

Bearing-free rotary encoders

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- **Bearing-free and therefore wear-free**
- **Digital or analogue interfaces**
- **Resolution 4096 steps/revolution, measuring range up to 32,768 revolutions**
- **Axial offset of the external magnet (Ø 12 mm) up to 20 mm**
- **Radial offset of the external magnet (Ø 12 mm) up to ± 3 mm**
- **Can also be used in rough environments and underwater**
- **Available with various housing versions (Ø 22; Ø 36, Ø 42; Ø 50)**

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Design

The bearing-free rotary encoders are based on our various electromagnetic rotary encoder model series. For the electrical data for the corresponding model series, please refer to the listed data sheets, each of which can be found on our homepage (www.twk.de).

The rotary encoders described here consist of a sensor housing and a separate magnet. The magnet is connected to the output shaft of an actuator, a joint or a drive. There is no mechanical connection to the rotary encoder. The rotary encoder is manufactured with various housings. The housings are available in stainless steel for use under particularly aggressive environmental conditions or in the foodstuffs and hygiene sectors.

The linearity of the bearing-free rotary encoders is $\leq 0.2\%$. Thanks to magnetic sampling, the bearing-free rotary encoders enable extensive axial and radial offset and allow the position magnet to be tilted.

The additional linearity deviations which occur as a result of this and the design forms of the individual housings are outlined in this data sheet.

Function

The electronics consist of an ASIC with Hall elements and the signal processing system. The external magnet's magnetic field acts through the closed housing. To increase the protection type and shock resistance, the rotary encoder can be completely cast-in.

