

Project item
Please contact our technical support
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<https://www.novotechnik.com/salessupport.php>

NOVOHALL
Rotary Sensor
Touchless

RFC-4800
SPI

Industrial



Special Features

- Touchless hall technology
- Electrical range 360°
- 2 part design, mechanically decoupled
- Wear-free
- High protection class IP67, IP68, IP69
- Resolution up to 14 bits
- Temperature range -40 °C to +85 °C
- 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 5x 0.14 mm ² (AWG 26), PUR, shielded

Mechanical Data

Dimensions	See dimension drawing
Mechanical travel	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

R F C - 4 8 0 2 - 2 1 4 - 8 3 1 - 3 0 2

Series

Mechanical version
4801: Elongated hole mounting
4802: Round hole mounting

Resolution
14: 14 bits

Interface
2: Digital Interface

Interface
8: Serial Peripheral Interface (SPI)

Interface parameters
31: Ub = 5 VDC, Binary code, rising cw

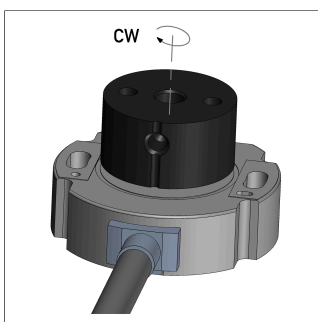
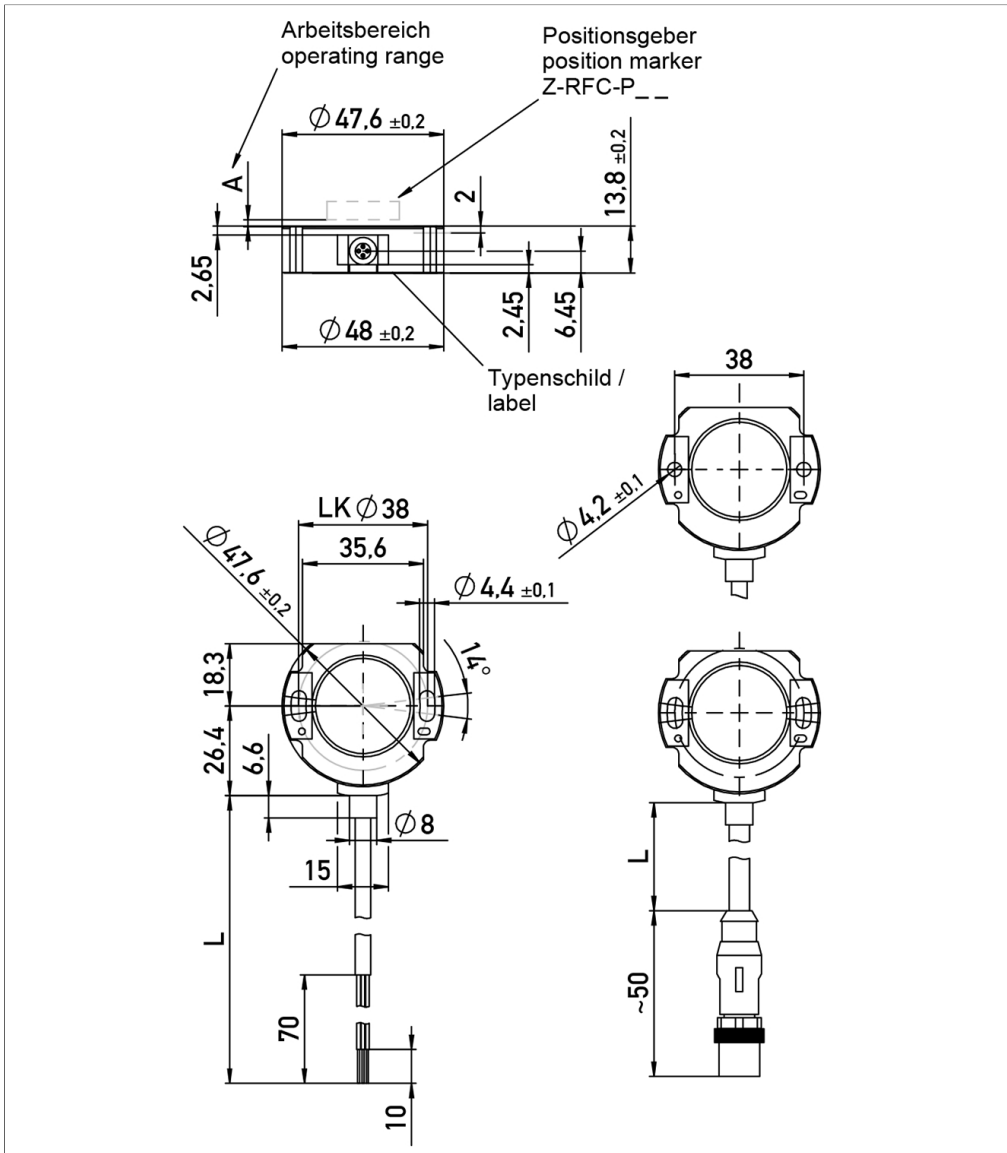
Electrical connection
302: Cable, 5-pole, shielded, L = 1 m
Cable versions and assembled connectors on request

