novotechnik
Siedle Group

NOVOHALL Rotary Sensor Contactless

RSX-7900

Heavy Duty
4 ... 20 mA

Mobile Applications

Special Features

- Very robust design for extreme environments
- High shaft load 300 N
- Non-contacting, magnetic encoder
- Measuring angles up to 360° in single and multi-channel versions
- Enhanced corrosion protection due to anodized aluminum housing and stainless steel shaft, salt spray resistant
- Excellent linearity
- High resolution to 12 bit
- Unlimited mechanical rotation
- Absolutely impermeable to splash-water IP6K9K
- High temperature resistance
- Long life > 100 million movements, even in high vibration mounting positions
- For highest EMC requirements such as ISO pulses and interference fields according to ISO 11452 and ECE directive
- Suitable for use in safety-related applications according to ISO 13849

Applications

- Position measurement in steering systems
- Pivotable vehicle bracings
- Transport systems with several steered 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 ambitous operating.
The robust full metal housing with a double ball bearing stainless steel shaft and a superior seal concept protects the sensor against various environmental influences.
The high accuracy and reliability of the magnetic angle measurement are further features, particularly in safety-related applications.
The robust but compact design allows direct mounting of the sensor without additional protective measures.
A variety of shaft versions allows guidance via lever arm or other driving elements.

Description	
Material	Housing: aluminium, anodized, AlMgSi1, salt spray resistant Shaft: SS X10CrNiS18-9 1.4305 / AISI 303
Mounting	With 4 screws M6, screw-in depth 15 mm min.
Fastening torque of mounting	800 ± 100 Ncm
Bearing	Double angular ball bearing
Electrical connection	Connector M12x1, A-coded / Cable with cable screw connection, 4x 0.5 mm² (AWG 20), TPE, unshielded

Mechanical Data	
Dimensions	see dimension drawing
Mechanical travel	360° continuous
Permitted shaft load static or dynamic	300 N (axial / radial)
Torque	max. 4 Ncm Depending on the environmental temperature and standstill time, the necessary force for the inital operating of the shaft may increase
Weight	approx. 500 g

Ordering Specifications

Ordering Specifications

Preferred types printed in bold

Supply voltage Ub
3: Ub = 12/24 VDC

Output signal
2: 4 ... 20 mA
Other output signals on request

Output characteristic
1: Rising characteristic cw
2: Rising characteristic ccw
3: Crossed outputs channel 1 rising cw (partly redundant)
4: Crossed outputs channel 1 rising cw (fully redundant)
Other output characteristics on request

Electrical connection
Single channel / partly redundant version: 1 output
252: 1 x cable 4-pole, 2 m, unshielded
551: 1 x connector M12, 4-pin, unshielded
Fully redundant version: 2 outputs
352: 2 x 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	-	6	5	1

Measuring range
06: Angle 60°
12: Angle 120°
18: Angle 180°
24: Angle 240°
30: Angle 300°
36: Angle 360°
Other angles on request

Number of channels
6: Single output (1x supply voltage Ub, 1x output)
7: Partly redundant (1x supply voltage Ub, 2x output)
8: Fully redundant (2x supply voltage Ub, 2x output)

