

**NOVOHALL  
Rotary Sensor  
non-contacting**

Series RSX-7900



**Special features**

- very robust design to extreme environmental conditions
- high shaft load 300 N
- non-contacting, magnetic
- measuring angles up to 360° in single and multi-channel versions
- enhanced corrosion protection by anodized aluminum housing and stainless steel shaft, salt spray resistant
- very good linearity
- resolution 12 bit
- unlimited mechanically rotatable
- absolutely impermeable to splash-water P6k9k
- high temperature resistance
- long life >100 million movements, even at vibration-loaded mounting positions
- designed for use in safety-related applications according to PLd, ISO 13849
- E1-approval

**Applications**

- Position measurement in steering systems
- pivotable vehicle bracings
- Transport systems with several axes
- Construction and agricultural machinery

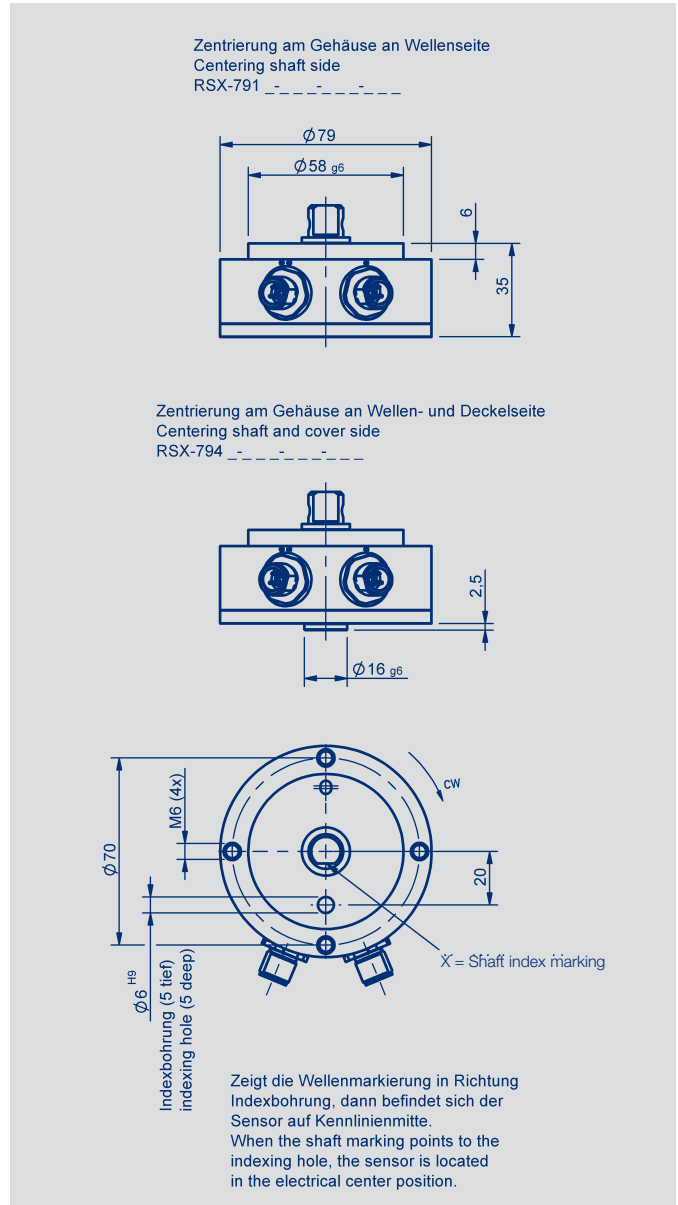
The angle sensor RSX-7900 is designed for use in mobile applications under extreme environmental conditions. The sensor is suitable for a continuously ambitious operating.

The robust full metal housing with a double ball bearing stainless steel shaft and a superior seal concept protects the sensor against mechanical and other environmental influences.

The high accuracy and reliability of the magnetic angle measurement are further features, particularly in safety-related applications.

The massive but compact design allows direct mounting of the sensor without additional protective measures. Various shaft versions allow guidance via lever arm or other driving elements.

