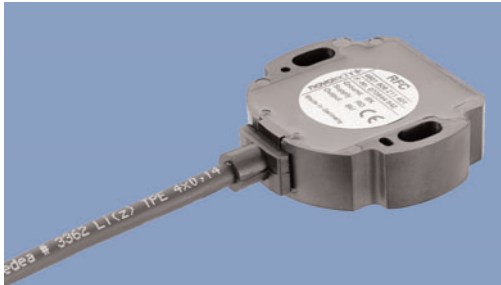
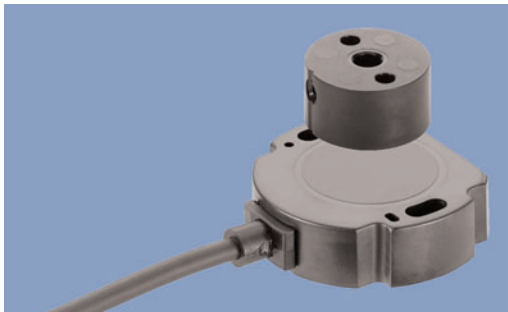


Angle Sensor touchless technology transmissive

Series RFC4800



The RFC4800 sensor utilizes the orientation of a magnetic field to determine the measurement angle. There are no moving parts. A magnetic position marker attached to the customer's shaft is physically separated from the sensor containing an integrated circuit that provides analog output representing the calculated angle.



This two-part design provides maximum flexibility when installing the sensor. The absence of a shaft and bearings means the sensor can operate without regard to customer application tolerances. The housing is made from a special high-grade, temperature-resistant plastic material. Elongated slots for screws simplify mounting and alignment.

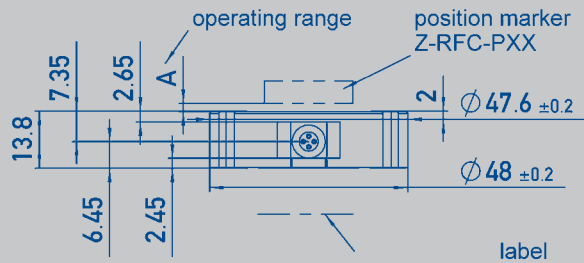
Special features

- touchless technology, magnetic measurement
- enables for transmissive measurements
- electrical range up to 360°
- simple mounting
- lateral magnet offset up to ± 3 mm
- protection class IP67
- unlimited mechanical lifetime
- resolution 12 bit
- independent linearity $\leq \pm 0.5$ %
- single and redundant output versions

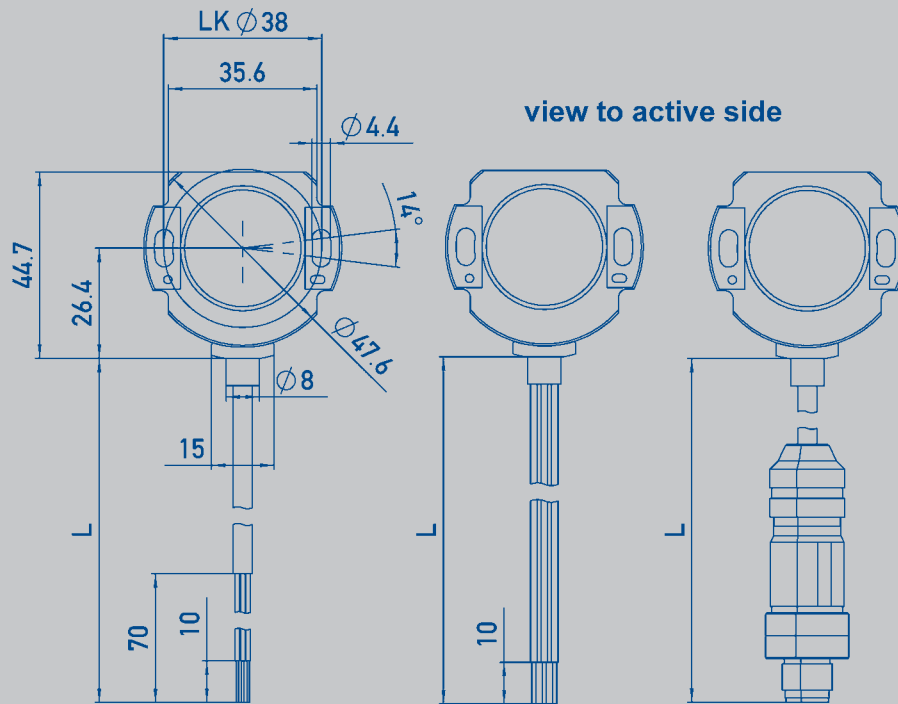
Measurements can be made transmissively through various non-magnetic materials. Electrical connections are made via a shielded cable sealed into the housing.

