NOVOHALL
Rotary Sensor
Non-contacting
RSC-2800
Current
Industrial

Special Features
• Non-contacting, magnetic technology
• Measuring range up to 360°
• Available with push-on coupling or marked shaft
• Simple mounting
• Protection class IP54, IP65, IP67
• Long life
• Very small hysteresis
• High resolution 12 bits
• Linearity < ±0.5 %
• Other configurations see separate data sheets

Applications
• Manufacturing Engineering (textile machinery, packaging machinery, sheet metal and wire machinery)
• Automation technology
• Medical engineering

The RSC-2800 sensor utilizes a contactless magnetic measurement technology to determine the measured angle. Unlike conventional Hall sensors, the orientation of the magnetic field is measured. The position information corresponding to the angular position is transmitted via a variety of analog and digital interfaces (see separate data sheets).

The housing is made of a special high grade temperature-resistant plastic material. Elongated slots allow simplicity in mounting together with ease of mechanical adjustment.

Three shaft options are available, including a push-on coupling option that ensures fast and simple installation.

<table>
<thead>
<tr>
<th>Description</th>
<th>Material</th>
<th>Housing: high grade, temperature resistant plastic PPS-GF40/SF50</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Shaft: SS X8CrNiSi18-9 1.4305 / AISI 303</td>
<td></td>
</tr>
<tr>
<td>Mounting</td>
<td>With 2 screws M4 and washers</td>
<td></td>
</tr>
<tr>
<td>Max. fastening torque of mounting screws</td>
<td>max. 180 Ncm</td>
<td></td>
</tr>
<tr>
<td>Bearing</td>
<td>Sintered bronze bushing</td>
<td></td>
</tr>
<tr>
<td>Electrical connection</td>
<td>Cable 4x 0.5 mm² (AWG 20), TPE, shielded / Connector M12x1, A-coded with cable L = 0.15 m</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mechanical Data</th>
<th>Dimensions</th>
<th>See dimension drawing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical travel</td>
<td>360° continuous</td>
<td></td>
</tr>
<tr>
<td>Permitted shaft load</td>
<td>20 N (axial / radial)</td>
<td></td>
</tr>
<tr>
<td>static or dynamic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Torque</td>
<td>0.15 Ncm (IP54), 0.5 Ncm (IP65), 1.0 Ncm (IP67)</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>approx. 50 g</td>
<td></td>
</tr>
</tbody>
</table>
Ordering Specifications

Preferred types printed in bold
- Delivery time up to 25 pcs. within 10 working days E/W
- Best low-volume pricing

Supply voltage \( U_b \)
1: \( U_b = 24 \text{ VDC} \)

Interface parameters
2: 4 ... 20 mA

Output characteristic
1: Rising output characteristic cw
2: Rising output characteristic ccw
Other output characteristics on request

Electrical connection
201: Cable, 4-pole, shielded, \( L = 0.5 \text{ m} \)
202: Cable, 4-pole, shielded, \( L = 1 \text{ m} \)
206: Cable, 4-pole, shielded, \( L = 3 \text{ m} \)
210: Cable, 4-pole, shielded, \( L = 5 \text{ m} \)
220: Cable, 4-pole, shielded, \( L = 10 \text{ m} \)
501: Connector M12x1, 4-pin, with cable, shielded, \( L = 0.15 \text{ m} \)
Cable versions and assembled connectors on request

R S C - 2 8 3 2 - 6 3 6 - 1 2 1 - 2 0 2

Series

Measuring range
03: Angle 0° ... 30° min.
... 06, 12, 18, 24, 36
... 36: Angle 0° ... 360° max.
Other angles on request

Number of channels
6: One-channel version (1 x supply voltage \( U_b \) / 1 x output)

Mechanical version
2801: 6 mm shaft with marking, IP54*
2802: 6 mm shaft with marking, IP65*
2805: 6 mm shaft with marking, IP67*
2802: 6 mm shaft with flattening, IP54
2832: 6 mm shaft with flattening, IP65
2862: 6 mm shaft with flattening, IP67
2821: push-on coupling, IP54
2841: push-on coupling, IP65
2871: push-on coupling, IP67
Other shaft configurations on request
* Not recommended for new designs
When the marking of the shaft is pointing towards the electrical outlet, the sensor output is near the electrical center position.
## Technical Data

