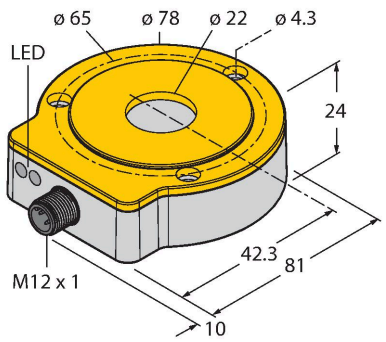
RI360P0-QR24M0-ELIU5X2-H1151
Contactless Encoder – Analog
Premium Line



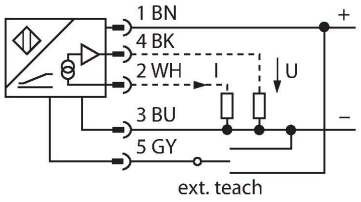
Technical data

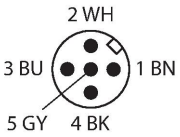
Type	RI360P0-QR24M0-ELIU5X2-H1151
ID	1590908
Measuring principle	Inductive
General data	
Max. Rotational Speed	12000 rpm
	Determined with standardized construction, with a steel shaft Ø 20 mm, L = 50 mm and reducer Ø 20 mm
Starting torque shaft load (radial / axial)	not applicable, because of contactless measuring principle
Resolution	16 bit
Measuring range	0…360 °
Nominal distance	1.5 mm
Repeat accuracy	≤ 0.01 % of full scale
Linearity deviation	≤ 0.05 % f.s.
Temperature drift	≤ ± 0.004 % / K
Output type	Absolute singleturn
Resolution singleturn	16 Bit
Electrical data	
Operating voltage	15…30 VDC
Residual ripple	≤ 10 % U_{ss}
Isolation test voltage	≤ 0.5 kV
Short-circuit protection	yes
Wire breakage/Reverse polarity protection	yes / yes (voltage supply)
Output function	5-pin, Analog output
Voltage output	0…10 V

Features

- Compact, rugged housing
- Many mounting possibilities
- Status displayed via LED
- Measuring range indicated via LED
- Immune to electromagnetic interference
- Measuring range programmable via Easy Teach
- Output signal programmable via Easy Teach
- Resolution, 16-bit
- 15…30 VDC
- 0…10 V and 4…20 mA
- Male M12 x 1, 5-pin

Wiring diagram

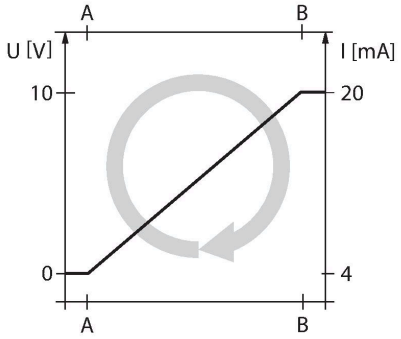




Functional principle

The measuring principle of inductive angle sensors is based on oscillation circuit coupling between the positioning element and the sensor, whereby an output signal is provided proportional to the angle of the positioning element. The rugged sensors are wear and maintenance-free, thanks to the contactless operating principle. They convince through their excellent repeatability, resolution and linearity within a broad temperature range. The innovative technology ensures a high immunity to electromagnetic DC and AC fields.

