

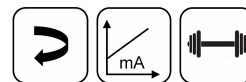
**NOVOHALL  
Rotary Sensor  
Non-contacting**

**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 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**

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 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

#### Housing

1: Centering shaft side

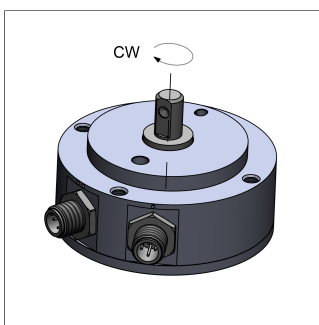
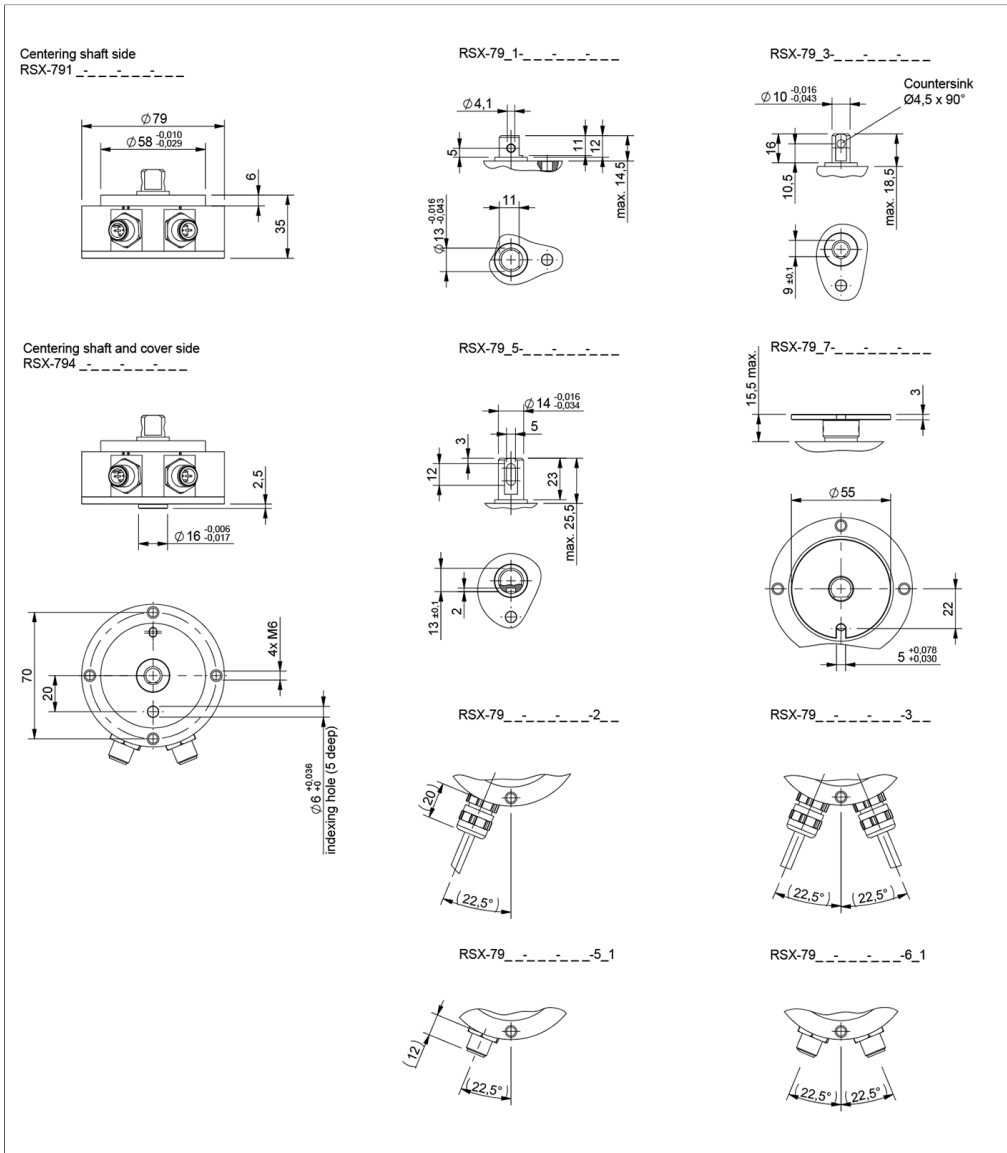
4: Centering shaft and cover side

