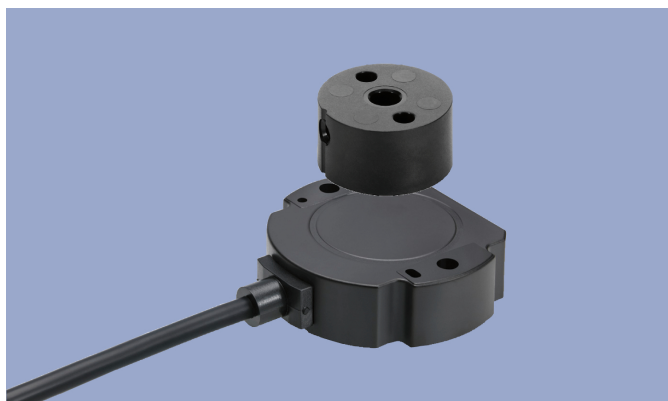


**NOVOHALL
Rotary Sensor
Touchless**

**RFC-4800
Incremental
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 12 bits
- Temperature range -40 °C to +85 °C
- For very high rotational speeds
- 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	Connector M12x1, A-coded with cable L = 0.15 m / Cable 4x 2x 0.25 mm ² (AWG 24), TPE, shielded

Mechanical Data

Dimensions	See dimension drawing
Mechanical travel	continuous
Weight	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

5: Incremental Interface A / B / Z

Interface parameters

Low Speed Mode (minimum edge separation 8 µs)

15: Ub = 5 VDC, output RS422, TTL-compatible

35: Ub = 24 VDC, output RS422, TTL-compatible

39: Ub = 24 VDC, output HTL-compatible, Push-Pull

High Speed Mode (minimal edge separation 0,5 µs)