Technical data

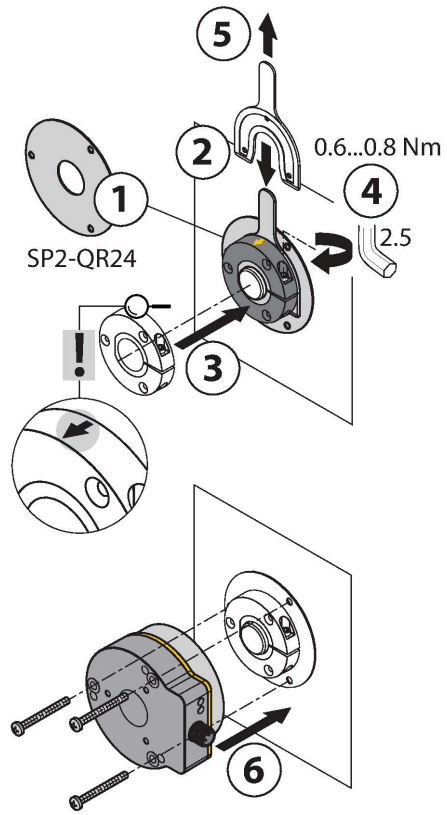


Current output	4…20 mA
Diagnostic	Positioning element not within detection range: Output signal 24 mA or 11 V
Load resistance voltage output	≥ 4.7 kΩ
Load resistance current output	≤ 0.4 kΩ
Sample rate	5000 Hz
Current consumption	< 50 mA
Mechanical data	
Design	QR24
Dimensions	81 x 78 x 24 mm
Flange type	Flange without mounting element
Shaft Type	Hollow shaft
Shaft diameter D [mm]	6 6.35 9.525 10 12 12.7 14 15.875 19.05 20
Housing material	Metal/plastic, ZnAlCu1/PBT-GF30-V0
Electrical connection	Connector, M12 × 1
Environmental conditions	
Ambient temperature	-25…+85 °C
	Acc. to UL approval to +70 °C
Vibration resistance	55 Hz (1 mm)
Vibration resistance (EN 60068-2-6)	20 g; 10…3000 Hz; 50 cycles; 3 axes
Shock resistance (EN 60068-2-27)	100 g; 11 ms ½ sine; 3 × each; 3 axes
Continuous shock resistance (EN 60068-2-29)	40 g; 6 ms ½ sine; 4000 × each; 3 axes
Protection class	IP68 IP69K
MTTF	138 years acc. to SN 29500 (Ed. 99) 40 °C
Power-on indication	LED, Green
Measuring range display	LED, yellow, yellow flashing
Included in delivery	MT-QR24 mounting aid

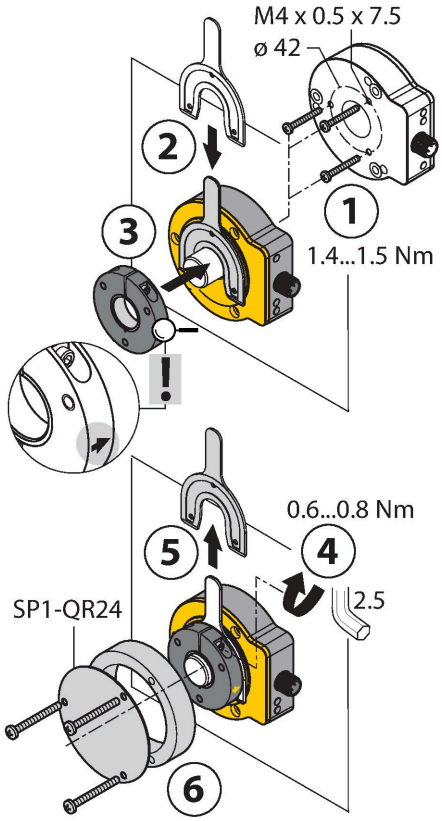
Mounting instructions

Mounting instructions/Description

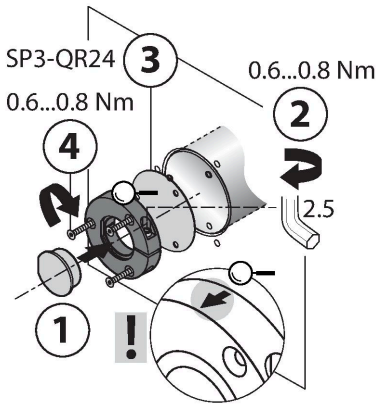
A



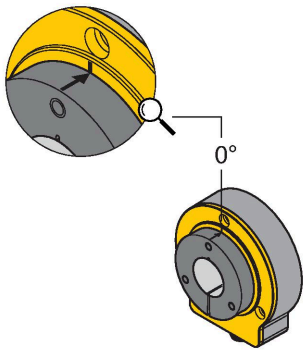
B



C



Default: 0°



Extensive range of mounting accessories for easy adaptation to many different shaft diameters. Based on the functional principle of RLC coupling, the sensor operates absolutely wear-free and is immune to magnetized metal splinters and other interference fields. Wrong installation is hardly possible.
The adjacent figure shows the two separate units, sensor and positioning element.
Mounting option A:
First, interconnect positioning element and rotatable shaft. Then place the encoder above the rotating part in such a way that you get a tight and protected unit.
Mounting option B:
Push the encoder on the back site of the shaft and fasten it to the machine. Then clamp the positioning element to the shaft with the bracket.
Mounting option C:
If the positioning element is to be screwed on a rotating machine part, use the RA0-QR24 plug which is included in the delivery. Then tie up the bracket. Screw on the encoder via the three bores.

The separately arranged sensor and positioning element inhibit that compensating currents or damaging mechanical loads are transmitted via the shaft to the sensor. In addition, the encoder remains tight and highly protected during its entire lifespan.
The accessories enclosed in the delivery help to mount encoder and positioning element at an optimal distance from each other. LEDs indicate the switching status.

Status display via LED
green steady:
Optimal sensor supply
yellow steady:
Positioning element has reached the end of the measuring range. This is indicated by a lower signal quality.
yellow flashing:
Positioning element is outside the measuring range.
off:
Positioning element is in the measuring range.