<table>
<thead>
<tr>
<th>Type</th>
<th>RSC-28_ _- _- _ <em>-12</em> _- _- _</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output signal</td>
<td>4 ... 20 mA</td>
</tr>
<tr>
<td>Burden</td>
<td>≤ 500 Ω</td>
</tr>
<tr>
<td>Number of channels</td>
<td>1</td>
</tr>
<tr>
<td>Update rate</td>
<td>typ. 5 kHz</td>
</tr>
<tr>
<td>Measuring range</td>
<td>0 ... 30° up to 0 ... 360° in 10° steps</td>
</tr>
<tr>
<td>Independent linearity</td>
<td>≤ ±0.5 %FS</td>
</tr>
<tr>
<td>Resolution</td>
<td>12 bits</td>
</tr>
<tr>
<td>Repeatability</td>
<td>≤ ±0.1°</td>
</tr>
<tr>
<td>Hysteresis</td>
<td>≤ ±0.1°</td>
</tr>
<tr>
<td>Temperature error</td>
<td>Measuring range 30 ... 170°: ≤ ±0.14 %FS, Measuring range &gt; 180°: ≤ ±0.5 %FS</td>
</tr>
<tr>
<td>Supply voltage Ub</td>
<td>24 VDC (18 ... 30 VDC)</td>
</tr>
<tr>
<td>Current consumption w/o load</td>
<td>typ. 15 mA (typ. 8 mA on request)</td>
</tr>
<tr>
<td>Polarity protection</td>
<td>yes (supply lines)</td>
</tr>
<tr>
<td>Short circuit protection</td>
<td>yes (output vs. GND and supply voltage)</td>
</tr>
<tr>
<td>Insulation resistance (500 VDC)</td>
<td>≥ 10 MΩ</td>
</tr>
</tbody>
</table>

### Environmental Data

- **Max. operational speed**: 800 rpm
- **Vibration** IEC 60068-2-6: 2 g, 5 ... 2000 Hz, $A_{max} = 0.75$ mm
- **Shock** IEC 60068-2-27: 50 g, 6 ms
- **Protection class DIN EN 60529**: IP54 / IP65 / IP67
- **Operating temperature**: -40 ... +180°C
- **-25 ... +85°C (connector M12)**
- **Life**: > 50 Mio. movements (mechanically)
- **Functional safety**: If you need assistance in using our products in safety-related systems, please contact us
- **MTTF (IEC 60050)**: 105 years

### EMC Compatibility

- **EN 61000-4-2 ESD (contact/air discharge)**: 4 kV, 8 kV
- **EN 61000-4-3 Electromagnetic fields (RFI)**: 10 V/m
- **EN 61000-4-4 Field transients (bursts)**: 1 kV
- **EN 61000-4-6 Cond. disturbances (HF fields)**: 10 V eff.
- **EN 61000-4-8 Magnetic fields**: 3 A/m
- **EN 55011 Noise radiation**: Class B

### Connection Assignment

<table>
<thead>
<tr>
<th>Signal</th>
<th>Cable code</th>
<th>Connector code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply voltage Ub</td>
<td>GN</td>
<td>Pin 1</td>
</tr>
<tr>
<td>GND</td>
<td>BN</td>
<td>Pin 3</td>
</tr>
<tr>
<td>Signal output</td>
<td>WH</td>
<td>Pin 2</td>
</tr>
<tr>
<td>Do not connect / not assigned</td>
<td>YE</td>
<td>Pin 4</td>
</tr>
</tbody>
</table>

Connect cable shielding to GND
Technical Data
Output
Characteristics

Output characteristic

Output characteristic

On request: trapezoid output characteristic

On request: different gradients

Output characteristic

On request: parabolic output characteristic
Sensor Mounting

Z-106-G-6
Backlash-free, double cardanic shaft coupling for Ø6 mm to Ø6 mm, Ø6.35 mm or Ø10 mm, mounting via 2 threaded pins with internal hexagon.
Material: Aluminium, PEEK
Operating temp.: -40 ... +180°C
Transferable torque: ≤ 1 Nm
Displacement: rad. ≤ 0.1 mm, angl. ≤ 0.45°

