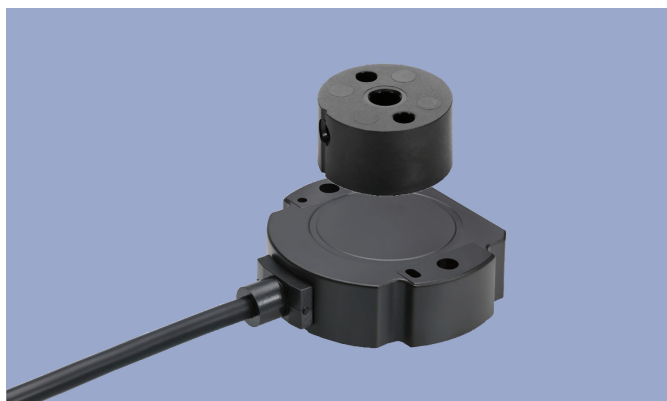
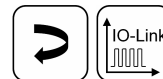


**NOVOHALL  
Rotary Sensor  
Touchless**

**RFC-4800**

IO-Link

**Industrial**



**Special Features**

- Touchless hall technology
- Electrical range up to 360°
- 2 part design, mechanically decoupled
- High protection class IP67, IP68, IP69
- Resolution 14 bit
- Wear-free
- Temperature range -40 °C to +105 °C
- Optimized for use in industrial applications
- Other configurations see separate data sheets

**Applications**

- Manufacturing Engineering (textile machinery, packaging machinery, sheet metal and wire machinery)
- Automation technology
- Medical Engineering

The 2 part design consisting of sensor and magnetic position marker offers great flexibility when mounting. The absence of shaft and bearing makes the assembly much less sensitive to axial and radial application tolerances - separate couplings are obsolete. Measurements can be made transmissively through any non-ferromagnetic material.

The sensor is perfectly suitable for use in harsh environmental conditions through the completely encapsulated electronics.

**Description**

Material	Housing: high grade, temperature resistant plastic
Mounting	With 2 pan head screws M4x20 (included in delivery)
Fastening torque of mounting	250 Ncm
Electrical connection	Cable 4x 0.5 mm <sup>2</sup> (AWG 20), TPE, unshielded / Connector M12x1, A-coded with cable L = 0.15 m

**Mechanical Data**

Dimensions	See dimension drawing
Mechanical travel	360° continuous
Weight (w/o connection)	approx. 50 g

## Ordering Specifications

**Ordering Specifications**

Preferred types printed in bold

- Delivery time up to 25 pcs. within 10 working days EXW
- Best low-volume pricing

**Interface**  
A: IO-Link

**Interface parameters**  
11: 1x position, rising cw  
Other process data such as speed, revolution counter or cams on request

**Electrical connection**  
252: Cable, 4-pole, unshielded, L = 1 m  
256: Cable, 4-pole, unshielded, L = 3 m  
260: Cable, 4-pole, unshielded, L = 5 m  
270: Cable, 4-pole, unshielded, L = 10 m  
551: Connector M12x1, 4-pin, unshielded, with cable, L= 0.15 m  
Cable versions and assembled connectors on request

