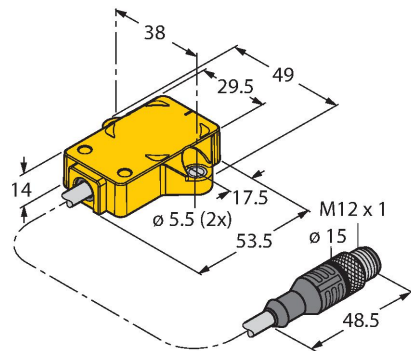


# RI360P1-QR14-ELIU5X2-0.3-RS5

## Miniature Encoder – With Analog Output

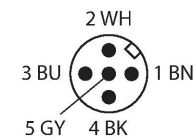
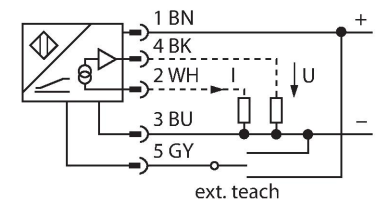
### Premium Line



### Features

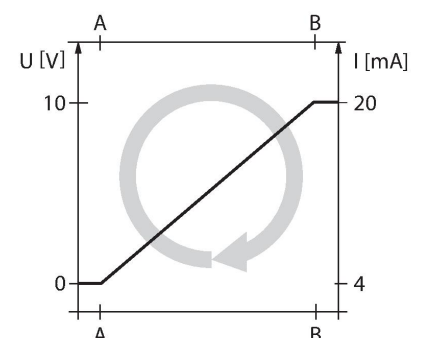
- Rectangular, plastic
- Many mounting possibilities
- P1-Ri-QR14 included in delivery
- Measuring range displayed via LED
- Immune to electromagnetic interference
- Resolution, 12-bit
- 15...30 VDC
- Analog output
- Programmable measuring range
- 0...10 V and 4...20 mA
- Cable with male connector, M12 x 1

### 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

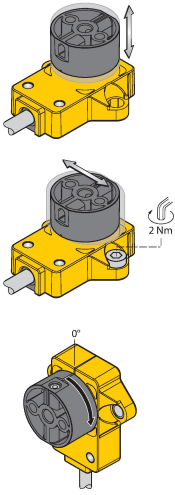
|                                             |                                                           |
|---------------------------------------------|-----------------------------------------------------------|
| Type                                        | RI360P1-QR14-ELIU5X2-0.3-RS5                              |
| ID                                          | 1590854                                                   |
| Measuring principle                         | Inductive                                                 |
| General data                                |                                                           |
| Starting torque shaft load (radial / axial) | Not applicable because of contactless measuring principle |
| Resolution                                  | 0.09°                                                     |
| Measuring range                             | 0...360 °                                                 |
| Nominal distance                            | 1.5 mm                                                    |
| Repeat accuracy                             | ≤ 0.025 % of full scale                                   |
| Linearity deviation                         | ≤ 0.3 % f.s.                                              |
| Temperature drift                           | ≤ ± 0.01 %/K                                              |
| Output type                                 | Absolute singleturn                                       |
| Electrical data                             |                                                           |
| Operating voltage $U_B$                     | 15...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                                                 |
| Load resistance voltage output              | ≥ 4.7 kΩ                                                  |
| Load resistance current output              | ≤ 0.4 kΩ                                                  |
| Sample rate                                 | 800 Hz                                                    |
| Current consumption                         | < 50 mA                                                   |

Technical data

| Mechanical data                             |                                                                      |
|---------------------------------------------|----------------------------------------------------------------------|
| Design                                      | Rectangular, QR14                                                    |
| Dimensions                                  | 53.5 x 49 x 14 mm                                                    |
| Flange type                                 | Flange without mounting element                                      |
| Shaft Type                                  | Blind hole shaft                                                     |
| Shaft diameter D (mm)                       | 6<br>6.35                                                            |
| Housing material                            | Plastic, PBT-GF30-V0                                                 |
| Electrical connection                       | Cable with connector, M12 × 1                                        |
| Cable quality                               | Ø 5.2 mm, Black, LiFY, PVC, 0.3 m                                    |
| Core cross-section                          | 5 x 0.25 mm <sup>2</sup>                                             |
| Environmental conditions                    |                                                                      |
| Ambient temperature                         | -25...+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                               |
| Salt spray test (EN 60068-2-52)             | Severity degree 5 (4 test cycles)                                    |
| Protection class                            | IP68<br>IP69K                                                        |
| MTTF                                        | 138 years acc. to SN 29500 (Ed. 99) 40 °C                            |
| Power-on indication                         | LED, Green                                                           |
| Measuring range display                     | multifunction LED, green<br>green flashing                           |
| Included in delivery                        | positioning element P1-Ri-QR14; for technical details see data sheet |