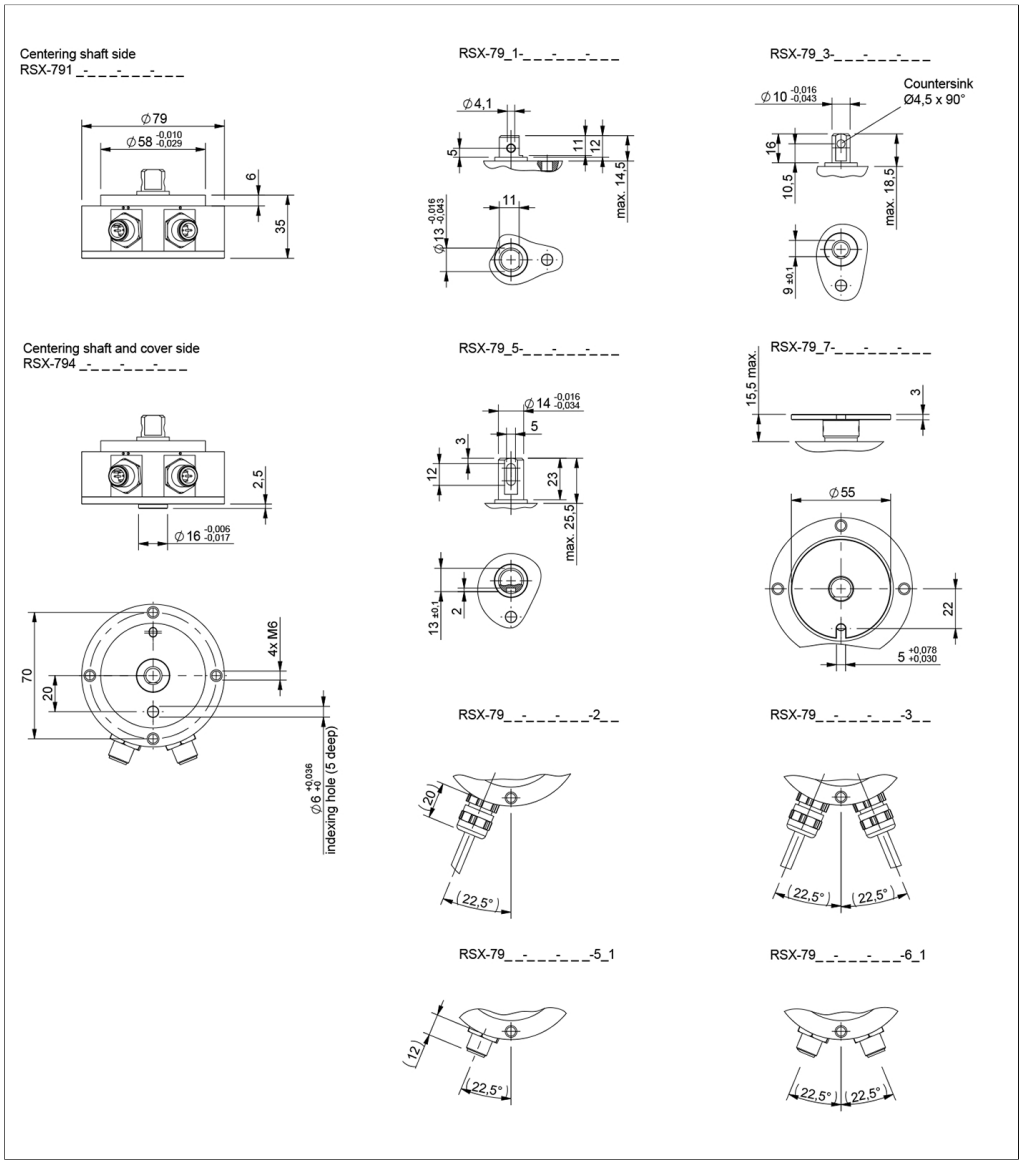
Shaft
1: Ø 13x12 mm with cross hole Ø 4,1 mm
3: Ø 10x16 mm with countersink Ø 4.5x90°
7: Ø 13x12 mm with mounted driving plate Z-IPX-M21
Other shaft configurations on request

Series

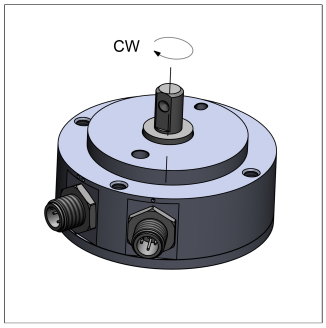
Housing
1: Centering shaft side
4: Centering shaft and cover side

Model / size
79: 79 x 35 mm

Drawing



CAD data see
www.novotechnik.de/en/download/cad-data/



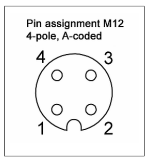
When the flattening of the shaft points towards the indexing hole, the sensor is near the electrical center position.

