

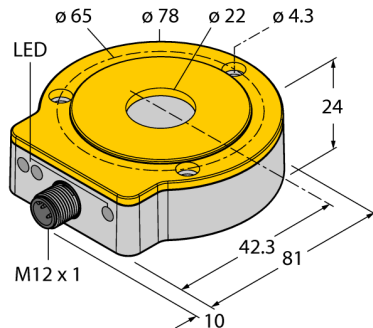
Contactless Encoder

SSI

RI360P0-QR24M0-HESG25X3-H1181

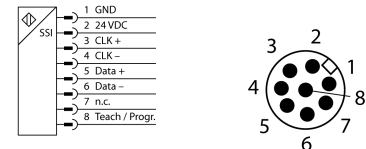


Industrial
Automation



- Compact, rugged housing
- Many mounting possibilities
- Status displayed via LED
- Positioning element and aluminium ring not incl.
- SSI output
- 25 bit, Gray-coded
- SSI clock rate: 62.5 KHz ... 1 MHz
- Single or multiturn, length of data frame and bit coding parametrizable via PACTware with programming box USB-2-IOL-0002 and adapter cable RKC8.302T-1,5-RSC4T/TX320
- Default settings: Singleturn Bit 0 ... Bit 15, Multiturn Bit 16 ... Bit 21, Status Bit 22 ... Bit 24
- Zero point, sync./async. operating mode adjustable via Easy Teach
- Compatible with all standard SSI masters
- In sync. mode, jitter < 5 µs required on the master side
- Immune to electromagnetic interference
- 15...30 VDC
- Male M12 x 1, 8-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.

Type designation	RI360P0-QR24M0-HESG25X3-H1181
Ident-No.	1590905
Ident-No (TUSA)	M1590905
Measuring principle	inductive
Max. Rotational Speed	6000 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	≤ ± 0.003 % / K
Ambient temperature	-25...+85 °C
Operating voltage	15...30 VDC
Residual ripple	≤ 10 % U _m
Isolation test voltage	≤ 0.5 kV
Output function	8-pin, SSI, 25 Bit, Gray coded
Output Type	absolute multiturn
Singleturn/Resolution	16 Bit
Resolution multiturn	6 Bit
Process data area	configurable
Diagnostic bits	Bit 22: Position was changed during power drop Bit 23: Positioning element has reached the end of the measuring range. This is indicated by a lower signal quality. Bit 24: Positioning element is outside the measuring range. Data messages parametrizable as multiturn and singleturn process data or error bits
Sample rate	5000 Hz The sensor's sampling rate depends on the master's SSI cycle time. Sampling rate 1...5 KHz in synchronized operating mode (signal propagation delay 200 µs)
Current consumption	< 100 mA

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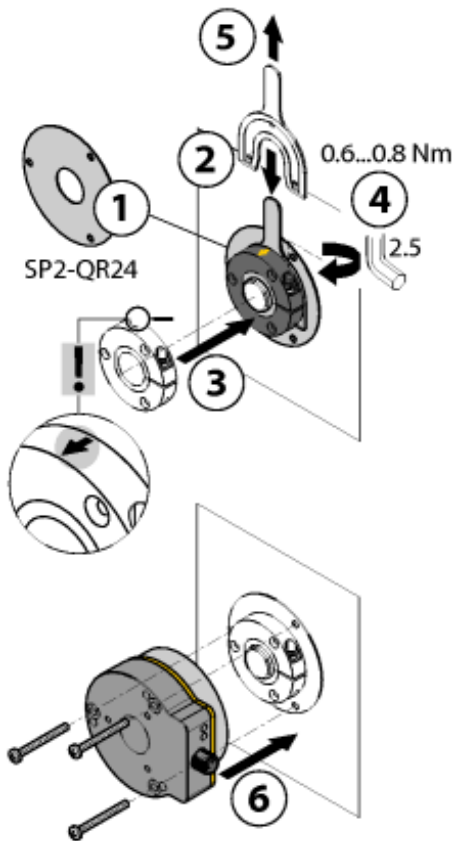


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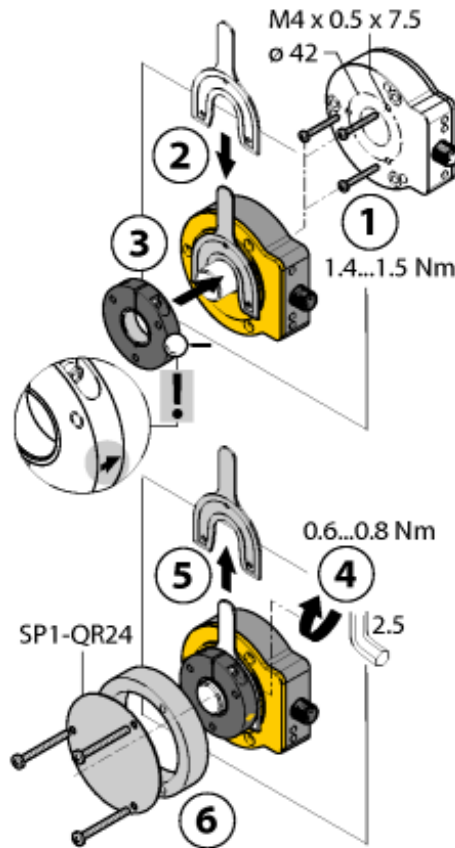
Dimensions	81 x 78 x 24 mm
Shaft Type	Hollow shaft
Housing material	Metal/Plastic, ZnAlCu1/PBT-GF30-V0
Electrical connection	Connector, M12 × 1
Vibration resistance	55 Hz (1 mm)
Vibration resistance (EN 60068-2-6)	20 g; 10...3000 Hz; 50 cycles; 3 axes
Shock resistance (EN 60068-2-27)	100 g; 11 ms ½ sinus; 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
Error indication	LED red
Included in delivery	MT-QR24 mounting aid

