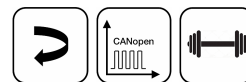


**NOVOHALL  
Rotary Sensor  
Non-contacting**

**RSX-7900**  
Heavy Duty  
CANopen  
**Mobile Applications**



**Special Features**

- Very robust design for extreme environmental conditions
- High shaft load 300 N
- Non-contacting, magnetic encoder
- Measuring angles up to 360° in one and multi-channel versions
- Enhanced corrosion protection due to anodized aluminum housing and stainless steel shaft, salt spray resistant
- Excellent linearity
- High resolution to 14 bit
- Unlimited mechanical rotation
- Absolutely impermeable to splash-water IP69K
- High temperature resistance to -40...+105°C
- Long life > 100 million movements, even in vibration mounting positions
- For highest EMC requirements such as ISO pulses and interference fields according to ISO 11452 and ECE directive

**Applications**

- Position measurement in steering systems
- Pivotal 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 ambitious 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.

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: stainless steel X10CrNiS18-9 1.4305
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 mm <sup>2</sup> (AWG 20), TPE, shielded

**Mechanical Data**

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

## Ordering Specifications

### Ordering Specifications

Preferred types printed in bold

#### Interface

**6: CANopen**

##### Interface parameters

###### One-channel version

**1: 1x position, 1x speed**

5: 1x position, 1x speed with bus termination 120 Ω

###### Two-channel version

**2: 2x position, 2x speed**

6: 2x position, 2x speed with bus termination 120 Ω

##### Baud rate

**1: 1000 kBaud**

2: 800 kBaud

3: 500 kBaud

4: 250 kBaud

5: 125 kBaud

7: 50 kBaud

##### Electrical connection

###### 1 Output

201: 1x cable 4-pole 1.0 m, shielded

511: 1x connector M12, 5-pole, shielded

###### 2 Outputs (CAN IN/OUT)

301: 2x cable 4-pole 1.0 m, shielded

611: 2x connector M12 (male), 5-pole, shielded

Cable versions and assembled connectors on request

**R S X - 7 9 1 1 - 2 1 4 - 6 2 4 - 6 1 1**

Series

Model / size

79: 79 x 35 mm

#### 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

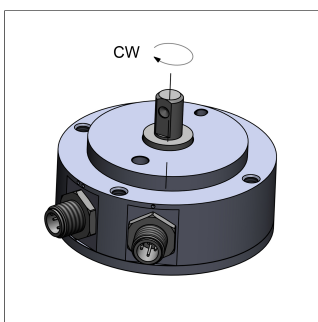
