



DOCUMENTO OBSOLETO

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Special features

- touchless technology, magnetic measurement
- enables for transmissive measurements
- electrical range up to 360°
- linearity $\pm 0.5\%$
- simple mounting
- lateral magnet offset up to $\pm 1.5\text{ mm}$
- protection class IP67 / IP69k
- single and redundant versions
- unlimited mechanical lifetime
- resolution 12 bit
- very favourable price/performance ratio
- extremely flat design

The sensor utilizes the orientation of a magnetic field for the determination of the measurement angle. Therefore, a position marker is attached to the rotating shaft, provided by the customer. The magnetic field orientation is captured with an integrated circuit. An analogue output signal represents the calculated angle.

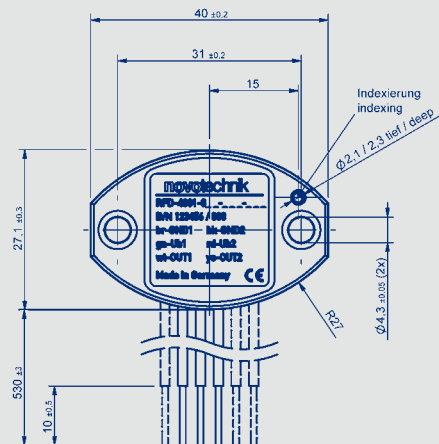
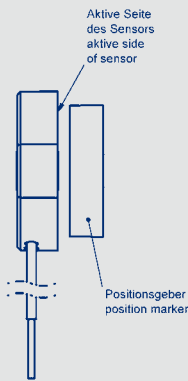
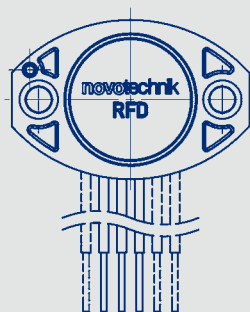
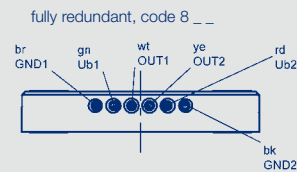
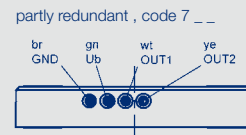
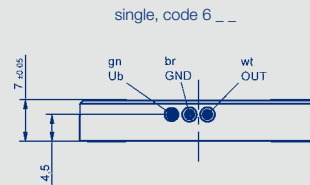
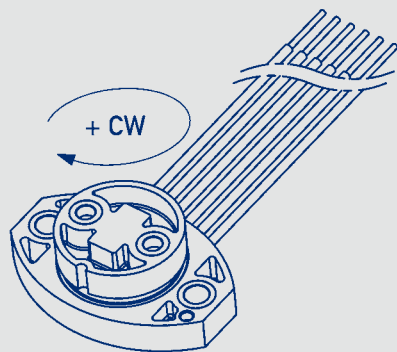
The extreme miniaturization of the sensor enables the application also in very small installation spaces. The housing is made of high grade temperature-resistant plastic material. The sensor is sealed and therefore is not sensitive to dust, dirt or moisture.

The two-part design of the sensor Series RFD and its position marker offers the customer maximal variability when mounting the sensor. The absence of shaft and bearing makes the assembly insensitive for customer application tolerances. Measurements can be made transmissively through various (non-magnetic) materials.

Electrical connection is made via lead wires.

Description

Housing	high grade, temperature resistant plastic, Thermoplast with brass inserts
Electrical connections	lead wires 3 x 0.5 m (0.5 mm ²) single lead wires 4 c 0.5 m (0.5 mm ²) partly redundant lead wires 6 x 0.5 m (0.5 mm ²), fully redundant

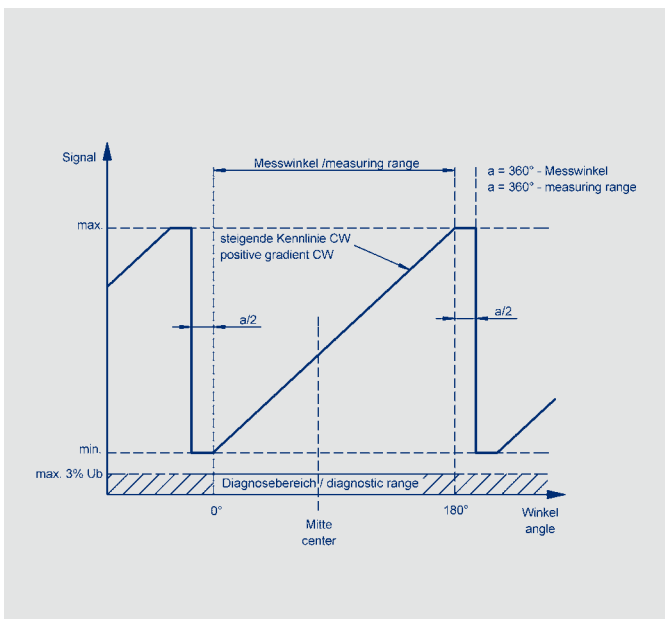


When the shaft marking points to the cable outlet, the sensor is in an electrical center position.

