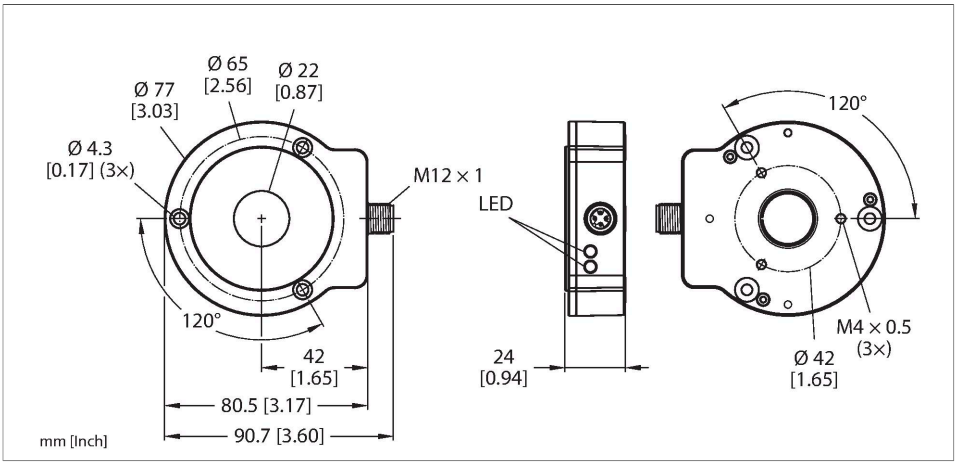
# RI360P0-QR24M0-IOLX2-H1141/3GD
# Contactless Encoder with ATEX Certificate – IO-Link, 3GD, Zone 2 (22)
# Premium Line



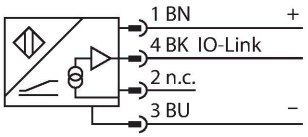

## Technical data

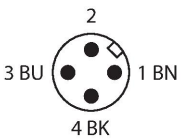
| | |
|---|---|
| Type | RI360P0-QR24M0-IOLX2-H1141/3GD |
| ID | 100003122 |
| Measuring principle | Inductive |
| **General data** | |
| Max. rotational speed | 800 rpm |
| | Determined with standardized construction, with a steel shaft Ø 20 mm, L = 50 mm and reducer Ø 20 mm. |
| Starting torque shaft load (radial / axial) | not applicable, because of contactless measuring principle |
| Measuring range | 0…360 ° |
| Nominal distance | 1.5 mm |
| Repeat accuracy | ≤ 0.01 % of full scale |
| Linearity deviation | ≤ 0.05 % f.s. |
| Temperature drift | ≤ ± 0.003 %/K |
| Output type | Absolute semi-multiturn |
| Resolution singleturn | 16 bit/65,536 units per revolution |
| Resolution multiturn | 13 bit/8192 revolutions |
| Number of diagnostic bits | 3 Bit |
| **Electrical data** | |
| Operating voltage $U_B$ | 24 VDC |
| Ripple $U_{ss}$ | ≤ 10 % $U_{Bmax}$ |
| Isolation test voltage | 0.5 kV |

## Features

- Compact and robust housing
- Versatile mounting options
- Status displayed via LED
- Immune to electromagnetic interference
- 16 bits singleturn
- Process value in 32 bit IO-Link telegram
- 3 error bits
- 16 bits singleturn
- 13 bits multiturn
- 15…30 VDC
- M12 × 1 male connector, 4-pin
- ATEX category II 3 G, Ex zone 2
- ATEX category II 3 D, Ex zone 22