Bearing-free rotary encoders

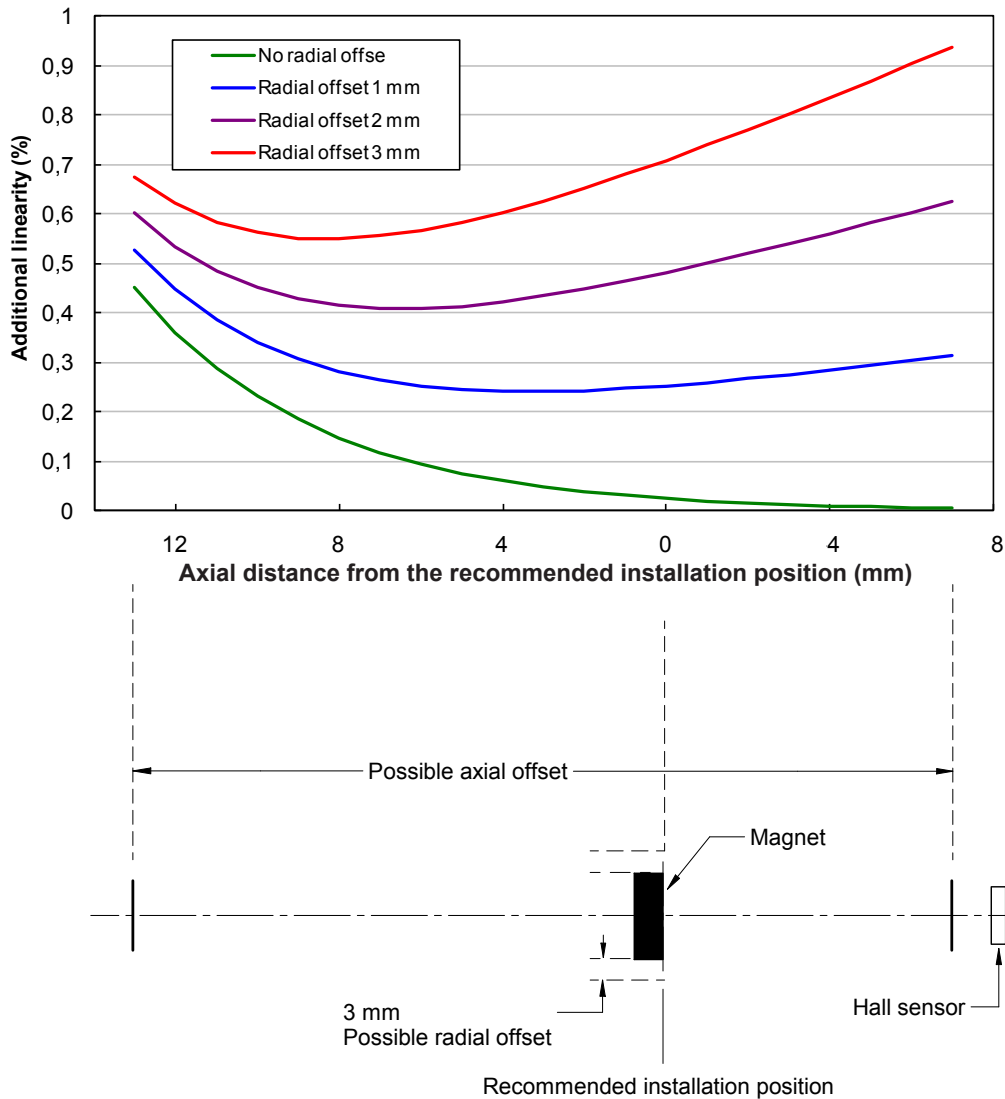
Technical data

Linearity

The linearity of the bearing-free rotary encoders is $\leq 0.2\%$.

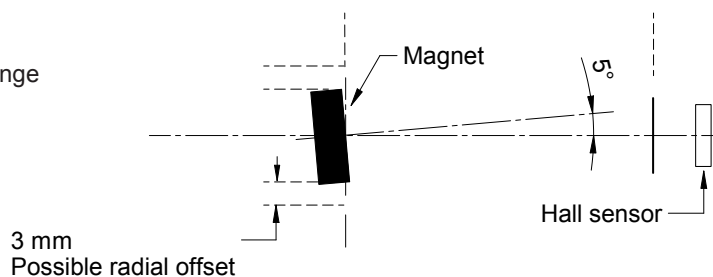
An additional linearity deviation occurs due to the magnet's axial and radial offset. The deviation is shown in the following diagram for the four radial offset values of 0 mm, 1 mm, 2 mm and 3 mm.

Additional linearity depending on the axial and radial offset



Maximum tilt angle of the magnet

Tilting the magnet by up to $\pm 5^\circ$ may change the linearity by a maximum of 0.8%.