Technical Data

Type	**RSX-79_ _-_ _ _-32_-_ _ _**
Output signal	4 ... 20 mA
Burden	≤ 250 Ω
Number of channels	1 / 2
Update rate	5 kHz
Measuring range	60°, 120°, 180°, 240°, 300°, 360°
Absolute linearity	Measuring range < 90°: ±2 %FS, Measuring range ≥ 90°: ±1 %FS
Interlinearity	Measuring range < 90°: ±4 %FS, Measuring range ≥ 90°: ±2 %FS
Resolution	12 bit
Repeatability	≤ ±0.2°
Hysteresis	typ. < ±0.1° Only angle 360°: typ. < 0.25° (lower hysteresis on request)
Temperature error	Measuring range < 90°: 200 ppm/K, Measuring range ≥ 90°: 160 ppm/K
Supply voltage Ub	12/24 VDC (9 ... 34 VDC)
Current consumption w/o load	typ. 20 mA per channel (Ub = 24 V)
Polarity protection	yes (supply lines)
Short circuit protection	yes (all outputs vs. GND and supply voltage)
Insulation resistance (500 VDC)	≥ 10 MΩ
Environmental Data	
Max. operational speed	50 rpm
Vibration IEC 60068-2-6	20 g, 5 ... 2000 Hz, Amax = 0.75 mm
Shock IEC 60068-2-27	50 g, 6 ms
Protection class ISO 20653	IP67, IP6K9K (with connector M12: IP67)
Operating temperature	-40 ... +85°C
Life	> 100 Mio. movements
Functional safety	Suitable for safety-relevant applications according to ISO 13849 after customer validation. Further safety data (DCavg...) and support for functional safety are available on request.
MTTF (ISO 13849-1 parts count method, w/o load, wc)	46 years (per channel)
MTTFd (ISO 13849-1 parts count method, w/o load, wc)	92 years (per channel)
	MTTF certificate s. https://www.novotechnik.de/en/downloads/certificates/mttfd-certificates/
EMC Compatibility	
ISO 10605 ESD (Handling/Component)	8 kV / 15 kV
ISO 11452-2 Radiated HF-fields	100 V/m
ISO 11452-5 Radiated HF-Fields, stripline	200 V/m
CISPR 25 Radiated emission	Level 5
ISO 7637-2 Pulses on supply lines	(1, 2a, 2b, 3a, 3b, 4, 5) Level 4
ISO 7637-3 Pulses on output lines	Level 4
Emission/immunity E1	acc. to ECE-R10

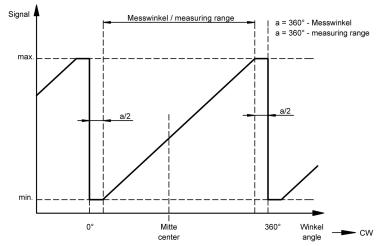
Connection Assignment

Signal	Connector code 5_ _	Cable code 2_ _	Connector code 5_ _	Cable code 2_ _	2x Connector code 6_ _	2x Cable code 3_ _
	one-channel	one-channel	partly redundant	partly redundant	fully redundant	fully redundant
Supply voltage Ub 1	Pin 1	GN	Pin 1	GN	Channel 1 / Pin 1	Channel 1 / GN
GND 1	Pin 3	BN	Pin 3	BN	Channel 1 / Pin 3	Channel 1 / BN
Signal output 1	Pin 2	WH	Pin 2	WH	Channel 1 / Pin 2	Channel 1 / WH
Signal output 2	Not assigned	Not assigned	Pin 4	YE	Channel 2 / Pin 4	Channel 2 / YE
Supply voltage Ub 2	-	-	-	-	Channel 2 / Pin 1	Channel 2 / GN
GND 2	-	-	-	-	Channel 2 / Pin 3	Channel 2 / BN