**R F C - 4 8 5 2 - 2 1 4 - A 1 1 - 2 5 2**

Series

Mechanical version  
4851: Elongated hole mounting  
4852: Round hole mounting

Resolution  
14: 14 bits

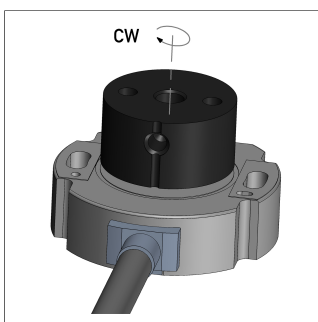
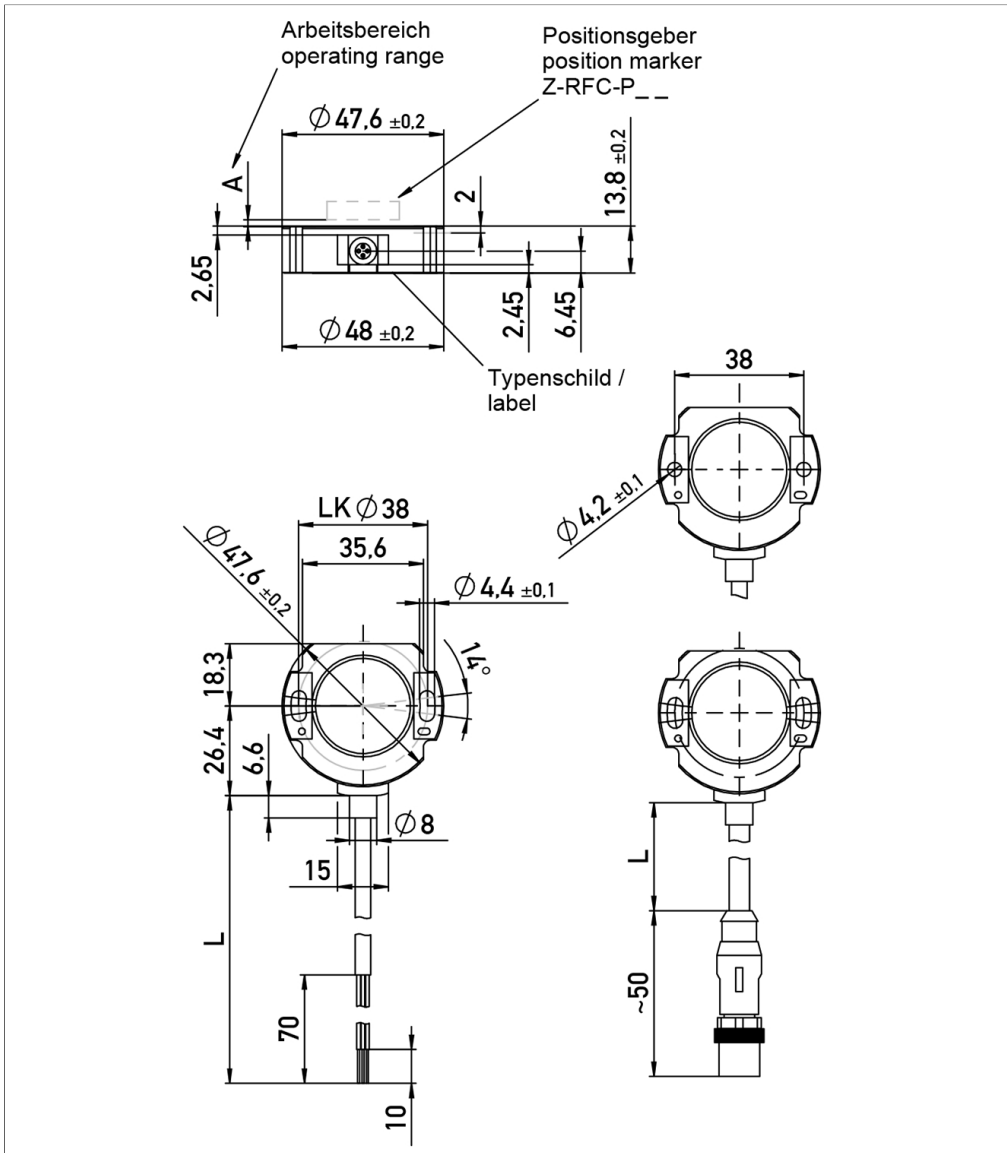
Interface  
2: Digital Interface

### Accessories included in delivery

- 2x Pan head screws M4x20

**Drawing**

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

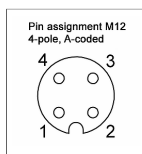


When the marking of the position marker is pointing towards the cable, the sensor output is near the electrical center position.