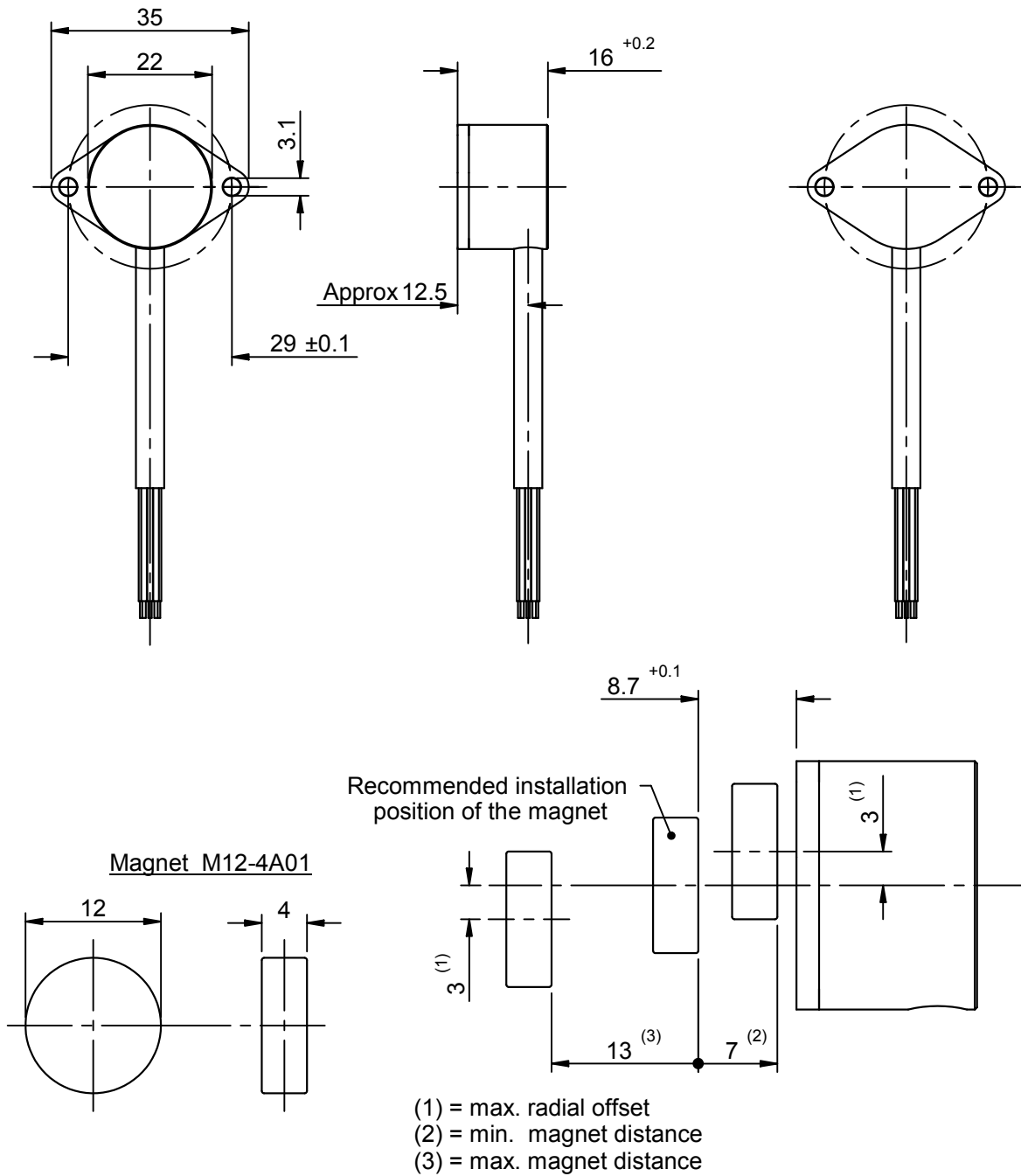


Bearing-free rotary encoders

Bearing-free single-turn rotary encoder model TBE 22

Installation drawing

Dimensions in mm



Order number

Bearing-free single-turn rotary encoder model TBE22 specified according to data sheet: [RBX 11367](#)