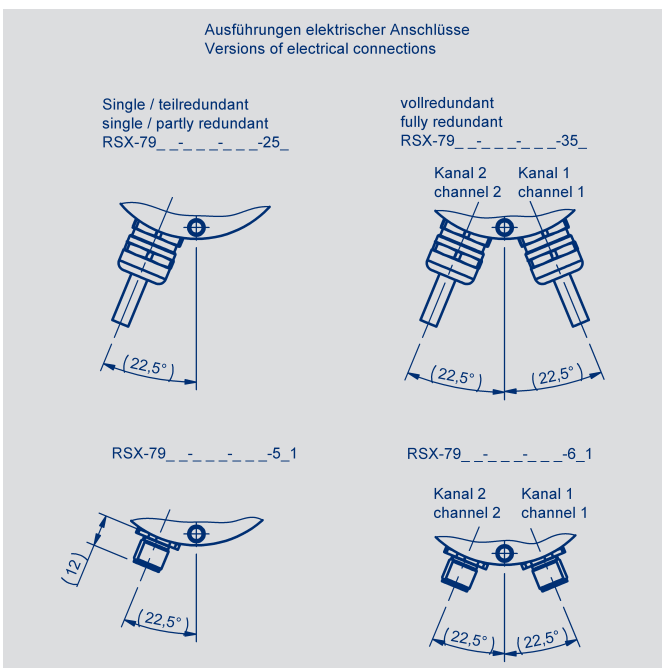
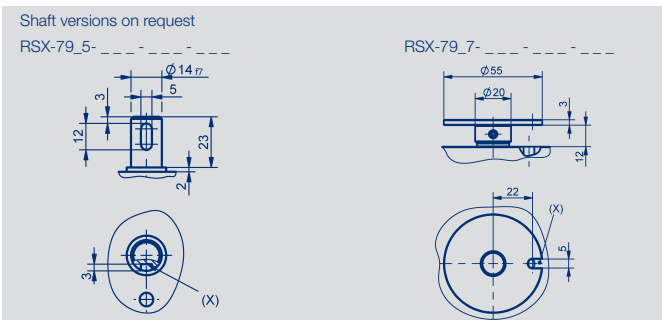
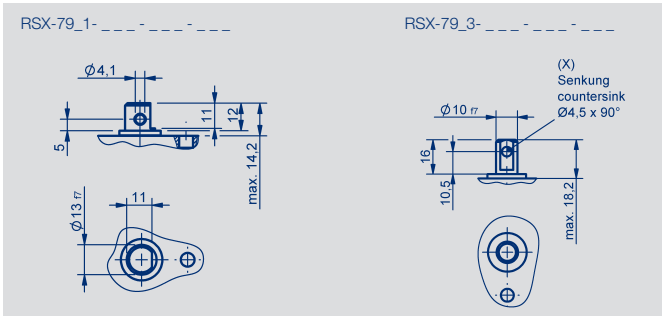
The centering of the housing can be done either by direct fitting by a 58 mm diameter frontside or as reverse fitting by a 16 mm diameter in the cover.



**Description**

Housing	anodized aluminum; salt spray resistant
Shaft	stainless steel
Bearing	double angular ball bearing
Electrical connections	cable or M12 connector

## Pin Assignment



### Single channel version

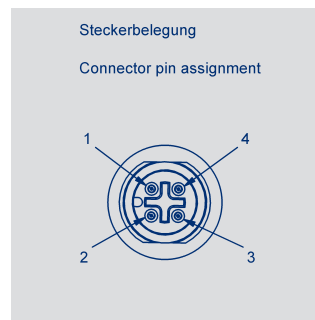
	Cable (Code -252)	M12 connector (Code -551)
Supply	# 1	Pin 1
GND	# 2	Pin 3
Signal	# 3	Pin 2
Not assigned	# 4 GN/GE	Pin 4

### Partly redundant version

	Cable (Code -252)	M12 connector (Code -551)
Supply	# 1	Pin 1
GND	# 2	Pin 3
Signal 1	# 3	Pin 2
Signal 2	# 4	Pin 4
Not assigned	GN/GE	-

### Fully redundant version

	2 x Cable (Code -352)	2 x M12 connector (Code -651)
Supply 1	Channel 1 / # 1	Channel 1 / Pin 1
GND 1	Channel 1 / # 2	Channel 1 / Pin 3
Signal 1	Channel 1 / # 3	Channel 1 / Pin 2
Supply 2	Channel 2 / # 1	Channel 2 / Pin 1
GND 2	Channel 2 / # 2	Channel 2 / Pin 3
Signal 2	Channel 2 / # 4	Channel 2 / Pin 4
Not assigned	Channel 1 / # 4 Channel 1 / GN/GE Channel 2 / # 3 Channel 2 / GN/GE	Channel 1 / Pin 4 Channel 2 / Pin 2



