Sensor head



### Magnetic ring (hub screw) pulse rate 2048, 3200, 4096, 6400



- M5 set screw