#### 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.

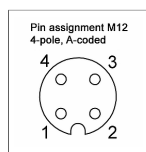
## Technical Data

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 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 (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/mttfd-certificates/">https://www.novotechnik.de/en/downloads/certificates/mttfd-certificates/</a>	

<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

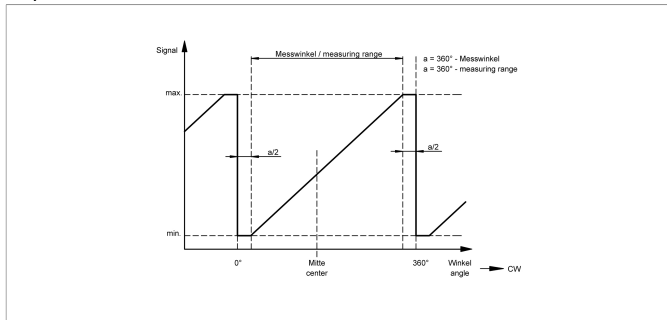
### Connection Assignment

Signal	Connector 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

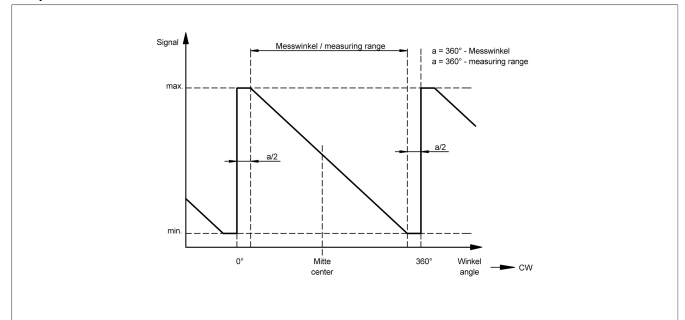


**Technical Data  
Output  
Characteristics**

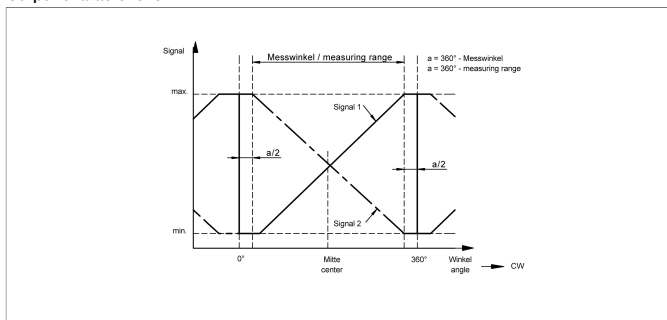
Output characteristic



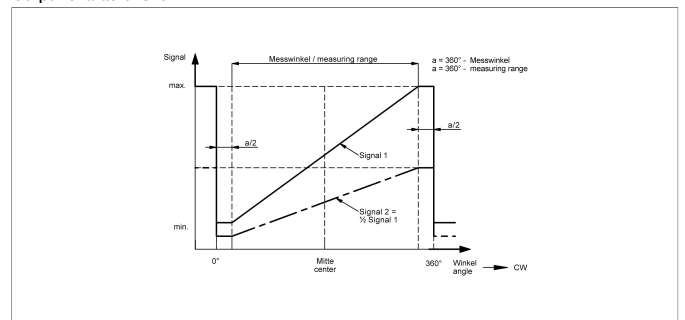
Output characteristic



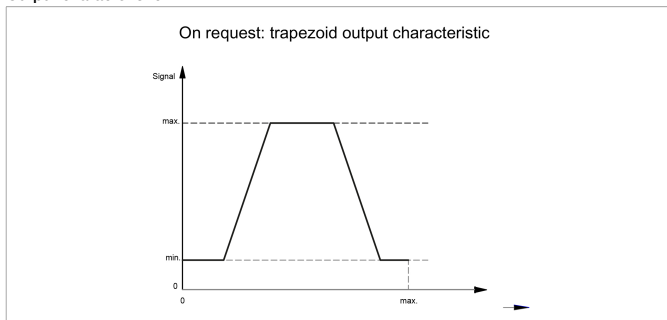
Output characteristic



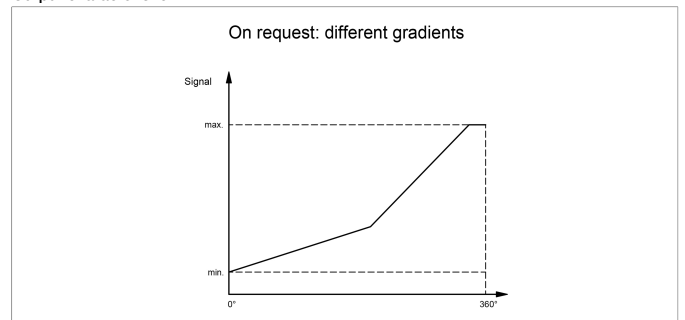
Output characteristic



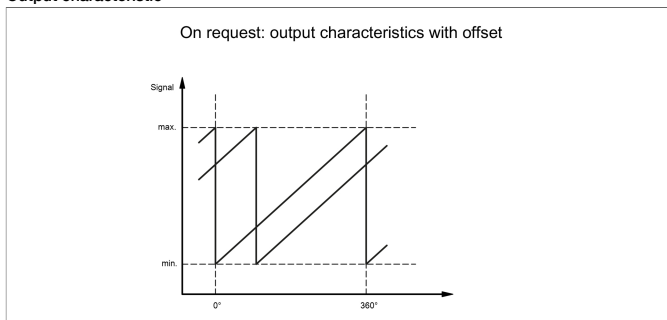
Output characteristic



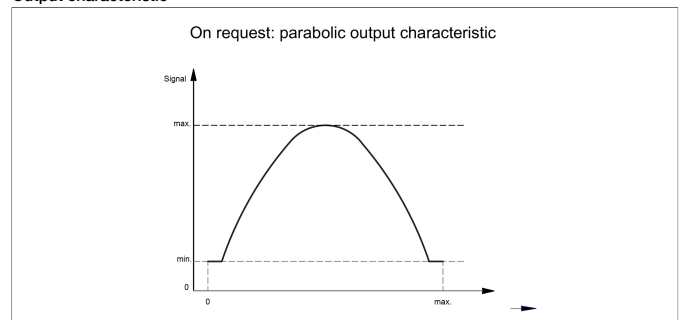
Output characteristic



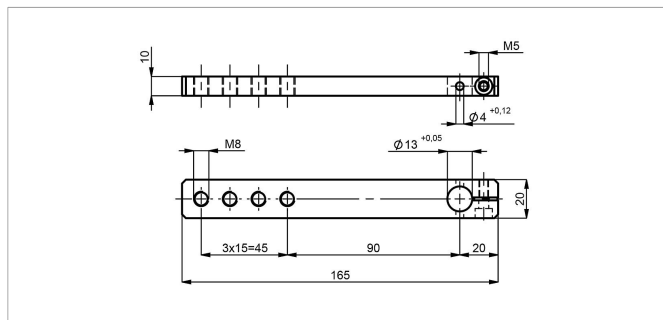
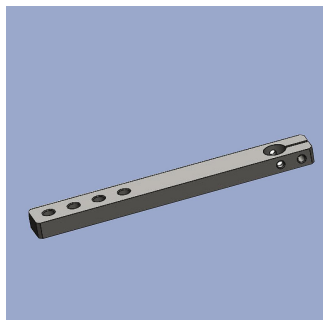
Output characteristic