<b>Type</b>	<b>RFC-48 _-2_-A_-_-_-</b> <b>IO-Link</b>
Measured variables	Position (other process data such as speed, revolution counter or cams on request)
Measuring range	360°
Number of channels	1
Protocol	IO-Link Spec V1.1 to IEC 61131-9, Smart Sensor Profile (V1.0 compatible)
Programmable parameters	Zero point offset, averaging, rotating direction
Diagnosis	activated (in case of error, output signal is outside of the plausible signal range)
Resolution position (across 360°)	14 bits
Update rate (output)	1 kHz
Transfer rate	COM 3 (230.4 kBaud)
Frame type	2.2
Minimum cycle time	1 ms
Independent linearity	≤ ±0.5 %FS
Repeatability	≤ ±0.36°
Hysteresis	≤ ±0.36°
Temperature error	±0.2 %FS
Supply voltage Ub	24 VDC (18 ... 30 VDC)
Current consumption w/o load	≤ 50 mA
Polarity protection	yes (supply lines)
Short circuit protection	yes (output vs. GND and supply voltage up to 40 VDC)
Overvoltage protection	35 VDC (permanent)
Insulation resistance (500 VDC)	≥ 10 MΩ
Cross section	0.5 mm <sup>2</sup> (AWG 20)
<b>Environmental Data</b>	
Max. operational speed	Mechanically unlimited
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 DIN EN 60529	IP67 / IP68 / IP69, IP67 (connector M12)
Operating temperature	-40 ... +105°C, -25 ... +85°C (connector M12)
Life	Mechanically unlimited
Functional safety	If you need assistance in using our products in safety-related systems, please contact us
MTTF (IEC 60050)	810 years
Traceability	Serial number on type labeling: production batch of the sensor assembly and relevant sensor components
<b>EMC Compatibility</b>	
EN 61000-4-2 ESD (contact/air discharge)	4 kV, 8 kV
EN 61000-4-3 Electromagnetic fields (RFI)	10 V/m
EN 61000-4-4 Fast transients (burst)	2 kV
EN 61000-4-6 Cond. disturbances (HF fields)	10 V eff.
EN 55016-2-3 Radiated disturbances	Industrial and residential area

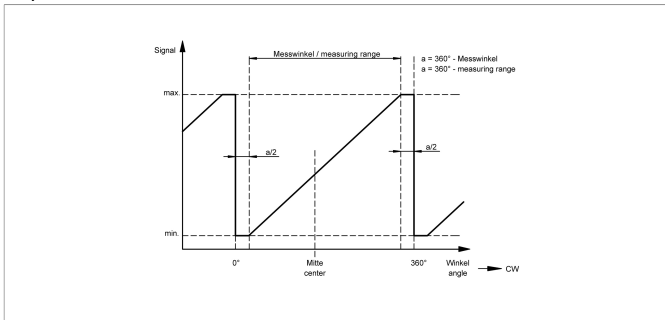
**Connection Assignment**

Signal	Cable code 2_ _	Connector code 5_ _
Supply voltage Ub (L+)	BN	Pin 1
GND (L-)	WH	Pin 3
C/Q	YE	Pin 4
Do not connect (alt. GND)	GN	Pin 2



## Technical Data Output Characteristics

### Output characteristic



## Position Markers

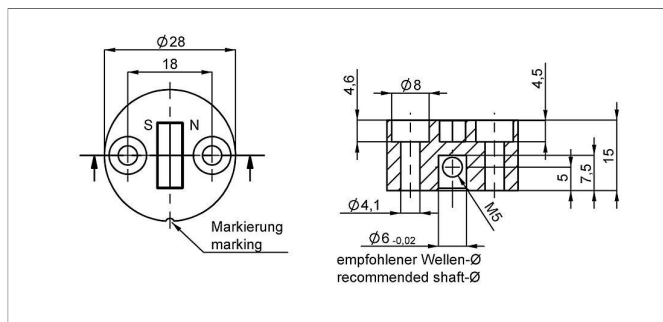


### Z-RFC-P02

Position marker for frontal fixation with 2 cylinder head screws M4x20 (with microencapsulation) or with locking pin (both included in delivery).

Material PF  
Max. permitted  $\pm 3$  mm  
radial offset

P/N	Pack. unit [pcs]
40005661	1
400056080	25

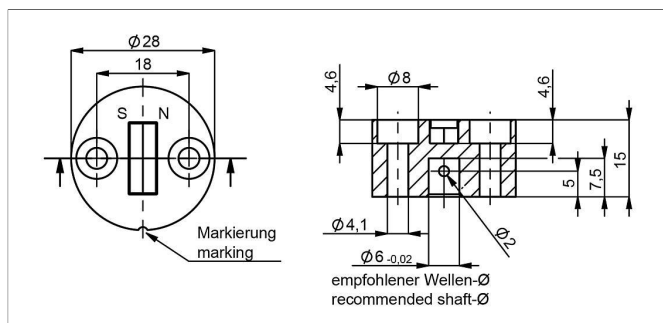


### Z-RFC-P08

Position marker for fixation with threaded pin M5 (included in delivery).

