

**NOVOHALL  
Rotary Sensor  
Non-contacting**

**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 onee 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 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, 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: 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, unshielded

**Mechanical Data**

Dimensions	See dimension drawing
Mechanical travel	360° 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

#### Supply voltage $U_b$

3:  $U_b = 12/24$  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**

Series

#### 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  $U_b$ , 1x output)

7: Partly redundant (1x supply voltage  $U_b$ , 2x output)

8: Fully redundant (2x supply voltage  $U_b$ , 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

#### Housing

1: Centering shaft side

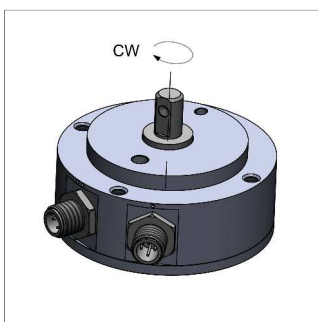
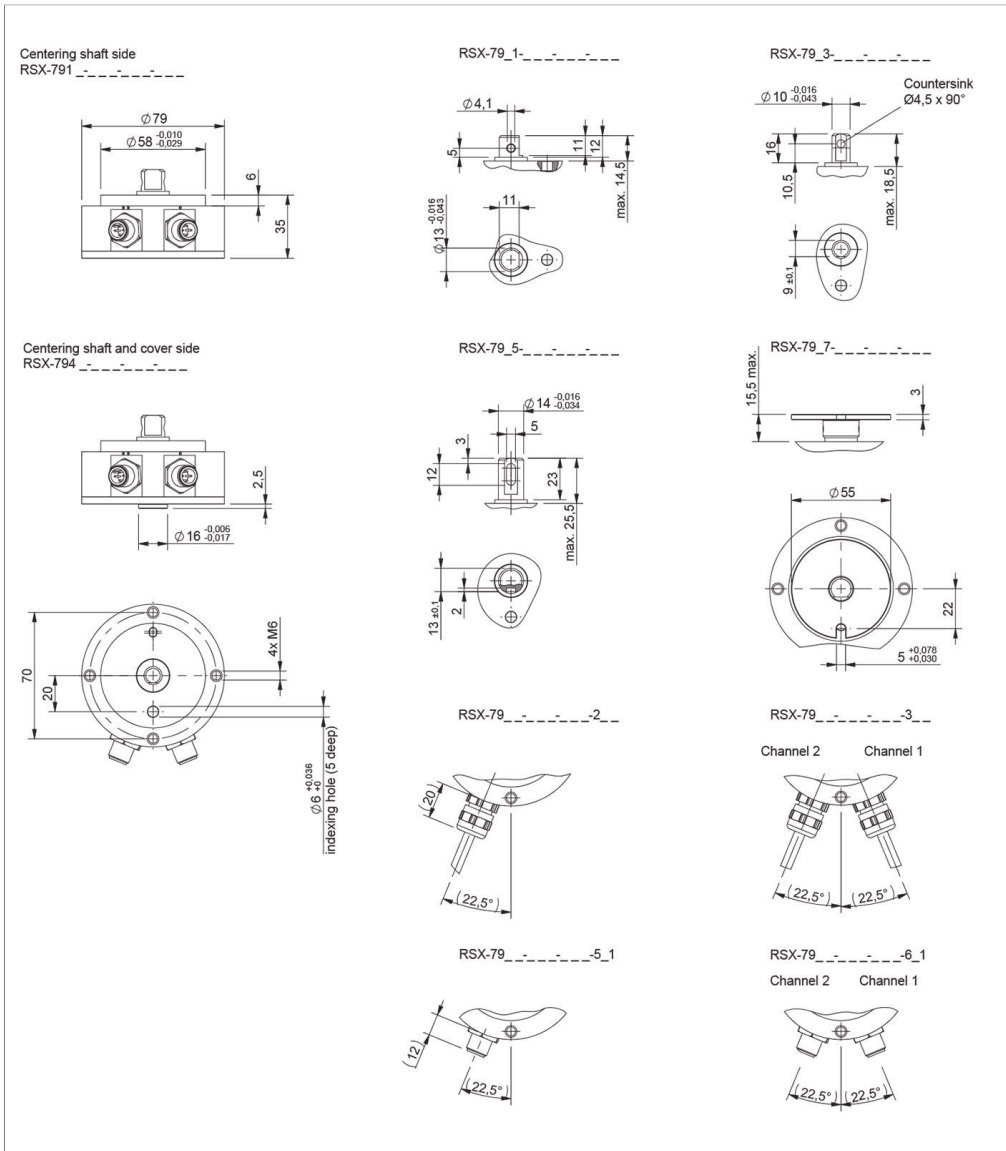
4: Centering shaft and cover side