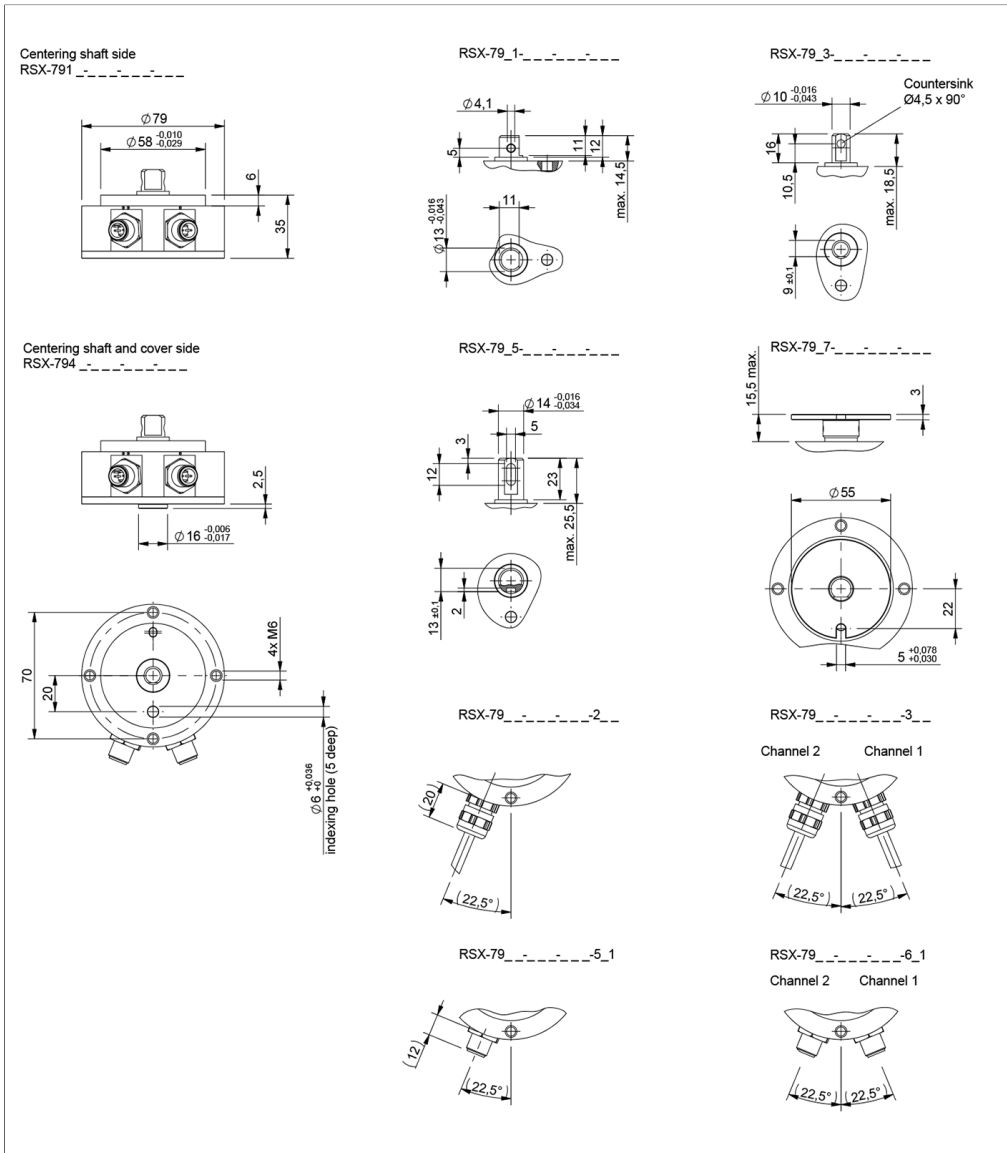
#### Housing

**1: Centering shaft side**

4: Centering shaft and cover side

**Drawing**

CAD data see  
[www.novotechnik.de/en/download/cad-data/](http://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

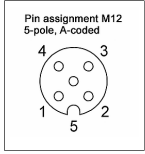


Type	RSX-79 --214_6_ _ _ _
Measured variables	Position and speed
Measuring range	360°
Number of channels	1 / 2
Protocol	CANopen protocol to CiA DS-301 V4.2.0, Device profile DS-406 V3.2 Encoder Class C2, LSS services to CiA DS-305 V1.1.2
Programmable parameters	Position, speed, cams, working areas, rotating direction, scale, offset, node ID, baud rate
Node ID	1 ... 127 (default 127)
Baud rate	50 ... 1000 kBAud
Update rate	1 kHz
Resolution position (across 360°)	14 bits
Resolution speed	$360^\circ/2^{14} \approx 0.022^\circ/\text{ms}$
Absolute linearity	1 Channel: $\pm 0.5\%$ FS, 2 Channels: $\pm 0.85\%$ FS
Repeatability	$\leq \pm 0.1^\circ$
Hysteresis	$\leq \pm 0.1^\circ$
Temperature error	$\pm 0.2\%$ FS
Supply voltage Ub	12/24 VDC (8 ... 34 VDC)
Current consumption at Power-on	$\leq 50$ mA
Power drain w/o load	$< 0.4$ W
Overvoltage protection	45 VDC (permanent)
Polarity protection	yes (supply lines)
Short circuit protection	yes (output vs. GND and supply voltage up to 40 VDC)
Insulation resistance (500 VDC)	$\geq 10$ M $\Omega$
Cross section	0.5 mm <sup>2</sup> (AWG 20)
Bus termination internal	120 $\Omega$ (optionally)
<b>Environmental Data</b>	
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 / IP69K (connector M12: IP67)
Operating temperature	-40 ... +105°C
Life	$> 100$ Mio. movements
Functional safety	If you need assistance in using our products in safety-related systems, please contact us
MTTF (IEC 60050)	413 years (one-channel) or 303 years (two-channel, per channel)
Traceability	Serial number on type labeling: production batch of the sensor assembly and relevant sensor components
<b>EMC Compatibility</b>	
ISO 10605 ESD (Handling/Component)	8 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 4
ISO 7637-2 Transient Emissions	Level 3
ISO 7637-2 Pulses on supply lines	(1, 2a, 2b, 3a, 3b, 4, 5) Level 3
ISO 7637-3 Pulses on output lines	Level 4
EN 13309 Construction machinery	
Emission/Immunity E1	acc. to ECE-R10

