

RI360P0-EQR24M0-HESG25X3-H1181 Contactless Encoder with Stainless Steel Housing – SSI Premium Line





Technical data

Туре	RI360P0-EQR24M0-HESG25X3-H1181	
ID	1590911	
Measuring principle	Inductive	
General data		
Max. rotational speed	6000 rpm	
	Determined with standardized construc- tion, with a steel shaft \emptyset 20 mm, L = 50 mm and reducer \emptyset 20 mm	
Starting torque shaft load (radial / axial)	not applicable, because of contactless measuring principle	
Measuring range	0360 °	
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	6 bit/64 revolutions	
Number of diagnostic bits	3 Bit	
Electrical data		
Operating voltage $U_{\scriptscriptstyle B}$	1530 VDC	
Ripple U _{ss}	≤ 10 % U _{Bmax}	
Isolation test voltage	0.5 kV	
Wire break/reverse polarity protection	yes (voltage supply)	
Communication protocol	SSi	
Output function	8-pin, 25 Bit, Gray coded	
Process data area	configurable	

Features

- Compact, rugged housing
- Active face, plastic PA12-GF30
- Housing, stainless steel V4A (1.4404)
- Status displayed via LED
- SSI output
- 25 bit, Gray-coded
- SSI clock rate: 62.5 KHz ... 1 MHz
- Single or multiturn, length of data frame and bit coding parametrizable via PACTware with programming box USB-2-IOL-0002 and adapter cable RKC8.302T-1,5-RSC4T/ TX320
- Default settings: Singleturn Bit 0 ... Bit 15, Multiturn Bit 16 ... Bit 21, Status Bit 22 ... Bit 24
- Zero point, sync./async. operating mode adjustable via Easy Teach
- Compatible with all standard SSI masters
 In sync. mode, jitter < 5 µs required on the master side
- Immune to electromagnetic interference
- 15...30 VDC
- Male M12 x 1, 8-pin

Wiring diagram





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Diagnostic bits	Bit 22: Position was changed during pow- er drop Bit 23: Positioning element has reached the end of the measuring range. This is indicated by a lower signal quality. Bit 24: Positioning element is outside the measuring range.	
DeviceNet input data	Data messages parametrizable as multi- turn and singleturn process data or error bits	
Sample rate	5000 Hz	
	The sensor's sampling rate depends on the master's SSI cycle time. Sampling rate 15 KHz in synchronized operating mode (signal propagation delay 200 µs)	
Current consumption	< 100 mA	
Mechanical data		
Design	EQR24	
Dimensions	81 x 78 x 24 mm	
Flange type	Flange without mounting element	
Shaft Type	Hollow shaft	
Shaft diameter D (mm)	6 6.35 9.525 10 12 12.7 14 15.875 19.05 20	
Housing material	Stainless-steel/Plastic, 1.4404 (AISI 316L)/PA12-GF30	
Electrical connection	Connector, M12 × 1	
Environmental conditions		
Ambient temperature	-25+85 °C	
	Acc. to UL approval to +70 °C	
Vibration resistance	55 Hz (1 mm)	
Vibration resistance (EN 60068-2-6)	20 g; 103000 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 IP69K	
MTTF	138 years acc. to SN 29500 (Ed. 99) 40 °C	
Power-on indication	LED, Green	
Measuring range display	LED, yellow, yellow flashing	
Error indication	LED, red	
Included in delivery	Adapter sleeve MT-QR24	



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 semimultiturn 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.



Technical data

UL certificate

E210608

Mounting instructions





Extensive range of mounting accessories for easy adaptation to many different shaft diameters. Based on the functional principle of RLC coupling, the encoder is immune to magnetized metal splinters and other interferences.

The adjacent figure shows the two separate units, sensor and positioning element. Mounting option A:

First, interconnect positioning element and rotatable shaft. Then place the encoder above the rotating part in such a way that you get a tight and protected unit.

Mounting option B: Push the encoder on the back site of the shaft and fasten it to the machine. Then clamp

the positioning element to the shaft with the bracket.