## Wiring diagram



## Technical data

| | |
|---|---|
| Wire break/reverse polarity protection | yes (voltage supply) |
| Communication protocol | IO-Link |
| Sample rate | 1000 Hz |
| Current consumption | < 50 mA |
| Approval acc. to | ATEX declaration of conformity |
| Device marking | II 3 G Ex ec IIA T4 Gc<br>II 3 D Ex tc IIIC T100 °C Dc |
| **IO-Link** | |
| IO-Link specification | V 1.1 |
| Programming | FDT/DTM |
| Communication mode | COM 2 (38.4 kBaud) |
| Process data width | 32 bit |
| Minimum cycle time | 3 ms |
| Function pin 4 | IO-Link |
| Included in the SIDI GSDML | Yes |
| **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<br>6.35<br>9.525<br>10<br>12<br>12.7<br>14<br>15.875<br>19.05<br>20 |
| Housing material | Metal/plastic, ZnAlCu1/PBT-GF30-V0 |
| Electrical connection | Connector, M12 × 1 |
| **Environmental conditions** | |
| Ambient temperature | -25…+70 °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<br>IP69K |

## Functional principle

The measuring principle of inductive encoders 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. Turck refers to semi-multiturn because the multiturn process data is calculated internally from the number of single-turn zero passes. Because the sensor does not detect any revolutions when not supplied with power, the plausibility of the multiturn process data is indicated by a diagnostic bit. The rugged sensors are maintenance- and wear-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 high immunity to electromagnetic DC and AC fields.

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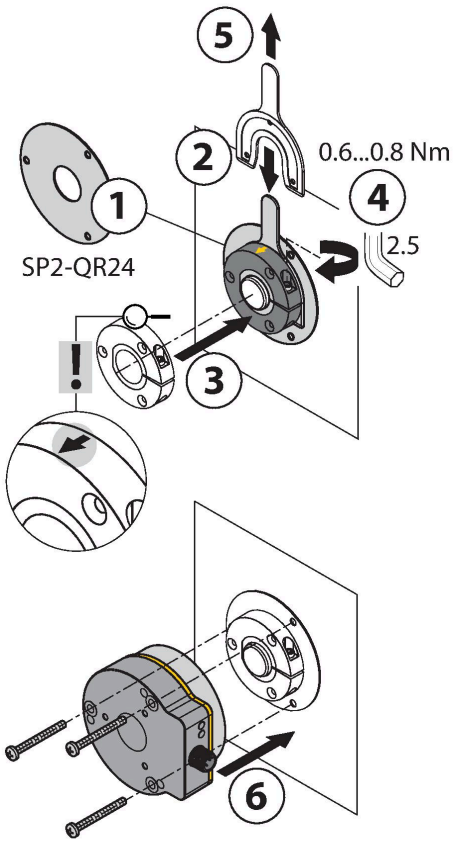
## Technical data

