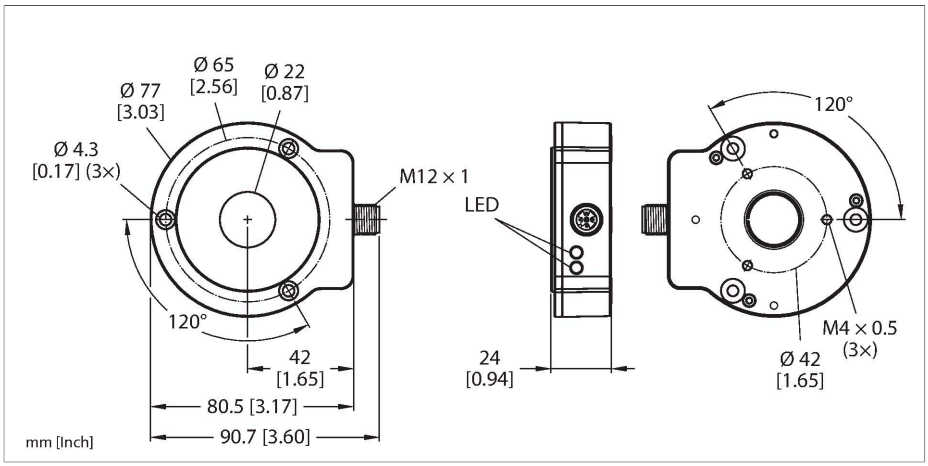
RI360P0-QR24M0-ELIU5X2LD-H1151
Contactless Encoder – Analog
Premium Line



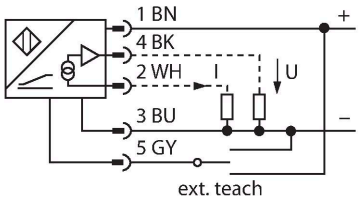
Technical data

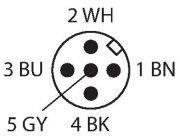
Type	RI360P0-QR24M0-ELIU5X2LD-H1151
ID	100029756
Measuring principle	Inductive
General data	
Max. rotational speed	12,000 rpm
	Determined with standardized construction, with a steel shaft Ø 20 mm, L = 50 mm and reducer Ø 20 mm
Starting torque shaft load (radial / axial)	not applicable, because of contactless 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 U_B	10…30 VDC
Ripple U_{ss}	≤ 10 % U_{Bmax}
Isolation test voltage	0.5 kV
Short-circuit protection	yes
Wire break/reverse polarity protection	yes/yes (voltage supply)
Output function	5-pin, Analog output
Voltage output	0…10 V
Current output	4…20 mA

Features

- Compact and robust housing
- Versatile mounting options
- 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
- 10…30 VDC
- 0…10 V and 4…20 mA
- Connector M12 × 1, 5-pin

Wiring diagram





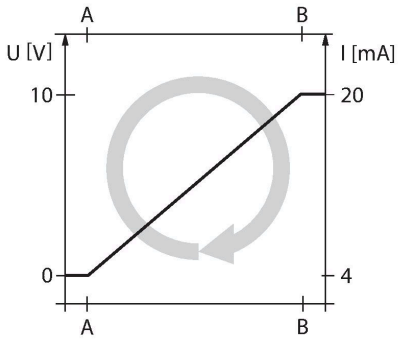
Functional principle

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

Technical data

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
Load dump protection	Impuls 5a: 123 V, Kriterium A
Current consumption	< 100 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	-40…+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
UL certificate	E210608

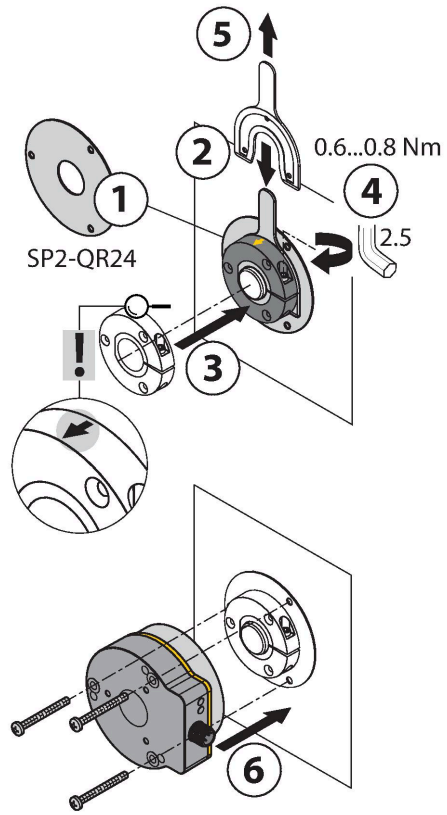
operating principle. They convince through their excellent repeatability, resolution and linearity within a broad temperature range. The innovative technology ensures a high immunity to electromagnetic DC and AC fields.