Accessories included in delivery

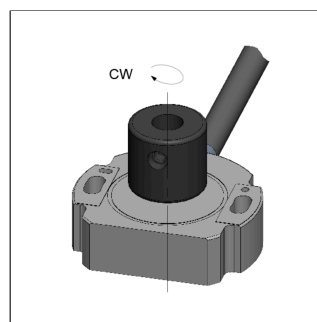
- 2x Pan head screws M4x20

Drawing

CAD data see
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 (index position).



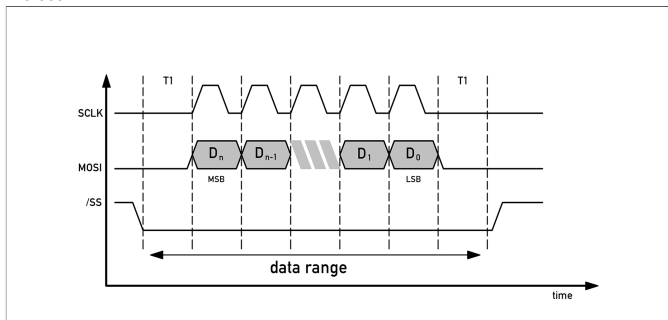
Only Z-RFC-P23/P43:
When the marking of the position marker is pointing away from the cable, the sensor output is near the electrical center position (index position).

Technical Data

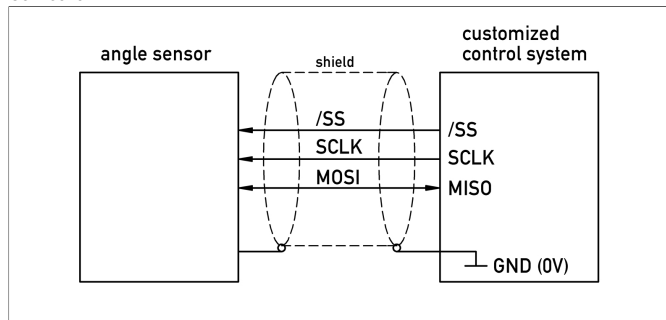
Type	RFC-48 _-2_-8_-_-_- SPI
Protocol	SPI
Coding	Binary
Level SCLK, MOSI, /SS	TTL level (see manual Singleturn SPI Detail)
Update rate (internal)	5 kHz
Resolution (across 360°)	14 bits
Measuring range	360°
Independent linearity	≤ ±0.5 %FS
Repeatability	typ. ≤ ±0.1°
Hysteresis	≤ ±0.1°
Temperature error	±0.625 %FS
Supply voltage Ub	5 VDC (4.5 ... 5.5 VDC)
Current consumption w/o load	typ. 15 mA
Polarity protection	yes (supply lines)
Short circuit protection	yes (vs. GND and supply voltage)
Max. clock rate	400 kHz
Insulation resistance (500 VDC)	≥ 10 MΩ
Environmental Data	
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
Operating temperature	-40 ... +85°C
Life	Mechanically unlimited
Functional safety	If you need assistance in using our products in safety-related systems, please contact us
MTTF (IEC 60050)	2720 years
Traceability	Serial number on type labeling: production batch of the sensor assembly and relevant sensor components
Conformity/Approval	CE, UKCA see https://www.novotechnik.de/en/downloads/certificates/declarations-of-conformity-eu/uk WEEE see https://www.novotechnik.de/en/downloads/certificates/eu-directive-weee/
EMC Compatibility	
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)	1 kV
EN 61000-4-6 Cond. disturbances (HF fields)	10 V eff.
EN 61000-4-8 Magnetic fields	3 A/m
EN 55011 Noise radiation	Class B
FS = Full scale: Signal span according to electrical measuring range	
Connection Assignment	
Signal	Cable code 3_ _
Supply voltage Ub	GN
GND	BN
MOSI / MISO	YE
SCLK	GY
/SS (slave select)	WH