| | |
|---|---|
| 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 |

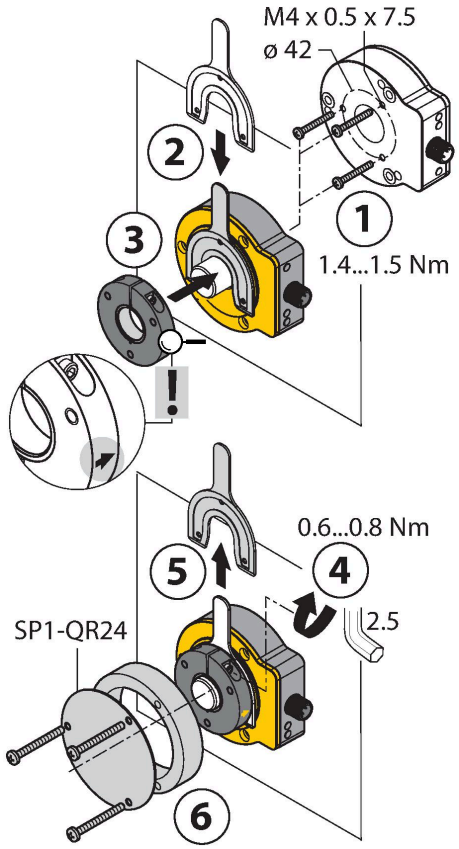
## Mounting instructions

Mounting instructions/Description

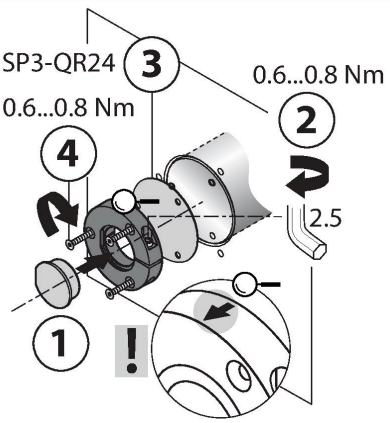
### A



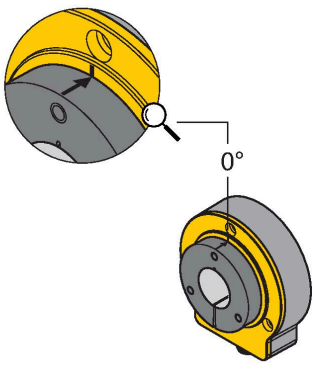

### B




### C




### Default: 0°

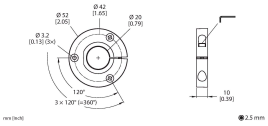
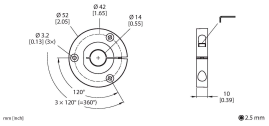
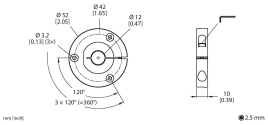
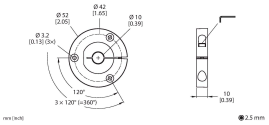
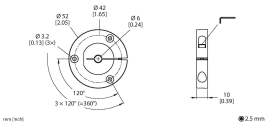
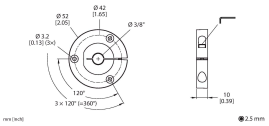
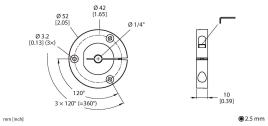
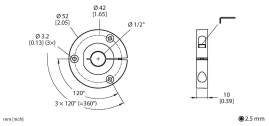
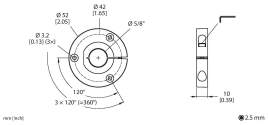
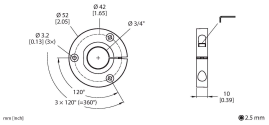
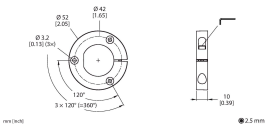
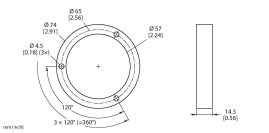
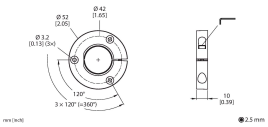
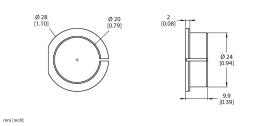
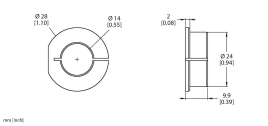
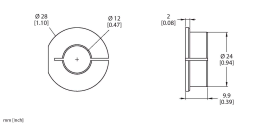
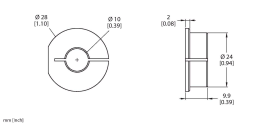
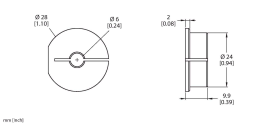



The extensive range of mounting accessories enables easy adaptation to many different shaft diameters. Due to the measuring principle, which is based on the functional principle of an RLC coupling, the encoder is immune to magnetized ferrous chips and other interferences. As a result, there are few possible 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