Mounting option C:

If the positioning element is screwed on a rotating machine part and not to a shaft, you must first put on the dummy plug RA8-QR24. Then tie up the bracket. Screw on the encoder via the three bores.

When mounting, ensure that the positioning element is correctly aligned towards the sensor's active face. For correct fitting see arrow on the edge of the positioning element. (Arrow must point in direction of sensor)

Due to the separate installation of positioning element and sensor no electrical currents or harmful mechanical forces are transmitted via the shaft to the sensor. The encoder also offers a high degree of protection for life and stays permanently sealed.

The accessories enclosed in the delivery help to mount encoder and positioning element at an optimal distance from each other. LEDs indicate the switching status. Optionally, you can use the shield plates which are included in the accessories to increase the allowed distance between positioning element and sensor.

Status display via LED

green Sensor is supplied properly, asynchronous

mode

green flashing

Sensor is supplied properly, synchronous mode

green fast flashing:

Sensor is supplied properly but is not receiving CLK pulses from the SSI master vellow

Positioning element is in the measuring range, signal low (e.g. distance too large), see status bit 23

yellow flashing

Positioning element is outside the coverage, see status bit 24

off

Positioning element is in the measuring range



Multiturn error red: Position was changed during power drop, see status bit 22

Parameters	Easy-Teach Input	LED Display	Description
Zero point	Bridge Pin 1 (GND) and Pin 8 for 2 s	Status LED flashes, after 2 s steady	Encoder position set to zero. The Multiturn flag and the red LED are reset
Switching between sync/async mode	Bridge Pin 2 (U₅) and Pin 8 for 2 s	Status LED flashes, after 2 s steady	The encoder is by default set to asynchronous mode. The encoder switches between async/
		async mode, Power LED flashes green: sync mode	sync mode by means of a teach pulse
Effective mode	Bridge Pin 2 (U₅) and Pin 8 for 10 s	After 10 s status LED flashes for 2 s	Effective direction of encoder CW (factory setting) Multiturn values are reset
	Bridge Pin 1 (GND) and Pin 8 for 10 s	After 10 s status LED flashes for 2 s	Effective direction of encoder CCW Multiturn values are reset
Multiturn error- flag	Bridge Pin 1 (GND) and Pin 8 for 15 s	After 15 s power and status LED alterante	Multiturn Error and multiturn counters are reset
Switching between single/multiturn mode	Bridge Pin 2 (U_{B}) and Pin 8 for 20 s	After 20 s the red LED flashes	Validity depends on revision status
Easy-Teach reset	Bridge Pin 2 (U₅) and Pin 8 for 15 s	After 15 seconds, power and status LED flash alternately; In case the red LED lights up, the Easy-Teach reset must be triggered again	The following factory defaults are restored: Effective direction (CW), zero point, multiturn error (delete), multiturn counter (zero)

To avoid unintended teaching, keep pin 8 potential-free.

Accessories







Accessories

Dimension drawing	Туре	ID	
	RKC8T-2/TXL	6625142	Connection cable, M12 female connector, straight, 8-pin, cable length: 2 m, jacket material: PUR, black; cULus approval
M12 x 1 0 15 5 14 14 M12 x 1 15 + 15 + 15 + 15 + 15 + 15 + 16 M12 x 1 18 M12 x 1 18 M12 x 1 19 M12 x 1	RKC8.302T-1.5-RSC4T/TXL320	6625003	Adapter cable to connect sensor to USB-2-IOL-0002 programming unit; M12 female connector, straight, 8-pin to M12 male connector, straight, 3-pin; cable length: 1.5 m; jacket material: PUR, black; cULus approved; RoHS compliant; protection class IP67
	E-RKC 8T-264-2	U-04781	Connection cable, female M12, straight, 8-pin (twisted pairs),shielded, cable length: 2 m, sheath material: PVC, black; cULus approval; other cable lengths and qualities available, see www.turck.com



Accessories



M12 × 1 >16