Technical Data Output Characteristics

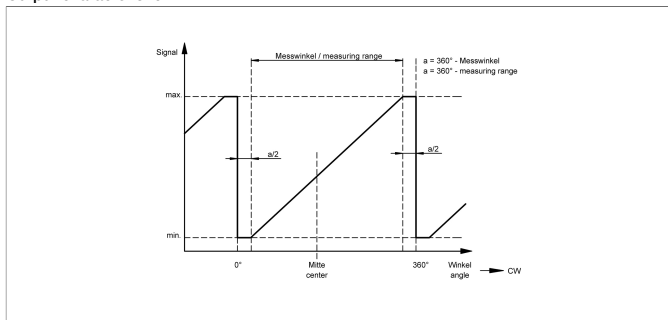
Protocol



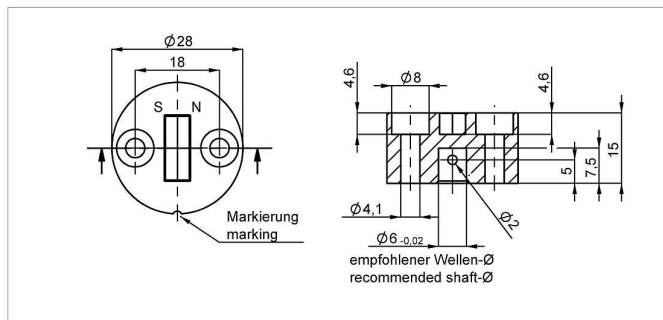
Connection



Output characteristic



Position Markers

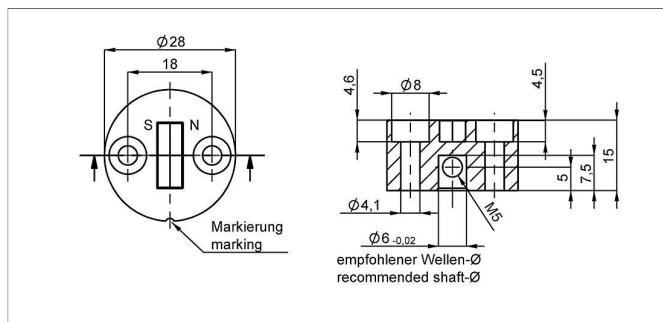
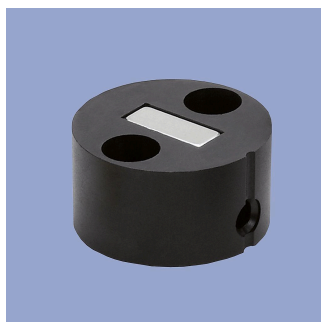


Z-RFC-P02

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

Material PF
Max. permitted ± 3 mm
radial offset
Operating temp. $-40 \dots +125^{\circ}\text{C}$

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

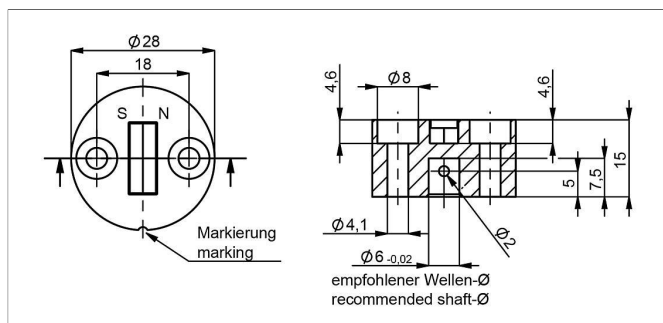


Z-RFC-P08

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

Material PF
Max. permitted ± 3 mm
radial offset
Operating temp. $-40 \dots +125^{\circ}\text{C}$