#### Model / size

79: 79 x 35 mm

**Drawing**

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



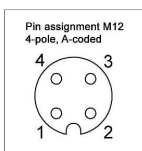
When the flattening of the shaft points towards the indexing hole, the sensor is near the electrical center position.

## Technical Data

Type	RSX-79 _ _ _ _ -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 bits
Repeatability	≤ ±0.2°
Hysteresis	typ. < ±0.1° Only measuring range 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 (vs. GND and supply voltage Ub)
Insulation resistance (500 VDC)	≥ 10 MΩ
<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 / IP6K9K (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 (IEC 60050)	461 years (per channel)
MTTFd (EN ISO 13849-1 parts count method, w/o load)	923 years (per channel)
	MTTF certificate s. <a href="https://www.novotechnik.de/en/downloads/certificates/mttf-certificates/">https://www.novotechnik.de/en/downloads/certificates/mttf-certificates/</a>
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 / 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

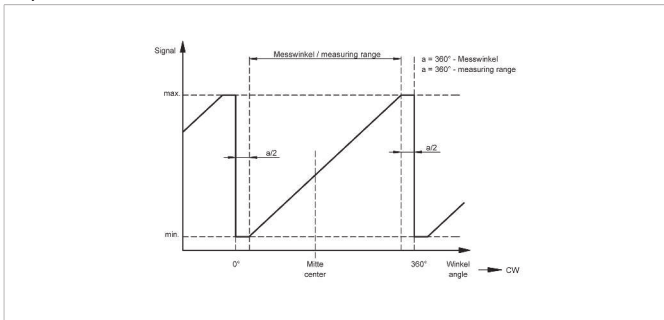
### Connection Assignment

Signal	Connector	Cable	Connector	Cable	2x Connector	2x Cable
	code 5_ _	code 2_ _	code 5_ _	code 2_ _	code 6_ _	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	-	-	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
Not assigned	Pin 4	YE	-	-	Channel 1 / Pin 4	Channel 1 / YE
					Channel 2 / Pin 2	Channel 2 / WH