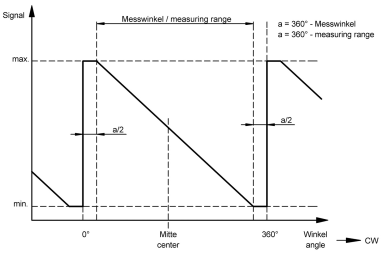


Technical Data
Output Characteristics

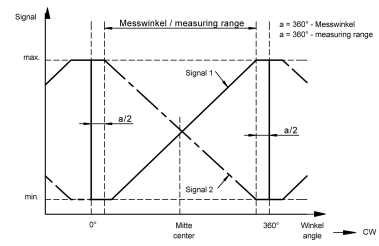
Output characteristic



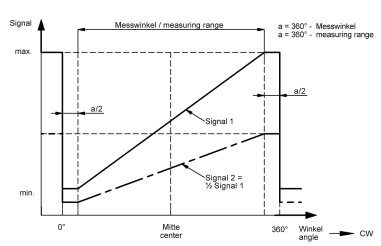
Output characteristic



Output characteristic

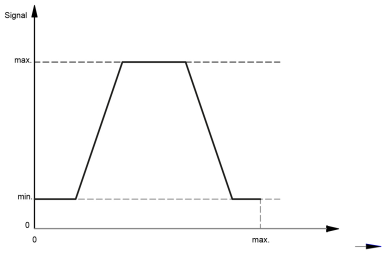


Output characteristic



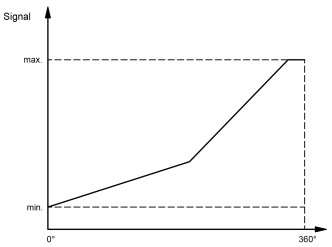
Output characteristic

On request: trapezoid output characteristic



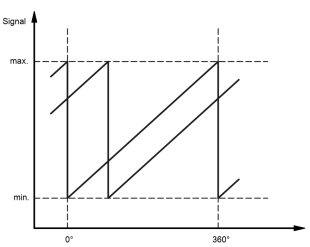
Output characteristic

On request: different gradients



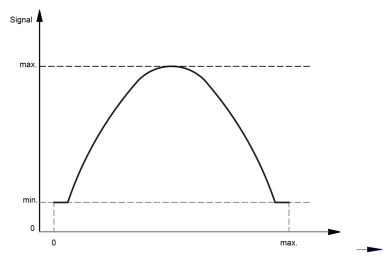
Output characteristic

On request: output characteristics with offset

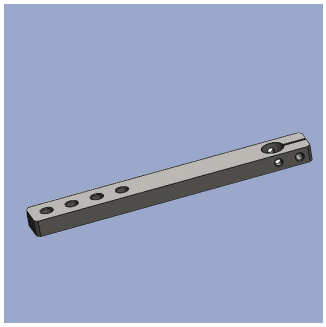


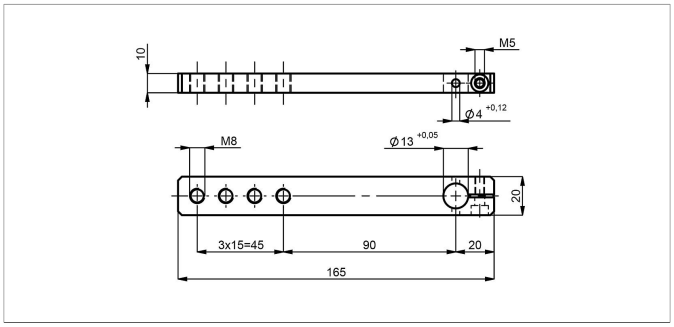
Output characteristic

On request: parabolic output characteristic



Sensor Mounting

