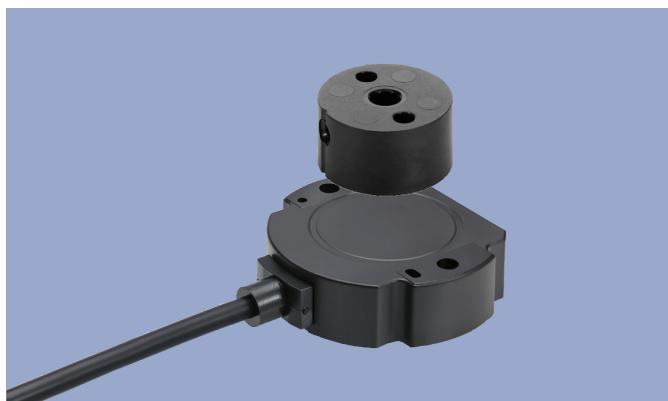
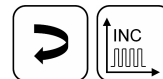


**NOVOHALL
Rotary Sensor
Touchless**

**RFC-4800
Incremental
Mobile Applications**



Special Features

- Touchless hall technology
- Electrical range 360°
- 2 part design, mechanically decoupled
- Wear-free
- High protection class IP67, IP68, IP69
- Resolution up to 12 bits
- Temperature range -40 °C to +85 °C
- For very high rotational speeds
- Other configurations see separate data sheets

Applications

- Mobile working machines (industrial trucks, construction machinery, agricultural and forestry machinery)
- Marine applications

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	Lead wires 0.5 mm ² (AWG 20), PVC / Connector M12x1, A-coded with cable L = 0.15 m / Cable 4x 0.5 mm ² (AWG 20), TPE, unshielded

Mechanical Data

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

Ordering Specifications

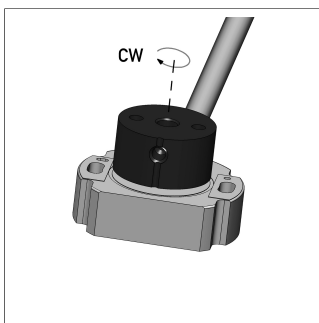
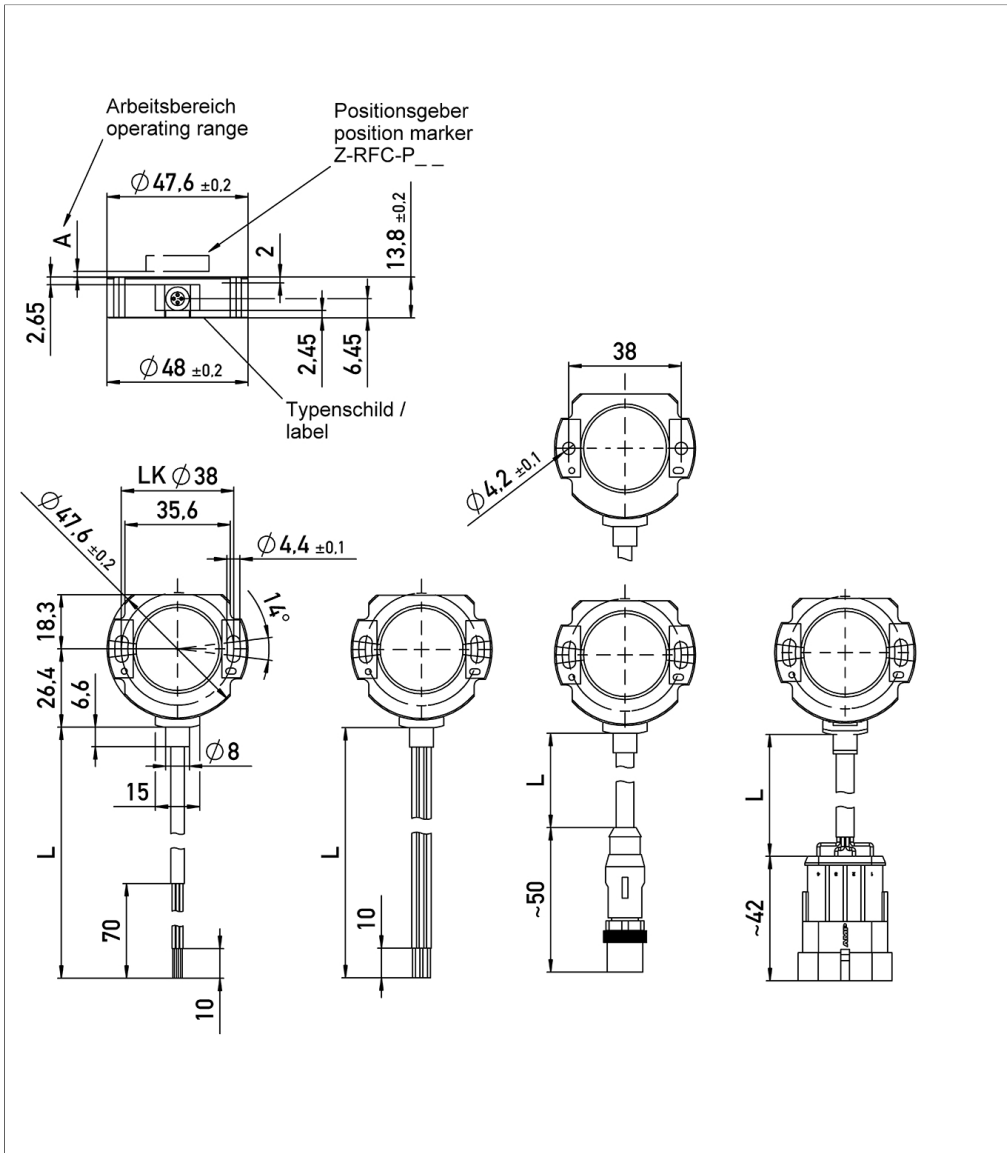
Ordering Specifications				Interface			
<p>Preferred types printed in bold</p> <ul style="list-style-type: none"> • Delivery time up to 25 pcs. within 10 working days EXW • Best low-volume pricing 				<p>5: Incremental Interface A / B / Z</p> <p>Interface parameters Low Speed Mode (minimum edge separation 8 µs) 56: 12/24 VDC supply voltage, output low side, open collector UWW signals instead of ABZ signals for motor commutation on request Absolute position at Power On (Power on Burst) on request</p>			
				<p>Electrical connection</p> <p>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 411: Lead wires 4x L = 0.5 m 551: Connector M12x1, 4-pin, with cable, L= 0.15 m, unshielded Cable versions and assembled connectors on request</p>			
R F C - 4 8 0 2 - 2 1 2 - 5 5 6 - 2 5 2							
<p>Series</p>		<p>Mechanical version 4801: Elongated hole mounting 4802: Round hole mounting</p>		<p>Resolution 12: 1024 ppr - 4096 counts (after quadrature) 11: 512 ppr - 2048 counts (after quadrature) 10: 256 ppr - 1024 counts (after quadrature) 09: 128 ppr - 512 counts (after quadrature) Other resolutions on request</p>		<p>Interface 2: Digital Interface</p>	

