novotechnik
Siedle Group

# NOVOTURN Multiturn Sensor non-contacting

## Series RSM2800 analog

**Special features**

- True Power On System: counts turns even when not powered. Patented non-volatile technology does not require gears or batteries
- non-contacting, magnetic
- long life
- 2 to 16 turn range (720 to 5760°)
- continuous analog output signal across the selected angle range
- resolution 16 bit
- independent linearity up to ±0.03 %
- protection class IP54, IP65 or IP67
- 1 or 2 outputs
- available with push-on coupling or marked shaft
- easy mounting
- see separate data sheet for digital interfaces

The RSM 2800 combines multiple-turn angle measurement, compact size, and attractive price.

The patented NOVOTURN technology measures angles across multiple turns, providing high resolution and accuracy. This technology detects the turn count even while not powered. When powered up, the RSM2800 immediately reports the actual angular position, even if the input shaft was rotated while power was off.

The sensor utilizes contactless magnetic technology, providing a very long operational life time. It has excellent capabilities against mechanical shock and vibration.

The customer-selected measurement range is factory-programmed from a range of 2 turns to 16 turns.

The outputs (1 or 2) are linear across the measurement range.

The housing is made of a special high grade temperature resistant plastic material. The sensor is mounted with slots in the housing, which also provides for mechical adjustement.

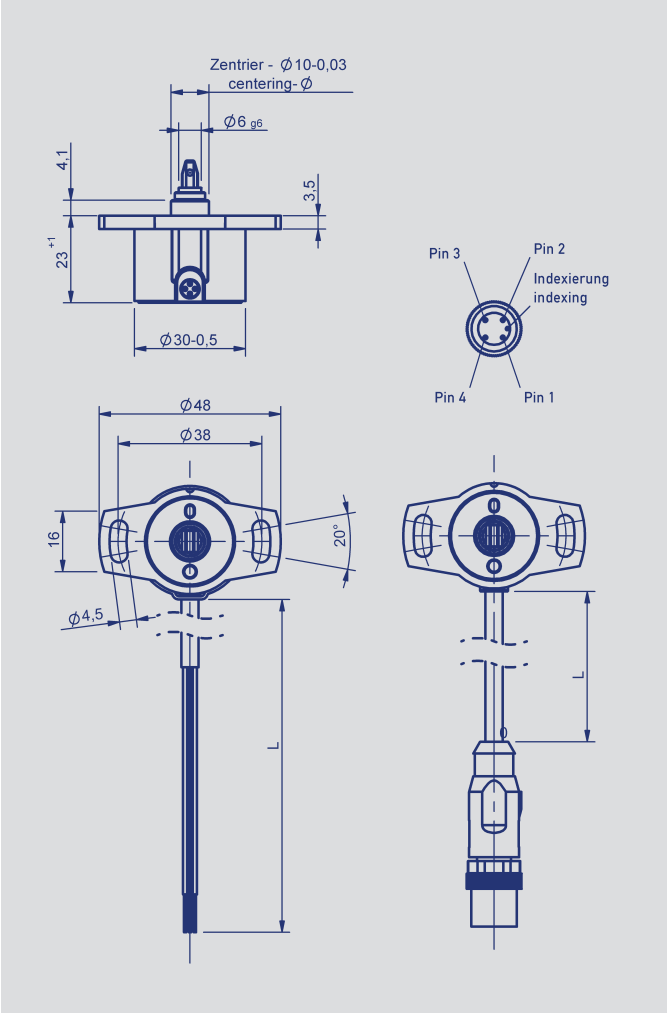
Three shaft types are offered, including D-shaped and Novotechnik‘s easy-to-mount „push-on“ coupling.

The sensor is insensitive to dirt and moisture (IP-rating dependent). A shielded cable of 0.5 m to 10 meters length is available.

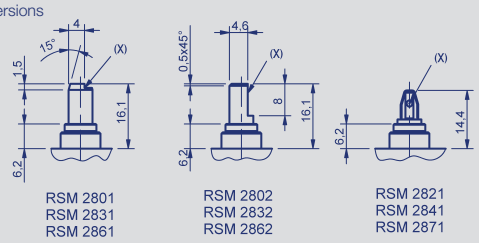
The RSM2800 provides a cost-effective alternative to conventional multi-turn encoders.

Applications for the RSM2800 exist in printing machines, drive and steering systems, wire length sensors, gate and door drives, fork-lifts, robotics, and many other areas.

| Description | |
|---|---|
| Housing | high grade, temperature resistant plastic |
| Shaft | stainless steel |
| Bearings | bronze sleeve bearing |
| Electrical connections | shielded cable, 4 x AWG 26<br>M12 connector with short cable |




Shaft versions



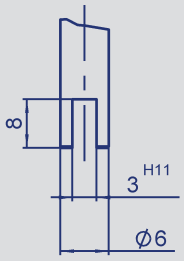

RSM 2801
RSM 2831
RSM 2861

RSM 2802
RSM 2832
RSM 2862

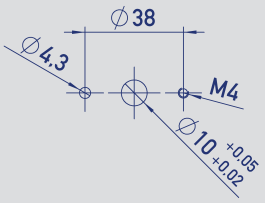
RSM 2821
RSM 2841
RSM 2871

(X) =Wellenmarkierung / shaft marking

Recommended dimensions of driving shaft
for RSM2821 and RSM2841.
Parallel offset < 0.05 mm.




