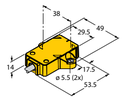
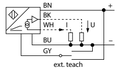
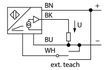
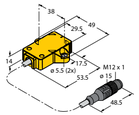
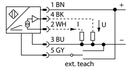
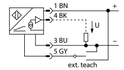
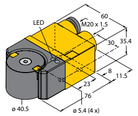
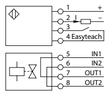
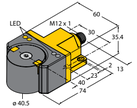
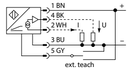
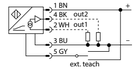
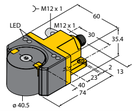
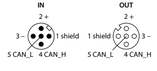
Types and Features

QR14

Dimension drawing	Wiring diagram		
			
	Ri360P1-QR14-ELiU5X2	Ri360P1-QR14-ELU4X2/S97	Ri360P1-QR14-ESG25X2
			
	Ri360P1-QR14-ELiU5X2-0,3-RS5	Ri360P1-QR14-ELU4X2-0,3-RS5/S97	Ri360P1-QR14-ESG25X2-0,3-RS8

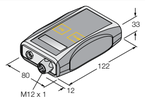
DSU35

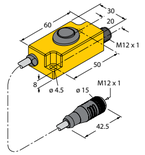
Dimension drawing	Wiring diagram	
		
	Ri360P1-DSU35TC-Li-Exi	
		
	Ri360P1-DSU35-ELiU5X2-H1151	Ri360P1-DSU35-2UP6X4-H1151
		
	Ri360P1-DSU35-CNX4-2H1650	

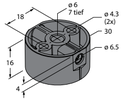
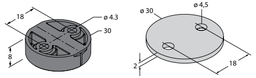
Type code	Measuring range	Ambient temperature	Operating voltage	Output	Resolution
Ri360P1-QR14-ELiU5X2[1]	0…360°	-25…+70 °C	15…30 VDC	0…10 V/4…20 mA	12 bit
Ri360P1-QR14-ELU4X2/S97[1]	0…360°	-40…+70 °C	8…30 VDC	0.5…4.5 V	12 bit
Ri360P1-QR14-ESG25X2[1]	0…360°	-25…+70 °C	15…30 VDC	SSI, 25 bit Gray coded	16 bit
Ri360P1-QR14-ELiU5X2-0,3-RS5[1]	0…360°	-25…+70 °C	15…30 VDC	0…10 V/4…20 mA	12 bit
Ri360P1-QR14-ELU4X2-0,3-RS5/S97[1]	0…360°	-40…+70 °C	8…30 VDC	0.5…4.5 V	12 bit
Ri360P1-QR14-ESG25X2-0,3-RS8[1]	0…360°	-25…+70 °C	15…30 VDC	SSI, 25 bit Gray coded	16 bit
Ri360P1-DSU35TC-Li-Exi[2]	0…360°	-20…+75 °C	14…30 VDC	4…20 mA, loop powered	12 bit
Ri360P1-DSU35-ELiU5X2-H1151[2]	0…360°	-20…+75 °C	15…30 VDC	0…10 V/4…20 mA	12 bit
Ri360P1-DSU35-2UP6X4-H1151[2]	0…360°	-20…+75 °C	10…30 VDC	PNP, normally open/closed	12 bit
Ri360P1-DSU35-CNX4-H1650[2]	0…360°	-20…+70 °C	10…30 VDC	CANopen, Profil DS406	16 bit

[1] Positioning element P1-Ri-QR14 included in delivery, [2] Positioning element P1-Ri-DSU3 included in delivery

Accessories

Dimension drawing	Type code/Description
Function accessories	
	**TB4** Analog test box for sensors with analog or switching output, incl. batteries
Adapter	
	**HSA-M6-QR14** Adapter pin for mounting on hollow and solid shafts, for P1-Ri-QR14, Ø solid shaft: 6 mm
	**HSA-M8-QR14** Adapter pin for mounting on hollow and solid shafts, for P1-Ri-QR14, Ø solid shaft: 8 mm

Dimension drawing	Type code/Description
Sleeves	
	**DS-Ri-QR14** Spacer sleeves for mounting the Ri-QR14 overhead
Teach-Adapter	
	**TX1-Q20L60** Teach adapter for easy programming of measuring range (optional)

Dimension drawing	Type code/Description
Positioning element	
	**P1-Ri-QR14** Positioning element for Ri-QR14, distance to the sensor surface 0…6 mm, included in delivery
	**P3-Ri-QR14** Flat positioning element. We recommend to use the Alu-shielding plate SP1-QR14.
	**P1-Ri-DSU35** Positioning element for Ri-DSU35 for frontal detection of angles, included in delivery (For more DSU35 accessories please visit www.turck.com)

28 subsidiaries and over
60 representations worldwide!

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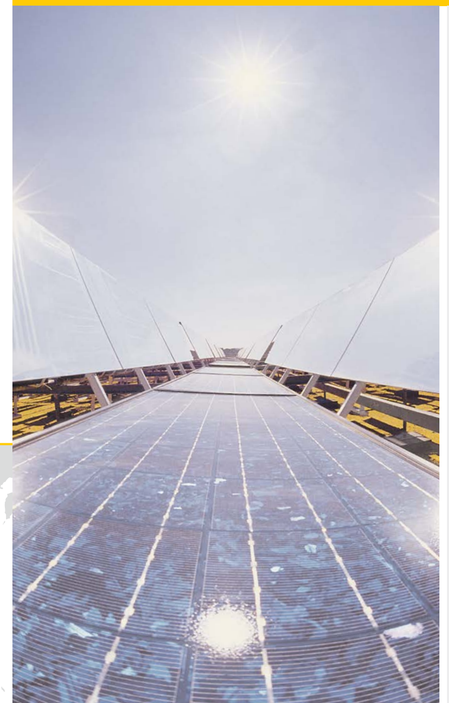
www.turck.com

Your Global Automation Partner

Ri360-DSU35 | Ri360-QR14
Inductive Angle Sensors



Ri360 – Inductive Angle Sensors

Detect angles contact-free

The Ri360 inductive angle sensors from Turck operate according to a revolutionary measuring principle which combines the benefits of conventional measuring systems in a single solution. The angular position is not detected by magnetic positioning element, but instead by means of an inductive RLC coupling. With a high level of immunity to interference, the robust IP67 plastic housing and a mechanically indefinite service life, the Ri angle sensors are suitable for many fields of application.