Output characteristic



## Sensor Mounting

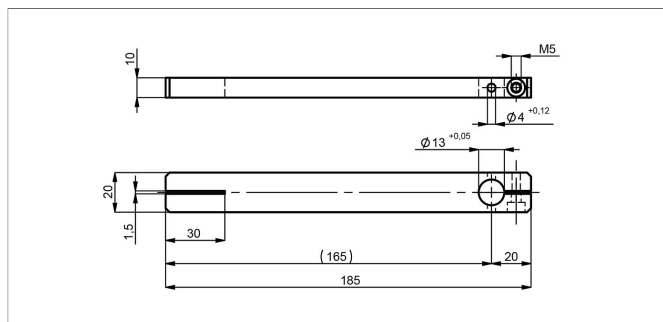
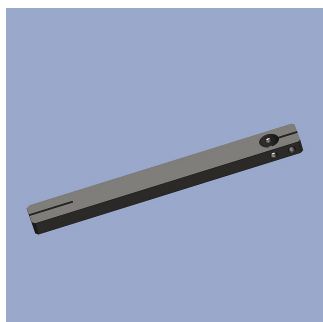


### Z-IPX-M01

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

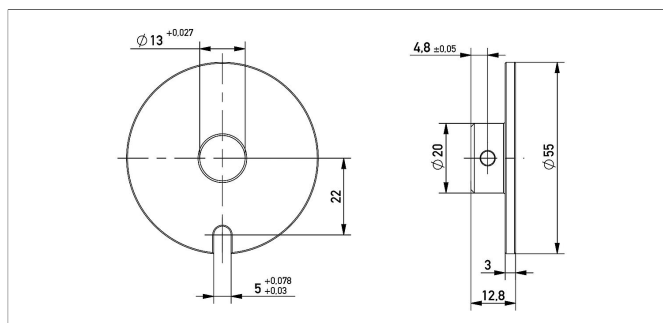
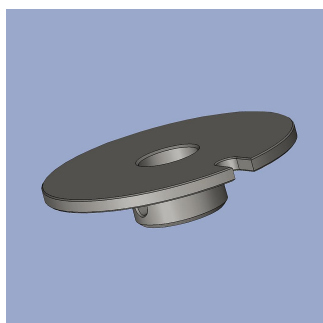


### Z-IPX-M11

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

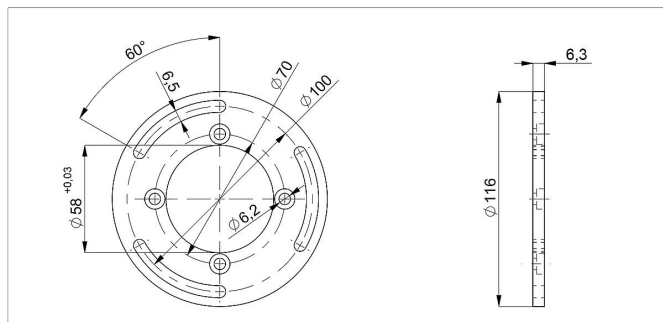
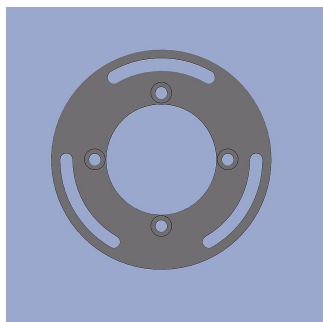