Recommended hole pattern
2 x Ø 4,3 oder 2 x M4

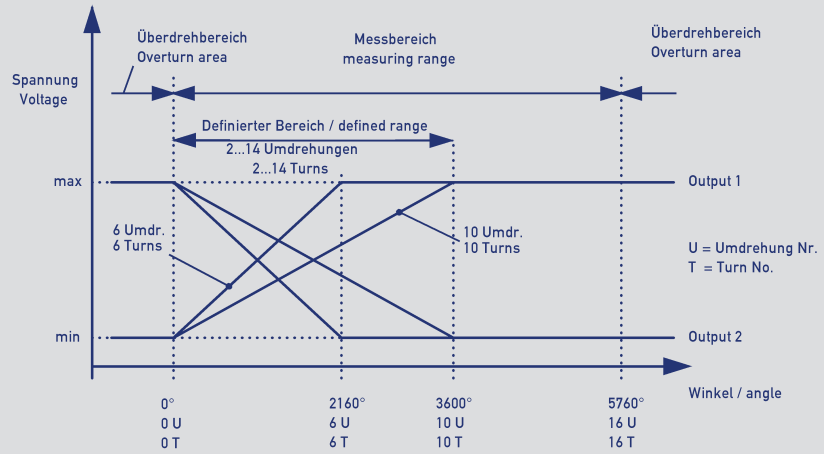



| Connection assignment | | |
|---|---|---|
| **Signal** | **M12 connector** | **Cable** |
| Ground | 3 | brown |
| Supply voltage | 1 | green |
| Signal output 1 | 2 | white |
| Signal output 2 / not assigned | 4 | yellow |

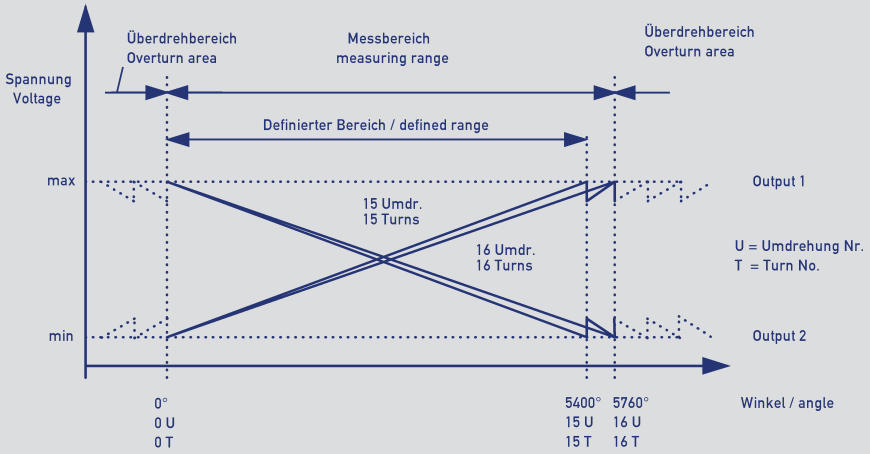
Cable shielding connect to ground.

When the shaft marking points toward the cable outlet, the sensor is in a full turn position.