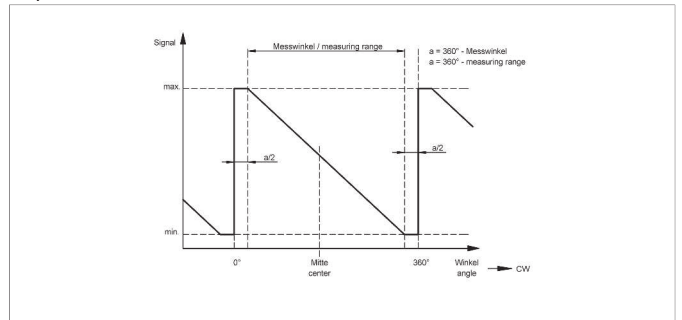


**Technical Data  
Output  
Characteristics**

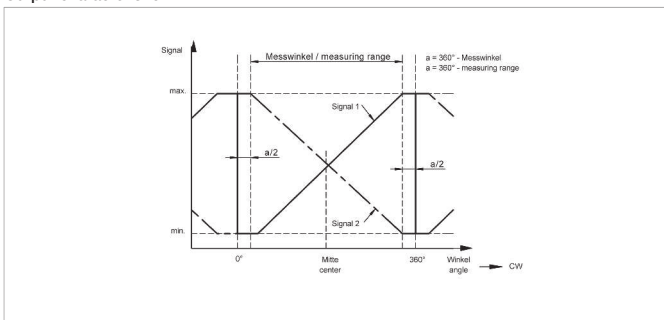
Output characteristic



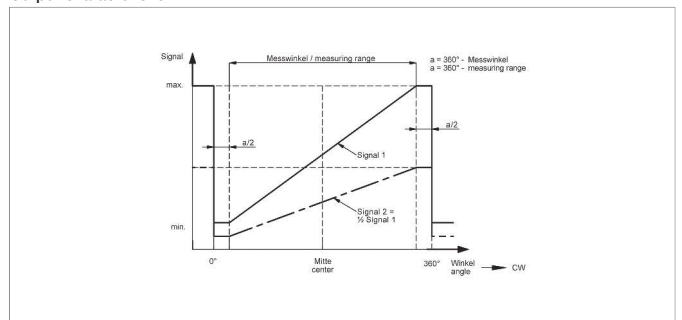
Output characteristic



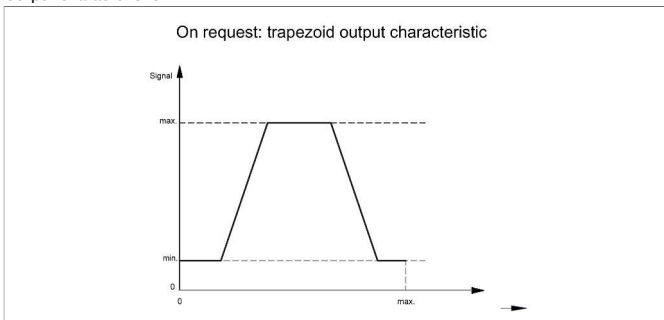
Output characteristic



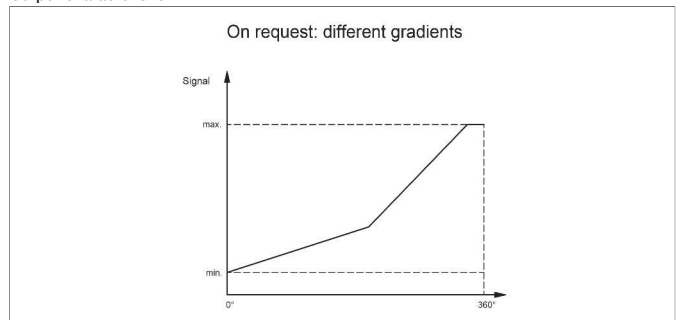
Output characteristic



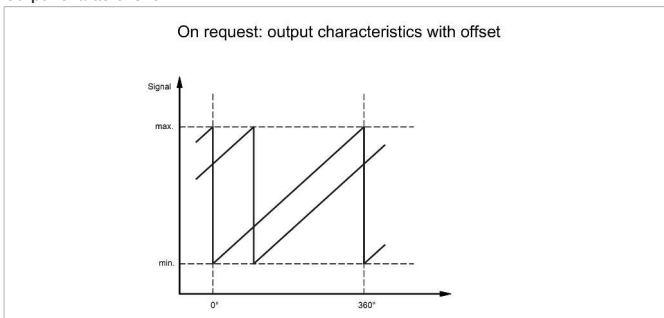
Output characteristic



