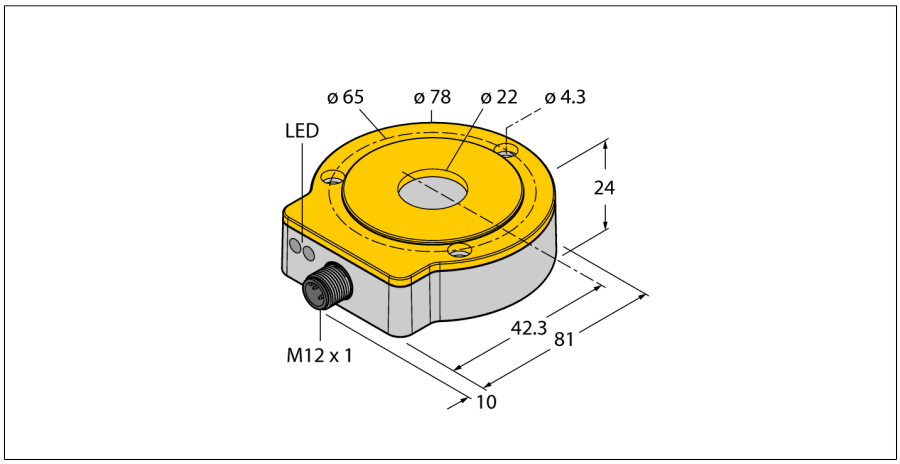
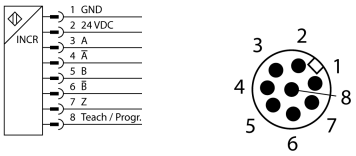
Contactless Encoder
Incremental
Ri360P0-QR24M0-INCRX2-H1181



Type designation	Ri360P0-QR24M0-INCRX2-H1181
Ident no.	1590910
Measuring principle	inductive
Max. Rotational Speed	10000 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
Measuring range	0…360°
Nominal distance	1.5 mm
Repeatability	≤ 0.01 % of full scale
Linearity deviation	≤ 0.05 % f.s.
Temperature drift	≤ ± 0.003 % / K
Ambient temperature	-25…+85 °C
Operating voltage	10… 30VDC
Residual ripple	≤ 10 % U_{ss}
Rated insulation voltage	≤ 0.5 kV
Short-circuit protection	yes/ cyclic
Wire breakage / Reverse polarity protection	yes/ yes (voltage supply)
Output function	8-pin, Push-Pull/HTL
Output Type	incremental
Resolution, incremental	1024
Pulse frequency max.	200 kHz
Signal level high	min. U_B - 2 V
Signal level low	max. 2.0 V
Sample rate	1000 Hz
Current consumption	< 100 mA
Dimensions	81 x 78 x 24 mm
Shaft Type	Hollow shaft
Housing material	Metal/Plastic, ZnAlCu1/PBT-GF30-V0
Electrical connection	Flange connector, M12 x 1
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 sinus; each 3x; 3 axes
Continuous shock resistance (EN 60068-2-29)	40 g; 6 ms ½ sinus; each 4000 x; 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

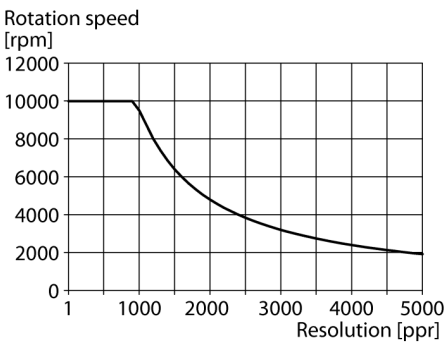
- **Compact, rugged housing**
- **Many mounting possibilities**
- **Status displayed via LED**
- **Immune to electromagnetic interference**
- **1024 pulses per revolution (default)**
- **360, 512, 1000, 1024, 2048, 2500, 3600, 4096, parametr. via Easy-Teach**
- **Free parametrization of the pulse number in the range from 1 to 5000 via PACT*ware*™**
- **Position of z-track set via Easy-Teach**
- **Burst function, absolute angular position output incrementally per Easy-Teach pulse**
- **10…30 VDC**
- **Male M12 x 1, 8-pin**
- **Push-pull A, B, Z, A (inverse), B (inverse)**

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.