(Page 4, model RBM22-06-512 R K1 E01)

TBE22 - E¹ A 4096 K E01

with SSI interface

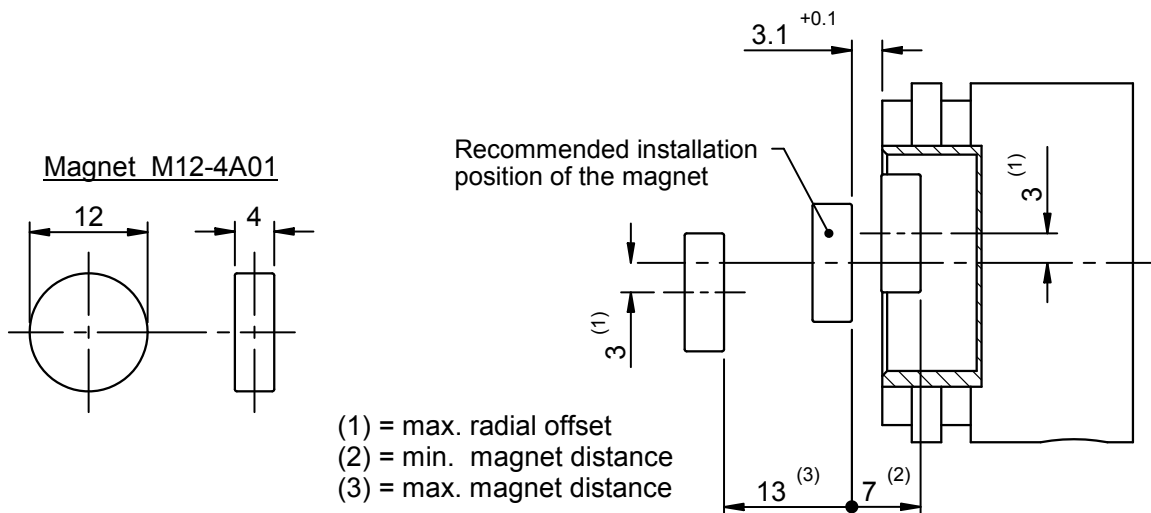
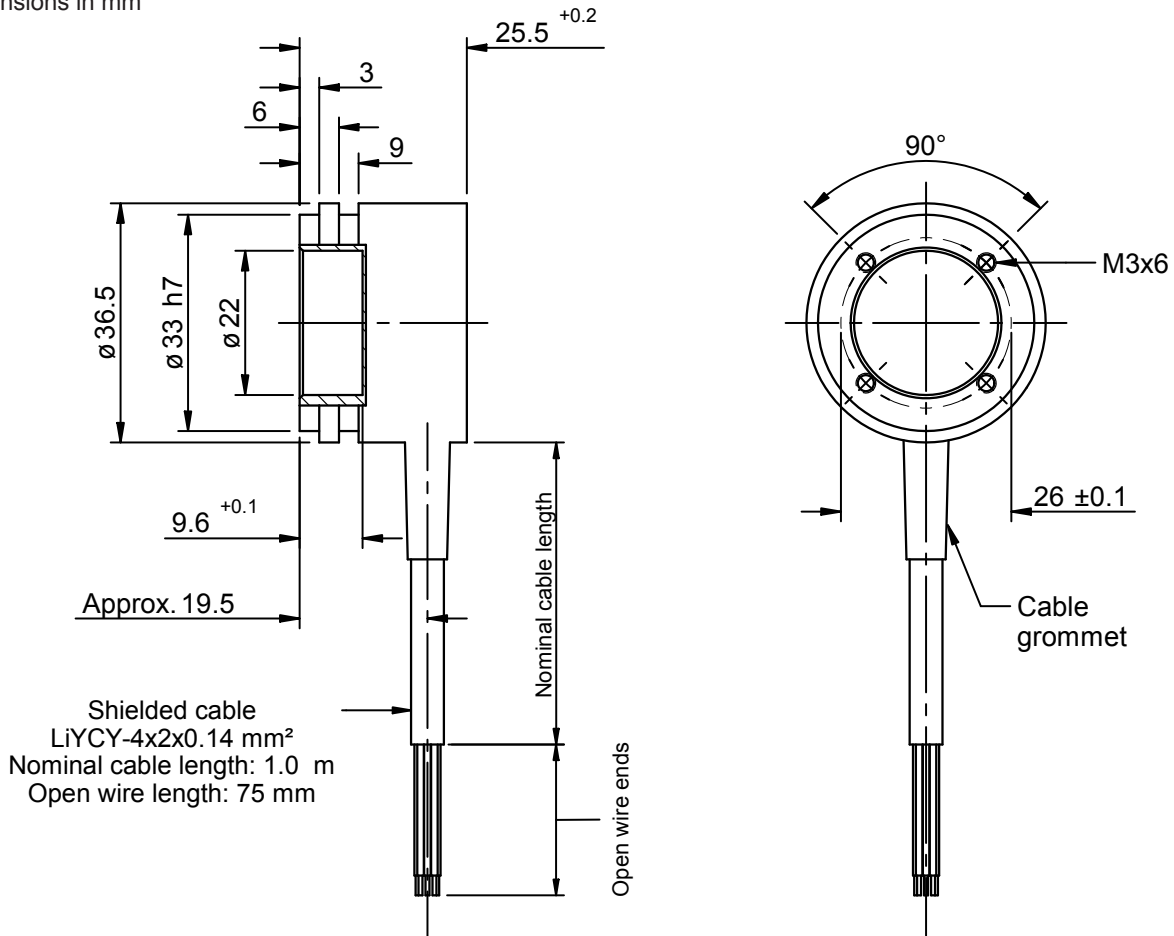
¹) The external magnet M12-4A01 forms part of the scope of delivery.