Accessories included in delivery

- 2x Pan head screws M4x20

Drawing

CAD data see
www.novotechnik.de/en/download/cad-data/



Rotational direction CW: A leads before B.

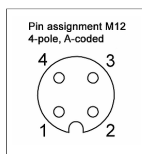
Technical Data

Type	RFC-48__-212-556-__	RFC-48__-211-556-__	RFC-48__-210-556-__	RFC-48__-209-556-__
	Incremental Open Collector			
Outputs	A- / B-			
Level	Open Collector			
Pulses per revolution	1024 ppr	512 ppr	256 ppr	128 ppr
Counts per revolution	4096 after quadrature	2048 after quadrature	1024 after quadrature	512 after quadrature
Minimum edge separation	8 µs			
Min. input frequency of counter input	32 kHz Valid for 128 and 256 ppr: The requirement for the minimum input frequency of counter input is reduced at lower speed (see charts).			
Max. operational speed	580 rpm	3,500 rpm	7,200 rpm	14,400 rpm
Measuring range	360°			
Independent linearity	≤ ±0.5 %FS			
Repeatability	≤ ±0.2°			
Hysteresis	≤ ±0.7°, lower hysteresis on request			
Temperature error	±0.375 %FS			
Supply voltage Ub	12/24 VDC (9 ... 34 VDC)			
Current consumption w/o load	typ. 10 mA			
Overvoltage protection	60 VDC (10 min.)			
Polarity protection	yes (supply lines)			
Short circuit protection	yes (all outputs vs. GND and supply voltage)			
Load outputs vs. supply voltage Ub	20 mA per channel			
Insulation resistance (500 VDC)	≥ 10 MΩ			
Environmental Data				
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 ... +85°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)	1154 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				
ISO 10605 ESD (Handling/Component)	8 kV / 15 kV			
ISO 11452-2 Radiated HF-fields	200 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) Level 3, (2a, 2b, 3a, 3b, 4, 5) Level 4			

