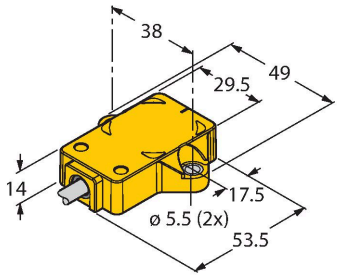
# RI360P1-QR14-ELIU5X2
# Inductive Angle Sensor – With Analog Output
# Premium Line



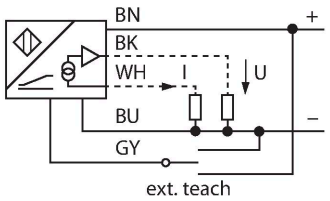

## Technical data

| | |
|---|---|
| Type | RI360P1-QR14-ELIU5X2 |
| Ident. no. | 1590853 |
| **Measuring principle** | **Inductive** |
| 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 |
| Ambient temperature | -25…+70 °C |
| Operating voltage | 15…30 VDC |
| Residual ripple | ≤ 10 % $U_{ss}$ |
| Isolation test voltage | ≤ 0.5 kV |
| Short-circuit protection | yes |
| Wire breakage/Reverse polarity protection | yes / yes (voltage supply) |
| Output type | Absolute singleturn |
| Output function | 4-wire, 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 |

## Features

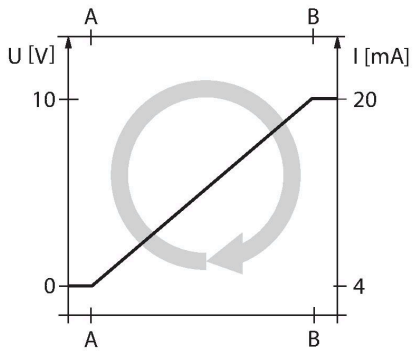
- Rectangular, plastic
- Many mounting possibilities
- P1-Ri-QR14 included in delivery
- Measuring range displayed via LED
- Immune to electromagnetic interference
- Resolution, 12-bit
- 4-wire, 15…30 VDC
- Analog output
- Programmable measuring range
- 0…10 V and 4…20 mA
- Cable connection

## 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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## Technical data

| | |
|---|---|
| Sample rate | 800 Hz |
| Current consumption | < 50 mA |
| **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 |
| Cable quality | Ø 5.2 mm, Lif9YH-11YH, PUR, 2 m |
| | Halogen-free, flame-retardant acc. to VDE |
| Core cross-section | 5 x 0.34 $mm^2$ |
| 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 |
| Salt spray test (EN 60068-2-52) | Severity degree 5 (4 test cycles) |
| Protection class | IP68 / 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 |

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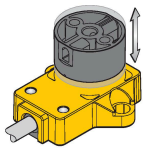
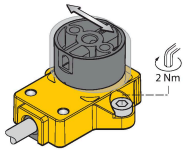
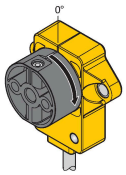
## Mounting instructions

| 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

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Individual (teaching with positioning element)

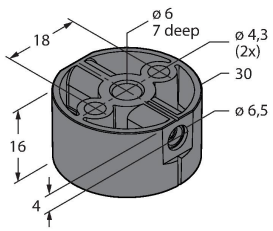
| Jumper between teach input Pin 5 (GY) | Gnd<br>Pin 3 (BU) | Ub<br>Pin 1 (BN) | LED |
|---|---|---|---|
| 2 seconds | start value | end value | status LED flashes, after 2 s steady |
| 10 seconds | CCW rotation, then return to last preset value | CW rotation, then return to last preset value | after 10 s status LED flashes fast for 2 s |
| 15 seconds | - | default setting (360°, CW) | after 15 s power and status LED alternate |

Preset – Mode (teaching without positioning element)

| Jumper between teach input Pin 5 (GY) | Gnd<br>Pin 3 (BU) | Ub<br>Pin 1 (BN) | LED |
|---|---|---|---|
| 2 seconds | activate preset mode | activate preset mode | status 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 status LED flashes fast for 2 s |
| 15 seconds | - | default setting (360°, CW) | after 15 s power and status LED alternate |
| Angular range | Gnd<br>Pin 3 (BU) | Ub<br>Pin 1 (BN) | status LED |
| 30° | press once | - | 1 x flashing |
| 45° | press twice | - | 2 x flashing |
| 60° | press three times | - | 3 x flashing |
| 90° | - | press once | 1 x flashing |
| 180° | - | press twice | 2 x flashing |
| 270° | - | press three times | 3 x flashing |
| 360° | - | press four times | 4 x flashing |

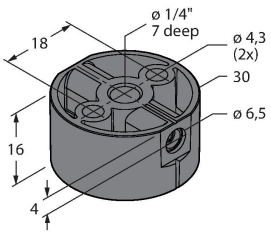
## Accessories

P1-RI-QR14 1590812



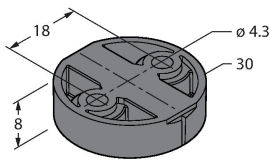

Positioning element for angle sensors RI-QR14, for Ø 6 mm shafts

P2-RI-QR14 1590819



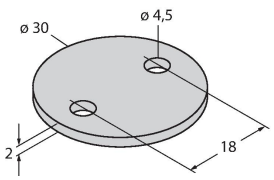

Positioning element for angle sensors RI-QR14, for Ø 6.35 mm shafts

P3-RI-QR14 1590865



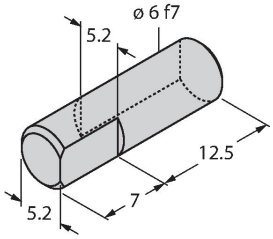

Positioning element for angle sensors RI-QR14, flat design, using shield plate SP1-QR14 is recommended

SP1-QR14 1590873



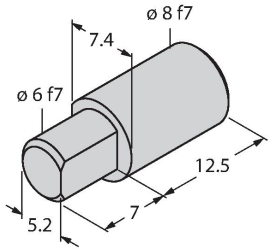

Shield plate Ø 30 mm, aluminium

HSA-M6-QR14 6901051



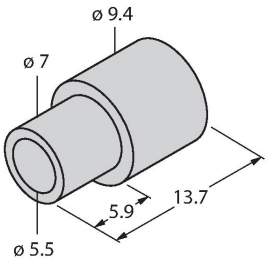

Adapter for RI-QR14 specific positioning elements, hollow on solid shaft, Ø 6 mm

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