## Technical Data

<b>Mechanical Data</b>		
Dimensions	see dimension drawing	
Mounting	with 4 screws M6, screw-in depth 15 mm min.	
Starting torque of mounting screws	8 ±1	Nm
Mechanical travel	360 continuous	°
Permitted shaft loading (axial and radial) static or dynamic force	300 (axial), 300 (radial)	N
Torque *	max. 4	Ncm
Maximum operational speed	50	min-1
Weight	approx. 500	g
<b>Electrical Data</b>		
Supply voltage Ub	12/24 (9...34)	VDC
Current consumption (w/o load)	typical 20	mA
Reverse voltage	yes	
Short circuit protection	yes, all outputs vs. GND and Ub	
Measuring range	60, 120, 180, 240, 300, 360	°
Number of channels	1 / 2	
Update rate	5	kHz
Resolution	12	bit
Repeatability	0.2	°
Hysteresis	0.1	°
Absolute linearity at measuring range < 90°	2.0	±%FS
Absolute linearity at measuring range ≥ 90°	1.0	±%FS
Interlinearity at measuring range < 90°	4.0	±%FS
Interlinearity at measuring range ≥ 90°	2.0	±%FS
Output signal	4...20 (burden max. 250 Ω)	mA
Temperature error at measuring range < 90°	200	ppm/K
Temperature error at measuring range ≥ 90°	160	ppm/K
Insulation resistance (500 VDC)	≥ 10	MΩ
Cross-section cable	AWG 20, 0.5	mm <sup>2</sup>
<b>Environmental Data</b>		
Temperature range	-40...+85	°C
Vibration (IEC 60068-2-6)	5...2000 Amax = 0.75 amax = 20	Hz mm g
Shock (IEC 60068-2-27)	50 (6 ms)	g
Protection class (DIN EN 60529)	IP67 connector outlet IP6k9k cable outlet	
Life	>100x10 <sup>6</sup>	movements
EMC Conformity	ISO TR 10605 Packaging and Handling + Component Test (ESD) 8 kV, 15 kV ISO 11452-2 Radiated EM HF-Fields, Absorber Hall: 100 V/m ISO 11452-5 Radiated EM HF-Fields, Stripline 200 V/m CISPR 25 Radiated and conducted emission class 5 ISO 7637-2/3 Transient disturbance emission level 3 Interference emission and immunity according to ECE-R10 (E1)	
<b>Functional safety</b>		
	After validation by customer, redundant versions are suitable for applications according PLd ISO 13849	
MTTF (DIN EN ISO 13849-1 parts count method, w/o load)	46 (per channel)	years
MTTFd (DIN EN ISO 13849-1 parts count method, w/o load)	92 (per channel)	years

\*) Depending on the environmental temperature and standstill time, the necessary force for the initial operating of the shaft may increase

## Ordering specifications

### Ordering specifications

Preferred types printed in bold.

Supply  $U_b$  / interface  
3:  $U_b = 12/24\text{ V}$  (9 ... 34 V)

Output signal  
2: 4 mA ... 20 mA  
Other characteristics on request

Output characteristic  
1: rising CW  
2: rising CCW  
3: **Partly redundant version: crossed output channel 1 rising / channel 2 falling CW**  
4: **Fully redundant version: crossed output channel 1 rising / channel 2 falling CW**  
Other characteristics on request

Electrical connection  
single channel / partly redundant version: 1 output  
252: 1 x round cable 4-pole, 2 m, unshielded  
551: 1 x connector M12, 4-pin, unshielded  
Fully redundant version: 2 outputs  
352: 2 x round cable 4-pole, 2 m, unshielded  
651: 2 x connector M12, 4-pin, unshielded  
Cable versions and assembled connectors on request

**R S X** - **7 9 1 1** - **8 3 6** - **3 2 4** - **3 5 2**

Series

Measuring range

06: 60°  
12: 120°  
18: 180°  
24: 240°  
30: 300°  
36: 360°

Other angles on request

Number of channels

6: single channel version (1 x  $U_b$ , 1 x output)  
7: partly redundant version (1 x  $U_b$ , 2 x output)  
8: fully redundant version (2 x  $U_b$ , 2 x output)

Shaft

1: steel  $\varnothing 13 \times 12$  mm with cross hole  $\varnothing 4,1$  mm  
3: steel  $\varnothing 10 \times 16$  mm with countersink  $\varnothing 4,5 \times 90^\circ$

Other shaft versions on request

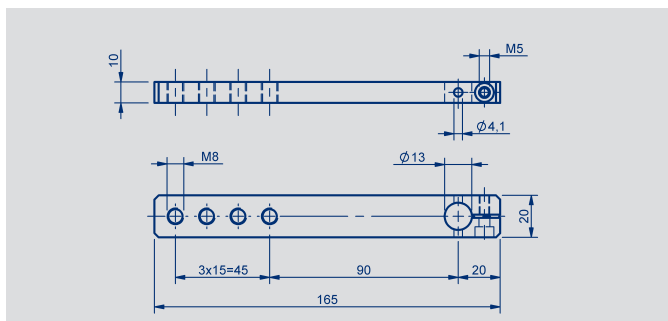
Housing

1: anodized aluminum, centering shaft side  
4: anodized aluminum, centering shaft and cover side