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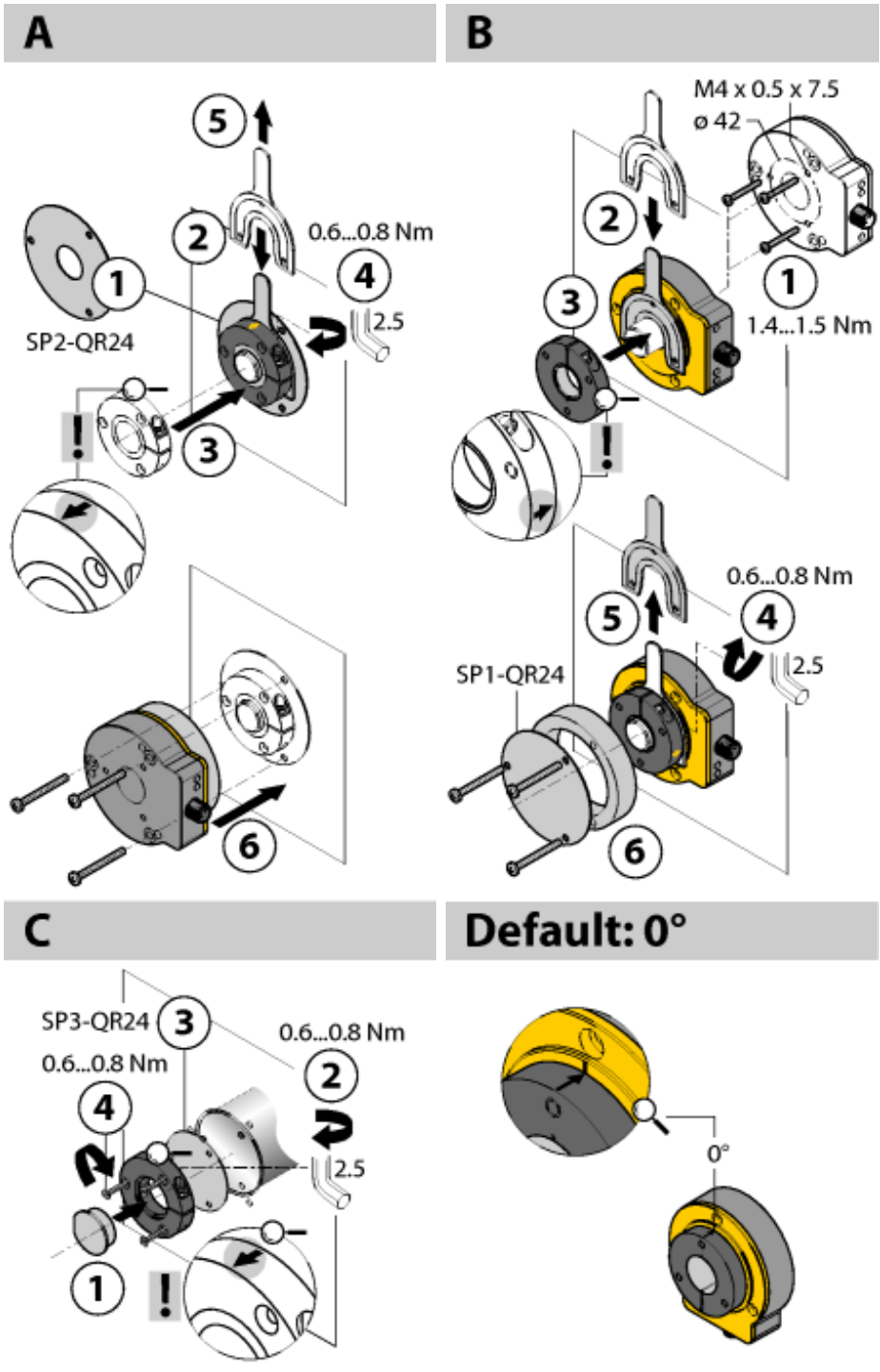

Extensive range of mounting accessories for easy adaptation to many different shaft diameters. Based on the functional principle of RLC coupling, the sensor operates absolutely wear-free and is immune to magnetized metal splinters and other interference fields. Wrong installation is hardly possible.
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.

Individual Parameterization (Teaching with Positioning Element)

Jumper between teach input Pin 8	Gnd Pin 1	Ub Pin 2	LED
2 s	Z-track zero point teaching	One-time triggering of burst function	Status LED flashes then turns steady 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 (z-track, CW)	After 15 s power and status LED alternate

To avoid unintended teaching, keep pin 8 potential-free.

Preset Programming Mode (Teaching without Positioning Element)

Jumper between teach input Pin 8	Gnd Pin 1	Ub Pin 2	LED
	2 s Resolution setting mode active for 10 s	2 s Resolution setting mode active for 10 s	Status LED steady, flashes after 2 s as long as selection mode is active
360 pulses/360°	Start value		1 x flashing
512 pulses/360°	Press once		2 x flashing
1000 pulses/360°	Press twice		3 x flashing
1024 pulses/360°	Press three times		4 x flashing
2048 pulses/360°	Press four times		5 x flashing
2500 pulses/360°		Start value	1 x flashing
3600 pulses/360°		Press once	2 x flashing
4096 pulses/360°		Press twice	3 x flashing
5000 pulses/360°		Press three times	4 x flashing

To avoid unintended teaching, keep pin 8 potential-free.