Output signals measurement range 2...14 turns




Output signals measurement range 15 ... 16 turns



| Technical Data | RSM - 28 _ _ - _ _ _ - 2 _ _ - _ _ _<br>ratiometric | RSM - 28 _ _ - _ _ _ - 11_ - _ _ _<br>Analog voltage | RSM - 28 _ _ - _ _ _ - 12 _ - _ _ _<br>Analog current | |
|---|---|---|---|---|
| **Mechanical Data** | | | | |
| Dimensions | see dimension drawing | | | |
| Mounting | 2 fillister head screws M4 and washer | | | |
| Starting torque of mounting screws with washer at housing flange | 180 | | | Ncm |
| Mechanical travel | 360 continuous | | | ° |
| Permitted shaft load (axial and radial) static or dynamic force | 20 | | | N |
| Torque | 0.15 (IP54), 0.5 (IP65), 1.0 (IP67) | | | Ncm |
| Permitted operational speed | 800 | | | RPM |
| Weight | ~ 50 | | | g |
| **Electrical Data** | | | | |
| Supply voltage Ub | 5 ±0,5 | 24 ±6 | 24 ±6 | VDC |
| Number of channels | 1 / 2 | 1 / 2 | 1 | |
| Output signal | ratiometric<br>load ≥ 10 kΩ | 0,1...10 V<br>load ≥ 10 kΩ | 4...20 mA, load ≤ 500 Ω | |
| Load supply current | 30 typical | | | mA |
| Reverse voltage | yes | | | |
| Short circuit protection | yes (signal to Ub and ground) | | | |
| Measuring range | 0 ... 720°, 0...5760 (360° steps) | | | ° |
| Resolution | 16 | | | bit |
| Repeatability | ±0.1 | | | % |
| Hysteresis | < 0.1 | | | % |
| Independent linearity | 0.25...0.031 (s. table below) | | | % |
| Start-up time | typ. 10 | | | ms |
| Response time | max. 2 | | | ms |
| Temperature error of output signal | ±0.15 | ±0.31 | ±0.625 | % FS |
| Insulation resistance (500 VDC) | ≥ 10 | | | MOhms |
| Wire diameter | ~ 0.14 mm² (AWG 26) | | | mm² |
| **Environmental Data** | | | | |
| Temperature range | -40...+85 | | | °C |
| Insensibility against magnetic DC fields | < 15 | | | mT |
| Vibration (IEC 68000-2-6) | 5...2000 Hz<br>Amax = 0.75 mm<br>amax = 20 g | | | |
| Shock (IEC 68000-2-27) | 50 (6 ms) | | | g |
| Life | > 50 x 106 (mechanical) | | | movements |
| MTTF (DIN EN 13849-1<br>parts count method, w/o load) | 175 single<br>175 (per output, with 2 outputs) | 184 single<br>184 (per output, with 2 outputs) | 186 | years<br>years |
| Functional Safety | When using our produkcts in safety-related systems, please contact us | | | |
| Protection class (to DIN EN 60529) | IP54 / IP65 / IP67 | | | |
| EMC compatibility | EN 61000-4-2 electrostatic discharges (ESD) 4kV, 8kV<br>EN 61000-4-3 electromagnetic fields 10V/m<br>EN 61000-4-4 electrical fast transient / burst 1kV<br>EN 61000-4-6 conducted disturbances, induced by RF fields 10V/m eff.<br>EN 61000-4-8 power frequency magnetic fields 3A/m<br>EN 55011/EN 55022/A1 radiated disturbances class B | | | |

**Linearities**

| Measuring range | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | turns |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Linerarity typ. | 0.250 | 0.167 | 0.125 | 0.100 | 0.083 | 0.071 | 0.063 | 0.056 | 0.050 | 0.045 | 0.042 | 0.039 | 0.036 | 0.033 | 0.031 | % |
| Linearity max. | 0.350 | 0.267 | 0.225 | 0.200 | 0.183 | 0.171 | 0.163 | 0.156 | 0.150 | 0.145 | 0.142 | 0.138 | 0.136 | 0.133 | 0.131 | % |

novotechnik
Siedle Group

Novotechnik U.S., Inc.
155 Northboro Road
Southborough, MA 01772

Phone 508 485 2244
Fax 508 485 2430
info@novotechnik.com
www.novotechnik.com



## Ordering specifications

**Preferred types printed in bold:**
- reduced delivery time for up to 25 pieces
- best low-volume pricing

**Supply Voltage Ub**
**1: Ub = 24 V (18.0 ... 30 V)**
**2: Ub = 5 V (4.5 ... 5.5 V)**

**Output signal Ub = 24 V (1 _ _)**
**1: 0 ... 10 V**
**2: 4...20 mA**

**Output signal Ub = 5 V (2 _ _)**
**1: 0.25 ... 4.75 V ratiometric to Ub**
2: 0.5 ... 4.5 V ratiometric to Ub

**Output configuration**
**1: rising curve CW**
2: rising curve CCW
**3: 2 crossed outputs, Ch1 rising CW, Ch2 rising CCW (only Ub = 5 V (2 _ _) and output 0...10 V (11_)**
other characteristics on request

**Electrical connection**
201: Round cable 4-pol., shielded, L = 0.5 m
**202: Round cable 4-pol., shielded, L = 1 m**
**206: Round cable 4-pol., shielded, L = 3 m**
210: Round cable 4-pol., shielded, L = 5 m
220: Round cable 4-pol., shielded, L = 10 m
**501: M12 x 1 connector shielded, straight; L = 150 mm**
other cable lengths and assembled connectors on request

R S M – 2 8 3 2 – 0 1 0 – 1 1 1 – 2 0 2

**Series**

**Mechanical version**
2801: 6 mm shaft with marking, IP54*
2831: 6 mm shaft with marking, IP65*
2861: 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 versions on request

**Number of turns output characteristics**
from 002 = 2 turns to 016 = 16 turns, in increments of 1 turn
**003, 006, 010, 016**
other angles on request

X turns correspond to an electrical angle of X • 360°
* not recommended for new designs

## Recommended accessories

MAP 300/400/4000 process-control indicators with display.