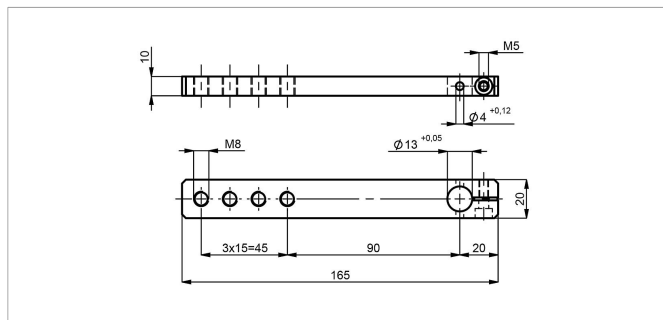
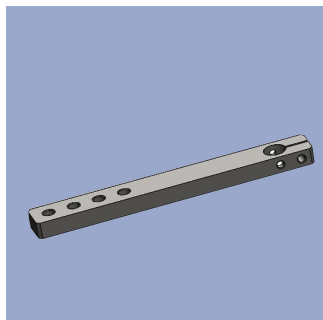
FS = Full scale: Signal span according to electrical measuring range

**Connection Assignment**

Signal	Connector	Cable
	code 5_/_/6_ _	code 2_ _/3_ _
Supply voltage Ub	Pin 2	BN
GND	Pin 3	WH
CAN_H	Pin 4	GN
CAN_L	Pin 5	YE
CAN_SHLD	Pin 1	Shield
Connect cable shielding to GND		



## Sensor Mounting

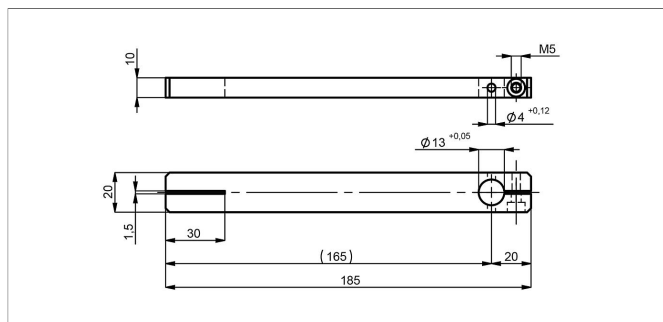
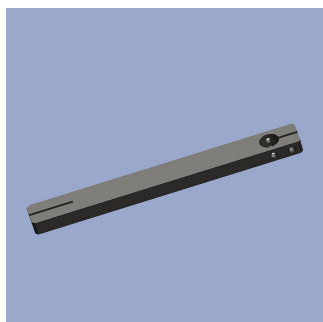


### Z-IPX-M01

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

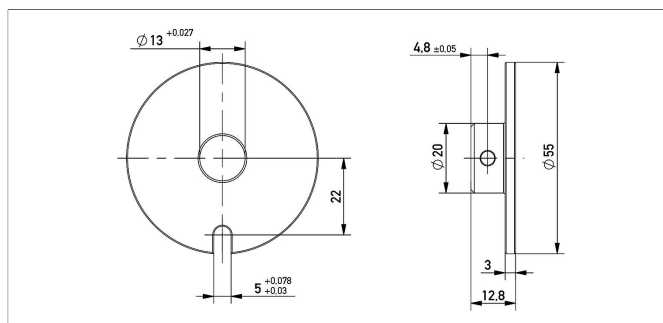
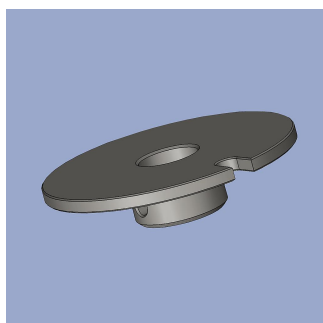


