

QR series



QR40EMN-360HB-2I-CM-UL

**Absolute rotary encoder
(contactless), Redundant**

Output
4 - 20 mA / 20 - 4 mA

Supply voltage
10 - 32 Vdc

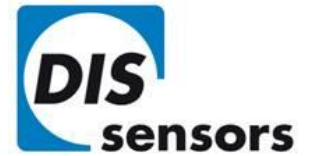
Measuring range
360°



General specifications v20220329

Housing	Reinforced plastic injection molded (Celanex 2300 GV3/30 - glass filled PBT, black)											
Dimensions (indicative)	40x40x17 mm											
Mounting	Included: 2x M4x25 stainless steel pozidrive pan head screws, self-tapping (PZ DIN7500CZ), Mounting on flat surface only. Screw with maximum Torque 2 Nm											
Ingress Protection (IEC 60529)	IP67, IP69K (with IP69K mating connector)											
Relative Humidity	0 - 95% (non condensing, fully potted)											
Weight	approx 50 gr.											
Magnet type	11,2 x 5,5 x 8 mm Neodymium/N35/nickel coated/remanent 1,2 T											
Magnet distance to sensor	0 to 10 mm, magnet at front side											
Max. radial magnet misalignment	1 mm Radial Off Axis (< 0,3 mm for minimum non-linearity)											
Direction of magnetization	Axial in 8 mm (Northpole marked)											
Supply voltage	10 - 32 Vdc											
Polarity protection	Yes											
Current consumption	≤ 25 mA (excluding output signal)											
Operating temperature	-40 to 85°C											
Storage temperature	-40 to 85°C											
Measuring range	360°											
Programmable center position	No											
Accuracy												
Resolution	12 bit over 360° (min. step 0,09°)											
Sensitivity error	±0.5% typ. (@20°C), ±1% typ. (full Temp. range)											
Offset error	Magnet + Sensor: <3° typ. (with perfect external magnet positioning)											
Non linearity	< ± 1,5° in magnet alignment range (both outputs individual)											
Repeatability	0,26°											
Response time	< 4 ms											
Max speed	100 rpm											
Output signal	4 - 20 mA / 20 - 4 mA											
Short circuit protection	Yes (T<55°C), Max 10 s (T>55°C)											
Output load resistor	Rload ≤ 50*Vs - 250 [Ω] (Eg: Vs = 24 V: Rload ≤ 950 Ω)											
Connection (length ±10%)	M12 5p male connector (Glass fibre reinforced grade, contacts CuZn pre-nickeled galv. Au)											
Pinout M12 connector	<table border="0"> <tr> <td>Pin 1:</td> <td>+ Supply voltage</td> <td rowspan="5"> </td> </tr> <tr> <td>Pin 2:</td> <td>not connected</td> </tr> <tr> <td>Pin 3:</td> <td>Gnd</td> </tr> <tr> <td>Pin 4:</td> <td>Output 1</td> </tr> <tr> <td>Pin 5:</td> <td>Output 2</td> </tr> </table>	Pin 1:	+ Supply voltage		Pin 2:	not connected	Pin 3:	Gnd	Pin 4:	Output 1	Pin 5:	Output 2
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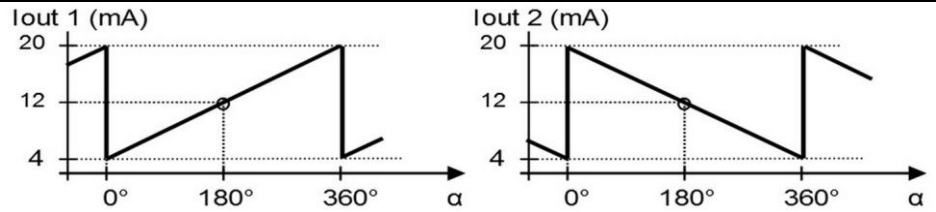


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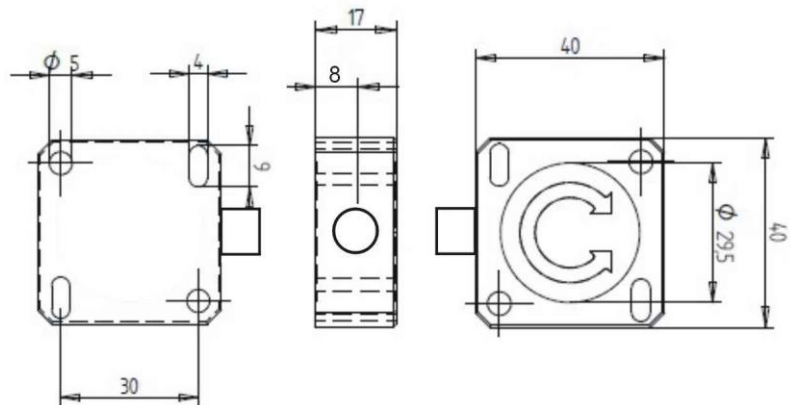
Magnet field within specifications:
Differences between outputs < 3°

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.

This device is not a safety component according to the EU Machine Directive (ISO13849).

Modifications or non-approved use are not permitted and will result in loss of warranty and void any claims against the manufacturer.

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

Electrical ratings: max. input Voltage 32V dc, max. current 50mA

Front view

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

Magnet North pole is indicated

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

Magnet orientation

