

**Novoturn  
Multiturn Sensor  
non-contacting**

Series RSM2800  
Analog output version



**Special features**

- Non-contacting, magnetic
- Long life
- Electrical angle 720° up to 5760° (2 to 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
- One or two outputs
- Independent linearity  $\pm 0.25\%$
- Optional digital interfaces see separate data sheet

By combining single turn angle detection and a separate turn detection function this sensor is able to measure angles across multiple turns providing high resolution and accuracy. The sensor can detect turns in an unpowered state and stores turns in non-volatile memory, it is a true power on angle sensor in a very compact size.

The sensor uses non-contacting technology ensuring a very long life. By using non-contacting technology the sensor also has a high tolerance to external effects like shock, vibration etc.

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.

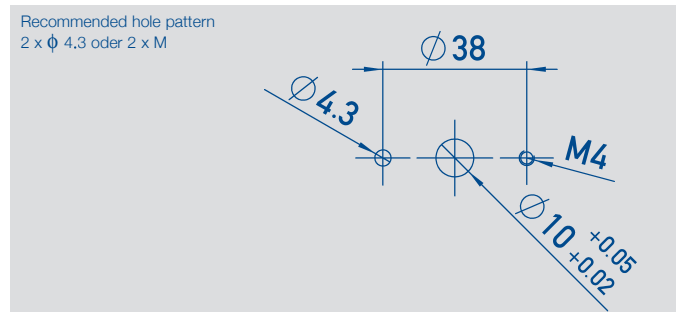
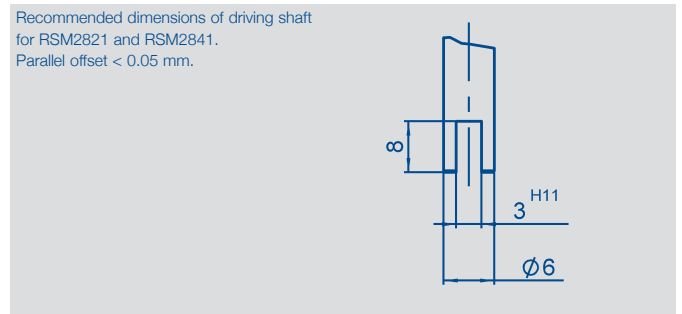
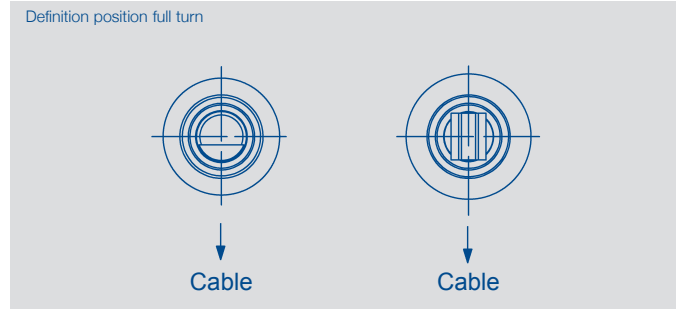
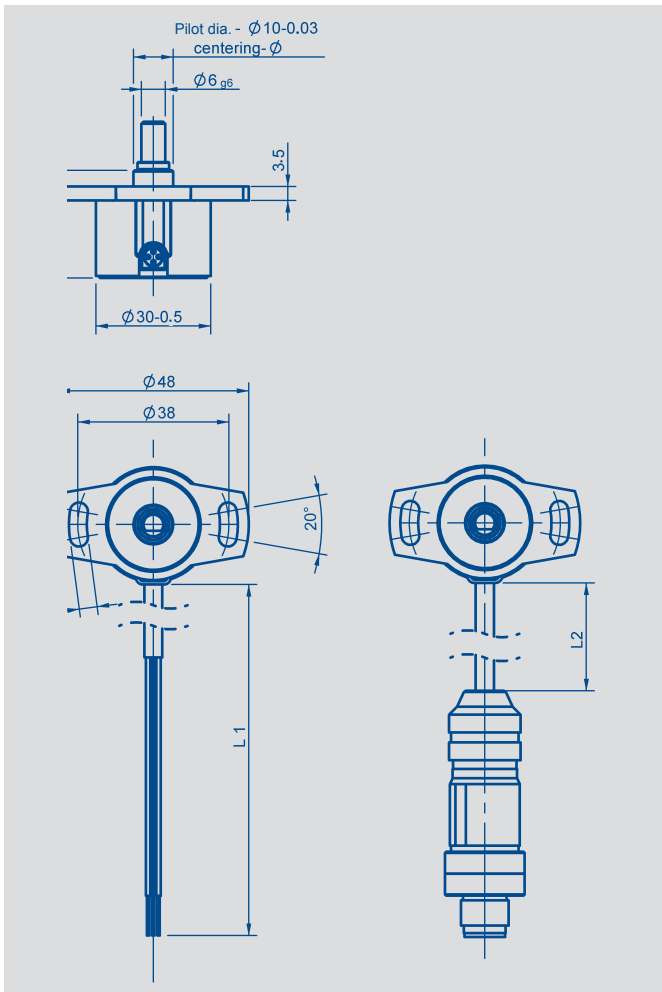
The special backlash-free push-on coupling ensures extremely quick and easy installation. The sensor is not sensitive to either dirt or dampness. Electrical connection is made via a shielded cable which is potted into the housing.

