novotechnik
Siedle Gruppe

NOVOTURN
Multiturn Sensor
non-contacting
Series RSM2800
analog

Special features
- non-contacting, magnetic
- long life
- electr. angle 720° up to 5760° in 360°-steps available (equates 2 ... 16 turns)
- continuous analog output signal across the selected angle range
- True Power On System: detection also in unpowered state, position value is non-volatile
- available with push-on coupling or marked shaft
- easy mounting
- protection class IP54 up to IP67
- 1 or 2 outputs
- resolution 16 bit
- independent linarity up to ±0,03 %
- optional digital interfaces see separate data sheet

This sensor unites the ability to measure angles across multiple turns with the compactness and pricely atractivity of multiple turn wirewound potentiometers.

By combining a single turn angle detection and a separate turn detection this sensor is able to measure angles across multiple turns providing high resolution and accuracy. Due to the facts that the sensor can detect turns in unpowered state and that the sensor does store turns non volatile, it is a real true power on angle sensor in a very compact size.

The sensor works internally magnetic and hereby contactless and serves a very long life time. By using contactless technology the sensor has a high resistance against mechanical influences like shock, vibration etc.

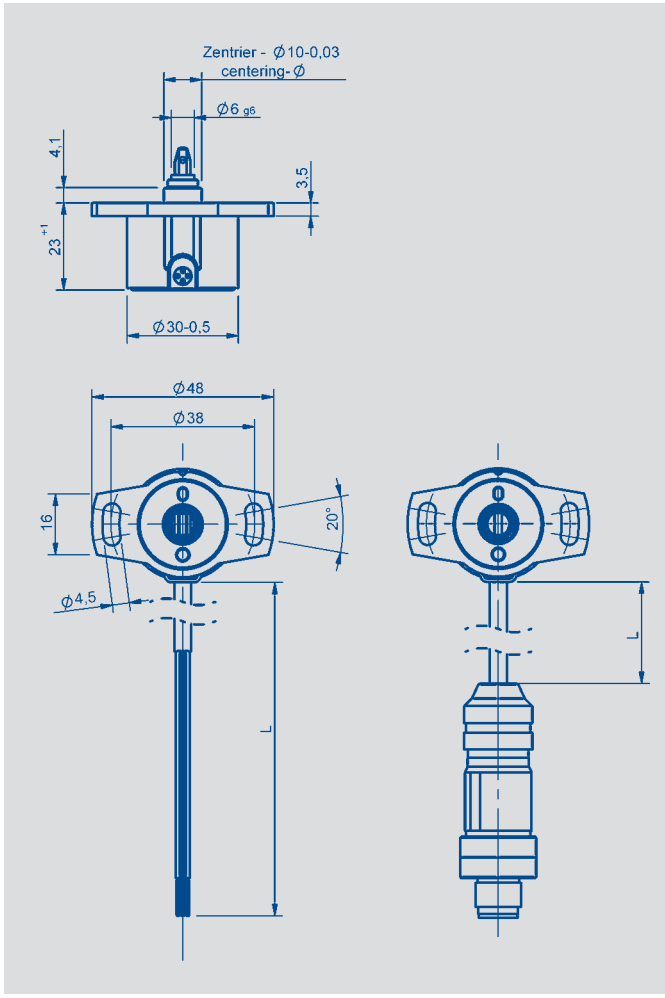
The measurement range can be selected between 2 and 16 turns to 5760°. The output signal (1 or 2 channels) has a linear behaivour across the selected measurement range. This is how the output span is taken best use of.

The housing is made of a special high grade temperature resistant plastic material. Fixings are in the form of elongated slots which allow simplicity in mounting together with ease of mechanical adjustment.

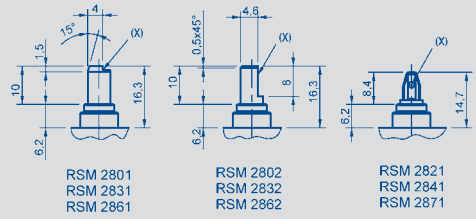
The special backlash-free push-on coupling ensures extremely quick and easy installation. The transducer is not sensitive to either dirt or dampnes. Electrical connection is made via a shielded cable which is potted into the housing.
With the RSM2800 for the first time a compact and contactless solution can be provided that makes in many places actual costly solutions like gear drives and so this sensor can help to reduce total cost of systems.

Applications can be found in many areas like printing machines, drive and steering systems, wire length sensors, gate and door drives, in mobile applications such as lifts, in paper industry, in robotics and in common as a replacement for wirewound potentiometers or encoders.