Description

Housing	high grade, temperature resistant plastic
Electrical connections	shielded cable AWG 26 (0.14 mm ²) unshielded cable AWG 26 (0.14 mm ²) lead wires AWG 20 (0.5 mm ²)

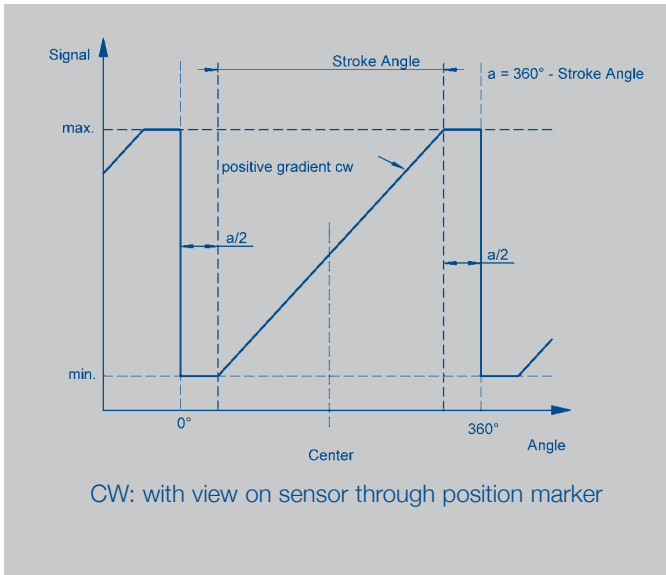


cw: view on active side of sensor

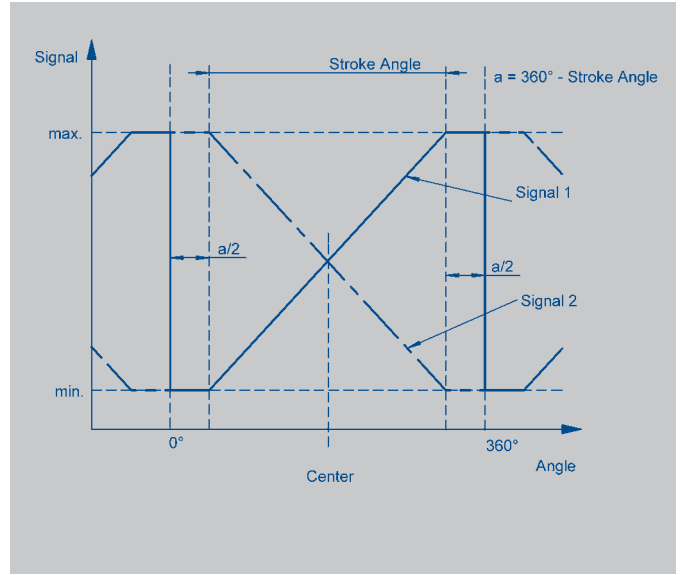


When the shaft marking is pointing to cable, the sensor is located in an electrical center position.

Output characteristic single (model 600)

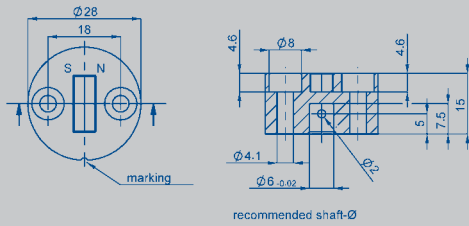


Output characteristics redundant (model 700)

