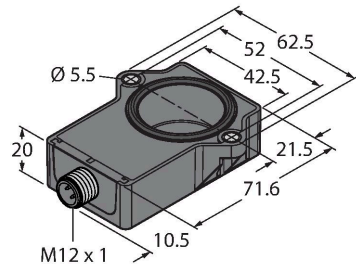


# RI60P1-QR20-LU4X2-H1141

## Miniature Encoder – With Analog Output

### Premium Line



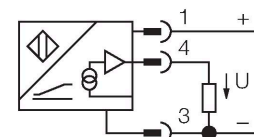
#### Technical data

Type	RI60P1-QR20-LU4X2-H1141
ID	100000204
Measuring principle	Inductive
<b>General data</b>	
Starting torque shaft load (radial / axial)	Not applicable because of contactless measuring principle
Resolution	0.09°/12 bit
Measuring range	-30...30 °
Nominal distance	1 mm
Repeat accuracy	≤ 0.15 % of full scale
Linearity deviation	≤ 1.25 % f.s.
Temperature drift	≤ ± 0.01 %/K
Output type	Absolute singleturn
<b>Electrical data</b>	
Operating voltage $U_B$	8...30 VDC
Ripple $U_{rs}$	≤ 10 % $U_{Bmax}$
Isolation test voltage	0.5 kV
Short-circuit protection	yes
Wire break/reverse polarity protection	no/yes (voltage supply)
Output function	3-wire, Analog output
Voltage output	0.5...4.5 V
Diagnostic	Positioning element not detected: Output signal 5 V

#### Features

- Rectangular, plastic
- Compact and robust housing
- Versatile mounting possibilities
- Positioning element P1-RI-QR20 included in delivery
- For vehicle board nets, 12 V and 24 V
- Increased interference immunity 100 V/m following the e1 type approval
- Protection against conducted interference acc. to DIN ISO 7637-2 (SAE J 113-11)
- Extended temperature range
- High protection class IP68/IP69K
- Protection against salt spray and rapid temperature changes
- Measuring range displayed via LED
- Immune to electromagnetic interference
- Resolution: 0.09°
- 3-wire, 8...30 VDC
- Analog output 0.5...4.5 V
- Output 5 V (typ.) where there is no RLC coupling

#### Wiring diagram

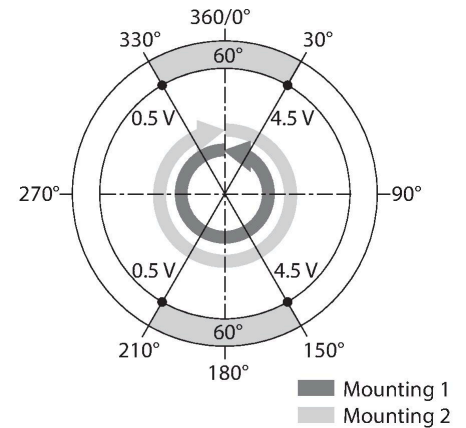


#### Functional principle

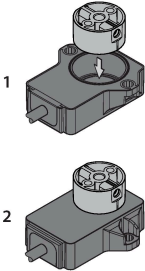
## Technical data

Load resistance voltage output	≥ 4.7 kΩ
Sample rate	800 Hz
Load-dump protection (DIN ISO 7637-2)	Severity degree IV/Level 4
Current consumption	< 100 mA
<b>Mechanical data</b>	
Design	Rectangular, QR20
Dimensions	71.6 x 62.6 x 20 mm
Flange type	Flange without mounting element
Shaft Type	Blind hole shaft
Shaft diameter D (mm)	6 6.35
Housing material	Plastic, Ultem
Electrical connection	Connector, M12 × 1
<b>Environmental conditions</b>	
Ambient temperature	-40...+85 °C
Storage temperature	-40...+125 °C
Temperature changes (EN60068-2-14)	-40... +85 °C; 20 cycles
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 IP69K
MTTF	423 years acc. to SN 29500 (Ed. 99) 40 °C
Power-on indication	LED, Green
Measuring range display	multifunction LED, green green flashing
Included in delivery	Positioning element P1-RI-QR20; for technical details see data sheet

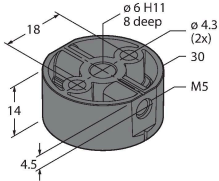
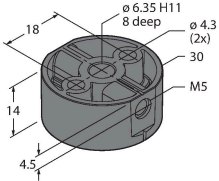
These sensors are extremely reliable even under the most extreme environmental conditions. Their extremely robust design meets the requirements for the IP68 and IP69K protection ratings. Thanks to their excellent resistance to constant shocks and thermal shock resistance, they are the ideal choice for mobile applications, such as road construction vehicles and agricultural machinery.



Mounting instructions


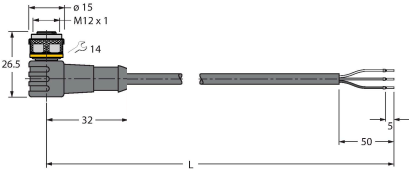
Mounting instructions/Description	
	<p>There are two different mounting options. One option is to position the positioning element above the sensor housing. However, it can also be mounted so that the sensor housing completely encloses the positioning element.</p> <p>LED function Operating voltage Green:Power on Displayed measuring range Green:Positioning element is in the detection range Green flashing:Positioning element is within the measuring range, low signal intensity (e.g. distance too large) Off:Positioning element is outside the detection range</p> <p>Inductive measuring principle provides more safety Due to the measuring principle, which is based on the functional principle of an RLC coupling, the sensor operates absolutely wear-free and is immune to magnetized ironware and other interferences. The amplitude of the signal can be changed by metal parts, which in turn affects the accuracy. 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 can be up to 5 mm, whereby the nominal distance is 1 mm.</p>

Accessories

P1-RI-QR20	1593041	P2-RI-QR20	1593042
			
Positioning element for encoder RI-QR20, for Ø 6 mm shafts		Positioning element for encoder RI-QR20, for Ø 6.35 mm shafts	

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Wiring accessories

Dimension drawing	Type	ID	
	RKC4T-2/TXL	6625500	Connection cable, M12 female connector, straight, 3-pin, cable length: 2 m, jacket material: PUR, black; cULus approval
	WKC4T-2/TXL	6625512	Connection cable, M12 female connector, angled, 3-pin, cable length: 2 m, jacket material: PUR, black; cULus approval