Description	
Housing	high grade, temperature resistant plastic
Shaft	stainless steel
Bearings	bronze sleeve bearing
Electrical connections	shielded cable, 4 x AWG26 M12 connector with short cable

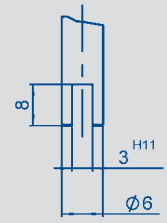


Shaft versions

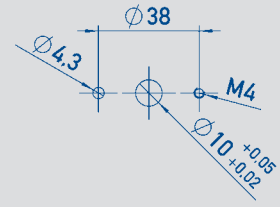


(X) =Wellenmarkierung / shaft marking

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



Recommended hole pattern
2 x ϕ 4,3 oder 2 x M



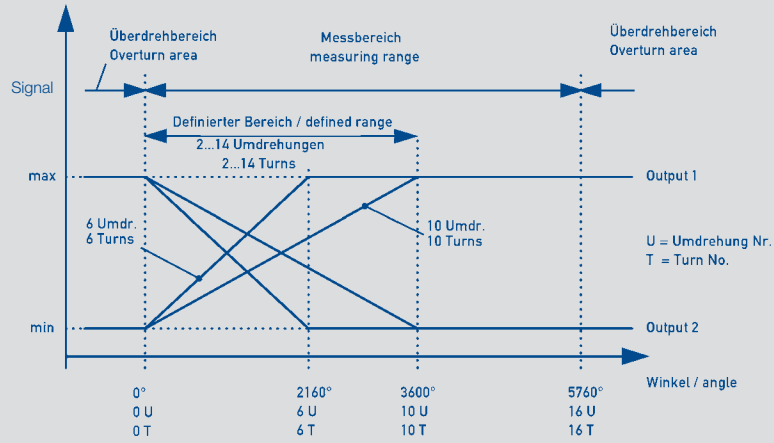
Connection assignment

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

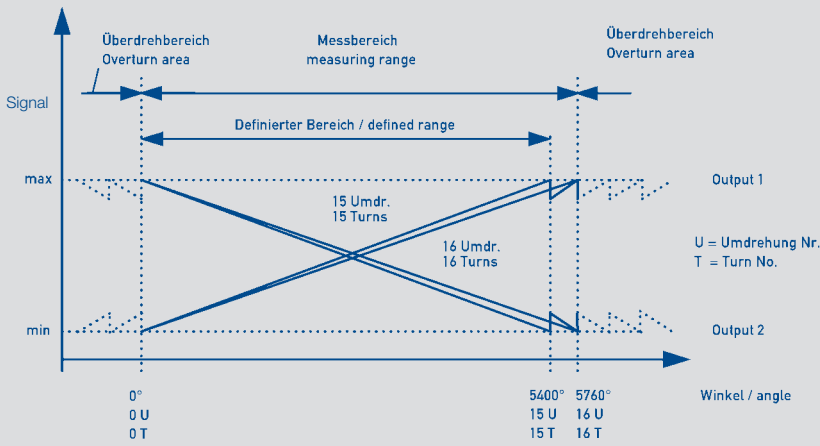
Cable shielding connect to ground.

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

Output signals measurment range 2 ... 14 cycles



Output signals measurment range 15 ... 16 cycles



Technical Data	RSM - 28 _ _ - _ _ _ - 2 _ _ - _ _ _ ratiometric	RSM - 28 _ _ - _ _ _ - 11_ - _ _ _ Analog voltage	RSM - 28 _ _ - _ _ _ - 12 _ - _ _ _ Analog current	
Mechanical Data				
Dimensions	see dimension drawing			
Mounting	2 M4 fillister-head screws and washer			
Torque of mounting screws on 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			min^{-1}
Weight	ca. 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, burden ≤ 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...0.05 (s. table below)			%
Start-up time	typ. 10			ms
Response time	max. 2			ms
TC of output signal	≤ 25	≤ 50	100	ppm/K
Insulation resistance (500 VDC)	≥ 10			MΩ
Wire diameter	ca. 0.14 mm^2 (AWG26)			mm^2
Environmental Data				
Temperature range	-40...+85			°C
Insensibility against magnetic DC fields	< 15			mT
Vibration (IEC 680002-6)	5...2000 A_{max} = 0.75 a_{max} = 20			Hz mm g
Shock (IEC 68000-2-27)	50 (6 ms)			g
Life	> 50 x 10^6 (mechanical)			movements
Protection class (nach DIN EN 60529)	IP54 / IP65 / IP67			
EMC compatibility	EN 61000-4-2 electrostatic discharges (ESD) 4kV, 8kV EN 61000-4-3 electromagnetic fields 10V/m EN 61000-4-4 electrical fast transient / burst 1kV EN 61000-4-6 conducted disturbances, induced by RF fields 10V/m 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
Linearity typ.	0,250	0,167	0,125	0,100	0,083	0,071	0,063	0,056	0,050	0,045	0,042	0,038	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	%

Ordering specifications

Preferred types printed in bold:
- delivery time up to 25 pcs. within 10 working days
- no low volume surcharge

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_))

Electrical connection
201: Round cable 4-pol., shielded, L = 0.5 m
202: Round cable 4-po., shielded, L = 1 m
206: Round cable 4-pol., shilded, 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

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

Series
RSM

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

Number of turns output characteristics
from 002 = 2 turns to 016 = 16 turns, increment 1 turn
003, 006, 010, 016

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

Recommended accessories

Process-controlled indicators MAP300/400/4000 with display.

Available on request

- alternative measuring ranges
- alternative output configurations
- various assembled plugs
- alternative shaft types