Material PF  
Max. permitted  $\pm 3$  mm  
radial offset

P/N	Pack. unit [pcs]
400056070	1
400056084	25

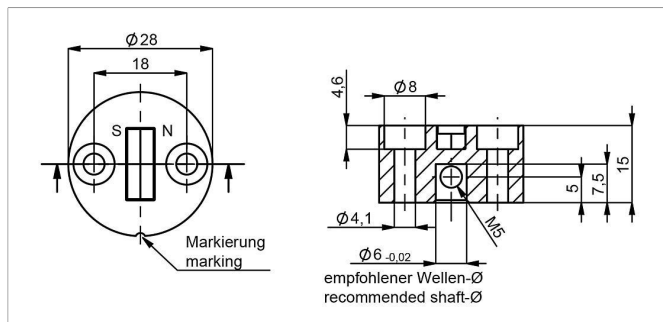


### Z-RFC-P41

Position marker for frontal fixation with 2 cylinder head screws M4x20 (with microencapsulation) or with locking pin (both included in delivery).

Material PF  
Max. permitted  $\pm 3$  mm  
radial offset

P/N	Pack. unit [pcs]
400105037	1
400105038	25



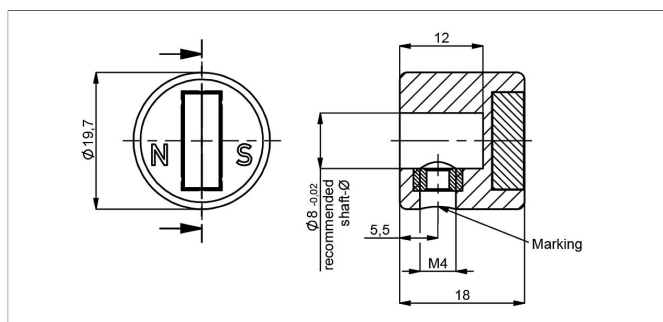
### Z-RFC-P47

Position marker for frontal fixation with 2 cylinder head screws M4x20 (with microencapsulation) or with threaded pin M5 (both included in delivery).

Material PF  
Max. permitted  $\pm 3$  mm  
radial offset

P/N	Pack. unit [pcs]
400105039	1
400105040	25

## Position Markers



### Z-RFC-P23

Position marker for fixation with threaded pin M4 (included in delivery)

Caution: For orientation of the output characteristic please follow the user manual of the position marker!

Material PA6-GF

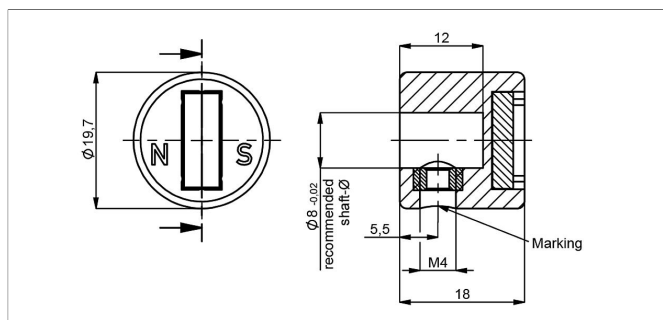
Max. permitted  $\pm 3$  mm

radial offset

P/N	Pack. unit [pcs]
400056074	1
400056085	25

400056074

400056085



### Z-RFC-P43

Position marker for fixation with threaded pin M4 (included in delivery)

Caution: For orientation of the output characteristic please follow the user manual of the position marker!

Material PA6-GF

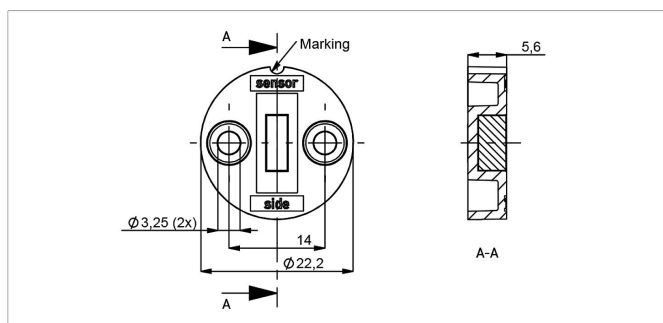
Max. permitted  $\pm 3$  mm

radial offset

P/N	Pack. unit [pcs]
400105041	1
400105042	25

400105041

400105042



### Z-RFC-P30

Position marker for frontal fixation with 2 cylinder screws M3x8 (included in delivery).