<table>
<thead>
<tr>
<th>P/N</th>
<th>Type</th>
<th>ØA / ØB [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>400103910</td>
<td>Z-106-G-6</td>
<td>6 / 6</td>
</tr>
<tr>
<td>400103912</td>
<td>Z-106-G-6,35</td>
<td>6 / 6.35</td>
</tr>
<tr>
<td>400103913</td>
<td>Z-106-G-10</td>
<td>6 / 10</td>
</tr>
</tbody>
</table>

Z-104-G-6
Fork coupling with low backlash for Ø6 mm. Mounting with 2 cylinder head screws M3 with internal hexagon.
Angle screwdriver DIN 911 AF 1.5 included in delivery.
Material: SS, ground driving pin
Displacement: ≤ 1 mm

<table>
<thead>
<tr>
<th>P/N</th>
<th>Type</th>
<th>ØA / ØB [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>400005690</td>
<td>Z-104-G-6</td>
<td>6 / 6</td>
</tr>
</tbody>
</table>

Z-105-G-6
Backlash-free fork coupling for Ø6 mm. Mounting with 1 cylinder head screw M3 with internal hexagon.
Angle screwdriver DIN 911 AF 2.5 included in delivery.
Material: Aluminium, anodized (black)
Driving pin and spring hardened
Transferable torque: ≤ 5 Ncm
Displacement: ≤ 1 mm

<table>
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<tr>
<th>P/N</th>
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</tr>
</thead>
<tbody>
<tr>
<td>400005691</td>
<td>Z-105-G-6</td>
</tr>
</tbody>
</table>
Connector System
M12

EEM-33-32/62/97
M12x1 Mating female connector, 4-pin, straight, A-coded, with molded cable, shielded, IP67, open-ended

Plug housing: PA
Cable sheath: PUR, Ø = max. 6 mm,
-25 ... +80°C (moved)
-50 ... +80°C (fixed)
Lead wires: PP, 0.34 mm²

P/N | Type   | Length | Description
--- | --- | --- | ---
400005600 | EEM-33-32 | 2 m | IP67, UL
400005609 | EEM-33-62 | 5 m | CAN, UL
400005650 | EEM-33-97 | 10 m | Suitable for applications in engines, UL-approved

IP67
Protection class IP67 DIN EN 60529
Very good Electromagnetic Compatibility (EMC) and shield systems

IP68
Protection class IP68 DIN EN 60529
Very good resistance to oils, coolants and lubricants

UL
UL - approved
MAP-4000
Multifunctional measuring device with digital display for direct connection of potentiometric and normalized signals.
• Supply voltage 10...30 VDC, 80...250 VDC or AC
• High accuracy up to 0.1%
• Adjustable supply voltage for sensors 5...24 V
• Temperature coefficient 100 ppm/K
• Optional RS 232, RS 485, analog output, limited switch
• Complete data see separate data sheet
Connecting Options on request

M12 connector
- Customized lengths
- 3-, 4-, 6- and 6-pole versions
- Protection class IP68
- Ordering codes of standard versions see ordering specifications

Molex Mini Fit Jr.
- Customized length and lead wires
- 3-, 4- and 6-pole versions
- On request

Tyco AMP Super Seal
- Pin- and bushing housing
- Customized lengths
- 3-, 4- and 6-pole versions
- Protection class IP67
- On request

Molex Mini Fit Jr.
- Customized length and lead wires
- 3-, 4- and 6-pole versions
- On request

Deutsch DTM 04
- Pin- and bushing housing
- Customized lengths
- 3-, 4- and 6-pole versions
- Protection class IP67
- On request

ITT Cannon Sure Seal connector
- Customized lengths
- 3-, 4- and 6-pole versions
- Protection class IP67
- On request
The specifications contained in our datasheets are intended solely for informational purposes. The documented specification values are based on ideal operational and environmental conditions and can vary significantly depending on the actual customer application. Using our products at or close to one or more of the specified performance ranges can lead to limitations regarding other performance parameters. It is therefore necessary that the end user verifies relevant performance parameters in the intended application. We reserve the right to change product specifications without notice.