Bearing-free rotary encoders

Bearing-free single-turn rotary encoder model TBX 36

Installation drawing

Dimensions in mm



Order number

Bearing-free single-turn rotary encoder model TBX36 according to data sheet: [TBX 11713](#)

- | | |
|--|------------------------|
| TBE36 - E ¹⁾ A 4096 R K E01 | with SSI interface |
| TBI 36 - E ¹⁾ A 1024 K D01 | with pulse output |
| TBN36 - E ¹⁾ A 4096 R C2 K N01 | with CANopen interface |
| TBA36 - E ¹⁾ A 360 W KA 01 / B 01 / C 01 / D 01 | with analogue output |

¹⁾ The external magnet M12-4A01 forms part of the scope of delivery.

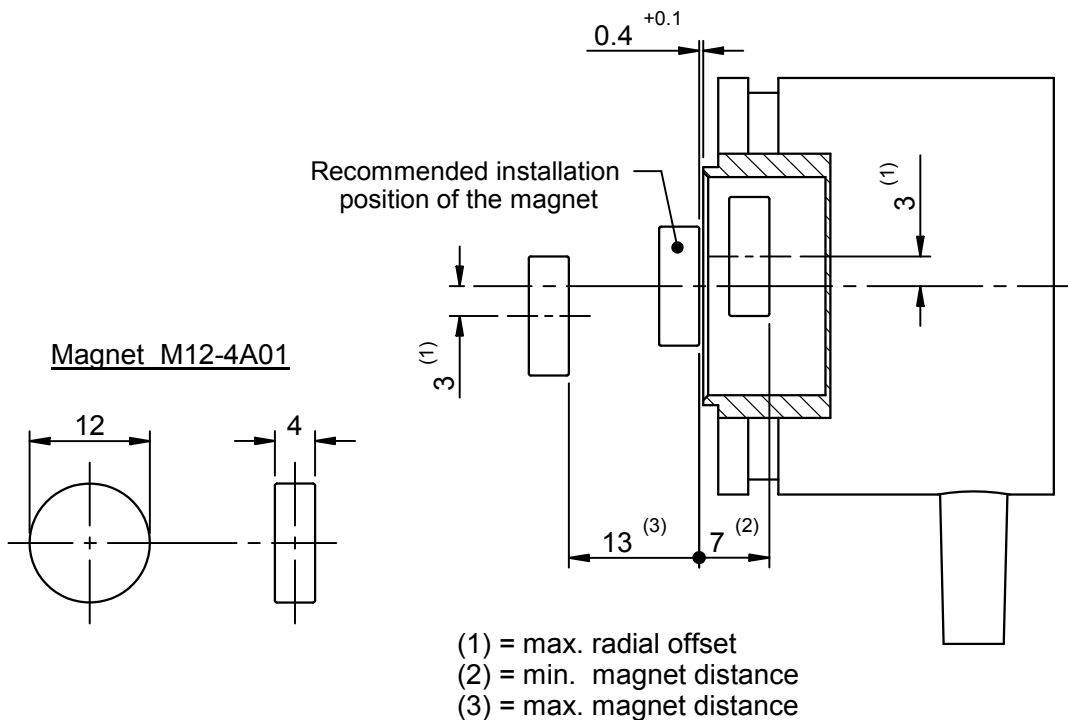
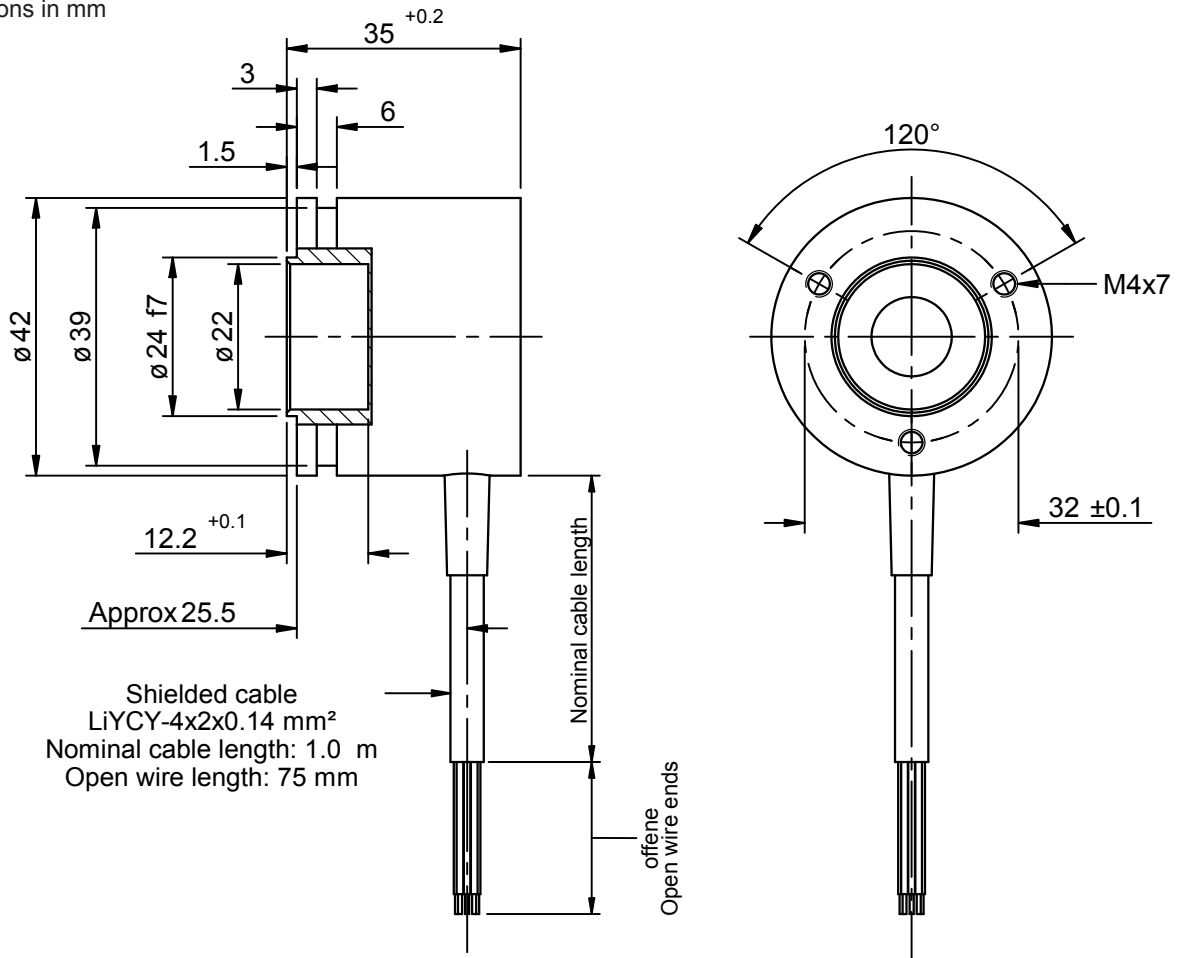
Bearing-free rotary encoders