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

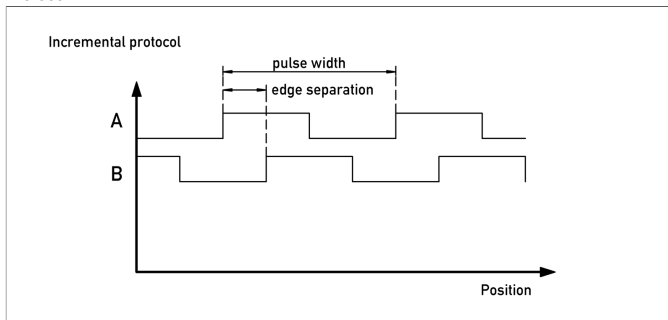
Connection Assignment

Signal	Lead wires code 4__	Connector code 5__	Cable code 2__
A-	BU	Pin 1	GN
Supply voltage Ub	RD	Pin 2	WH
GND	BK	Pin 3	BN
B-	BU/WH	Pin 4	YE

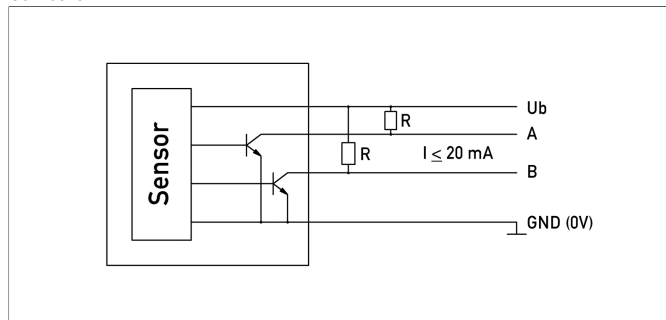


Technical Data

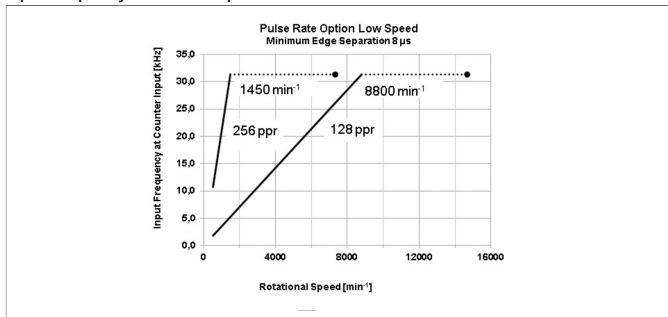
Protocol



Connection



Input Frequency at Counter Input



Position Markers

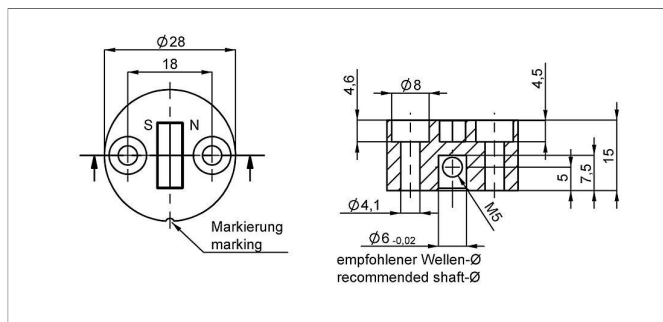


Z-RFC-P02

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

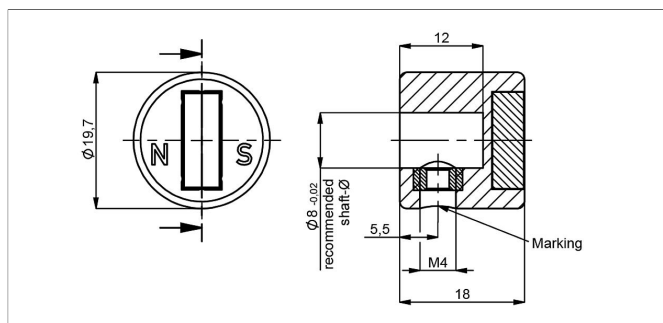


Z-RFC-P08

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



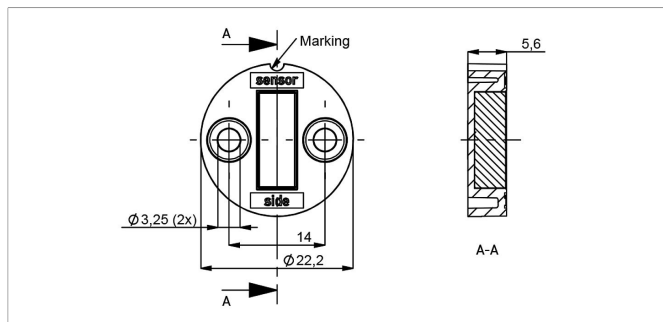
Z-RFC-P23

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



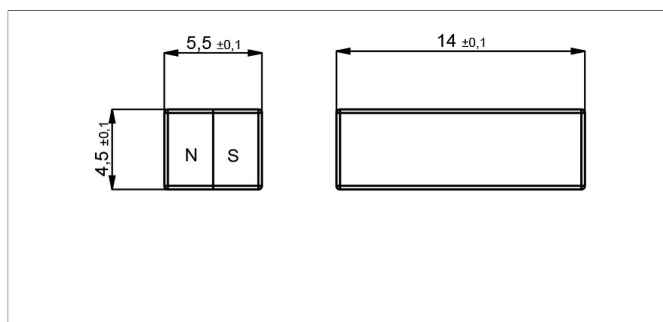
Z-RFC-P31

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

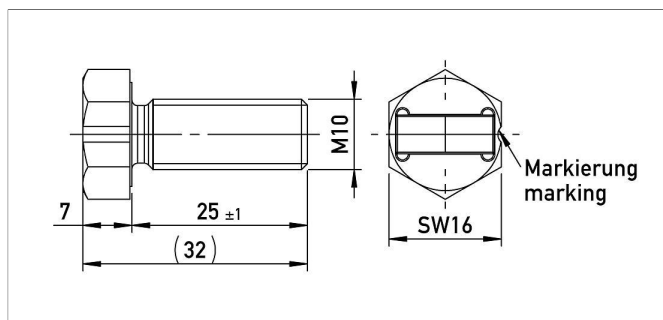
Position Markers



Z-RFC-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. $-40 \dots +125^\circ\text{C}$

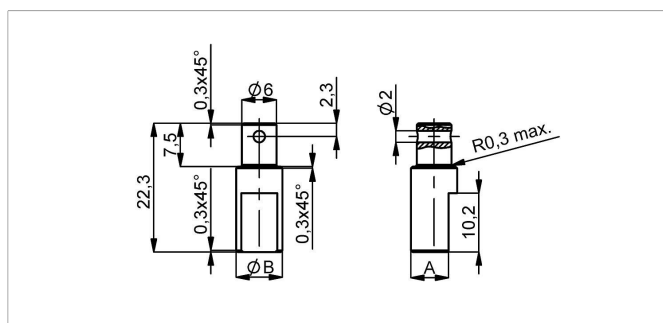