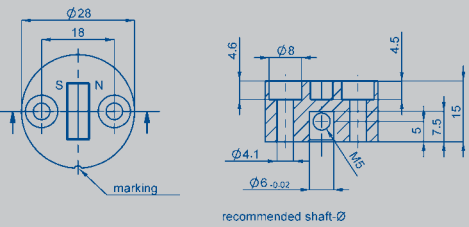


Position marker examples

Position marker Z-RFC-P02



Position marker Z-RFC-P08



Connection assignment single

Signal	Lead wires	Cable	M12
Supply voltage	Red	Green	1
GND	Black	Brown	3
Signal output	Blue	White	2
Shield	-	Shield (if existing)	Shield
not assigned	-	Yellow	4

Connection assignment redundant

Signal	Lead wires	Cable	M12
Supply voltage 1	Red	Green	1
GND 1	Black	Brown	3
Signal output 1	Blue	White	2
Supply volage 2	Red/White	-	-
GND 2	Black/White	-	-
Signal output 2	Blue/White	Yellow	4
Shield	-	Shield (if existing)	Shield

Type designations	RFC 4801 636 2XX XXX supply voltage 5 V	RFC 4801 636 1XX XXX supply voltage 24 V	RFC 4801 636 3XX XXX supply voltage 12/24 V		
Mechanical Data					
Dimensions	see dimension drawing				
Mounting	with 2 M4 screws (included)				
Mechanical travel	360 continuous				
Maximum operational speed	unlimited				
Weight	ca. 50				
Electrical Data					
Supply voltage U_b	5 (4.5 ... 5.5)	24 (18 ... 30)	12 / 24 (9 ... 34)		VDC
No-load supply current	15 typical				
Reverse voltage	yes, only supply lines	yes	yes		
Short circuit protection, vs. GND and + U_b	yes	yes	yes		
Measuring range	0 ... 30 up to 0 ... 360, in 10° steps				
Update rate	5000 typ.				
Resolution	12 bit				
Repeatability	0.1				
Independent linearity	≤ 0.5 of signal range				
Output signal	ratiometric to U_b 0.25...4.75 V 0.5...4.5 V (load ≥ 1 k Ω)	0.1 ... 10 V (load ≥ 10 k Ω)	0.25 ... 4.75 V 0.5 ... 4.5 V (load ≥ 5 k Ω)	4 ... 20 mA (burden max. 250 Ω)	
TC at stroke angle 30 up to 170°	typical 100	typical 150	typical 100	typical 150	ppm/K
TC at stroke angle 180 up to 360°	typical 50	typical 80	typical 50	typical 80	ppm/K
Insulation resistance (500 VDC)	≥ 10				
Cross-section cable	ca. 0.14	ca. 0.14	ca. 0.14		mm ²
Cross-section lead wires	0.5	-	0.5		mm ²
Environmental Data					
Temperature range	-40...+125	-40 ... +125	-40 ... +125	-40 ... +105 -40 ... +125, if $U_b \leq 28V$	°C °C
Vibration (IEC 60068-2-6)	5...2000 $A_{max} = 0.75$ $a_{max} = 20$				
Shock (IEC 60068-2-6)	100 (6 ms)				
Life	mechanical unlimited; > 50 000 h MTBF				
Protection class (DIN 40050 / IEC 529)	IP67				
EMC compatibility	EN 61000-4-2 EN 61000-4-3 EN 61000-4-4 EN 61000-4-6 EN 55011	EN 61000-4-2 EN 61000-4-3 EN 61000-4-4 EN 61000-4-6 EN 55011	ISO 11452-5 ISO 11452-2 ISO 7637-1/2/3 ISO TR10605 CISPR25 ISO 14982		