Bearing-free single-turn rotary encoder model TBX 42

Bearing-free multiturn rotary encoder model TMX 42

Installation drawing

Dimensions in mm



Bearing-free rotary encoders

Bearing-free single-turn rotary encoder model TBX 42

Bearing-free multiturn rotary encoder model TMX 42

Order number

Bearing-free single-turn rotary encoder TBX42 according to data sheet: [TBX 11930](#)

TBE42 - E ¹⁾ A 4096 R K E01	with SSI interface
TBI 42 - E ¹⁾ A 1024 K D01	with pulse output
TBN42 - E ¹⁾ A 4096 R C2 K N01	with CANopen interface
TBA42 - E ¹⁾ A 360 W K A 01 / B 01 / C 01 / D 01	with analogue output

Bearing-free multiturn rotary encoder TMX42 according to data sheet: [TMX 11931](#)

TME42 - E ¹⁾ A 4096 R 4096 K E01	with SSI interface
TMN42 - E ¹⁾ A 4096 R 4096 C2 K N01	with CANopen interface
TMA42 - E ¹⁾ A 3600 WK A 01 / B 01 / C 01 / D 01	with analogue output

¹⁾The external magnet M12-4A01 forms part of the scope of delivery

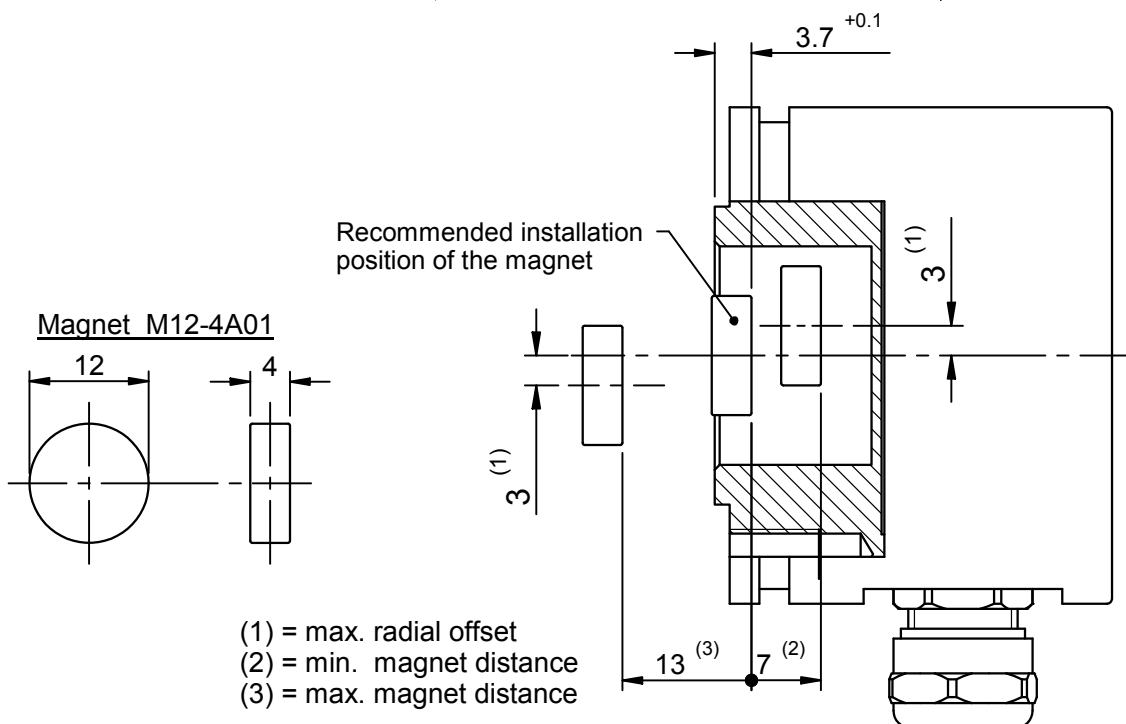
