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.

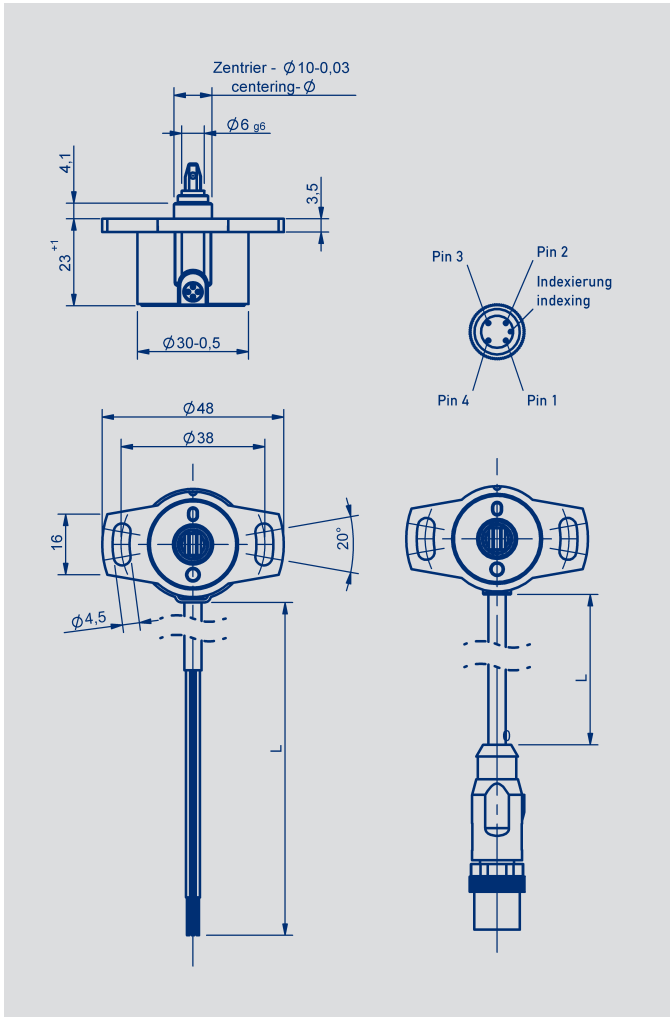
Three shaft types are offered, including D-shaped and Novotechnik‘s easy-to-mount „push-on“ coupling.

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

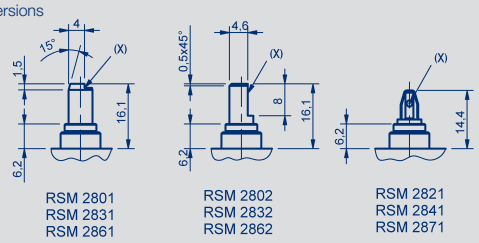
The RSM2800 provides a cost-effective alternative to conventional multi-turn encoders.

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 M12 connector with short cable