Type designations	RFC 4801 736 2XX XXX supply voltage 5 V	RFC 4801 736 3XX XXX supply voltage 12/24 V	
Mechanical Data			
Dimensions	see dimension drawing		
Mounting	2 M4 screws (included)		
Mechanical travel	360 continuous		
Maximum operational speed	unlimited		
Weight	ca. 50		
Electrical Data			
Supply voltage U_b	5 (4.5 ... 5.5)	12 / 24 (9 ... 34)	VDC
No-load supply current	30 typical		
Reverse voltage	yes, only supply lines	yes	
Short circuit protection (vs. GND and + U_b)	yes	yes	
Measuring range	0 ... 30 up to 0 ... 360, in 10° -steps		
Update rate	5000 typ.		
Resolution	12 bit		
Repeatability	0.1		
Independent linearity	$\leq \pm 0.5$ of signal range		
Output signal	ratiometric to U_b 0.25...4.75 V 0.5...4.5 V (load ≥ 1 k Ω)	0.25 ... 4.75 V 0.5 ... 4.5 V (load ≥ 5 k Ω)	
TC at stroke angle 30 up to 170°	typical 100		
TC at stroke angle 180 up to 360°	typical 50		
Insulation resistance (500 VDC)	≥ 10		
Cross-section cable	ca. 0.14	ca. 0.14	mm ²
Cross-section lead wires	0.5		
Environmental Data			
Temperature range	-40...+125	-40 ... +85 -40 ... +105, if $U_b \leq 28V$	°C °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)		
Life	mechanical unlimited; > 50 000 h MTBF		
Protection class (DIN 40050 / IEC 529)	IP67		
EMC compatibility	EN 61000-4-2 EN 61000-4-3 EN 61000-4-4 EN55011	ISO 11452-5 ISO 11452-2 ISO 7637-1/2/3 ISO TR10605 CISPR25 ISO 14982	
Working distance A / magnet constant	Z-RFC-P01: A = 0 ... 1.5 mm / magnet constant = 1.85 [°/mm ²] Z-RFC-P02: A = 0 ... 4 mm / magnet constant = 0.8 [°/mm ²] (Position marker see separate data sheet)]		
Lateral magnet offset (will cause additional linearity error)	max. ± 3 mm (Z-RFC-P02), max. ± 1.5 mm (Z-RFC-P01) The maximum error which is caused by lateral offset between sensor and position marker can be approximated as follows: Error [°] = magnet constant x (offset [mm]) ² The magnet constant depends on the position marker. Example: Z-RFC-P02: magnet constant = 0.8 °/mm ² ; offset = 0,5 mm Error [°] = 0.8°/mm ² x (0,5 mm) ² = 0,2°		

Ordering specifications

				Operating voltage Ub 1: Ub = 24 VDC (18 VDC ... 30 VDC) 2: Ub = 5 VDC (4.5 VDC ... 5.5 VDC) 3: Ub = 12/24 VDC (9 VDC ... 34 VDC)		
				Output signal range Ub = 24 VDC (1XX) 1: 0 V ... 10 V (only single)		
				Output signal range Ub = 5 VDC (2XX) 1: 0.25 ... 4.75 V ratiometric to Ub 2: 0.5 ... 4.5 V ratiometric to Ub		
				Output signal range Ub = 12/24 VDC (3XX) 2: 4 mA ... 20 mA (only single) 4: 0.5 V ... 4.5 V 5: 0.25 V ... 4.75 V		
				Output characteristics 1: Rising cw 2: Rising ccw 3: Two crossed outputs, output 1 rising cw, output 2 rising ccw		
				Electrical connection 201: Round cable 4-pol., L = 0.5 m shielded (24 V, 5 V) 206: Round cable 4-pol., L = 3 m shielded (24 V, 5 V) 251: Round cable 4-pol., L = 0.5 m unshielded single and partly redundant (5 V, 12/24 V) 401: Lead wires 3 x L = 0.5 m (0.5 qmm) single (12/24 V, 5 V) 421: Lead wires 6 x L = 0.5 m (0.5 qmm), fully redundant (5 V) 501: Connector M12 shielded, at round cable L = 0.21 m, single and partly redundant		
R	F	C	4	8	0	1
			6	3	6	2
				1	1	2
					0	1
Series			Stroke angle 03: Stroke angle 0° ... 30° ... 36: Stroke angle 0° ... 360°			
			Model 6: Model 600 single output 7: Model 700 redundant (2-channel versions)			
			Mechanical specification 4801: Standard			

Required accessories

Position marker Z-RFC-P01,
 Art.No. 005660;
 Position marker Z-RFC-P02,
 Art.No. 005661
 (Information about working
 distances and other position
 markers see separate data
 sheet)

Recommended accessories

Process-controlled indicators
 MAP... with display.

Available on request

Cable versions
 Customized connectors
 Specific angle ranges /
 characteristics
 Other interfaces