Mounting instructions

Mounting instructions/Description



Adapter pins provide more flexibility  
Extensive range of mounting accessories  
for easy adaptation  
to many different shaft diameters.  
LED function  
Operating voltage  
Green: Voltage is present  
Displayed measuring range  
Green: Positioning element is within the  
detection range  
Flashing green: Positioning element is within  
the  
measuring range with reduced signal quality  
(e.g.  
the distance is too great)  
Off: Positioning element is outside the  
sensing range  
Functional safety thanks to the inductive  
measuring principle  
The measuring principle of RLC coupling

makes the sensor absolutely wear-free and immune to magnetized ferrous chips and other interference fields. Owing to the differential analysis, the output signal remains almost unchanged, even if the position of the positioning element deviates from the ideal axis of rotation. The distance between the sensor and the positioning element

Variably adjustable (teaching with position sensor)

| Bridge between teach input pin 5 (GY) | Gnd Pin 3 (BU)                                 | Ub Pin 1 (BN)                                 | LED                                              |
|---------------------------------------|------------------------------------------------|-----------------------------------------------|--------------------------------------------------|
| 2 seconds                             | Initial value                                  | End value                                     | Power LED flashes then lights steadily after 2 s |
| 10 seconds                            | CCW rotation, then return to last preset value | CW rotation, then return to last preset value | After 10 s power LED flashes quickly for 2 s     |
| 15 seconds                            | -                                              | Factory setting (360°, CW)                    | Power and status LED alternate after 15 seconds  |

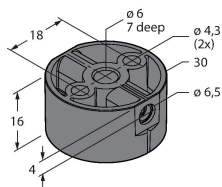
Preset – Mode (teach without position sensor)

| Bridge between teach input pin 5 (GY) | Gnd Pin 3 (BU)                                 | Ub Pin 1 (BN)                                 | LED                                             |
|---------------------------------------|------------------------------------------------|-----------------------------------------------|-------------------------------------------------|
| 2 seconds                             | Activate preset mode                           | Activate preset mode                          | Power LED steady, flashes after 2 s             |
| 10 seconds                            | CCW rotation, then return to last preset value | CW rotation, then return to last preset value | After 10 s power LED flashes quickly for 2 s    |
| 15 seconds                            | -                                              | Factory settings (360°, CW)                   | Power and status LED alternate after 15 seconds |
| Angular range                         | Gnd Pin 3 (BU)                                 | Ub Pin 1 (BN)                                 | Power LED                                       |
| 30°                                   | Press x 1                                      | -                                             | Blinking x 1                                    |
| 45°                                   | Press x 2                                      | -                                             | Blinking x 2                                    |
| 60°                                   | Press x 3                                      | -                                             | Blinking x 3                                    |
| 90°                                   | -                                              | Press x 1                                     | Blinking x 1                                    |
| 180°                                  | -                                              | Press x 2                                     | Blinking x 2                                    |
| 270°                                  | -                                              | Press x 3                                     | Blinking x 3                                    |
| 360°                                  | -                                              | Press x 4                                     | Blinking x 4                                    |

Accessories

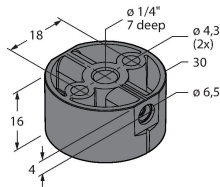
P1-RI-QR141590812

Positioning element for angle sensors RI-QR14, for Ø 6 mm shafts



P2-RI-QR141590819

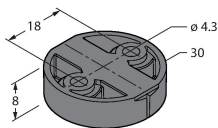
Positioning element for angle sensors RI-QR14, for Ø 6.35 mm shafts



P3-RI-QR14

1590865

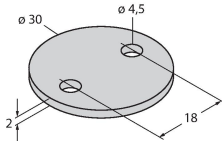
Positioning element for angle sensors RI-QR14, flat design, using shield plate SP1-QR14 is recommended



SP1-QR14

1590873

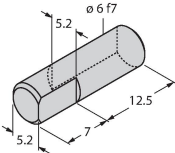
Shield plate Ø 30 mm, aluminium



HSA-M6-QR14

6901051

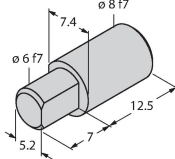
Adapter for RI-QR14 specific positioning elements, hollow on solid shaft, Ø 6 mm



HSA-M8-QR14

6901052

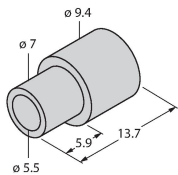
Adapter for RI-QR14 specific positioning elements, hollow on solid shaft, Ø 8 mm



DS-RI-QR14

1590814

Spacer sleeves for rear mounting of RI-QR14, 2 pcs. per bag



Accessories

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