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

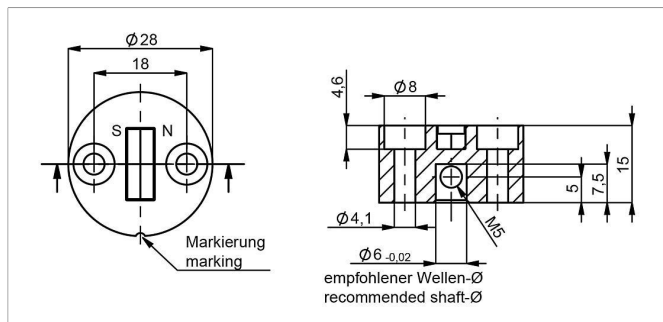


Z-RFC-P41

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

Material PF
Max. permitted ± 3 mm
radial offset
Operating temp. $-40 \dots +125^{\circ}\text{C}$

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



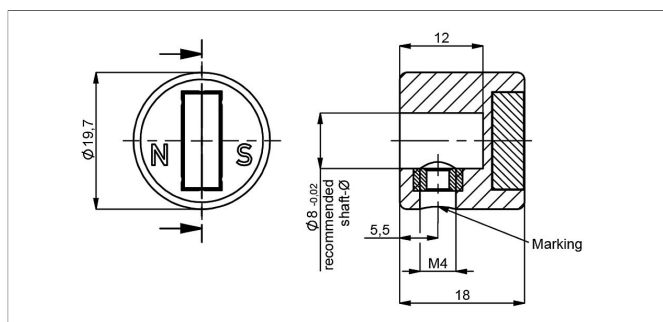
Z-RFC-P47

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

Material PF
Max. permitted ± 3 mm
radial offset
Operating temp. $-40 \dots +125^{\circ}\text{C}$

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!

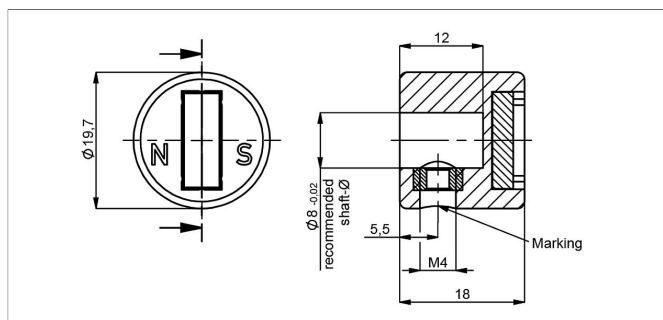
Material PA6-GF

Max. permitted ± 3 mm

radial offset

Operating temp. $-40 \dots +125^{\circ}\text{C}$

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



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!