Model / size

79: 79 x 35 mm

**Accessories**  
Sensor mounting

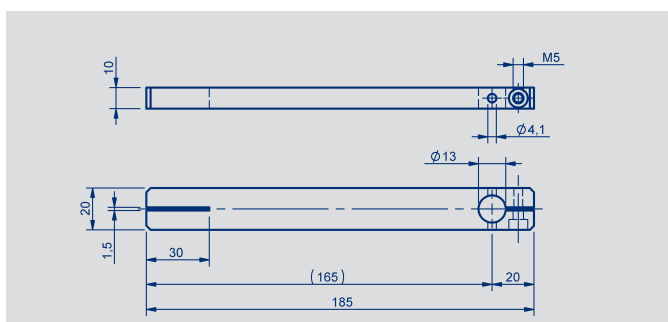


**Z-IPX-M01**

Lever arm 165 x 20 mm for pivot head drive

- aluminum
- for shaft RSX-79\_1-...
- P/N 056501

Assembly material (screw, locking pin) included in delivery

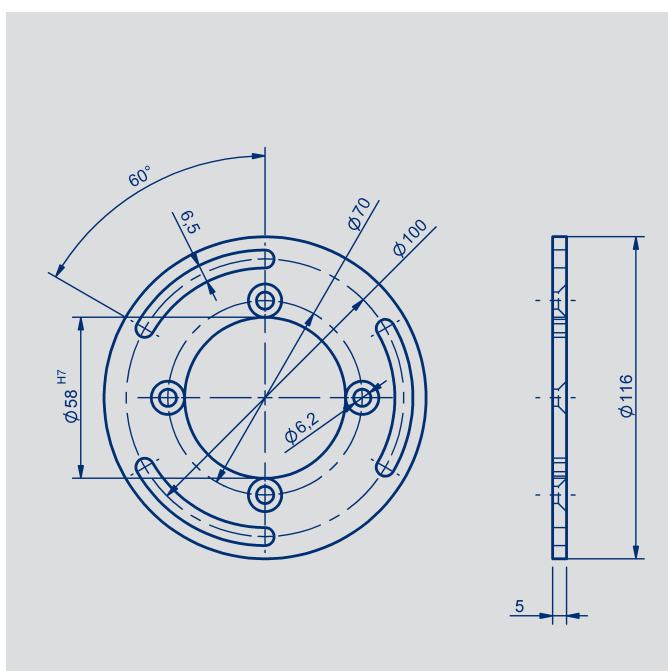


**Z-IPX-M11**

Lever arm 185 x 20 mm for lever arm drive, clamp connection on dimension 20 mm

- aluminum
- for shaft RSX-79\_1-...
- P/N 056502

Assembly material /screw, locking pin) included in delivery



**Z-IPX-M31**

Mounting plate for adjustable mounting on screw-hole circle 100 mm

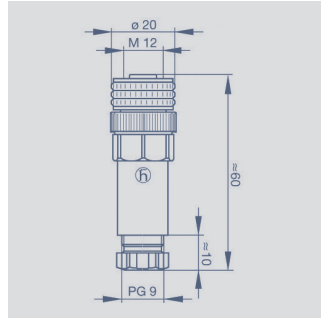
- aluminum, anodized
- P/N 056504

Assembly material (4 x countersink screw) included in delivery

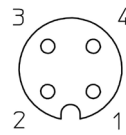
**Accessories**  
Connector System M12

Novotechnik U.S., Inc.  
155 Northboro Road  
Southborough, MA 01772  
Phone 508 485 2244  
Fax 508 485 2430  
info@novotechnik.com  
www.novotechnik.com

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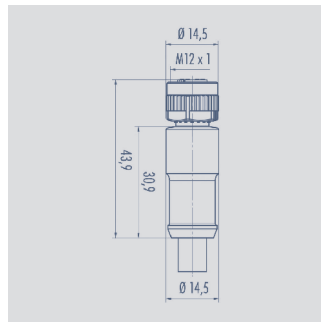
Pin assignment



**IP67**

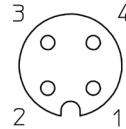
**M12x1 Mating female connector, 4-pin, straight, A-coded, with coupling nut, screw termination, IP67, not shieldable**

Connector housing	Plastic PBT -25 °C...+90 °C
For wire gauge	6...8 mm, max. 0,75 mm <sup>2</sup>
Type	EEM 33-88, P/N 005633



Pin assignment

- 1 = brown
- 2 = white
- 3 = blue
- 4 = black



**IP67**

**UL**



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

Connector housing	Plastic PA	
Cable sheath	PUR; Ø = max. 6 mm, -40 °C...+85 °C (fixed)	
Wires	PP, 0,34 mm <sup>2</sup>	
<b>Length</b>	<b>Type</b>	<b>P/N</b>
2 m	EEM 33-35	056135
5 m	EEM 33-36	056136
10 m	EEM 33-37	056137