With the RSM2800, for the first time a compact and non-contacting solution is available that can replace costly gear drive sensors and help to reduce total system cost.

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 the paper industry, in robotics and as a replacement for wirewound potentiometers or encoders.

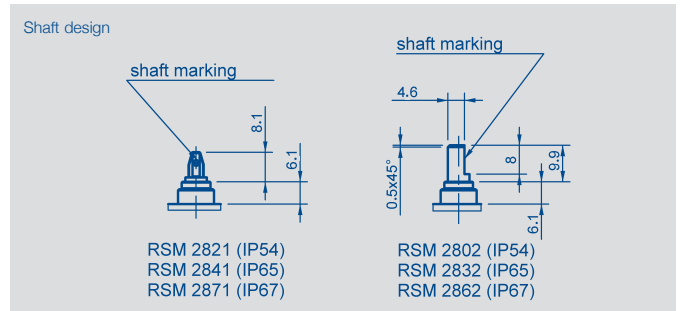
**Description**

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

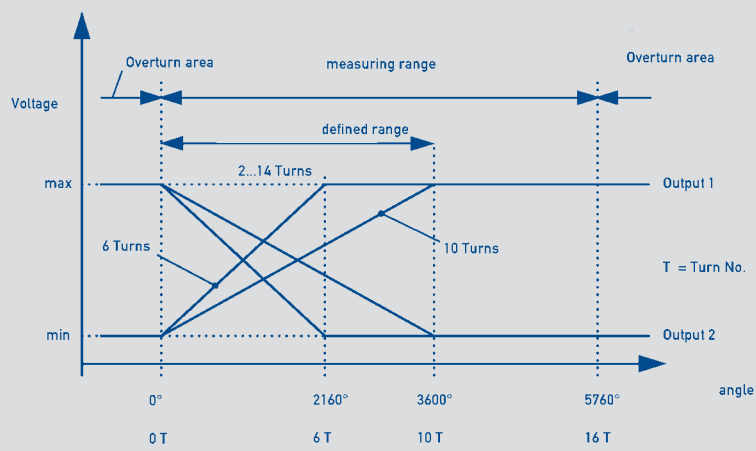


Connection assignment		
Signal	M12 connector	Cable
Ground	3	brown
Supply voltage	1	green
Signal output 1	2	white
Signal output 2 / not assigned	4	yellow

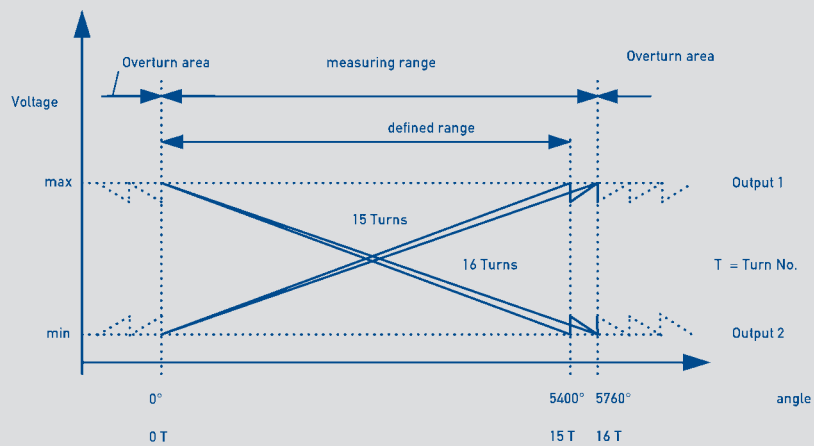
Cable shielding connect to ground.