10: Ub = 5 VDC, output RS422, TTL-compatible

30: Ub = 24 VDC, output RS422, TTL-compatible

34: Ub = 24 VDC, output HTL-compatible, Push-Pull

UWV signals instead of ABZ signals for motor commutation on request

Absolute position at Power On (Power on Burst) on request

Electrical connection

432: Cable, 8-pole, shielded, L = 1 m

436: Cable, 8-pole, shielded, L = 3 m

440: Cable, 8-pole, shielded, L = 5 m

450: Cable, 8-pole, shielded, L = 10 m

531: Connector M12x1, 8-pin, with cable, shielded, L = 0.15 m

Cable versions and assembled connectors on request

R F C - 4 8 0 2 - 2 1 2 - 5 3 5 - 4 3 2

Series

Mechanical version

4801: Elongated hole mounting

4802: Round hole mounting

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

Interface

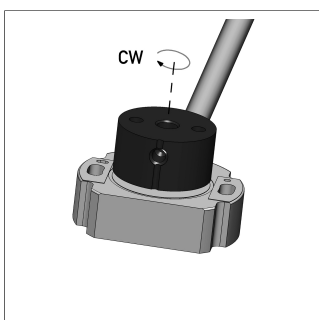
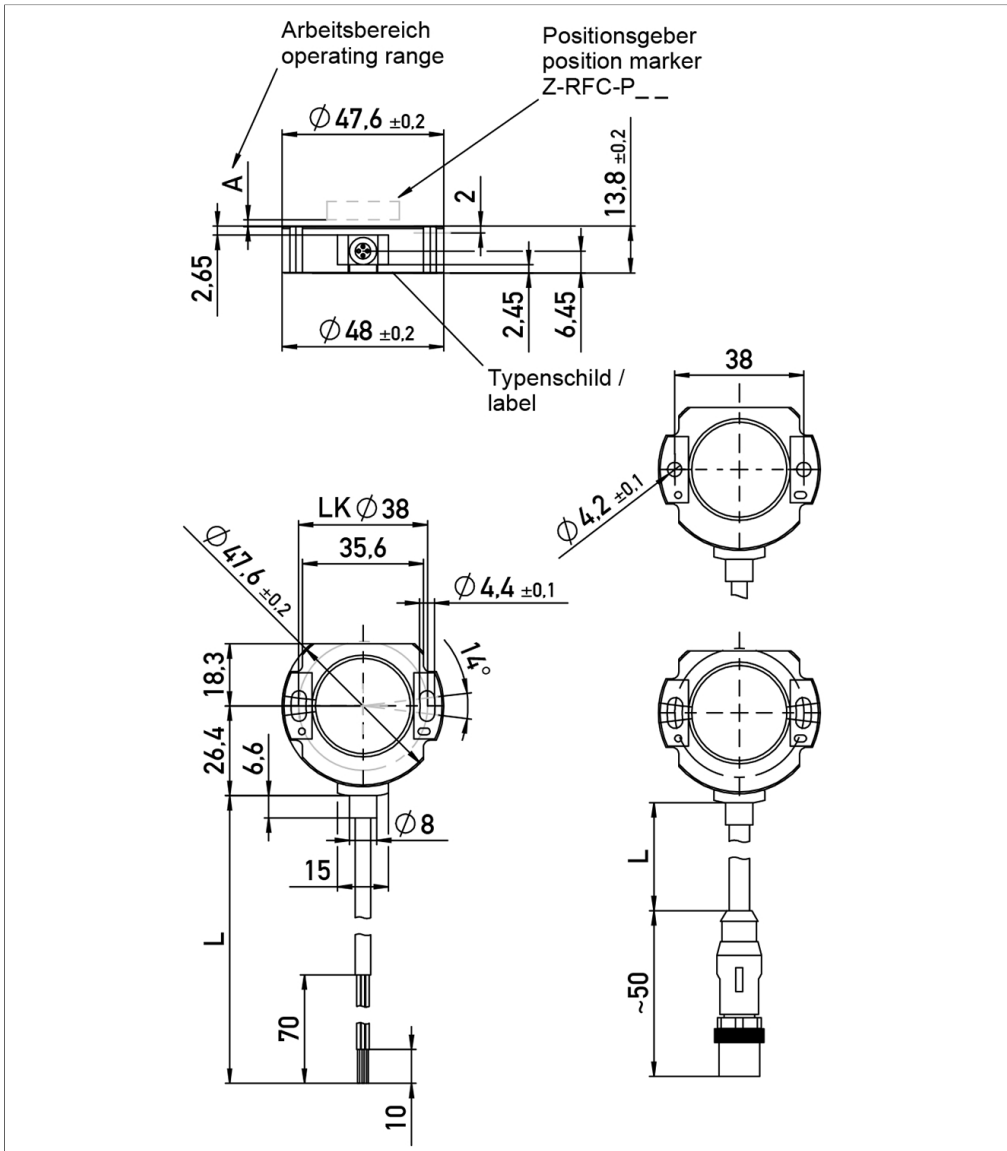
2: Digital Interface

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 away from the cable, the output is in the vicinity of the reference pulse (Z).
Rotational direction CW: A leads before B.

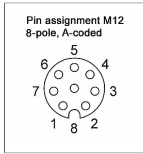
Technical Data

Type	RFC-48__2__51__	RFC-48__2__53__	RFC-48__2__53__
	Supply voltage 5 VDC, TTL	Supply voltage 24 VDC, TTL	Supply voltage 24 VDC, HTL
Measuring range	360°		
Protocol	A+ / A-, B+ / B-, Z+ / Z-		
Level	RS-422, TTL compatible	RS-422, TTL compatible	HTL compatible, Push-Pull
Length Z-pulse	90° electrical, distance between 2 edges A/B		
Pulses per revolution	1024 ppr (other resolutions see next page)		
Counts per revolution	4096 after quadrature		
Minimum edge separation	Low speed: 8 µs, high speed: 0.5 µs		
Max. operational speed	Low speed: 1800 rpm, high speed: 29000 rpm		
Min. input frequency of counter input	Low speed: 32 kHz, high speed: 500 kHz		
Independent linearity	typ. ±0.5 %FS		
Repeatability	≤ ±0.2°		
Hysteresis	≤ ±0.7°, lower hysteresis on request		
Temperature error	±0.375 %FS		
Supply voltage Ub	5 VDC (4.5 ... 5.5 VDC)	24 VDC (18 ... 30 VDC)	24 VDC (18 ... 30 VDC)
Current consumption w/o load	typ. 20 mA	typ. 10 mA	typ. 10 mA
Polarity protection	yes (supply lines)		
Short circuit protection	yes (all outputs vs. GND and supply voltage)	yes (all outputs vs. GND)	yes (all outputs vs. GND and supply voltage)
Ohmic load at outputs	≥ 120 Ω per channel A / B / Z	≥ 120 Ω per channel A / B / Z	≥ 750 Ω per channel A / B / Z
Insulation resistance (500 VDC)	≥ 10 MΩ		
Environmental Data			
Max. operational speed	Low speed: 1800 rpm, high speed: 29000 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 DIN EN 60529	IP67 / IP68 / IP69 (connector M12: IP67)		
Operating temperature	-25 ... +85°C (connector M12), -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)	2086 years	1425 years	1425 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	30 A/m		
EN 55016-2-3 Radiated disturbances	Industrial and residential area		