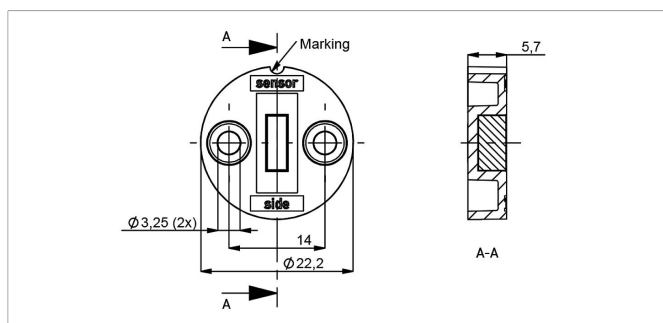
Material PA6-GF

Max. permitted ± 3 mm

radial offset

Operating temp. $-40 \dots +125^{\circ}\text{C}$

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



Z-RFC-P30

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

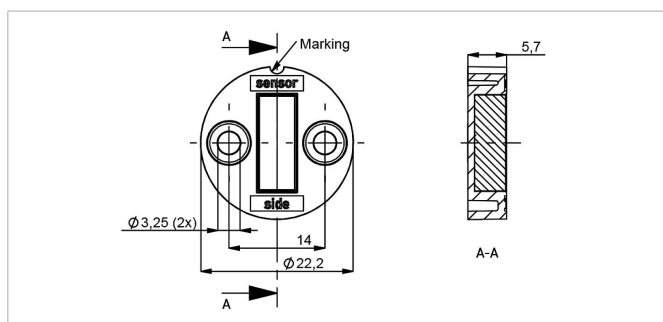
Material PBT-GF

Max. permitted ± 1.5 mm

radial offset

Operating temp. $-40 \dots +125^{\circ}\text{C}$

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



Z-RFC-P31

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

Material PBT-GF

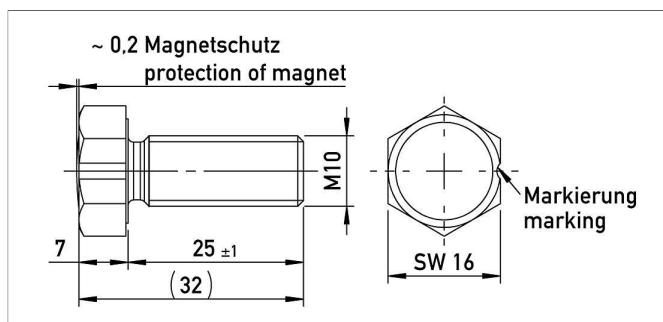
Max. permitted ± 3 mm

radial offset

Operating temp. $-40 \dots +125^{\circ}\text{C}$

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

Position Markers



Z-RFC-P18

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

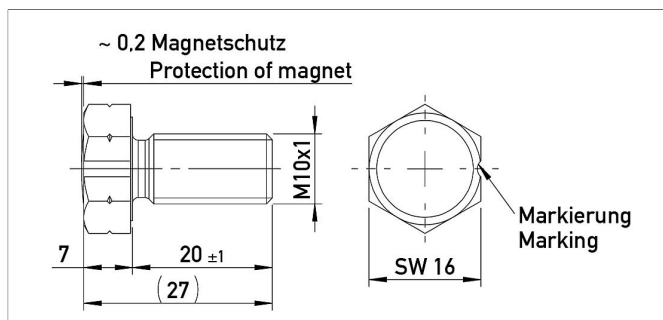
Material Aluminium, anodized

Max. permitted ± 3 mm

radial offset

Operating temp. $-40 \dots +125^\circ\text{C}$

P/N	Pack. unit [pcs]
400104756	1
400104757	25



Z-RFC-P28

Screw position marker M10x1 x 20 mm, similar DIN 933, magnet potted

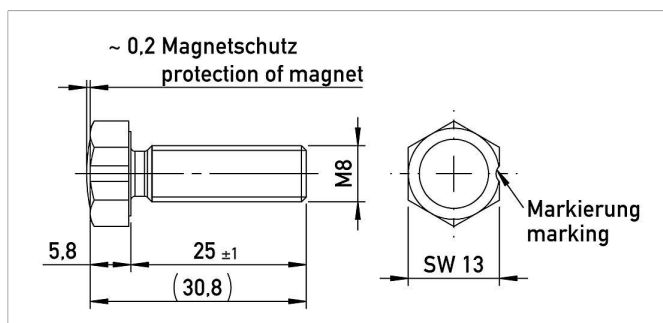
Material Aluminium, anodized

Max. permitted ± 3 mm

radial offset

Operating temp. $-40 \dots +125^\circ\text{C}$

P/N	Pack. unit [pcs]
400108462	1
400108463	25



Z-RFC-P19

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

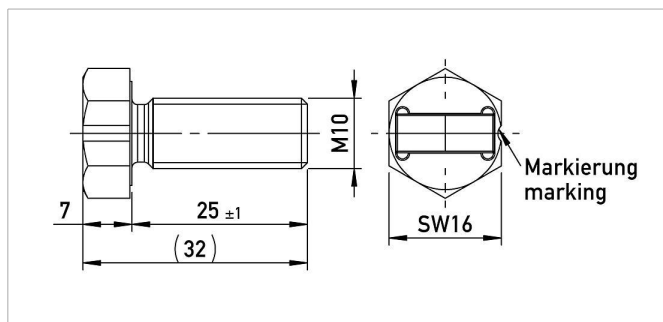
Material Aluminium, anodized

Max. permitted ± 1.5 mm

radial offset

Operating temp. $-40 \dots +125^\circ\text{C}$

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

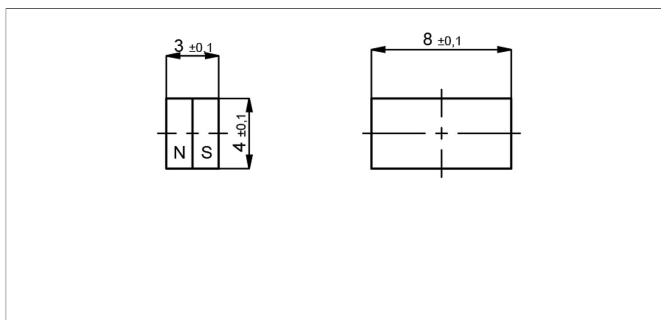
Max. permitted ± 3 mm