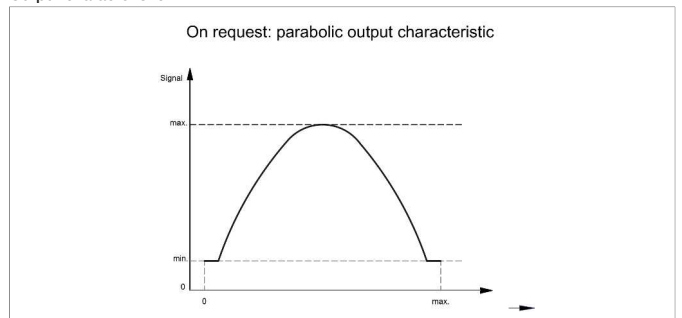
Output characteristic



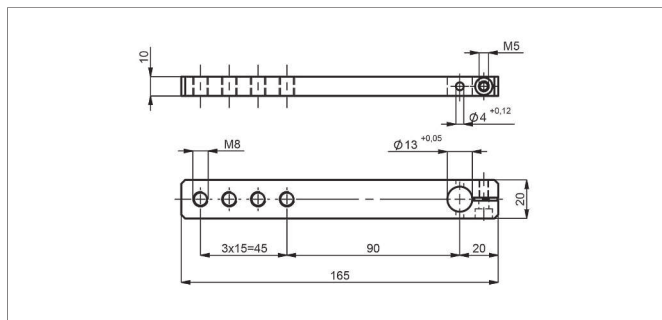
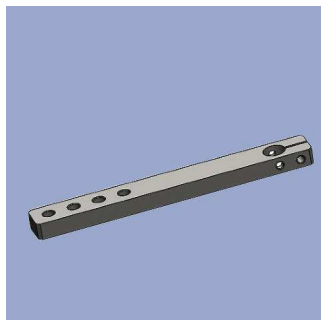
Output characteristic



Output characteristic



## Sensor Mounting

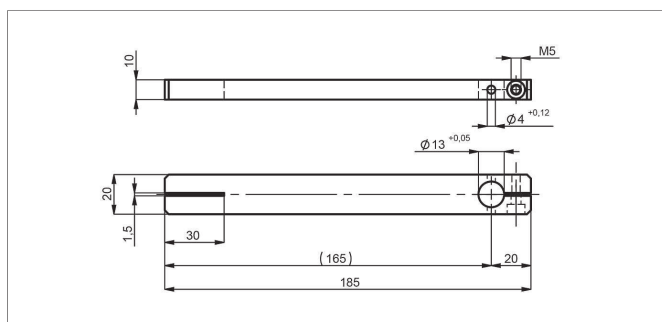


### Z-IPX-M01

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

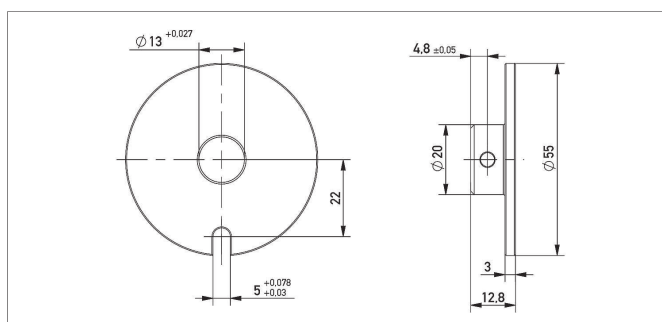
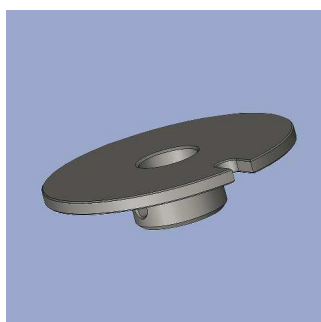