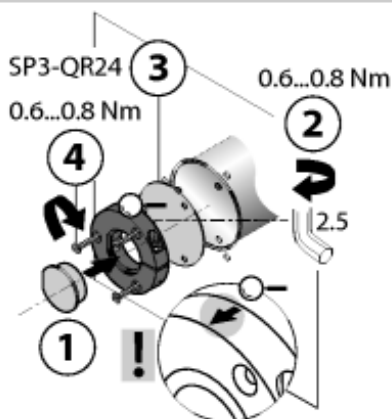
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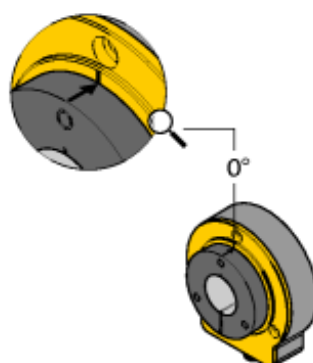
B



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 encoder is immune to magnetized metal splinters and other interferences.

The adjacent figure shows the two separate units, sensor and positioning element.

Mounting option A:

First, interconnect positioning element and rotatable shaft with the bracket. 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 screwed on a rotating machine part and not to a shaft, you must first put on the dummy plug RA8-QR24. Then tie up the bracket. Screw on the encoder via the three bores.

When mounting, ensure that the positioning element is correctly aligned towards the sensor's active face. For correct fitting see arrow on the edge of the positioning element. (Arrow must point in direction of sensor)

Due to the separate installation of positioning element and sensor no electrical currents or harmful mechanical forces are transmitted via the shaft to the sensor. The encoder also offers a high degree of protection for life and stays permanently sealed.

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. Optionally, you can use the shield plates which are included in the accessories to increase the allowed distance between positioning element and sensor.

Status display via LED

green

Sensor is supplied correctly, asynchronous mode

green flashing

Sensor is supplied properly, synchronous mode

green fast flashing:

Sensor is supplied properly but is not receiving CLK pulses from the SSI master

yellow

Positioning element is in the measuring range, signal low (e.g. distance too large), see status bit 23

yellow flashing

Positioning element is outside the coverage, see status bit 24

off

Positioning element is in the measuring range

Multiturn error

red:

Position was changed during power drop, see status bit 22

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Programming Instructions

Parameters	Easy-Teach Input	LED Display	Description
Zero point	Bridge Pin 1 (GND) and Pin 8 for 2 s	Status LED flashes, after 2 s steady	Encoder position set to zero. The Multiturn flag and the red LED are reset
Switching between sync/async mode	Bridge Pin 2 (U _a) and Pin 8 for 2 s	Status LED flashes, after 2 s steady Power LED steady green: async mode, Power LED flashes green: sync mode	The encoder is by default set to asynchronous mode. The encoder switches between async/sync mode by means of a teach pulse
Effective mode	Bridge Pin 2 (U _a) and Pin 8 for 10 s	After 10 s status LED flashes for 2 s	Effective direction of encoder CW (factory setting) Multiturn values are reset
	Bridge Pin 1 (GND) and Pin 8 for 10 s	After 10 s status LED flashes for 2 s	Effective direction of encoder CCW Multiturn values are reset
Multiturn error- flag	Bridge Pin 1 (GND) and Pin 8 for 15 s	After 15 s power and status LED alterante	Multiturn Error and multiturn counters are reset
Switching between single/multiturn mode	Bridge Pin 2 (U _a) and Pin 8 for 20 s	After 20 s the red LED flashes	Validity depends on revision status
Easy-Teach reset	Bridge Pin 2 (U _a) and Pin 8 for 15 s	After 15 seconds, power and status LED flash alternately; In case the red LED lights up, the Easy-Teach reset must be triggered again	The following factory defaults are restored: Effective direction (CW), zero point, multiturn error (delete), multiturn counter (zero)

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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Accessories

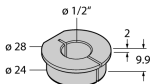
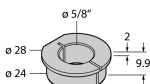
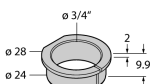

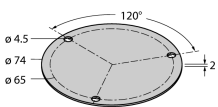
Type code	Ident-No.	Description	
RA3-QR24	1590930	Adapter sleeve, for Ø 12 mm shafts	
RA4-QR24	1590931	Adapter sleeve, for Ø 10 mm shafts	
RA5-QR24	1590932	Adapter sleeve, for Ø 6 mm shafts	
RA6-QR24	1590933	Adapter sleeve, for Ø 3/8" shafts	
RA7-QR24	1590934	Adapter sleeve, for Ø 1/4" shafts	

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Accessories

Type code	Ident-No.	Description	
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 Cu mounting option (reducing sleeves)	
SP1-QR24	1590938	Shield Ø 74 mm, aluminium	

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Accessories

Type code	Ident-No.	Description	
SP2-QR24	1590939	Shield Ø 74 mm, aluminium, 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	
E-RKC 8T-264-2	U-04781	Connection cable, female M12, straight, 8-pin (twisted pairs), shielded, cable length: 2 m, sheath material: PVC, black; cULus approval; other cable lengths and qualities available, see www.turck.com	

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Accessories

Type code	Ident-No.	Description	
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; protec- tion class IP67	
USB-2-IOL-0002	6825482	IO-Link Master with integrated USB port	