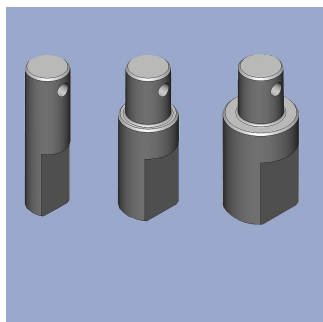
P/N	Pack. unit [pcs]
40005659	1
400056082	50



Z-RFC-P20

Screw position marker M10 x 25 mm, similar DIN 933
Material Aluminium, anodized
Max. permitted radial offset ± 3 mm
Operating temp. $-40 \dots +125^\circ\text{C}$

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



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

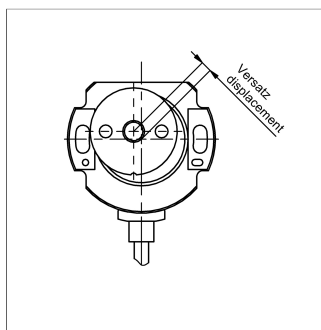
Working Distances Position Markers [mm] - Single-channel Versions

Z-RFC-P02 / P04 / P08

Z-RFC-P20 / P23 / P31

0 ... 1.4

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

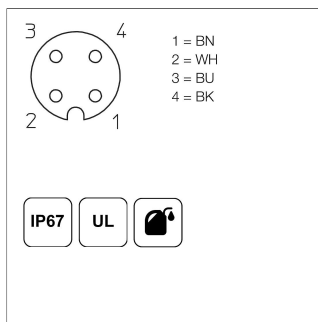
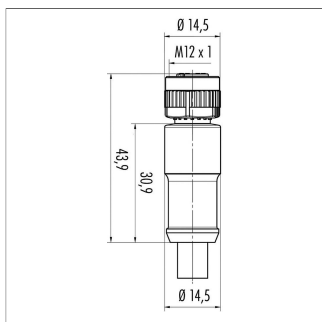
Z-RFC-P20 / P23 / P31

0.5 mm: $\pm 0.4^\circ$

1.0 mm: $\pm 0.7^\circ$

2.0 mm: $\pm 2.2^\circ$

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 mm²


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

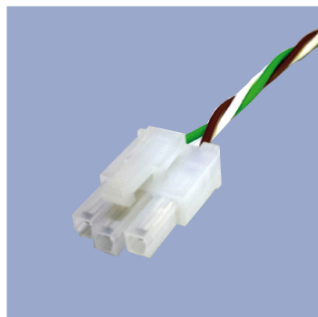
UL UL - approved

 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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