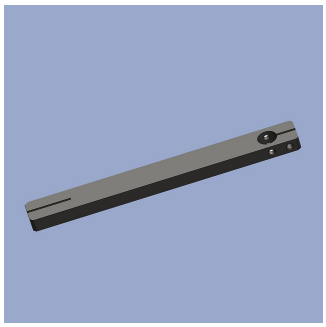


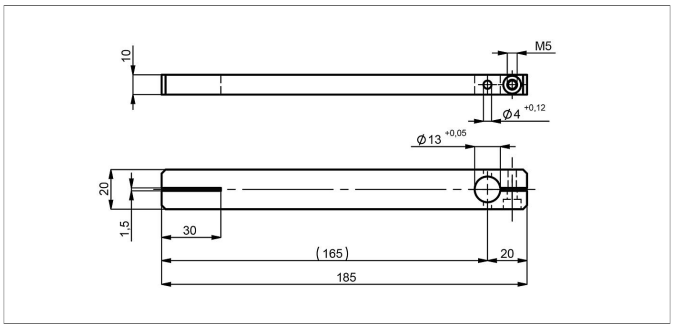


Z-IPX-M01
Lever arm 165 x 20 mm for pivot head drive. Mounted to shaft D = 13 mm with locking pin and screw (both included in delivery)

Material	Aluminium, anodized

P/N	Type
400105430	Z-IPX-M01

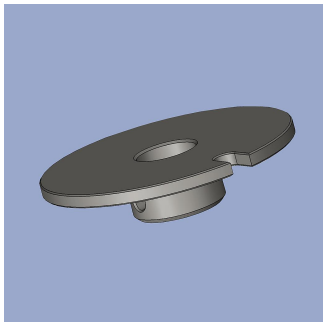


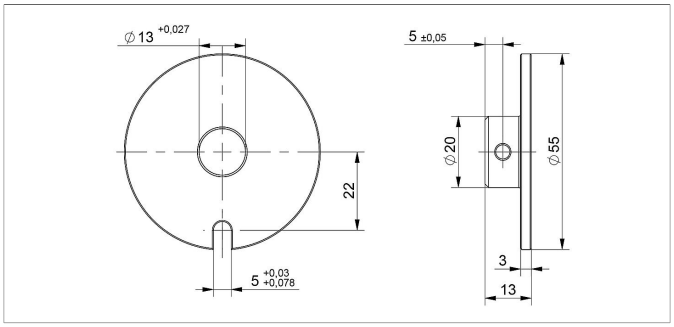


Z-IPX-M11
Lever arm 185 x 20 mm for lever arm drive, clamp connection on dimension 20 mm. Mounted to shaft D = 13 mm with locking pin and screw (both included in delivery)

Material	Aluminium, anodized

P/N	Type
400105431	Z-IPX-M11

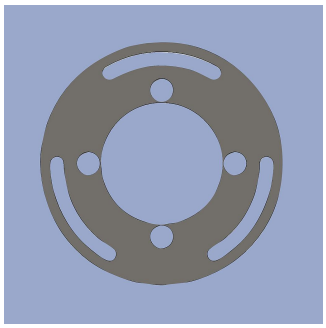


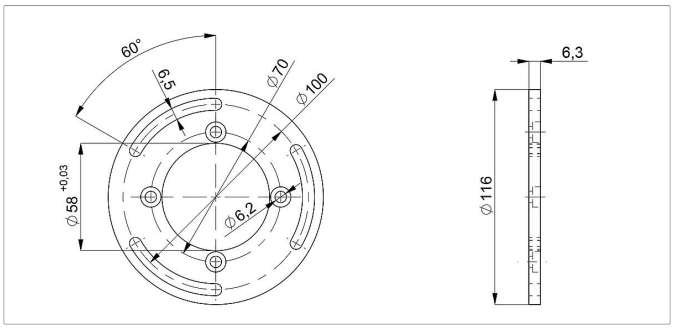


Z-IPX-M21
Driving plate D = 55 mm for lateral shaft drive with locking pin. Mounted to shaft D = 13 mm with locking pin (included in delivery)