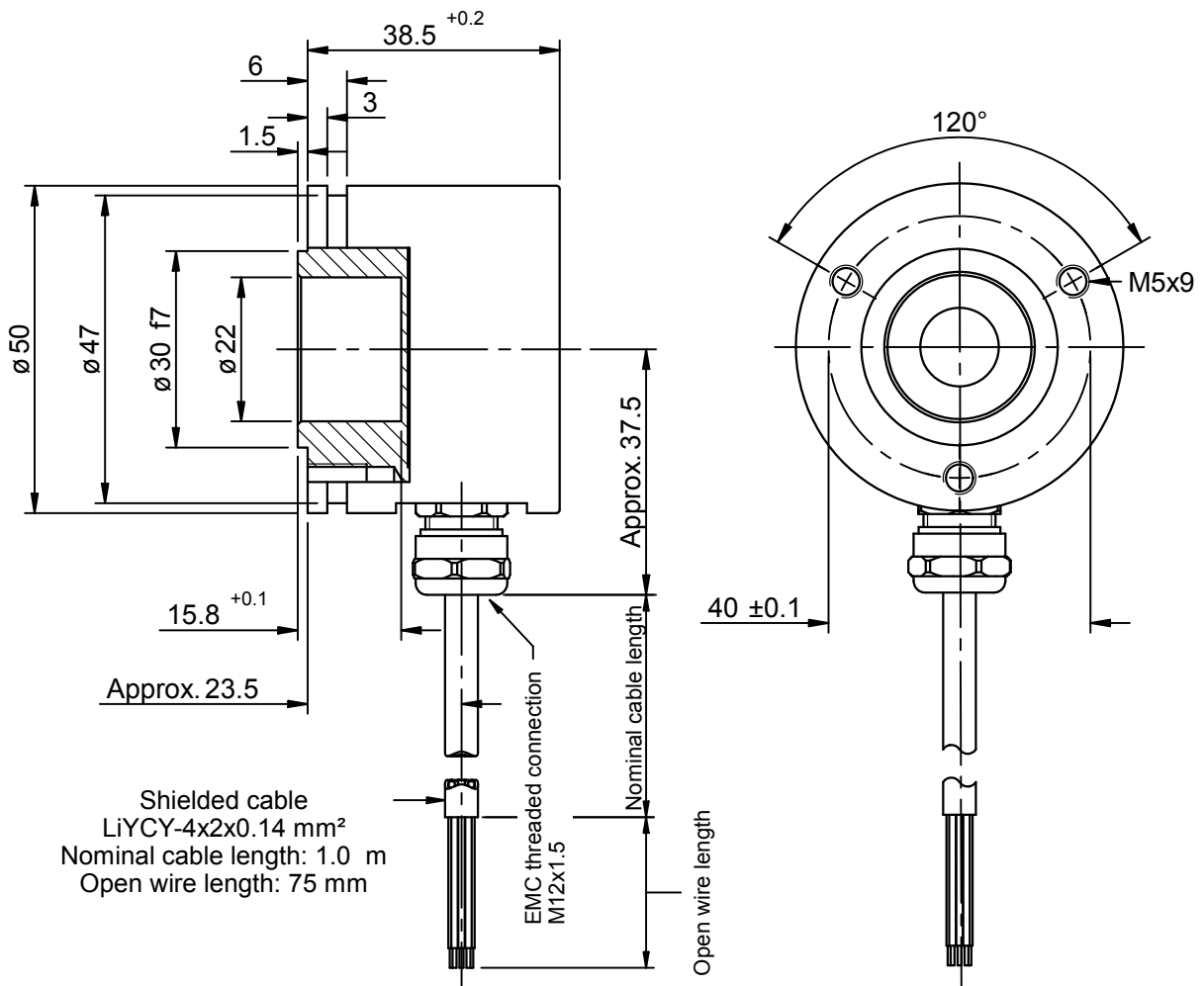
Bearing-free rotary encoders

Bearing-free single-turn rotary encoder model TBX 50

Bearing-free multiturn rotary encoder model TMX 50

Installation drawing

Dimensions in mm



Bearing-free rotary encoders

Bearing-free single-turn rotary encoder model TBX 50

Bearing-free multiturn rotary encoder model TMX 50

Bestellbezeichnung

Bearing-free single-turn rotary encoder TBX50 according to data sheet: [TBX 11294](#)

TBE50 - E ¹) A 4096 R S E01	with SSI interface
TBI 50 - E ¹) A 1024 S D01	with pulse output
TBN50 - E ¹) A 4096 R C2 S N01	with CANopen interface
TBA50 - E ¹) A 360 W S A 01 / B 01 / C 01 / D 01	with analogue output

Bearing-free multiturn rotary encoder TMX50 according to data sheet: [TMX 11451](#)

TME50 - E ¹) A 4096 R S E01	with SSI interface
TMN50 - E ¹) A 4096 R 4096 C2 S N01	with CANopen interface
TMA50 - E ¹) A 3600 WS A 01 / B 01 / C 01 / D 01	with analogue output

¹)The external magnet M12-4A01 forms part of the scope of delivery.