Material PBT-GF

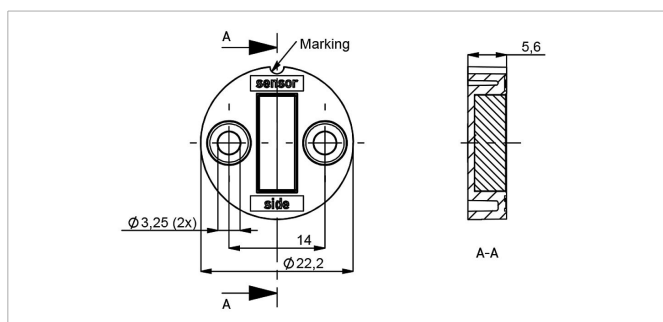
Max. permitted  $\pm 1.5$  mm

radial offset

P/N	Pack. unit [pcs]
400056086	1
400056087	25

400056086

400056087



### Z-RFC-P31

Position marker for frontal fixation with 2 cylinder screws M3x8 (included in delivery).

Material PBT-GF

Max. permitted  $\pm 3$  mm

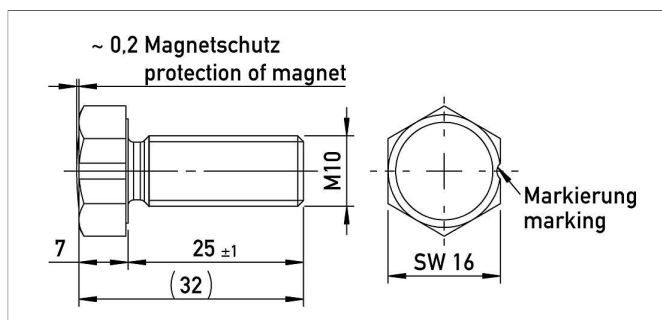
radial offset

P/N	Pack. unit [pcs]
400056088	1
400056089	25

400056088

400056089

## Position Markers



### Z-RFC-P18

Screw position marker M10 x 25 mm, similar  
DIN 933, magnet potted

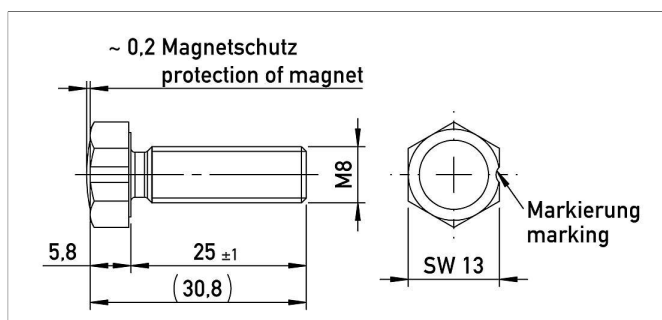
Material Aluminium, anodized

Max. permitted ± 3 mm

radial offset

P/N	Pack. unit [pcs]
-----	------------------

400104756	1
400104757	25



### Z-RFC-P19

Screw position marker M8 x 25 mm, similar  
DIN 933/ISO 4017, magnet potted

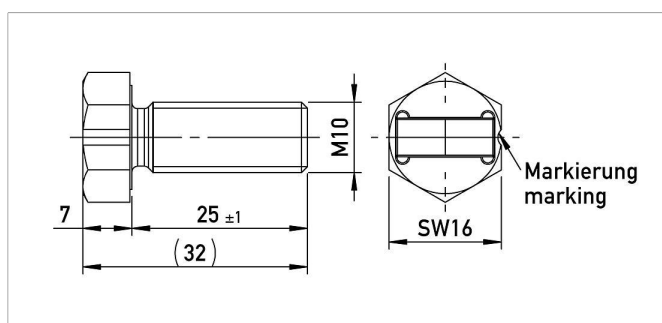
Material Aluminium, anodized

Max. permitted ± 1.5 mm

radial offset

P/N	Pack. unit [pcs]
-----	------------------

400104754	1
400104755	25



### Z-RFC-P20

Screw position marker M10 x 25 mm, similar  
DIN 933

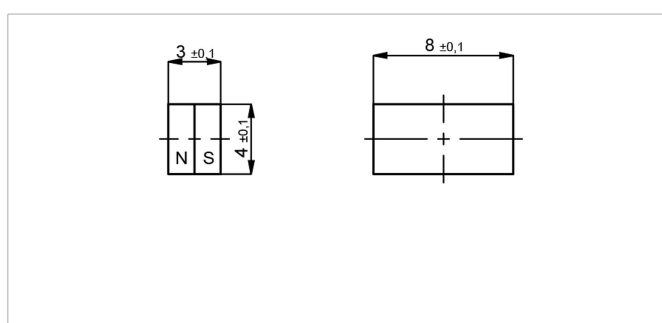
Material Aluminium, anodized

Max. permitted ± 3 mm

radial offset

P/N	Pack. unit [pcs]