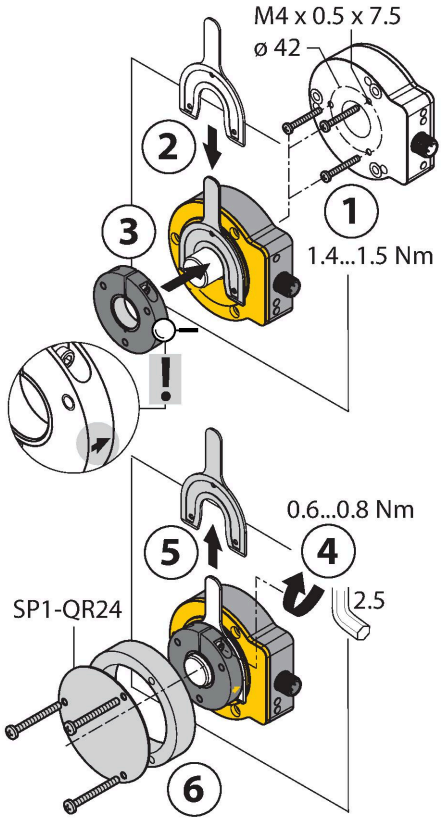
Mounting instructions

Mounting instructions/Description

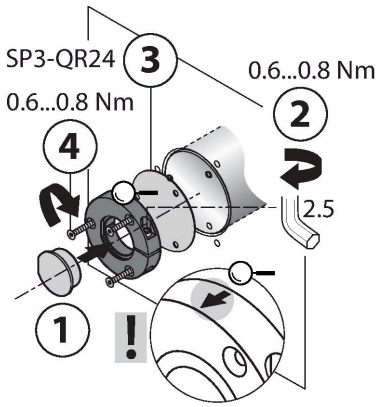
A



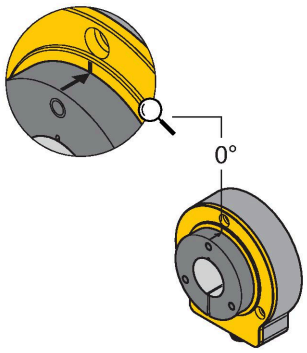
B



C



Default: 0°



The extensive range of mounting accessories enables easy adaptation to many different shaft diameters. Due to the measuring principle, which is based on the functional principle of an RLC coupling, the encoder is immune to magnetized ferrous chips and other interferences. As a result, there are few possible causes of error during mounting. The adjacent figures show the simple installation of the two separate units: the sensor element and the positioning element:
Mounting option A:
First, connect the positioning element to the rotatable shaft using the bracket. Then place the encoder with the aluminum ring above the rotating part in such a way that you get a closed and protected unit.
Mounting option B:
Slide the encoder backward onto the shaft and fasten it to the machine. Then fasten the positioning element to the shaft using the bracket.
Mounting option C:
If the positioning element is screwed onto a rotating machine part rather than being put on a shaft, you must first insert the dummy plug RA8-QR24. Then tighten the bracket. Next, mount the encoder via the three bores.

Due to the separate installation of positioning element and sensor, no electrical currents or harmful mechanical forces are transmitted to the sensor via the shaft. The encoder also offers a high degree of protection throughout its service life and stays permanently sealed. During commissioning, the accessories included in the delivery help to mount the encoder and the positioning element at an optimal distance from each other. In addition, LEDs indicate the status. Optionally, you can use the shield plates included in the accessories to increase the permitted distance between the positioning element and the sensor.

Status display via LED
Green:
Sensor is being supplied properly
Yellow:
Positioning element is within the measuring range, low signal quality (e.g. distance too great)
Yellow flashing:
Positioning element is outside the detection range
Off:
Positioning element is within the measuring range

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.

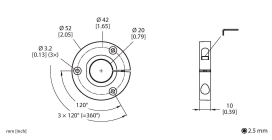
Preset Parameterization (Teaching without Positioning Element)

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.