### Z-IPX-M11

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

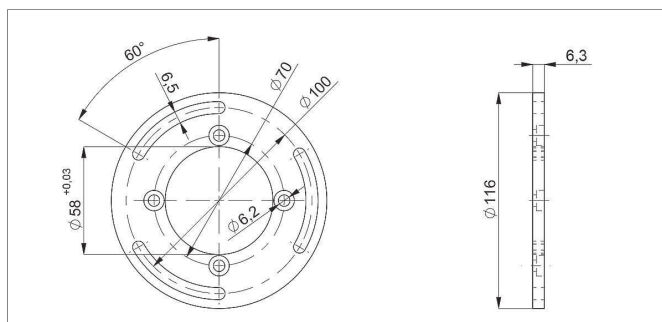
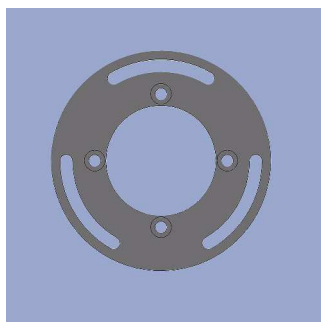


### Z-IPX-M21

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



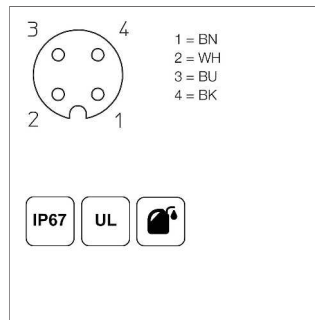
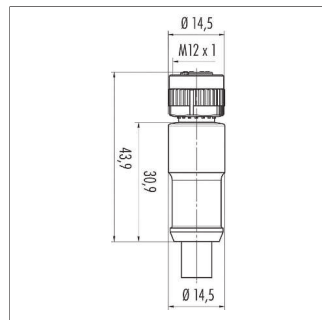
### Z-IPX-M31

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

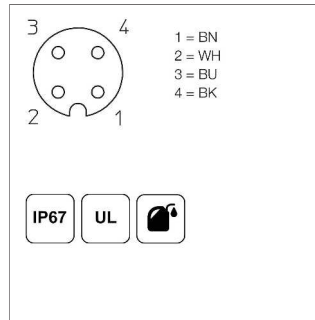
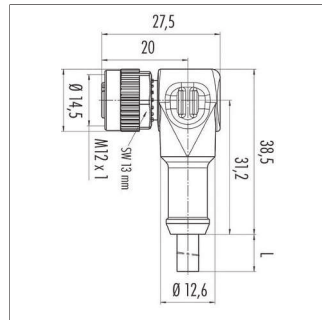


### EEM-33-35/36/37

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

Plug housing PA  
Cable sheath PUR, Ø = max. 6 mm, -40 ... +85°C (fixed)  
Lead wires PP, 0.34 mm<sup>2</sup>

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

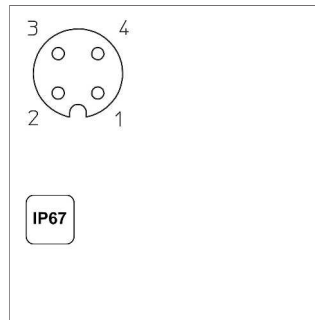
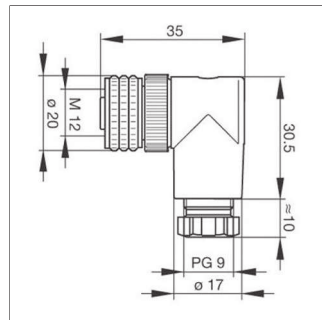


### EEM-33-38/39/40

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

Plug housing PA  
Cable sheath PUR, Ø = max. 6 mm, -40 ... +85°C (fixed)  
Lead wires PP, 0.34 mm<sup>2</sup>

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

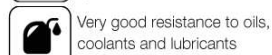
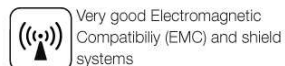
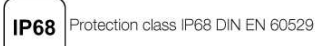
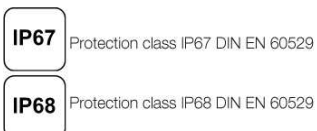


### EEM-33-89

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 mm<sup>2</sup>

P/N	Type
400005634	EEM-33-89



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