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

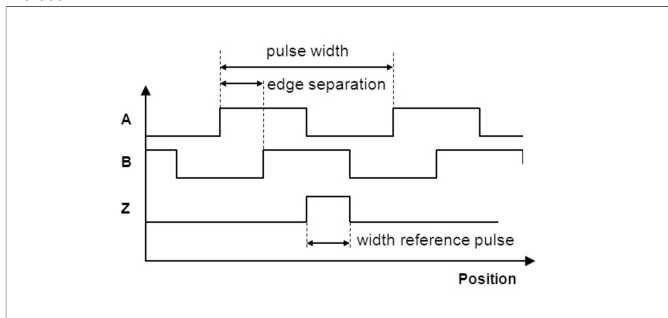
Connection Assignment

Signal	Connector code 5_ _	Cable code 4_ _
Supply voltage Ub	Pin 1	WH
GND	Pin 2	BN
A-	Pin 3	GN
A+	Pin 4	YE
B-	Pin 5	GY
B+	Pin 6	PK
Z-	Pin 8	RD
Z+	Pin 7	BU

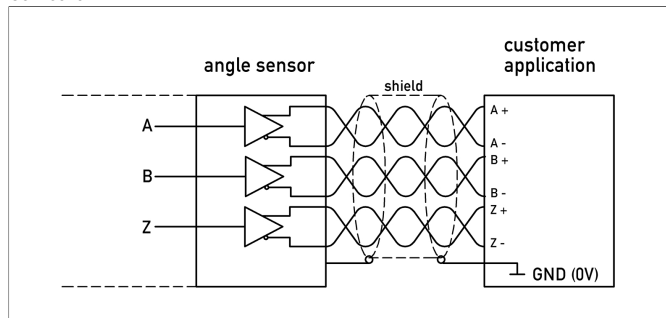


Technical Data

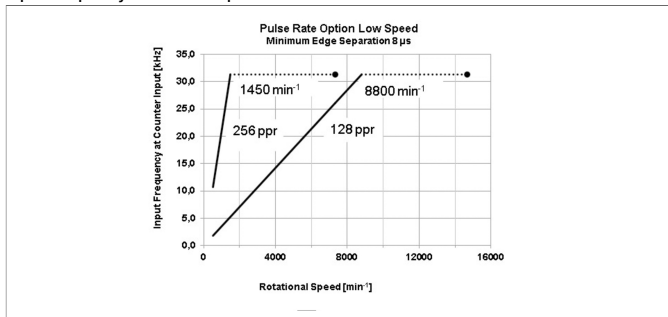
Protocol



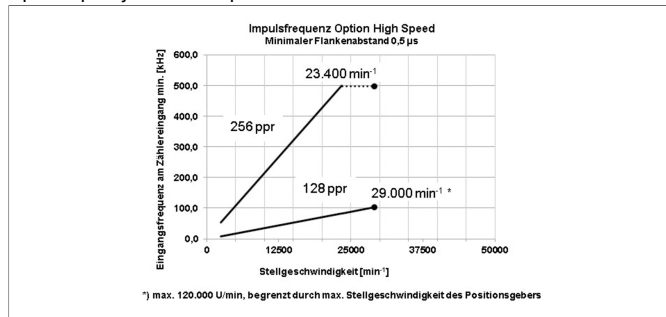
Connection



Input Frequency at Counter Input



Input Frequency at Counter Input

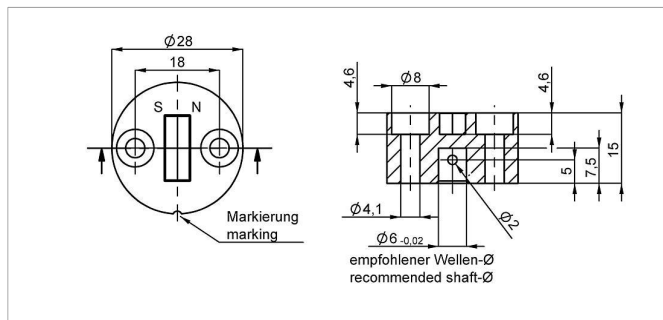


Electrical Data for various Resolutions

Pulses per revolution	1024	512	256	128	ppr
Counts per revolution	4096	2048	1024	512	
Option Low Speed					
Minimum edge separation	8				μs
Min. input frequency of counter input	32	32	32*	32*	kHz
Max. operational speed	1.800	3.600	7.200	14.400	rpm
Option High Speed					
Minimum edge separation	0,5				μs
Min. input frequency of counter input	500	500	500*	105*	kHz
Max. operational speed	29.000,				rpm
	higher speeds on request				

*) The requirement for the minimum input frequency of counter input is reduced at lower speed (see charts)