-----	------------------

400104758	1
400104759	25



### Z-RFC-P03

Magnet for direct application onto customer's  
shaft (see user manual).

We recommend mounting on non-magnetizable  
materials, otherwise the specified working  
distances will vary (e.g. reduction of approx. 20%  
with axial mounting on a magnetizable shaft).

Max. permitted ± 1.5 mm

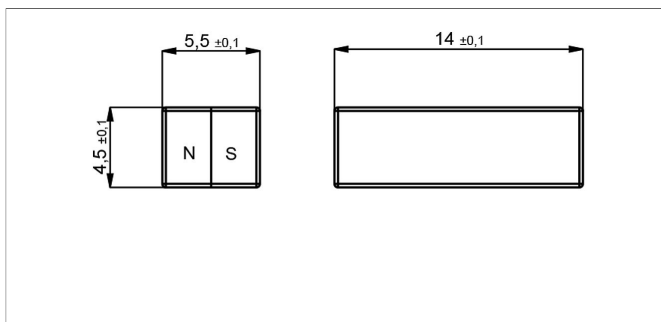
radial offset

P/N	Pack. unit [pcs]
-----	------------------

40005658	1
400056081	50



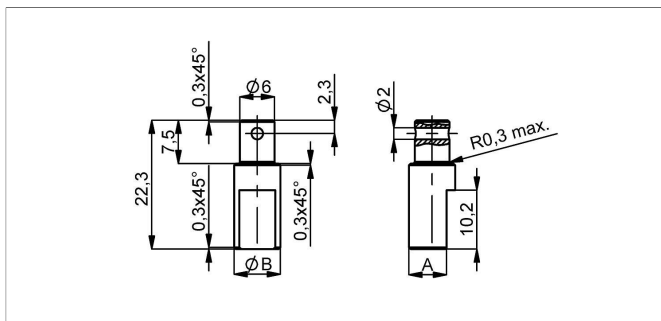
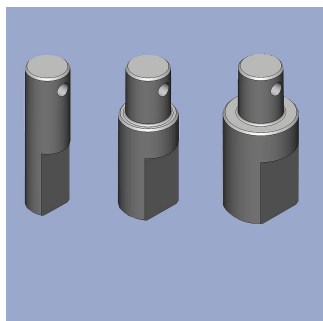
## Position Markers



### Z-RFC-P04

Magnet for direct application onto customer's shaft (see user manual).  
We recommend mounting on non-magnetizable materials, otherwise the specified working distances will vary (e.g. reduction of approx. 20% with axial mounting on a magnetizable shaft).  
Max. permitted radial offset  $\pm 3$  mm

P/N	Pack. unit [pcs]
40005659	1
400056082	50



### Z-RFC-S01/S02/S03

Shaft adapter for fixation at position marker Z-RFC-P02/P41 with locking pin

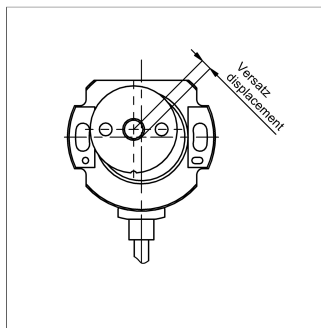
P/N	Type	ØB / A [mm]
400056206	Z-RFC-S01	6 / 4.5
400056207	Z-RFC-S02	8 / 6.5
400056208	Z-RFC-S03	10 / 8.5