The separated design of sensor unit and position encoder, plus error compensation with an offset of up to 3 mm guarantee the user a great deal of flexibility in terms of installation and reliable operation.

The position sensor can be fitted to both solid shafts and hollow shafts. The non-contact measuring principle compensates for application-side bearing tolerances, just as reliably as it does for vibrations caused by non-concentricity of shafts.

Measuring principle

The measuring principle of the angle sensor is based on an innovative RLC coupling which offers enormous advantages in comparison to magnetic systems. The sensor housing features extremely precisely manufactured PCB coils, which function as the emitter and receiver coil system. The emitter coil is induced by a high-frequency alternating field and, together with the positioning element, which is known as the resonator, completes an inductive RLC coupling. This has the consequence that the positioning element is in turn inductively coupled with the receiver coils.

The circular geometry of the receiver coils is structured so that, depending on the angle of rotation of the positioning element, different voltages are induced which can be evaluated as a dimension for the sensor signal to be supplied.

Teachable measuring ranges

The user can adjust the measuring range of the Ri sensors directly on the device. Not only can fixed preset angular ranges be selected, but start and end points for the sensors can be freely defined and the measuring ranges individually configured.

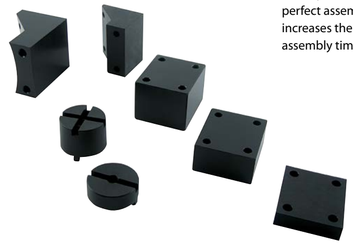
The following fixed preset angular ranges are available for selection, whereby the zero point is always remains unchanged: 30°, 45°, 60°, 90°, 180°, 270°. The direction of rotation can also be freely selected. The output characteristic curve can increase for both clockwise and counter clockwise movements.

e1 specification

With an increased interference immunity of 30 V/m in accordance with the e1 type approval as well as protection against conducted interference in accordance with DIN ISO 7637-2 (SAE J 133-11), the sensors in the Ri360…LU4/S97 series fulfil the requirements of the e1 specification and are therefore suitable for use in mobile applications.

Positioning element for Ri-QR14

The design of the positioning element for type QR14 allows all mounting variants: mounting on a shaft, screw mounting via countersunk holes and even mounting on a hollow shaft using special adapter pins.



Ri-DSU35 for rotary actuators

The Ri-DSU35 angle sensor and the well-established Ni4-DSU35 inductive dual sensor are identical in construction. The user also profits from the enormous mounting flexibility of the device. The sensor can be mounted on all standard rotary actuators thanks to an extensive range of available accessories. Additional mounting accessories may be required for use on very large drives. Turck also offers stable spacer plates with all necessary mounting accessories. A further advantage is that the same sensor/puck combination is used independent of the drive size. A selection aid for all standard drives is available on www.turck.com

Controlling rotary actuators

By contrast to dual sensors, which in principle can only record two positions, the new Ri-DSU35 sensors are also suitable for controlling 3-way flaps. An additional added value is that the valves are set to a specific angular position during a system's cleaning intervals. This special cleaning position can now be individually detected via the 360° angle detection by the sensors.

In addition, the sensors detect worn seals if the open/close position goes beyond the original angle value after numerous switching cycles. This further increases the plant availability.

Monitoring dancer rollers

The wear-free angle sensors of the Ri series can be used in printing machines, among other applications. There, the sensors continuously monitor the position of the dancer rollers to ensure a constant web tension. This ensures reliable handling of the paper during the printing process, preventing machine stops and guaranteeing print quality. The Ri sensors are also ideally suited for measuring the height positioning of paper stacks.

The contactless principle of the Ri angle sensors reduces downtimes and thus ensures a high level of machine availability.

Accessories for Ri-DSU35

A complete range of accessories ensures perfect assembly and installation. This increases the functionality while reducing assembly time.

Contactless and wear-free
The new measuring principle operates entirely contactless and wear-free. Important features such as accuracy, linearity and tightness are conserved for life and guarantee faultless operation of the sensor at all times.

Approvals (only DSU35)
For wiring into the Ex zones 1 and 21, we offer loop-powered intrinsically safe devices with a 4…20 mA output.

Rugged housing
The compact sensor is IP67 rated and resistant to many chemicals and oils. Made of high-quality plastic, the housing is very rugged. The two-part build consisting of sensor and positioning element compensates lateral offsets of and guarantees easy fitting and operation.

High linearity over 360°
The new angle sensors provide highly precise measuring signals within 360° and a repeatability of 0.09°. The contactless measuring principle reliably compensates bearing tolerances as well as vibration caused by irregularly rotating shafts. This guarantees a high degree of linearity.

Adaptable to any application
The DSU35 and QR14 types provide many freedom in terms of connectibility. While the DSU35 has the positioning element mounted in front, the QR14 features the active face on top.

Flexible process connection
Different types of outputs are also available: You can choose between 0…10 V, 4…20 mA and 0.5…4.5 V and an SSI interface. Standard M12 x 1 plug or cable connection are provided, making the use of special connectors redundant.