Material	Aluminium, anodized

P/N	Type
400105433	Z-IPX-M21



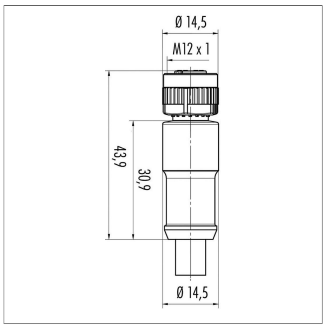


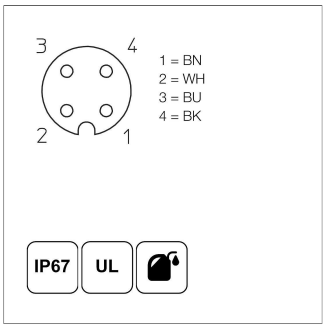
Z-IPX-M31
Mounting plate for adjustable mounting on screw-hole circle 100 mm. Assembly material (4 x cylinder head screws) included in delivery

Material	Aluminium, anodized

P/N	Type
400105432	Z-IPX-M31

Connector system M12



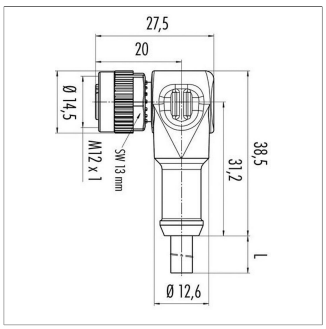


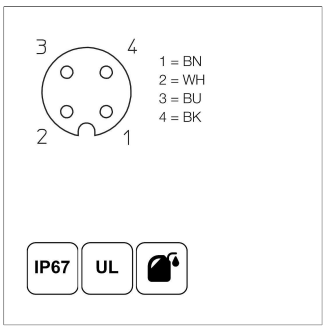
EEM-33-35/36/37

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

Operating temp.	-40 ... +85°C (fixed)
Plug housing	PA
Cable sheath	PUR, Ø = max. 6 mm
Lead wires	PP, 0.34 mm²

P/N	Type	Length
400056135	EEM-33-35	2 m
400056136	EEM-33-36	5 m
400056137	EEM-33-37	10 m



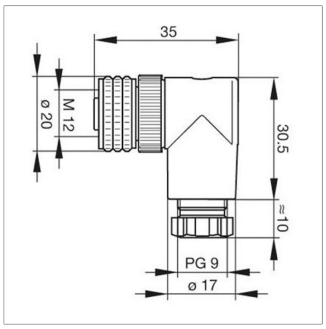


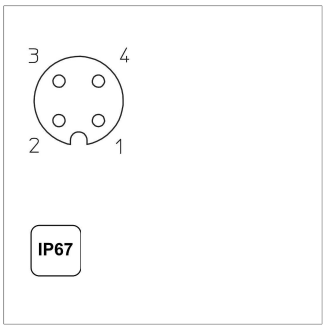
EEM-33-38/39/40

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

Operating temp.	-40 ... +85°C (fixed)
Plug housing	PA
Cable sheath	PUR, Ø = max. 6 mm
Lead wires	PP, 0.34 mm²

P/N	Type	Length
400056138	EEM-33-38	2 m
400056139	EEM-33-39	5 m
400056140	EEM-33-40	10 m





EEM-33-89

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

Operating temp.	-25 ... +90°C
Plug housing	PBT
For wire gauge	6 ... 8 mm, max. 0.75 mm²

P/N	Type
400005634	EEM-33-89

IP67 Protection class IP67 DIN EN 60529

IP68 Protection class IP68 DIN EN 60529

Very good Electromagnetic Compatibiliy (EMC) and shield systems

Very good resistance to oils, coolants and lubricants

Suited for applications in dragchains

UL UL - approved

CAN CAN-Bus

novotechnik
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