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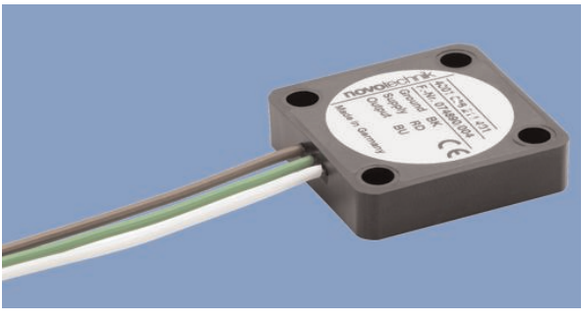
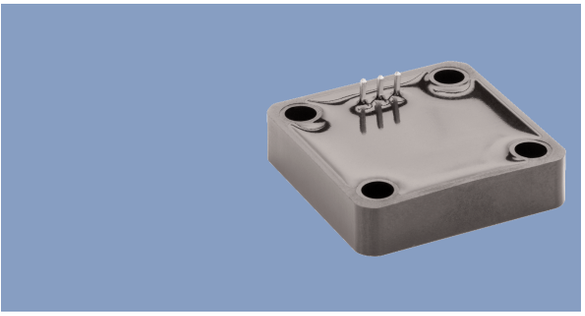
Siedle Group

Angle Sensor touchless technology transmissive

RFA4000 Series





Special features

- touchless technology, magnetic measurement
- enables transmissive measurements
- electrical range up to 360°
- simple mounting
- lateral magnet offset up to ±3 mm
- protection class IP67
- single and redundant versions
- unlimited mechanical lifetime
- 12 bit resolution
- independent linearity ±0.5 %
- very favorable price/performance ratio
- extremely flat design 30x30x7mm³

The RFA4000 Sensor utilizes the orientation of a magnetic field for the determination of the measurement angle.

A magnet is attached to the rotating shaft and the magnetic field orientation is captured with an integrated circuit. An analog output signal represents the calculated angle.

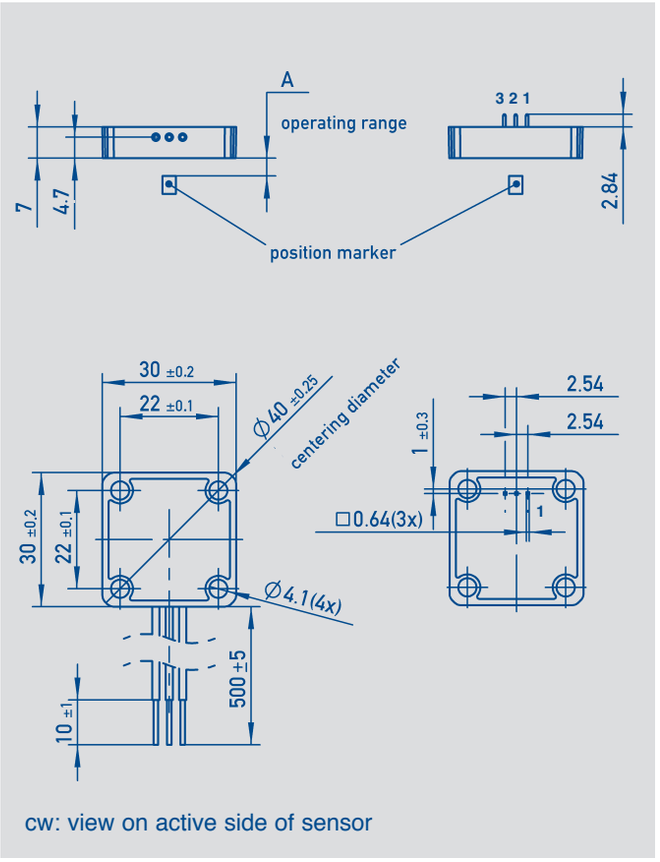
The extreme miniaturization of the sensor makes it ideal for applications in very small installation spaces. The housing is made of high grade temperature-resistant plastic.
The sensor is totally sealed and therefore is not sensitive to dust, dirt or moisture.

The two-part design of the RFA4000 Series sensor and its position marker offers the customer maximum flexibility when mounting the sensor.