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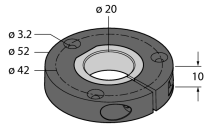
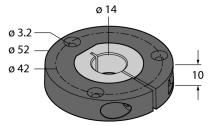
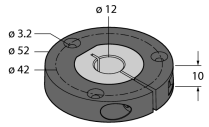
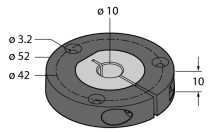
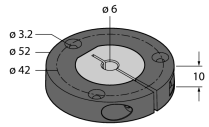
Accessories

Type code	Ident no.	Description	
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	

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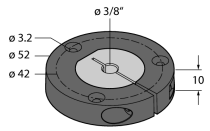
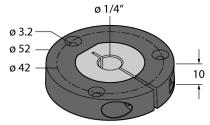
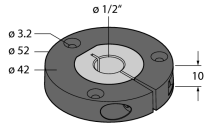
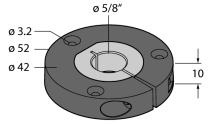
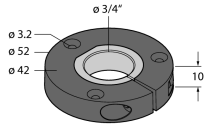
Accessories

Type code	Ident no.	Description	
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	

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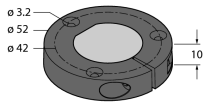
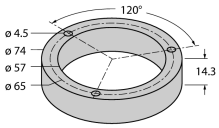
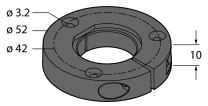
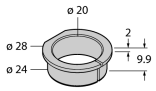
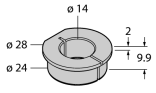
Accessories

Type code	Ident no.	Description	
P8-Ri-QR24	1590916	Positioning element with blanking plug for large shafts	
M1-QR24	1590920	Aluminium 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	

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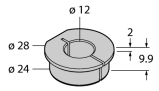
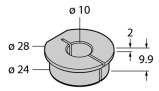
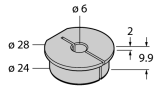
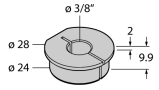
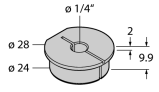
Type code	Ident no.	Description	
RA3-QR24	1590930	Adapter sleeve, for Ø 12 mm shafts	
RA4-QR24	1590931	Adapter sleeve, for Ø 10 mm shafts	
RA5-QR24	1590932	Adapter sleeve, for Ø 6 mm shafts	
RA6-QR24	1590933	Adapter sleeve, for Ø 3/8“ shafts	
RA7-QR24	1590934	Adapter sleeve, for Ø 1/4“ shafts	

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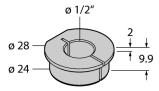
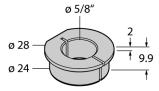
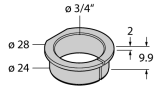
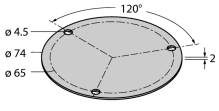
Type code	Ident no.	Description	
RA9-QR24	1590960	Adapter sleeve, for Ø 3/8“ shafts	
RA10-QR24	1590961	Adapter sleeve, for Ø 3/8“ shafts	
RA11-QR24	1590962	Adapter sleeve, for Ø 3/8“ shafts	
RA8-QR24	1590959	Plug for positioning element (alternative to adapter sleeve)	
SP1-QR24	1590938	Shield Ø 74 mm, aluminium	

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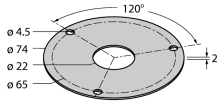
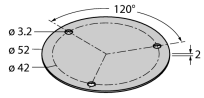
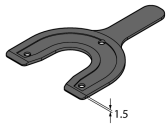
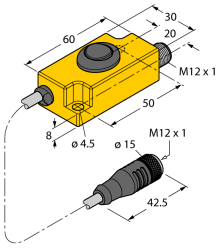
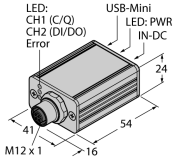
Type code	Ident no.	Description	
SP2-QR24	1590939	Shield Ø 74 mm, aluminiuim, with borehole for shaft feedthrough	
SP3-QR24	1590958	Shield Ø 52 mm, aluminium	
MT-QR24	1590935	Mounting aid for optimal alignment of positioning element	
TX2-Q20L60	6967117	Teach adapter for inductive encoders with 8-pin male M12 x 1, for simple programming via Easy Teach	
USB-2-IOL-0002	6825482	IO-Link Master with integrated USB port	

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Wiring accessories

Type code	Ident no.	Description	
RKC8T-2/TXL	6625142	Connection cable, female M12, straight, 8-pin, cable length: 2 m, sheath material: PUR, black; cULus approval; other cable lengths and qualities available, see www.turck.com	
RKC8.302T-1,5-RSC4T/TXL320	6625003	Adapter cable to connect sensor to USB-2-IOL-0002 parametrizing unit; female M12, straight, 8-pin on male M12, straigth, 3-pin; cable length: 1.5 m; sheath material: PUR, sheath color: black, cULus approved; RoHS conform; protection class IP67