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Individual Parameterization (Teaching with Positioning Element)

Bridge between teach input Pin 5 (GY)	Gnd Pin 3 (BU)	Ub Pin1 (BN)	LED
2 s	Start value	End value	Status LED flashes then turns steady after 2 s
10 s	CCW rotation, then return to last preset value	CW rotation, then return to last preset value	After 10 s status LED flashes fast for 2 s
15 s	-	Factory setting (360°, CW)	after 15 s power and status LED alternate

To avoid unintended teaching, keep pin 5 potential-free.

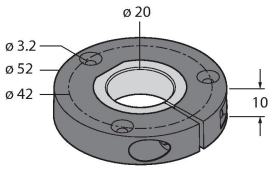
Preset Parameterization (Teaching without Positioning Element)

Bridge pin between teach input Pin 5 (GY)	Gnd Pin 3 (BU)	Ub Pin 1 (BN)	LED
2 s	Activate selection mode for output signal (for 10 s)	Activate preset mode (for 10 s)	Status LED steady, flashes after 2 s
10 s	CCW rotation direction	CW rotation direction	After 10 s status LED flashes fast for 2 s
15 s		Factory setting (360°, CW)	After 15 s power and status LED flash equally fast
Output configuration	Gnd Pin 3 (BU)		Status LED
I out: 4…20 mA	Press once		1 x flashing
I out: 0…20 mA	Press twice		2 x flashing
Uout: 0…10 V	Press three times		3 x flashing
Uout: 0…5 V	Press four times		4 x flashing
Uout: 0.5 V / 4.5 V	Press five times		5 x flashing
Preset mode / Angular range		Ub Pin 1 (BN)	Status LED
45°		Press once	1 x flashing
60°		Press twice	2 x flashing
90°		Press three times	3 x flashing
180°		Press four times	4 x flashing
270°		Press five times	5 x flashing

To avoid unintended teaching, keep pin 5 potential-free.

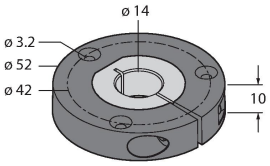
Accessories

P1-RI-QR24 1590921



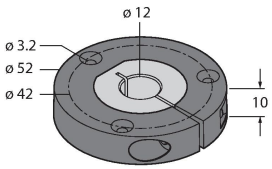
Positioning element, for Ø 20 mm shafts

P2-RI-QR24 1590922



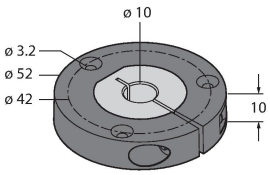
Positioning element, for Ø 14 mm shafts

P3-RI-QR24 1590923



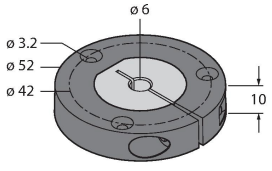
Positioning element, for Ø 12 mm shafts

P4-RI-QR24 1590924



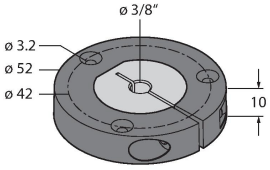
Positioning element, for Ø 10 mm shafts

P5-RI-QR24 1590925



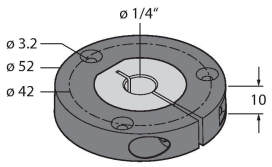
Positioning element, for Ø 6 mm shafts

P6-RI-QR24 1590926



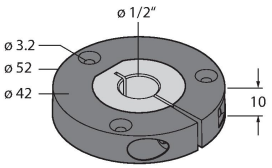
Positioning element, for Ø 3/8“ shafts

P7-RI-QR24	1590927



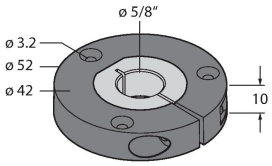
Positioning element, for Ø 1/4“ shafts

P9-RI-QR24	1593012



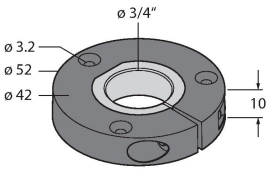
Positioning element for installation on Ø 1/2“ shafts

P10-RI-QR24	1593013



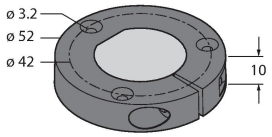
Positioning element for installation on Ø 5/8“ shafts

P11-RI-QR24	1593014



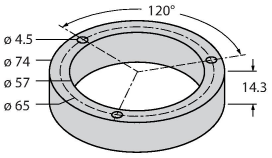
Positioning element for installation on Ø 3/4“ shafts

P8-RI-QR24	1590916



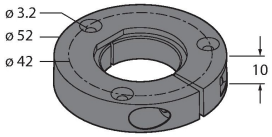
Positioning element with blanking plug for large shafts