## Position Markers

### Working Distances Position Markers [mm] - One-channel Versions

Z-RFC-P02 / P04 / P08 Z-RFC-P20 / P23 / P31	Z-RFC-P41 / P43 / P47	Z-RFC-P03 / P30	Z-RFC-P18	Z-RFC-P19	Z-RFC-P22
2.3 ... 5	0 ... 2.7	0.7 ... 2.2	0 ... 4.5	0 ... 2.2	4.4 ... 9.2

### Lateral Magnet Offset

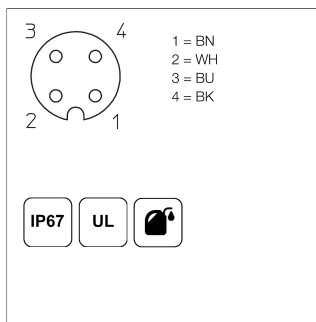
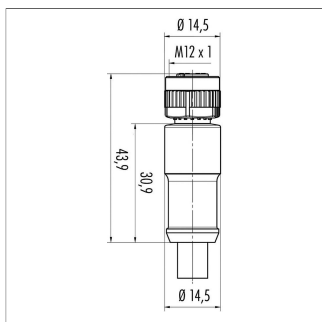


Lateral magnet offset will cause additional linearity error. The angle error, which is caused by radial displacement of sensor and position marker depends on the used position marker or magnet.

### Additional Linearity Error at Radial Displacement - One-channel Versions

Z-RFC-P02 / P04 / P08 Z-RFC-P20 / P23 / P31	Z-RFC-P41 / P43 / P47	Z-RFC-P03 / P30	Z-RFC-P18	Z-RFC-P19	Z-RFC-P22
0.5 mm: $\pm 0.4^\circ$	0.5 mm: $\pm 0.4^\circ$	0.5 mm: $\pm 1.4^\circ$	0.5 mm: $\pm 0.7^\circ$	0.5 mm: $\pm 1.3^\circ$	1.0 mm: $\pm 0.8^\circ$
1.0 mm: $\pm 1.1^\circ$	1.0 mm: $\pm 1.1^\circ$	1.0 mm: $\pm 3.7^\circ$	1.0 mm: $\pm 1.3^\circ$	1.0 mm: $\pm 2.6^\circ$	2.0 mm: $\pm 1.8^\circ$
2.0 mm: $\pm 3.5^\circ$	2.0 mm: $\pm 3.5^\circ$	2.0 mm: -	2.0 mm: $\pm 3.3^\circ$	2.0 mm: -	4.0 mm: $\pm 5.4^\circ$

## 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

**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

 Suited for applications in dragchains

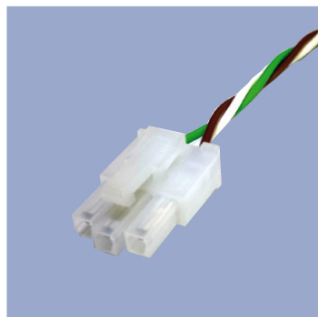
**UL** UL - approved

 CAN-Bus

## Connecting Options on request



- M12 connector**
- Customized lengths
  - 3-, 4-, 6- and 8-pole versions
  - Protection class IP68
  - Ordering codes of standard versions see ordering specifications



- Molex Mini Fit jr.**
- Customized length and lead wires
  - 3-, 4- and 6-pole versions
  - On request



- Tyco AMP Super Seal**
- Pin- and bushing housing
  - Customized lengths
  - 3-, 4- and 6-pole versions
  - Protection class IP67
  - On request



- Molex Mini Fit jr.**
- Customized length and lead wires
  - 3-, 4- and 6-pole versions
  - On request



- Deutsch DTM 04**
- Pin- and bushing housing
  - Customized lengths
  - 3-, 4- and 6-pole versions
  - Protection class IP67
  - On request



- ITT Cannon Sure Seal connector**
- Customized lengths
  - 3-, 4- and 6-pole versions
  - Protection class IP67
  - On request

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info@novotechnik.de  
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