Position Markers

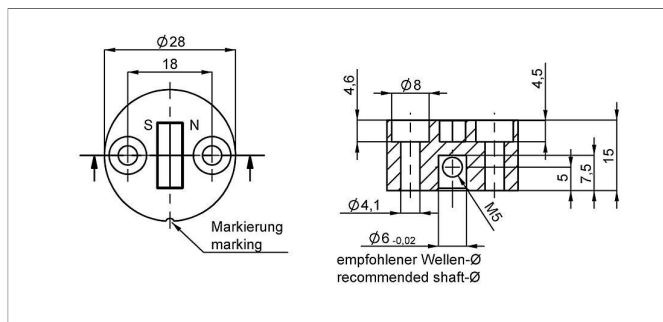


Z-RFC-P02

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

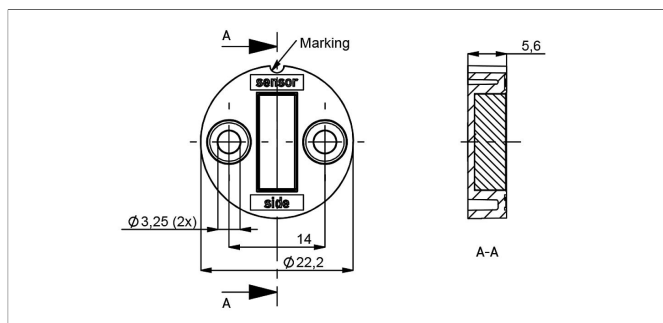


Z-RFC-P08

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

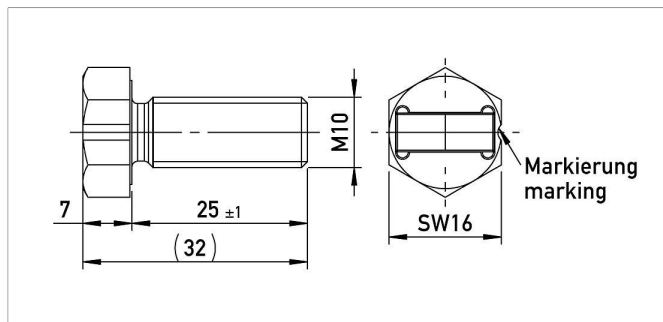


Z-RFC-P31

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



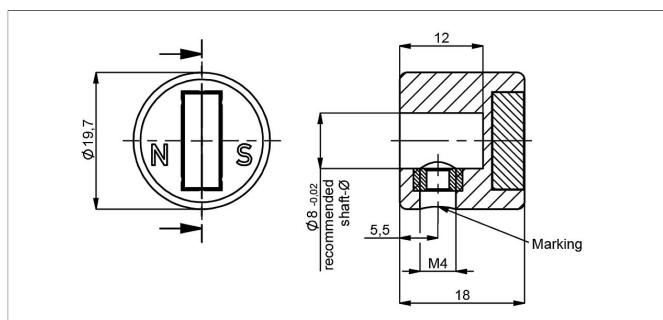
Z-RFC-P20

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-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!

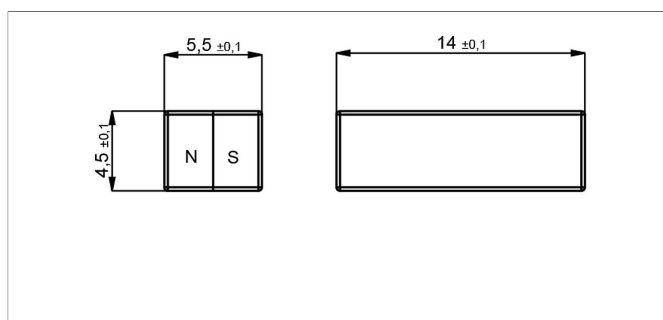
Material PA6-GF

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-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 ± 3 mm

radial offset

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

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

Position Markers

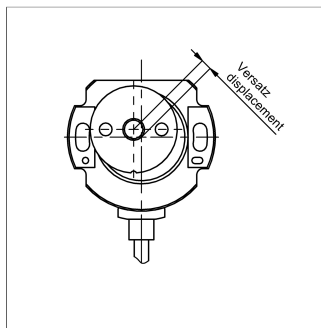
Working Distances Position Markers [mm] - Single-channel Versions

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: $\pm 0.4^\circ$

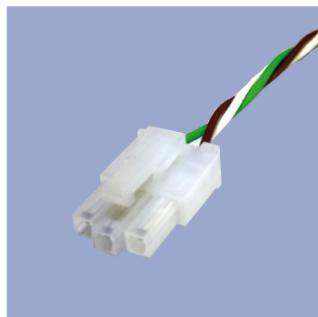
1.0 mm: $\pm 0.7^\circ$

2.0 mm: $\pm 2.2^\circ$

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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