M1-QR24	1590920



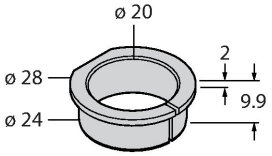
Aluminum protecting ring, for inductive encoders RI-QR24

PE1-QR24	1590937



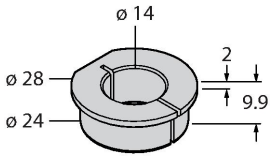
Positioning element without adapter sleeve

RA1-QR24	1590928



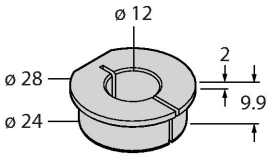
Adapter sleeve, for Ø 20 mm shafts

RA2-QR24	1590929



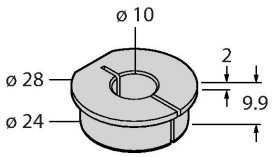
Adapter sleeve, for Ø 14 mm shafts

RA3-QR24	1590930



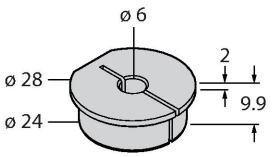
Adapter sleeve, for Ø 12 mm shafts

RA4-QR24	1590931



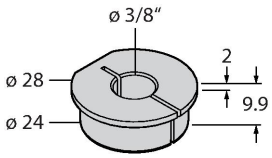
Adapter sleeve, for Ø 10 mm shafts

RA5-QR24	1590932



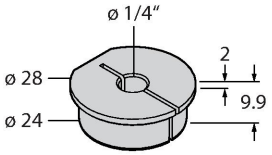
Adapter sleeve, for Ø 6 mm shafts

RA6-QR24	1590933



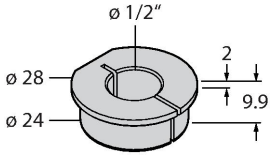
Adapter sleeve, for Ø 3/8“ shafts

RA7-QR24	1590934



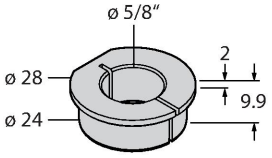
Adapter sleeve, for Ø 1/4“ shafts

RA9-QR24	1590960



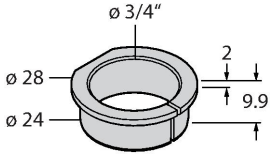
Adapter sleeve, for Ø 1/2" shafts

RA10-QR24	1590961



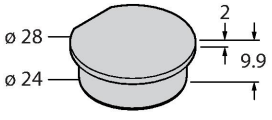
Adapter sleeve, for Ø 5/8" shafts

RA11-QR24	1590962

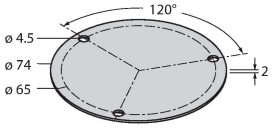


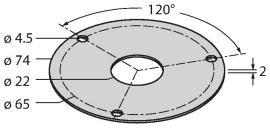
Adapter sleeve, for Ø 3/4" shafts

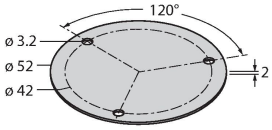
RA8-QR24	1590959

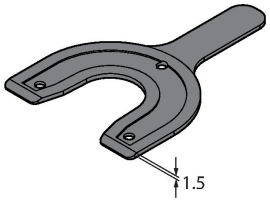


Plug for mounting option C

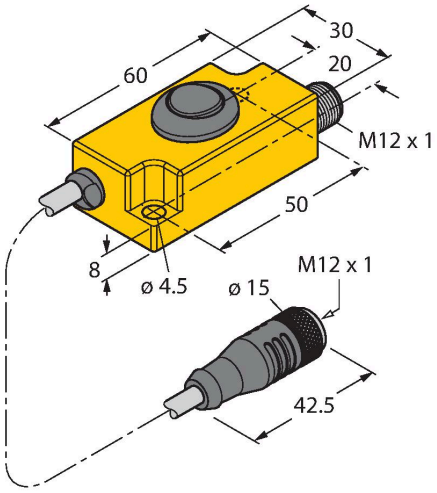
SP1-QR24	1590938
	Shield plate Ø 74 mm, aluminium

SP2-QR24	1590939
	Shield plate Ø 74 mm, aluminiuim, with borehole for shaft feedthrough

SP3-QR24	1590958
	Shield plate Ø 52 mm, aluminium

MT-QR24	1590935
	Mounting aid for optimal alignment of positioning element

Accessories

Dimension drawing	Type	ID	
	TX1-Q20L60	6967114	Teach adapter for inductive encoders, linear position, angle, ultrasonic and capacitive sensors