### Z-IPX-M21

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



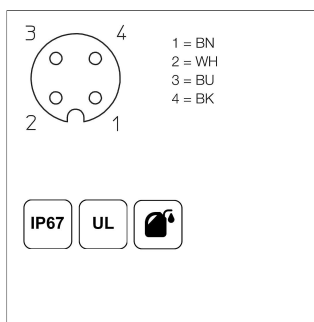
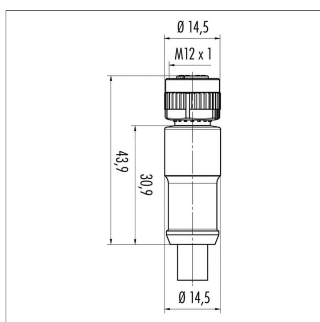
### Z-IPX-M31

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

Material Aluminium, anodized

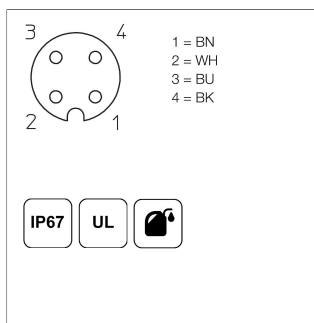
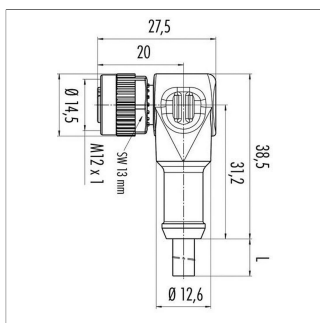
P/N	Type
400105432	Z-IPX-M31

## 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>

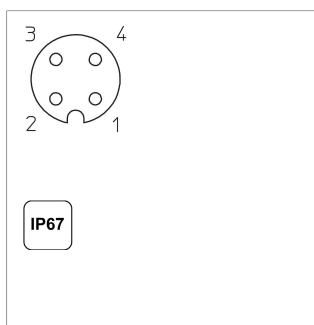
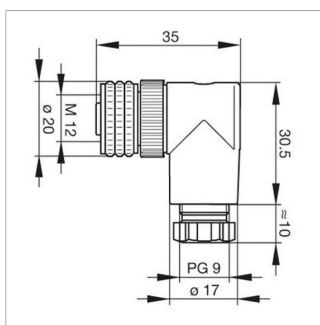
P/N	Type	Length
400056135	EEM-33-35	2 m
400056136	EEM-33-36	5 m
400056137	EEM-33-37	10 m



**EEM-33-38/39/40**  
M12x1 Mating female connector, 4-pin, angled, A-coded, with molded cable, not shielded, IP67, open ended

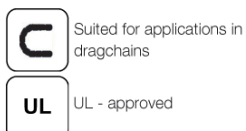
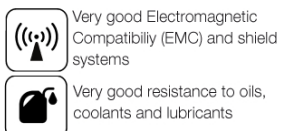
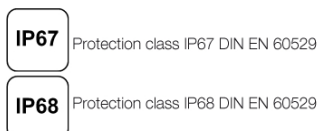
Plug housing PA  
Cable sheath PUR, Ø = max. 6 mm, -40 ... +85°C (fixed)  
Lead wires PP, 0.34 mm<sup>2</sup>

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



Novotechnik  
Messwertaufnehmer OHG  
P.O.Box 4220  
73745 Ostfildern (Germany)  
Horbstrasse 12  
73760 Ostfildern (Germany)  
Phone +49 711 4489-0  
Fax +49 711 4489-118  
info@novotechnik.de  
www.novotechnik.de



© Jan 7, 2020

The specifications contained in our datasheets are intended solely for informational purposes. The documented specification values are based on ideal operational and environmental conditions and can vary significantly depending on the actual customer application. Using our products at or close to one or more of the specified performance ranges can lead to limitations regarding other performance parameters. It is therefore necessary that the end user verifies relevant performance parameters in the intended application. We reserve the right to change product specifications without notice.