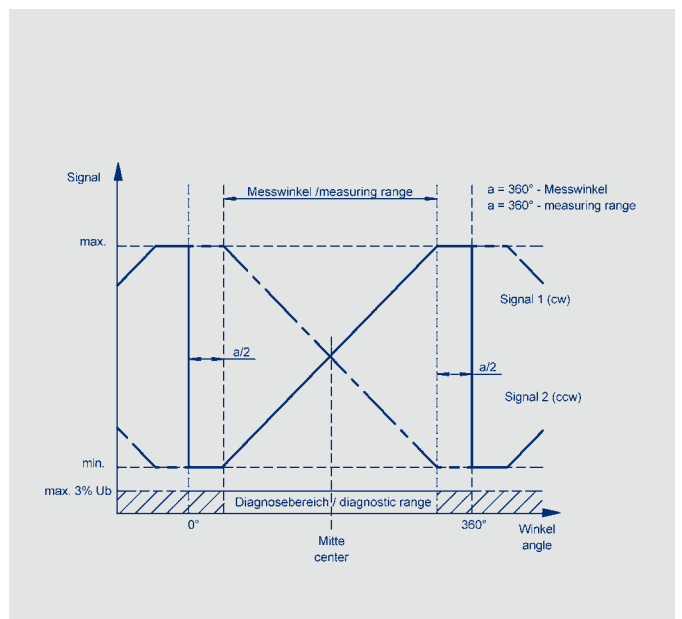
Pin assignment

Colour	single code 6 __	partly redundant code 7 __	fully redundant code 8 __
Green	Supply voltage +Ub	Supply voltage + Ub	Supply voltage +Ub 1
Brown	GND	GND	GND 1
White	Output	Output 1	Output 1
Red	-	-	Supply voltage +Ub 2
Black	-	-	GND 2
Yellow	-	Output 2	Output 2

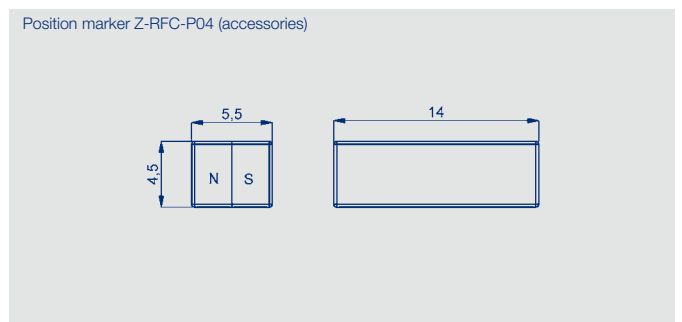
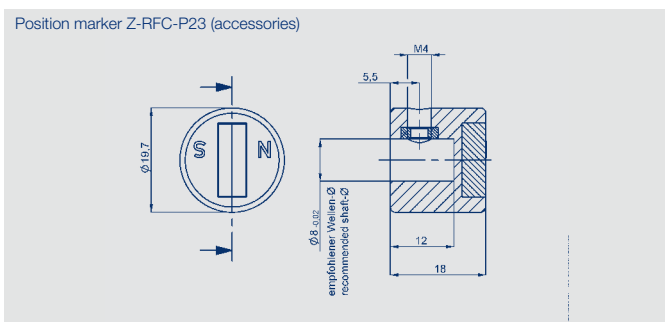
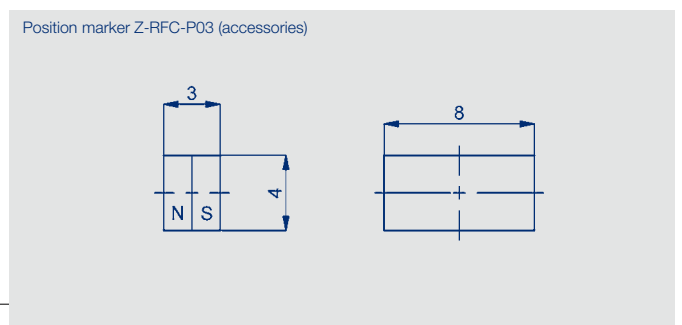
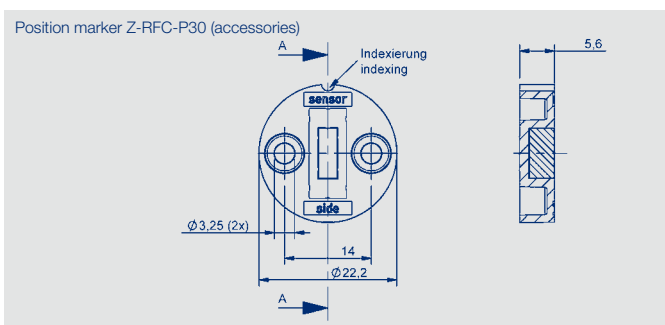
Output characteristics single (code 6 _ _)



Output characteristics redundant (code 7 / 8 _ _)



Position marker examples



Technical data and further position markers see separate data sheet.
Only Novotechnik approved magnets may be used.