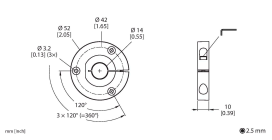
Accessories

P1-RI-QR24	1590921



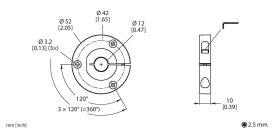
Positioning element, for Ø 20 mm shafts

P2-RI-QR24	1590922



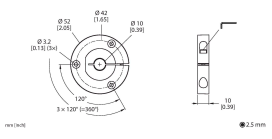
Positioning element, for Ø 14 mm shafts

P3-RI-QR24	1590923



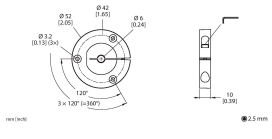
Positioning element, for Ø 12 mm shafts

P4-RI-QR24	1590924



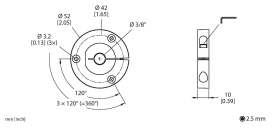
Positioning element, for Ø 10 mm shafts

P5-RI-QR24	1590925



Positioning element, for Ø 6 mm shafts

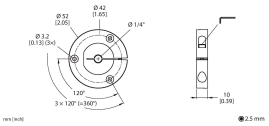
P6-RI-QR24	1590926



Positioning element, for Ø 3/8“ shafts

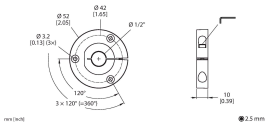
P7-RI-QR24 1590927

Positioning element, for Ø 1/4“ shafts



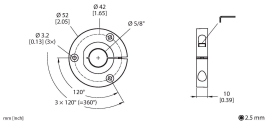
P9-RI-QR24 1593012

Positioning element for installation on Ø 1/2“ shafts



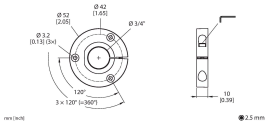
P10-RI-QR24 1593013

Positioning element for installation on Ø 5/8“ shafts



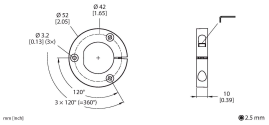
P11-RI-QR24 1593014

Positioning element for installation on Ø 3/4“ shafts



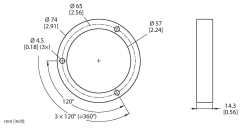
P8-RI-QR24 1590916

Positioning element with blanking plug for large shafts



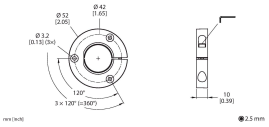
M1-QR24 1590920

Aluminum protecting ring, for inductive encoders RI-QR24



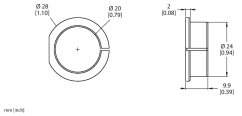
PE1-QR24 1590937

Positioning element without adapter sleeve



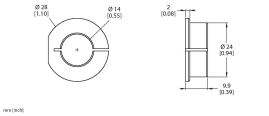
RA1-QR24 1590928

Adapter sleeve, for Ø 20 mm shafts



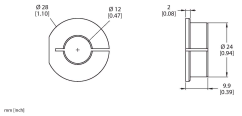
RA2-QR24 1590929

Adapter sleeve, for Ø 14 mm shafts



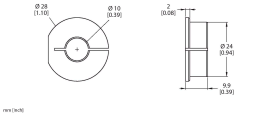
RA3-QR24 1590930

Adapter sleeve, for Ø 12 mm shafts



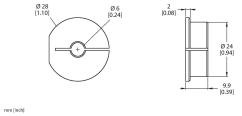
RA4-QR24 1590931

Adapter sleeve, for Ø 10 mm shafts



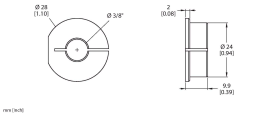
RA5-QR24 1590932

Adapter sleeve, for Ø 6 mm shafts



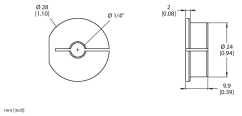
RA6-QR24 1590933

Adapter sleeve, for Ø 3/8“ shafts



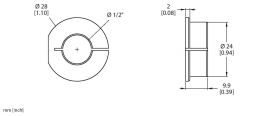
RA7-QR24 1590934

Adapter sleeve, for Ø 1/4“ shafts



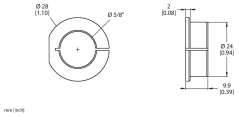
RA9-QR24 1590960

Adapter sleeve, for Ø 1/2" shafts



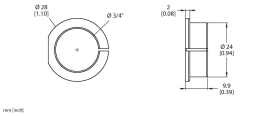
RA10-QR24 1590961

Adapter sleeve, for Ø 5/8" shafts



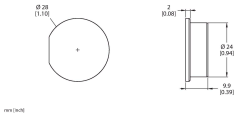
RA11-QR24 1590962

Adapter sleeve, for Ø 3/4" shafts



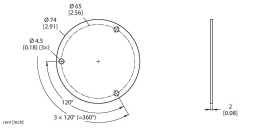
RA8-QR24 1590959

Plug for mounting option C



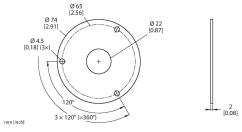
SP1-QR24 1590938

Shield plate Ø 74 mm, aluminium

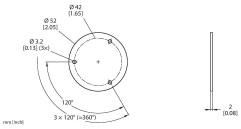


SP2-QR24 1590939

Shield plate Ø 74 mm, aluminiuim, with borehole for shaft feedthrough

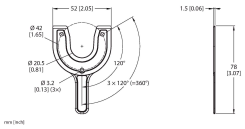


SP3-QR24	1590958



Shield plate Ø 52 mm, aluminium

MT-QR24	1590935



Mounting aid for optimal alignment of positioning element