Shaft versions



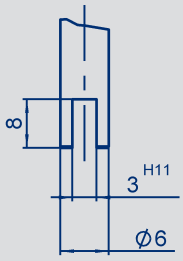
RSM 2801
RSM 2831
RSM 2861

RSM 2802
RSM 2832
RSM 2862

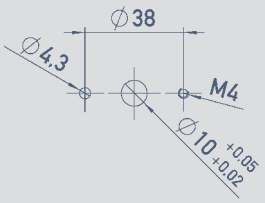
RSM 2821
RSM 2841
RSM 2871

(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

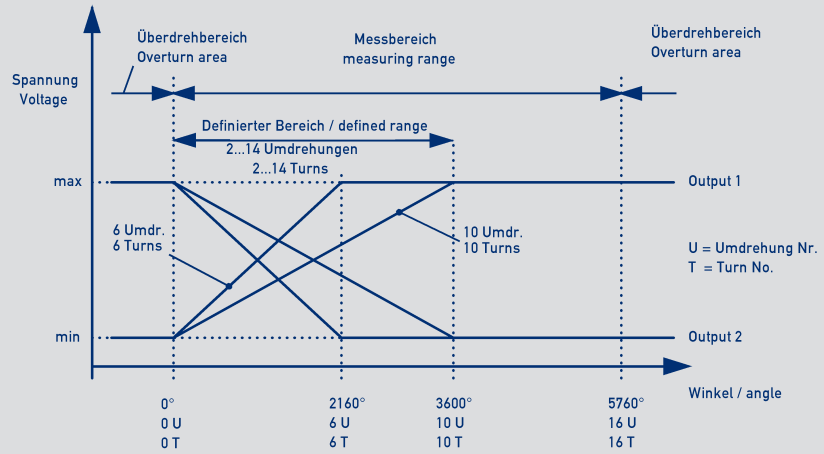


Connection assignment		
Signal	**M12 connector**	**Cable**
Ground	3	brown
Supply voltage	1	green
Signal output 1	2	white
Signal output 2 / not assigned	4	yellow

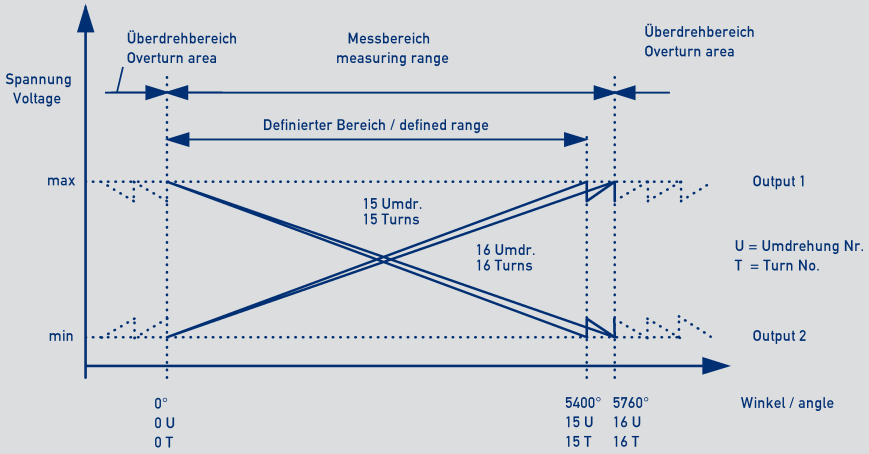
Cable shielding connect to ground.

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 _ _ - _ _ _ ratiometric	RSM - 28 _ _ - _ _ _ - 11_ - _ _ _ Analog voltage	RSM - 28 _ _ - _ _ _ - 12 _ - _ _ _ 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 load ≥ 10 kΩ	0,1 ... 10 V 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
Cross-section cable	AWG 26, 0.14 (AWG 20, 0.5)*			mm^2
Environmental Data				
Temperature range	-40 ... +85 (-25 ... +85 with connector M12)			°C
Insensibility against magnetic DC fields	< 15			mT
Vibration (IEC 68000-2-6)	5 ... 2000 Hz Amax = 0.75 mm amax = 20 g			
Shock (IEC 68000-2-27)	50 (6 ms)			g
Life	> 50 x 106 (mechanical)			movements
MTTF (DIN EN 13849-1 parts count method, w/o load)	175 single 175 (per output, with 2 outputs)	184 single 184 (per output, with 2 outputs)	186	years years
Functional Safety	If you need assistance in using our products 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) 4 kV, 8 kV EN 61000-4-3 electromagnetic fields 10V/m EN 61000-4-4 electrical fast transient / burst 1 kV EN 61000-4-6 conducted disturbances, induced by RF fields 10 V eff. EN 61000-4-8 power frequency magnetic fields 3A/m 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	%

*) The cross-sections of the lead wires will be increased to 0.5 mm^2.
The changeover is carried out depending on model type and starts from Q1-2016.
For questions, please call your local distributor or our hotline on +49 711 4489 250.

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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.