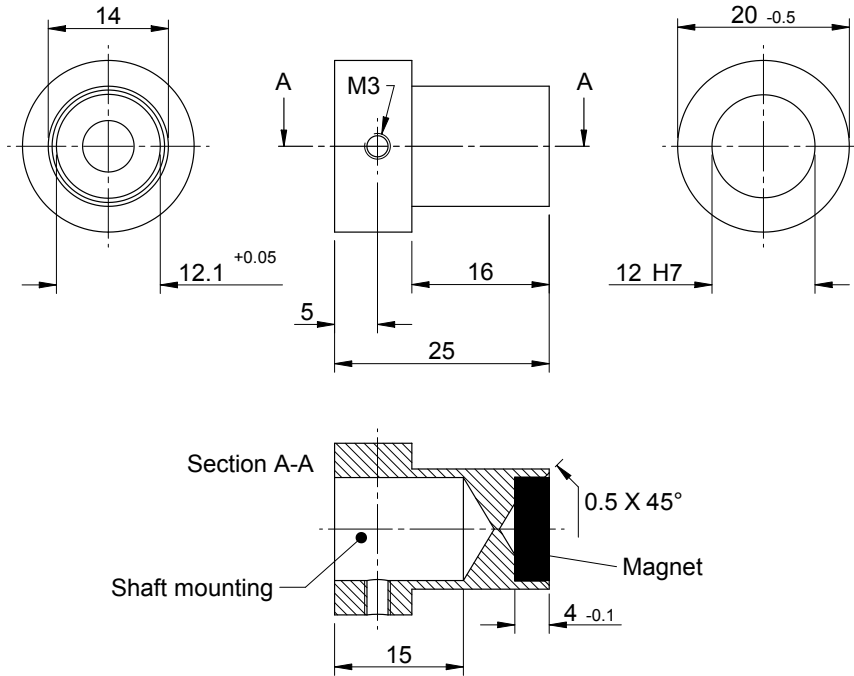
Bearing-free rotary encoders

Bearing-free rotary

Accessories

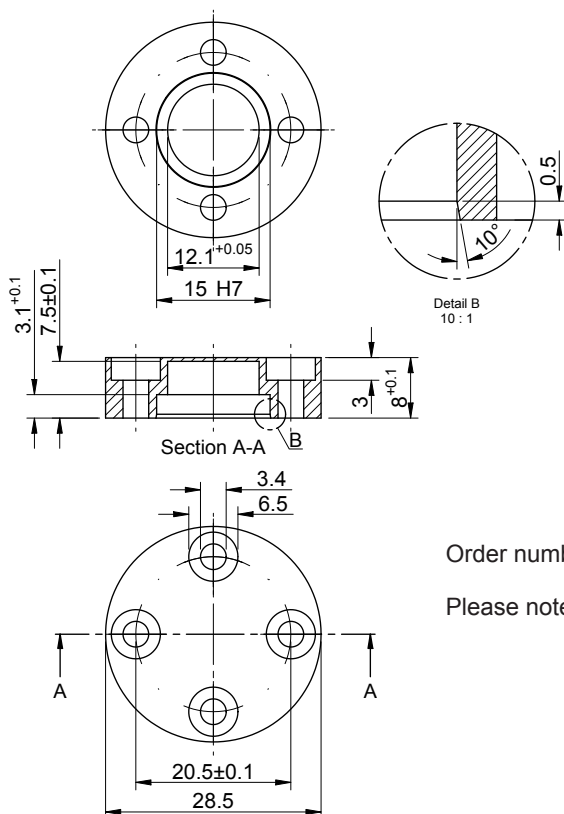
Magnetic hub

Dimensions in mm



Order number: **MN12-4W12A01.**

Please note: The magnet M12-4A01 forms part of the scope of delivery. The magnetic hub MN12-4W12A01 must be ordered separately.



Order number: **MN12-4M20.5A01.**

Please note: The magnet M12-4A01 forms part of the scope of delivery. The magnetic hub MN12-4M20.5A01 must be ordered separately.