## 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 |

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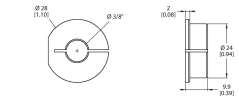
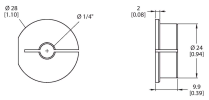
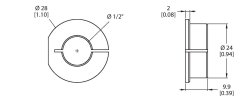
| RA6-QR24 | 1590933 |
|---|---|
| | Adapter sleeve, for Ø 3/8“ shafts |



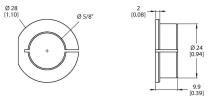
| RA7-QR24 | 1590934 |
|---|---|
| | Adapter sleeve, for Ø 1/4“ shafts |



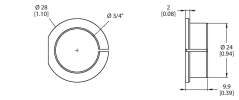
| RA9-QR24 | 1590960 |
|---|---|
| | Adapter sleeve, for Ø 1/2" shafts |



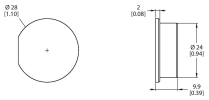
| RA10-QR24 | 1590961 |
|---|---|
| | Adapter sleeve, for Ø 5/8" shafts |



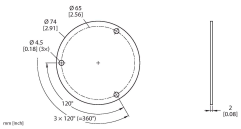
| RA11-QR24 | 1590962 |
|---|---|
| | Adapter sleeve, for Ø 3/4" shafts |



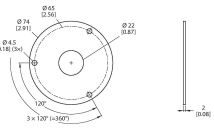
| RA8-QR24 | 1590959 |
|---|---|
| | Plug for mounting option C |



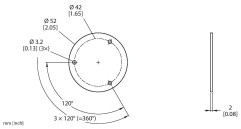
| SP1-QR24 | 1590938 |
|---|---|
| | Shield plate Ø 74 mm, aluminium |



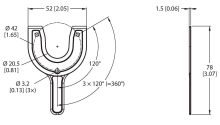
| SP2-QR24 | 1590939 |
|---|---|
| | Shield plate Ø 74 mm, aluminiuim, with borehole for shaft feedthrough |



| SP3-QR24 | 1590958 |
|---|---|
| | Shield plate Ø 52 mm, aluminium |



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



## Instructions for use

**Intended use**

**In order to ensure correct operation to the intended purpose it is required to observe the national regulations and directives.**

**For use in explosion hazardous areas conform to classification**

II 3 G and II 3 D (Group II, Category 3 G, electrical equipment for gaseous atmospheres and category 3 D, electrical equipment for dust atmospheres).

**Installation/Commissioning**

**These devices may only be installed, connected and operated by trained and qualified staff. Qualified staff must have knowledge of protection classes, directives and regulations concerning electrical equipment designed for use in explosion hazardous areas.Please verify that the classification and the marking on the device comply with the actual application conditions.**

**Installation and mounting instructions**

**Avoid static charging of cables and plastic devices. Please only clean the device with a damp cloth. Do not install the device in a dust flow and avoid build-up of dust deposits on the device.If the devices and the cable could be subject to mechanical damage, they must be protected accordingly. They must also be shielded against strong electro-magnetic fields.The pin configuration and the electrical specifications can be taken from the device marking or the technical data sheet.In order to avoid contamination of the device, please remove possible blanking plugs of the cable glands or connectors only shortly before inserting the cable or opening the cable socket.**

**Special conditions for safe operation**

**Devices with terminal chamber (cable glands) have a weaker strain relief. Sufficient strain relief must be ensured or the cable must be stationary-mounted.Do not disconnect the plug-in connection or cable under voltage.Please attach a warning label permanently in an appropriate fashion in close proximity to the plug-in connection with the following inscription: Nicht unter Spannung trennen / Do not separate when energized.Load voltage and operating voltage of this equipment must be supplied from power supplies with safe isolation (IEC 30 364/UL508), to ensure that the rated voltage of the equipment (24 VDC +10% = 26.4 VDC) is never exceeded by more than 40%.**

**Service/Maintenance**

**Repairs are not possible. The approval expires if the device is repaired or modified by a person other than the manufacturer. The most important data from the approval are listed.**