radial offset

Operating temp. $-40 \dots +125^\circ\text{C}$

P/N	Pack. unit [pcs]
400104758	1
400104759	25

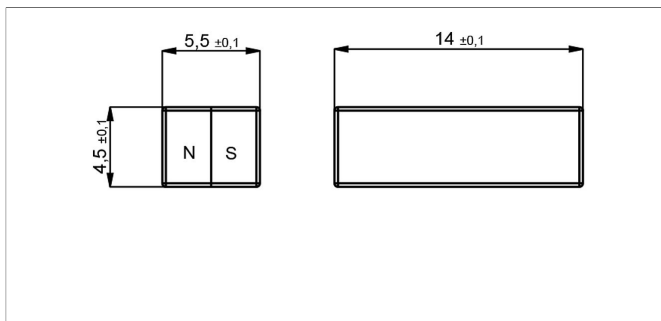
Position Markers



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 radial offset ± 1.5 mm
Operating temp. $-40 \dots +125^\circ\text{C}$

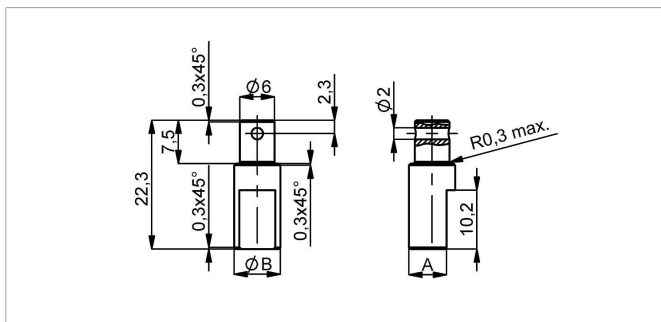
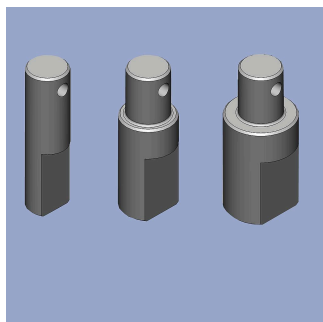
P/N	Pack. unit [pcs]
40005658	1
400056081	50



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 ± 3 mm
Operating temp. $-40 \dots +125^\circ\text{C}$

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

Material SS 1.4305 / AISI 303

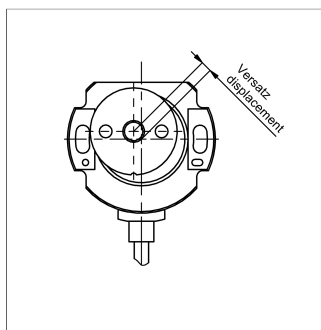
P/N	Type	ØB / A [mm]
400056206	Z-RFC-S01	6 / 4.5
400056207	Z-RFC-S02	8 / 6.5
400056208	Z-RFC-S03	10 / 8.5

Position Markers

Working Distances Position Markers [mm] - Single-channel Versions

Z-RFC-P02 / P04 / P08 Z-RFC-P20 / P23 / P31	Z-RFC-P41 / P43 / P47	Z-RFC-P03 / P30	Z-RFC-P18 / P28	Z-RFC-P19
0 ... 4	0 ... 2.7	0 ... 1.5	0 ... 4.5	0 ... 2.2

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.

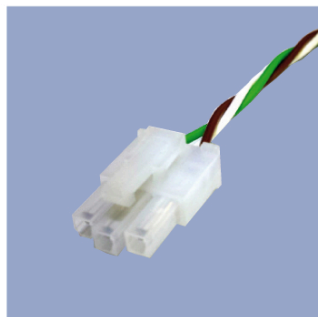
Additional Linearity Error at Radial Displacement - Single-channel Versions

Z-RFC-P02 / P04 / P08 Z-RFC-P20 / P23 / P31	Z-RFC-P41 / P43 / P47	Z-RFC-P03 / P30	Z-RFC-P18 / P28	Z-RFC-P19
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: $\pm 1.1^\circ$	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: $\pm 3.5^\circ$	2.0 mm: $\pm 3.5^\circ$	2.0 mm: -	2.0 mm: $\pm 3.3^\circ$	2.0 mm: -

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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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.