

# QR series



QR40EMN-360HB-2I-CM-UL

## Absolute rotary encoder (contactless) Full Redundant

Output  
4 - 20 mA / 20 - 4 mA

Supply voltage  
10 - 32 Vdc

Measuring range  
360°



### General specifications 12400, v20221216

Reinforced plastic injection molded (Celanex 2300 GV3/30 - glass filled PBT, black)

40x40x17 mm

Included: 2x M4x25 stainless steel pozidrive pan head screws, self-tapping (PZ DIN7500CZ), Mounting on flat surface only. Screw with care

IP67, IP69K (with IP69K mating connector)

0 - 95% (non condensing, fully potted)

approx 50 gr.

11,2 x 5,5 x 8 mm Neodymium/N35/nickel coated/remanention 1,2 T

0 to 10 mm, magnet at front side

1 mm Radial Off Axis ( < 0,3 mm for minimum non-linearity)

Axial in 8 mm (Northpole marked)

10 - 32 Vdc

Yes

≤ 25 mA ( excluding output signal )

-40 to 85°C

-40 to 85°C

360°

No

11 bit over 360° (min. step 0,18°)

±0.5% typ. (@20°C), ±1% typ. (full Temp. range)

Magnet + Sensor: <3° typ. (with perfect external magnet positioning)

< ± 1,5° in magnet alignment range (both outputs individual)

0,26°

< 4 ms

100 rpm

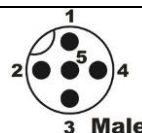
4 - 20 mA / 20 - 4 mA

Yes (T<55°C), Max 10 s (T>55°C)

Rload ≤ 50\*Vs - 250 [Ω] (Eg: Vs = 24 V: Rload ≤ 950 Ω)

M12 5p male connector (Glass fibre reinforced grade, contacts CuZn pre-nickeled galv. Au)

Pin 1: + Supply voltage  
Pin 2: not connected  
Pin 3: Gnd  
Pin 4: Output 1  
Pin 5: Output 2



Housing	
Dimensions (indicative)	
Mounting	
Ingress Protection (IEC 60529)	
Relative Humidity	
Weight	
Magnet type	
Magnet distance to sensor	
Max. radial magnet misalignment	
Direction of magnetization	
Supply voltage	
Polarity protection	
Current consumption	
Operating temperature	
Storage temperature	
Measuring range	
Programmable center position	
Accuracy	
Resolution	
Sensitivity error	
Offset error	
Non linearity	
Repeatability	
Response time	
Max speed	
Output signal	
Short circuit protection	
Output load resistor	
Connection (length ±10%)	
Pinout M12 connector	

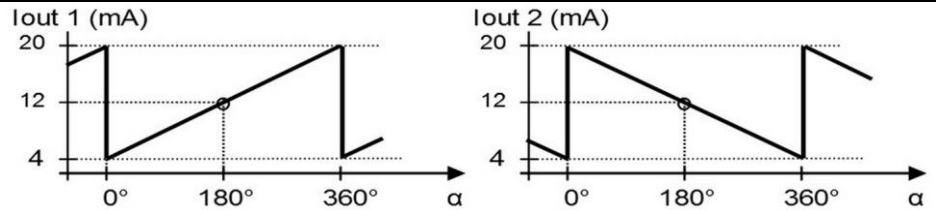
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100 rpm	
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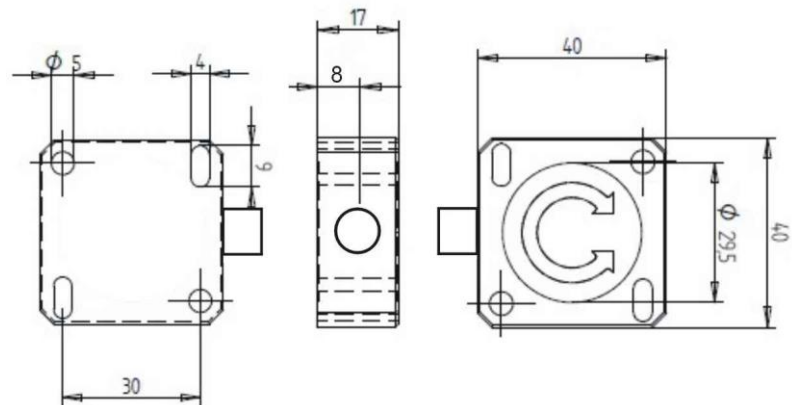
Magnet field within specifications:  
Differences between outputs < 3°

Magnet field outside specifications:  
Differences between outputs < 360°

### Transfer characteristic



### Dimensions (indicative only)



### Intended use & UL

#### Intended use:

QR series sensors are intended to measure rotation after installing in machines, equipment and systems. Flawless function in accordance with the specifications is ensured only when the device is used within its specifications. Modifications or non-approved use are not permitted and will result in loss of warranty and void any claims against the manufacturer.

This device can be used as safety component according to the EU Machine Directive (ISO13849), if the cross-check function between both outputs is performed by the application. An algorithm should be implemented in the application that compares the two outputs of this sensor, and brings the application into safe state if the difference between the two outputs exceeds the limits that fits the application involved.

#### UL:

UL certificate: UL File number: E312057

UL & c-UL listed product (standards UL60947-5-2 & CSA-C22.2 No. 14)

Product Identity / Category Code Number (CCN): Industrial Control Equipment / NRKH & NRKH7

Enclosure / Temperature rating: Enclosure type 1 / Temperature -40° . . +85°C

Electrical rating: Intended to be used with a Class 2 power source in accordance with UL1310

### Front view

Magnet drawn in  $\alpha=0^\circ$  position  
Magnet rotates clockwise:  $\alpha$  increases

Magnet North pole is indicated

Magnet surface to sensor: 11,2 x 8mm  
Magnet height: 5,5mm

### Magnet orientation