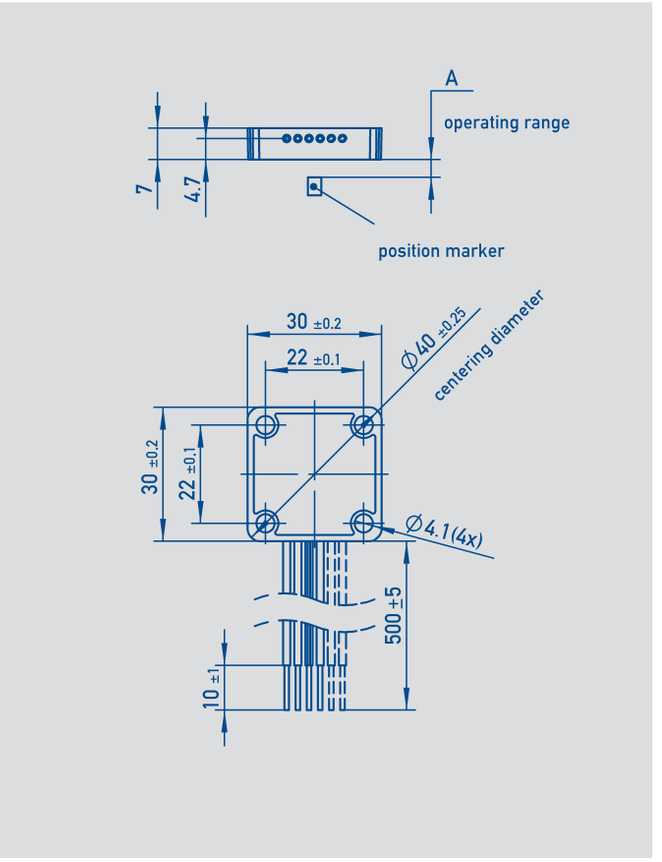
Because the sensor uses touchless technology with no shaft or bearings, application shaft offsets can be accomodated and measurements can be made transmissively through various (non-magnetic) materials.

Electrical connection is made via lead wires.

Description	
Housing	high grade, temperature resistant plastic
Electrical connections	lead wires AWG 20 (0.5 mm²) alternative soldering pins for PCB mounting



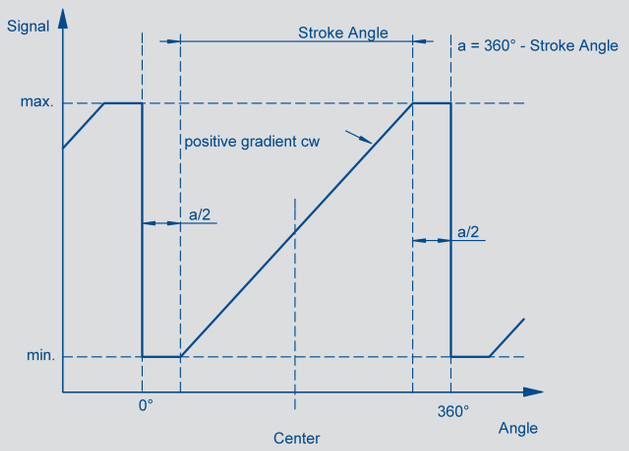
cw: view on active side of sensor



Wire colors / Pin assignment		
Signal	**color**	**Pin No.**
Supply voltage	Red	2
GND	Black	3
Signal output	Blue	1

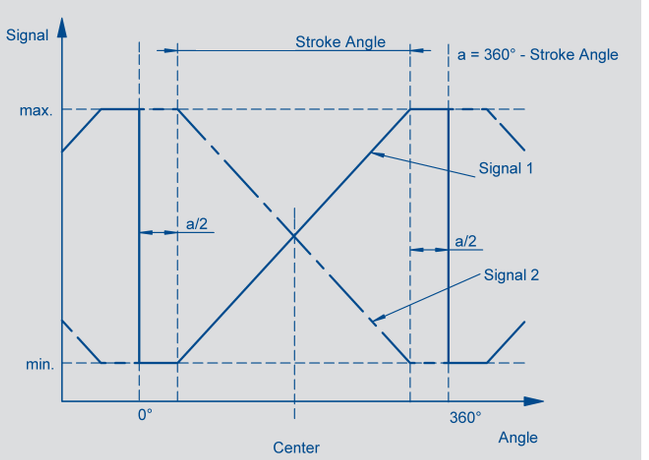
Wire colors assignment	
Signal	**Color**
Supply voltage	Red
GND	Black
Signal output	Blue
Supply voltage 2	Red / white
GND 2	Black / white
Signal output 2	Blue / white

Output characteristic single (model 600)



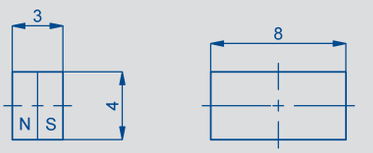
CW: With view on sensor through position marker

Output characteristics redundant (model 700)

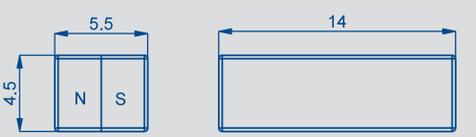


Position marker examples

Position marker Z-RFC-P03



Position marker Z-RFC-P04



For more information on position markers see separate data sheet.

