NOVOHALL
Rotary Sensor
Non-contacting
RSC-2800
Ratiometric
Mobile Applications

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 %
- Optimized for use in mobile applications with highest EMC requirements such as ISO pulses and high interferences to ISO 11452
- European E1 approved
- Other configurations see separate data sheets

Applications
- Mobile working machines (industrial trucks, construction machinery, agricultural and forestry machinery)

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.

Description

<table>
<thead>
<tr>
<th>Material</th>
<th>Housing: high grade, temperature resistant plastic PPS-GF40/SF50</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Shaft: SS 316N/ AISI 303</td>
</tr>
<tr>
<td>Mounting</td>
<td>With 2 screws M4 and washers</td>
</tr>
<tr>
<td>Max. fastening torque of mounting screws</td>
<td>max. 180 Ncm</td>
</tr>
<tr>
<td>Bearing</td>
<td>Sintered bronze bushing</td>
</tr>
<tr>
<td>Electrical connection</td>
<td>Cable 4x 0.5 mm² (AWG 20), TPE, unshielded</td>
</tr>
</tbody>
</table>

Mechanical Data

| Dimensions      | See dimension drawing                                       |
| Mechanical travel | 360° continuous                                             |
| Permitted shaft load static or dynamic | 20 N (axial / radial)                                      |
| Torque          | 0.15 Ncm (IP54), 0.5 Ncm (IP65), 1.0 Ncm (IP67)             |
| Weight          | approx. 50 g                                               |
### Ordering Specifications

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

#### Ordering Information

<table>
<thead>
<tr>
<th>R</th>
<th>S</th>
<th>C</th>
<th>2</th>
<th>8</th>
<th>3</th>
<th>2</th>
<th>6</th>
<th>3</th>
<th>6</th>
<th>2</th>
<th>1</th>
<th>1</th>
<th>2</th>
<th>5</th>
<th>2</th>
</tr>
</thead>
</table>

#### Supply Voltage $U_b$

- $U_b = 5$ VDC

#### Interface Parameters

1: 5%...95% of rated supply voltage $U_{b}$ (0.25...4.75 VDC)
2: 10%...90% of rated supply voltage $U_{b}$ (0.5...4.5 VDC)

#### Output Characteristic

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

#### Electrical Connection

- 252: Cable, 4-pole, unshielded, $L = 1$ m
- 256: Cable, 4-pole, unshielded, $L = 3$ m

Cable versions and assembled connectors on request

#### Measuring Range

- 05: Angle 0°...30° min.
- 06: Angle 0°...30° min.
- 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*
- 2831: 6 mm shaft with marking, IP66*
- 2881: 6 mm shaft with marking, IP65*
- 2802: 6 mm shaft with flattening, IP54
- 2832: 6 mm shaft with flattening, IP66
- 2862: 6 mm shaft with flattening, IP67
- 2821: push-on coupling, IP64
- 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

**Type**
- **RSC-28**

**Output signal**
- Ratiometric to supply voltage $U_b$
  - 5 ... 95% (0.25 ... 4.75 V)
  - 10 ... 90% (0.5 ... 4.5 V)

**Load**
- $\geq 1 \, \text{kΩ}$

**Number of channels**
- 1

**Update rate**
- typ. 5 kHz

**Measuring range**
- 0 ... 30° up to 0 ... 360° in 10°-steps

**Independent linearity**
- $\leq 0.5 \, \%$FS

**Resolution**
- 12 bits

**Repeatability**
- $\leq 0.1°$

**Hysteresis**
- $\leq 0.1°$

**Temperature error**
- Measuring range 30 ... 170°: typ. $\pm 0.625 \, \%$FS, Measuring range > 180°: typ. $\pm 0.31 \, \%$FS

**Supply voltage $U_b$**
- 5 VDC (4.5 ... 5.5 VDC)

**Current consumption w/o load**
- typ. 15 mA (typ. 8 mA on request)

**Polarity protection**
- yes (supply lines)

**Short circuit protection**
- yes (vs. GND and supply voltage)

**Insulation resistance (500 VDC)**
- $\geq 10 \, \text{MΩ}$

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### Environmental Data

**Max. operational speed**
- 800 rpm

**Vibration IEC 60068-2-6**
- 20 g, 5 ... 2000 Hz, $A_{\text{max}} = 0.75 \, \text{mm}$

**Shock IEC 60068-2-27**
- 30 g, 6 ms

**Protection class DIN EN 60529**
- IP54 / IP65 / IP67

**Operating temperature**
- -40 ... +85°C

**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)**
- 356 years

### EMC Compatibility

**ISO 11452-2 Radiated HF-fields**
- 30 V/m

**ISO 11452-5 Radiated HF-Fields, stripline**
- 60 V/m

**DBPR 25 Radiated emission**
- Level acc. ECE-R10

**Emission/Immunity E1**
- acc. to ECE-R10

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### Connection Assignment

<table>
<thead>
<tr>
<th>Signal</th>
<th>Cable code</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply voltage $U_b$</td>
<td>GN</td>
<td></td>
</tr>
<tr>
<td>GND</td>
<td>BN</td>
<td></td>
</tr>
<tr>
<td>Signal output</td>
<td>WH</td>
<td></td>
</tr>
<tr>
<td>Do not connect / not assigned</td>
<td>YE</td>
<td></td>
</tr>
</tbody>
</table>
Technical Data
Output Characteristics

Output characteristic

Output characteristic

On request: trapezoid output characteristic

Output characteristic

On request: different gradients

Output characteristic

On request: parabolic output characteristic
Sensor Mounting

Z-106-G-
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 ... +160°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.

- Material: SS, ground driving pin
- Displacement: ≤ 1 mm

<table>
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<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.

- Material: Aluminium, anodized (black) Driving pin and spring hardened
- Transferable torque: ≤ 5 Ncm
- Displacement: ≤ 1 mm

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<td>400005691</td>
<td>Z-105-G-6</td>
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</table>
Connector System
M12

M12x1 Mating female connector, 4-pin, straight, A-coded, with molded cable, not shielded, IP67, open ended

- Plug housing: PA
- Cable sheath: PUR, Ø = max. 6 mm, -40... +85°C (fixed)
- Lead wires: PP, 0.34 mm²

<table>
<thead>
<tr>
<th>P/N</th>
<th>Type</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>400056135</td>
<td>EEM-33-35</td>
<td>2 m</td>
</tr>
<tr>
<td>400056136</td>
<td>EEM-33-36</td>
<td>5 m</td>
</tr>
<tr>
<td>400056137</td>
<td>EEM-33-37</td>
<td>10 m</td>
</tr>
</tbody>
</table>

- Very good Electromagnetic Compatibility (EMC) and shield systems
- Very good resistance to oils, coolants and lubricants
- Suitable for applications in drag chains
- UL - approved
- CAN-Bus
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

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

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