### Z-IPX-M11

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

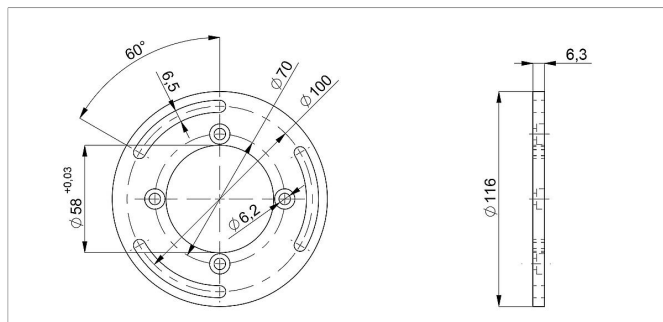
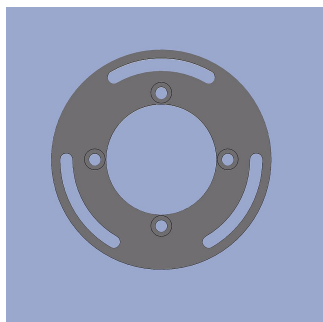


### Z-IPX-M21

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



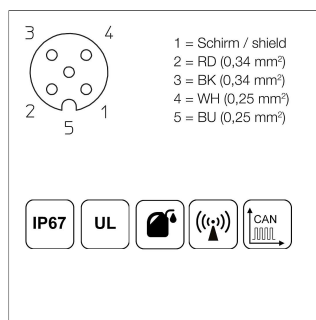
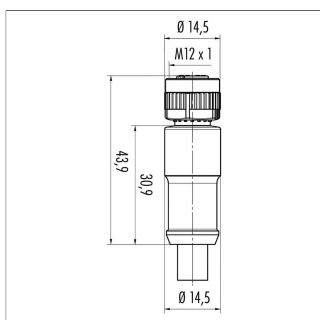
### Z-IPX-M31

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

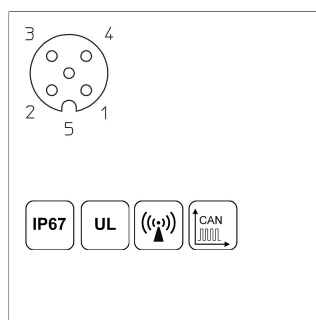
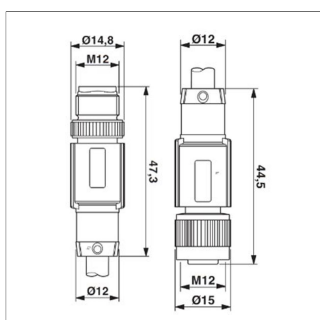


### EEM-33-41/42/43

M12x1 Mating female connector, 5-pin, straight, A-coded, with molded cable, IP67, shielded, open ended, CAN-Bus

Plug housing PUR  
Cable sheath PUR, Ø = 7.2 mm, -25 ... +85°C (fixed)  
Lead wires PP, 2x0.25 mm<sup>2</sup>+2x0.34 mm<sup>2</sup>

P/N	Type	Length
400056141	EEM-33-41	2 m
400056143	EEM-33-43	10 m



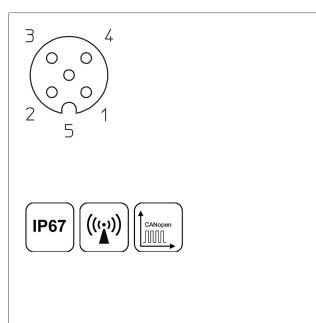
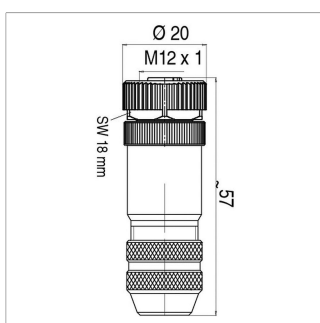
### EEM-33-52

M12x1 Mating female/male connector, 5-pin, straight, A-coded, with molded cable, IP67, shielded (shield on knurl), CAN-Bus