Output signals measurement range 2 ... 14 cycles



Output signals measurement range 15 ... 16 cycles



1-channel output	RSM - 28 - - - - - 2 - - - - - ratiometric	RSM - 28 - - - - - 11 - - - - - Analog voltage	RSM - 28 - - - - - 12 - - - - - Analog current	
<b>Mechanical Data</b>				
Dimensions	see dimension drawing			
Mounting	2 M4 fillister-head screws and washer			
Starting torque of mounting clamps 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			min <sup>-1</sup>
Weight	ca. 50			g
<b>Electrical Data</b>				
Supply voltage	Ub 5 ±0.5	24 ±6	24 ±6	VDC
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			%
Independent linearity	0.25...0.05 (s. table)			%
Ripple	no ripple definable in case of ratiometric output	20	20	%
TC of output signal	≤ 50	≤ 50	100	ppm/K
Insulation resistance (500 VDC)	≥ 10			MΩ
Wire diameter	ca. 0.14 <sup>2</sup> (AWG26)			mm <sup>2</sup>
<b>Environmental Data</b>				
Temperature range	-40...+85			°C
Insensibility against magnetic DC fields	< 15			mT
Vibration (IEC 680002-6)	5...2000 A <sub>max</sub> = 0.75 a <sub>max</sub> = 20			Hz mm g
Shock (IEC 68000-2-6)	50 (6 ms)			g
Life	> 50 x 10 <sup>6</sup> (mechanical)			movements
Protection class (DIN 40050 / IEC 529)	IP54 / IP65 / IP67			
EMC specifications	EN 61000-4-2 EN 61000-4-3 EN 61000-4-4 EN 61000-4-6 EN 61000-4-8 EN 55011			

2-channel output	RSM - 28 _ _ _ - _ _ _ - 2 _ 3 - _ _ _ ratiometric	RSM - 28 _ _ _ - _ _ _ - 113 - _ _ _ Analog voltage														
<b>Mechanical Data</b>																
Dimensions	see dimension drawing															
Mounting	2 M4 fillister-head screws and washer															
Starting torque of mounting clamps 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)															
Permitted operational speed	800															
Weight	ca. 50															
<b>Electrical Data</b>																
Supply voltage Ub	5 ±0.5	24 ±6	VDC													
Output signal	ratiometric (Ub = 5 V) load ≥ 10 kΩ	0.1...10 V load ≥ 10 kΩ														
Load supply current	30 typical															
Reverse voltage	yes															
Short circuit protection	yes (signal to Ub and ground)															
Measuring range	0 ... 720°, 0...5760 (360° steps)															
Resolution	16															
Repeatability	±0,1															
Independent linearity	0.25...0.05 (s. table)															
Ripple	no ripple definable in case of ratiometric output	20	%													
TC of output signal	≤ 50															
Insulation resistance (500 VDC)	≥ 10															
Wire diameter	ca. 0.14 <sup>2</sup> (AWG26)															
<b>Environmental Data</b>																
Temperature range	-40...+85															
Insensibility against magnetic DC fields	< 15															
Vibration (IEC 680002-6)	5...2000 A <sub>max</sub> = 0.75 a <sub>max</sub> = 20															
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<b>Linearity</b>																
Measuring range	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	movements
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**

	<p><b>Supply Voltage Ub</b>          1: Ub = 24 VDC (18 VDC ... 30 VDC)          2: Ub = 5 VDC (4.5 VDC ... 5.5 VDC)</p>	
	<p><b>Output signal Ub = 24 VDC (1 _ _)</b>          1: 0 ... 10 V          2: 4...20 mA</p>	
	<p><b>Output signal Ub = 5 VDC (2 _ _)</b>          1: 0.25 ... 4.75 V ratiometric to Ub          2: 0.5 ... 4.5 V ratiometric to Ub</p>	
	<p><b>Output configuration</b>          1: rising curve CW          2: rising curve CCW          3: 2 crossed outputs, Ch1 rising CW, Ch2 rising CCW          only Ub = 5 V (2 _ _) and Ub = 24 V and output 0...10 V (11_)</p>	
	<p><b>Electrical connection</b>          201: Round cable 4-pol., shielded, L = 0.5 m          202: Round cable 4-po., 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 = 0.15 m</p>	
<p><b>R S M - 2 8 0 1 - 0 1 0 - 1 1 1 - 2 0 1</b></p>		
<p><b>Series</b> RSM</p>	<p><b>Mechanical version</b>          2802: 6 mm shaft with flattening; IP54          2821: push-on coupling; IP54          2832: 6 mm shaft with flattening; IP65          2841: push-on coupling; IP 65          2862: 6 mm shaft with flattening, IP67          2871: push-on coupling, IP67</p>	<p><b>Number of turns output characteristics</b>          from 002 = 2 turns to 016 = 16 turns, increment 1 turn</p> <p style="text-align: right; font-size: small;">X turns correspond to an electrical angle of <math>X \cdot 360^\circ</math></p>

**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