Type designations	RFD-4021- - - - - 2 - - - 4 - -	
Mechanical Data		
Dimensions	see dimension drawing	
Mounting	with 2 M4 screws (included)	
Mechanical travel	360 continuous	°
Maximum operational speed	unlimited	
Weight	approx. 10	g
Cross-section lead wires	0.5	mm ²
Electrical Data		
Supply voltage Ub	5 (4.5 ... 5.5)	V
No-load supply current	typ. 13 (8 on request) per channel	mA
Reverse voltage	yes, only supply lines	
Short circuit protection	yes, all outputs vs. GND and Ub	
Measuring range	0 ... 30 up to 0 ... 360, in 10° steps	°
Resolution	12	bit
Number of channels	1 / 2	
Update rate	2500	Hz
Repeatability	0.1	°
Linearity	±0,5 (at RL = 10 kΩ vs. GND)	%
Output signal	ratiometric to Ub 0.25 V ... 4.75 V 0.5 ... 4.5 V	
Temperature error at stroke angle 30 up to 170°	±0.875	% FS
Temperature error at stroke angle 180 up to 360°	±0,6	% FS
Insulation resistance (500 VDC)	≥ 10	MΩ
Environmental Data		
Temperature range	40...+125	°C
Vibration (IEC 60068-2-6)	5...2000 Hz Amax = 0.75 mm amax = 20 g	
Shock (IEC 60068-2-27)	100 (6 ms)	g
Life	mechanical unlimited	
MTTF (DIN EN ISO 13849-1 parts count method, w/o load)	675 (single) 512 (per channel) partly redundant 516 (per channel) fully redundant	years years years
Functional Safety	When using our products in safety-related systems, please contact us	
Protection class (DIN EN 60529)	IP67 / IP69k	
EMC compatibility	ISO 11452-2 Radiated EM HF-Fields, Absorber Hall 200 V/m ISO 11452-5 Radiated EM HF-Fields, Stripline 200 V/m ISO TR10605 Packaging and Handling + Component Test 8/15 kV CISPR 25 Radiated Emission (conducted) GW 5 CISPR 25 Radiated Emission (Field) GW 5 EN 61000-4-4 Immunity against fast transient disturbance (Burst) 1kV EN 61000-4-6 Immunity against conducted disturbances induced by HF Fields 10V/m eff. EN 61000-4-8 Immunity against Power Frequency Magnetic Fields 30 A/m	
Working distance A / magnet constant	see data sheet position marker	
Lateral magnet offset	see data sheet	

Ordering specifications

Preferred types printed in bold:

- delivery time up to 25 pcs. within 10 working days
- no low volume surcharge

Operating voltage Ub
2: Ub = 5 VDC (4.5 VDC ... 5.5 VDC)

Output signal range
1: 0.25 ... 4.75 V ratiometric to Ub
2: 0.5 ... 4.5 V ratiometric to Ub

Output characteristics
1: rising cw
2: rising ccw
3: crossed outputs, channel 1 rising cw (partly redundant)
4: crossed outputs, channel 1 rising cw (fully redundant)
other characteristics on request

Electrical connection
401: lead wires 3 x 0.5 m, single (6 _ _)
411: lead wires 4 x 0.5 m, partly redundant (7 _ _)
421: lead wires 6 x 0.5 m, fully redundant (8 _ _)
other cable lengths and assembled connectors on request

R F D - 4 0 2 1 - 6 3 6 - 2 1 1 - 4 0 1

Series

Mechanical specification
4021: Standard

Measuring range
03: angle 0° ... 30° min.
...
06, 12, 18, 24, 36
...
36: angle 0° ... 360° max.
other angles on request

Number of channels
6: single output 1 x Ub / 1 x output
7: partly redundant 1 x Ub / 2 x output
8: fully redundant 2 x Ub / 2 x output

Order Code Example: RFD 4021 618 211 401: RFD4021 with 180° electrical angle, supply 5 V, output rising cw, range 0.25 ... 4.75 V, connection 3 lead wires
Order Code Example: RFD 4021 824 214 421: RFD4021 with 240° electrical angle, supply 5 V, output 1 rising cw / output 2 rising ccw, range 0.25 ... 4.75 V, connection 6 lead wires, 2 x Ub, 2 x output

Required accessories

Position marker Z-RFC-P30,
Art.No. 056086;
Position marker Z-RFC-P03,
Art.No. 005658;
Position marker Z-RFC-P04,
Art.No. 005659;
Position marker Z-RFC-P23,
Art.No. 056074
(further position markers see
separate data sheet
Positionmarker_rotary)

Recommended accessories

Process-controlled indicators
MAP... with display.

Available on request

SPI or PWM interface
Other interfaces