Plug housing PUR  
Cable sheath PUR, Ø = 6.7 mm, -25 ... +90°C (plug/socket) -20 ... +80°C (cable)

Lead wires PE, 2x0.25 mm<sup>2</sup>+2x0.34 mm<sup>2</sup>

P/N	Type	Length
400106373	EEM-33-52	5 m

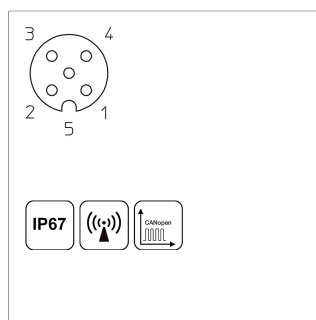
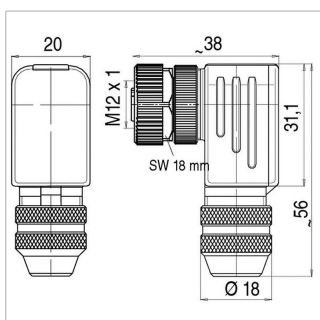


### EEM-33-73

M12x1 Mating female connector, 5-pin, straight, A-coded, with coupling nut, screw termination, IP67, shieldable, CAN bus

Plug housing Metal, -40 ... +85°C  
For wire gauge 6 ... 8 mm, max. 0.75 mm<sup>2</sup>

P/N	Type
400005645	EEM-33-73



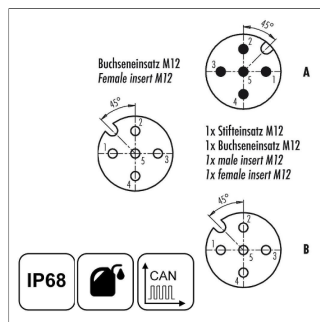
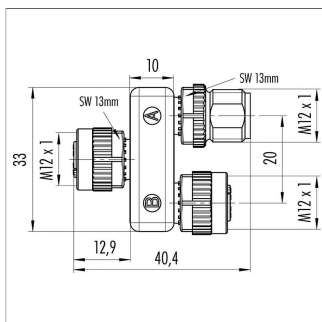
### EEM-33-75

M12x1 mating female connector, 5-pin, angled, A-coded, with coupling nut, screw termination, IP67, shieldable, CAN bus, turning and fixing of contact carrier in 90° positions possible.

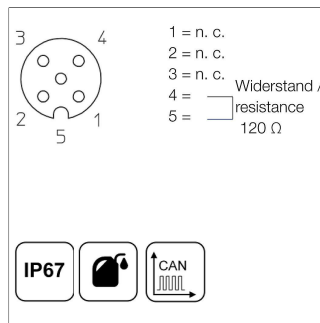
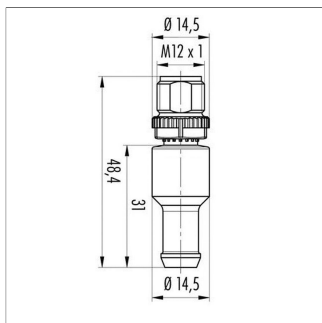
Plug housing Metal, -40 ... +85°C  
For wire gauge 6 ... 8 mm, max. 0.75 mm<sup>2</sup>

P/N	Type
400005646	EEM-33-75

## Connector System M12



**EEM-33-45**  
M12x1 splitter / T-connector, 5-pin,  
A-coded, IP68, 1:1 connection,  
female - male - female, CAN-Bus  
Plug housing PUR, -25 ... +85°C  
**P/N** **Type**  
400056145 EEM-33-45



**EEM-33-47**  
M12x1 terminating resistor, 5-pin, A-coded,  
IP67, 120 Ω resistance, CAN-Bus  
Plug housing PUR, -25 ... +85°C  
**P/N** **Type**  
400056147 EEM-33-47

**IP67** Protection class IP67 DIN EN 60529

**IP68** Protection class IP68 DIN EN 60529

Very good Electromagnetic Compatibility (EMC) and shield systems

Very good resistance to oils, coolants and lubricants

**C** Suited for applications in dragchains

**UL** UL - approved

CAN-Bus



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