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Toronto: 416 754 3168, Montreal: 514 695 5147, Toll Free: 1 888 754 7008

Type designations	RFA 4001 6XX 2XX XXX single	RFA 4001 7XX 2XX 41X redundant with shared supply	RFA 4001 7XX 2XX 42X fully redundant	
Mechanical Data				
Dimensions	see dimension drawing			
Mounting	with 4 M4 screws (included)			
Mechanical travel	360 continuous			°
Maximum operational speed	unlimited			min^{-1}
Weight	ca. 10			g
Electrical Data				
Supply voltage Ub	5 ±0.5			VDC
No-load supply current	typ. 15	typ. 30	typ. 15 per output	mA
Reverse voltage	yes, only supply lines			
Short circuit protection, vs. GND and +Ub	yes			
Measuring range	0 ... 30 up to 0 ... 360, in 10° steps			°
Update rate	5000 typ.			measur./s
Resolution	12 bit			
Repeatability	0.1			°
Independent linearity	0.5 of signal range			%
Output signal	ratiometric to Ub 0.25 V ... 4.75 V 0.5 ... 4.5 V (load ≥1 k)			
TC at stroke angle 30 up to 170° TC at stroke angle 180 up to 360°	typical 100 typical 50			ppm/K ppm/K
Insulation resistance (500 VDC)	10			M
Cross-section lead wires	0.5			mm^2
Environmental Data				
Temperature range	-40...+125			°C
Vibration (IEC 60068-2-6)	5...2000 A_{max} = 0.75 a_{max} = 20			Hz mm g
Shock (IEC 60068-2-6)	100 (6 ms)			g
Life	mechanical unlimited; > 50 000 h MTBF			
Protection class (DIN 40050 / IEC 529)	IP67			
EMC compatibility	ISO 11452-2 Interference test in Absorber chamber ISO 11452-5 Interference test Stripline CISPR 25 Emitted interference CISPR 25 Conducted emission ISO 7637-1 Transients ISO 10506 ESD components check ISO 10605 ESD Handling & Packaging			
Working distance A / magnet constant	Z-RFC-P03: A = 2 ±1 mm / magnet constant = 1.85 [°/mm^2] Z-RFC-P04: A = 4.5 ±1.7 mm / magnet constant = 0.8 [°/mm^2]			
Lateral magnet offset (will cause additional linearity error)	max. ±3 mm (Z-RFC-P04), max. ±1.5 mm (Z-RFC-P03) The maximum error which is caused by lateral offset between sensor and position marker may be approximated as follows: Error [°] = magnet constant x (offset [mm])^2 The magnet constant depends from the position marker. Example: Z-RFC-P04: magnet constant = 0.8 °/mm^2; offset = 0.5 mm Error [°] = 0.8°/mm^2 x (0.5 mm)^2 = 0,2°			

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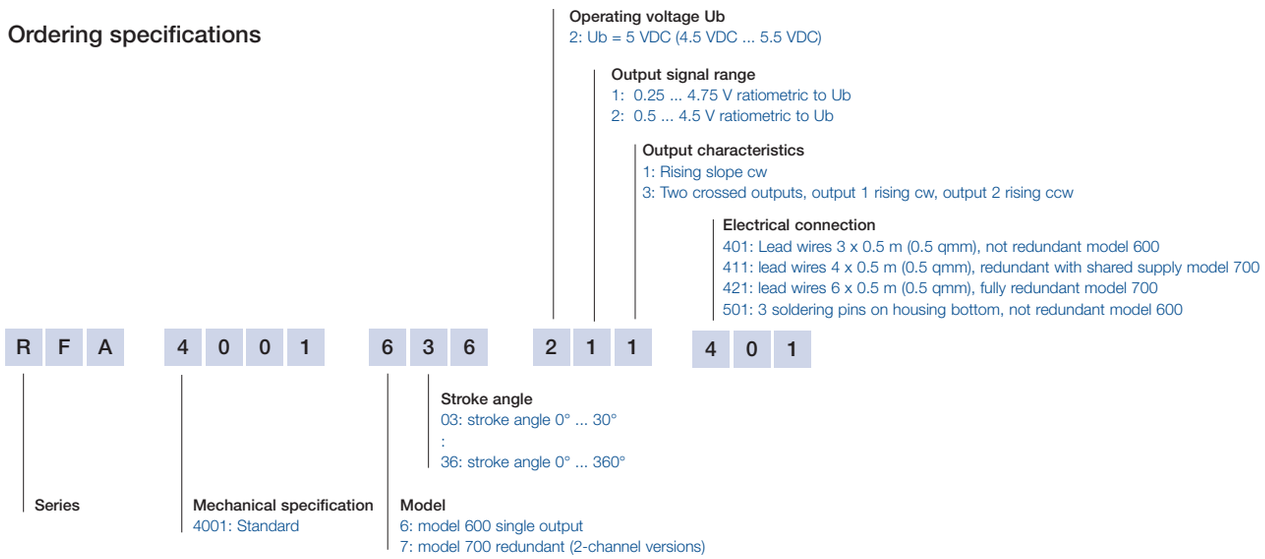
Ordering specifications



Order Code Example: RFA 4001 620 221 401: RFA4001 with 200° electrical angle, supply 5 V, output rising cw, range 0.5 ... 4.5 V, connection 3 lead wires
Order Code Example: RFA 4001 720 223 411: RFA4001 with 200° electrical angle, supply 5 V, output 1 rising cw / output 2 rising ccw, range 0.5 ... 4.5 V, connection 4 lead wires, redundant output with shared supply lines

Required accessories

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

Recommended accessories

Process-controlled indicators MAP... with display.

Available on request

Cable versions
Customized connectors
Specific angle ranges / characteristics
SPI or PWM interface
Other interfaces