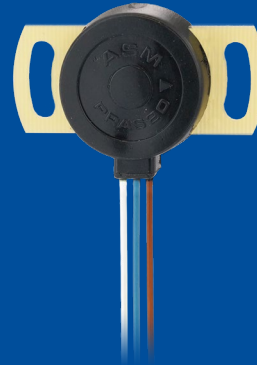


 PRAS20

Angle sensor for indoor applications



- Measurement range 0°... 360°
- Protection class IP60
- Overall height 6 mm
- Contactless with external position magnet, wear-free
- Optional redundant second channel

Product versions



Analog output



PRAS20 - Magnetic Angle Sensor
Version with analog output

Specifications

		Order options	
Measurement range	0 ... 15° to 0 ... 360° (in 15° increments)	1	15 / 30 / 45 / ... / 345 / 360
Output	Voltage 0.5 ... 10 V Voltage 0.5 ... 4.5 V ratiometric Current 4 ... 20 mA, 3 wire	2	U2B U6 I1B
Signal characteristics	Signal increasing CW, clockwise Signal increasing CCW, counterclockwise	3	CW CCW
Resolution	0.03% (60 ... 360°); 0.1% (15 ... 45°)		
Repeatability	±0.03% (60 ... 360°); ±0.1% (15 ... 45°)		
Linearity	±0.5% f.s. (typical)		
Rated distance sensor / magnet	Depending on the position magnet		
Housing material	Epoxy glass fibre, thermoplastic		
Mounting	Screws M4		
Protection class	IP60		
Connection	Single wire ETFE 3 x 0.5 mm ² , length 300 mm	4	A300
Shock	DIN EN 60068-2-27:2010, 100 g/11 ms, 100 shocks		
Vibration	DIN EN 60068-2-6:2008, 20 g 10 Hz-2 kHz, 10 cycles		
Temperature range	-40 ... +85°C		
Weight	8 g approx. (without cable)		
EMC	DIN EN 61326-1:2013		

Order code

PRAS20 – **1** – **2** – **3** – **4**

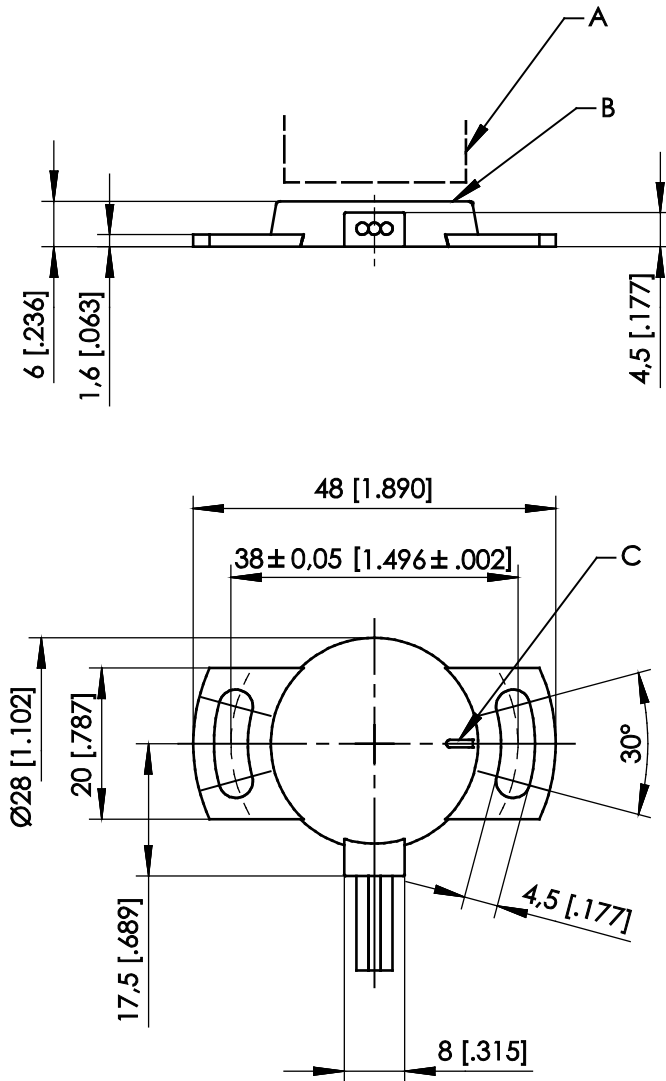
Order example: PRAS20 – 360 – U6 – CW – A300

Accessories:

Position magnets (see from page 4)

Magnetic shield (see page 12)

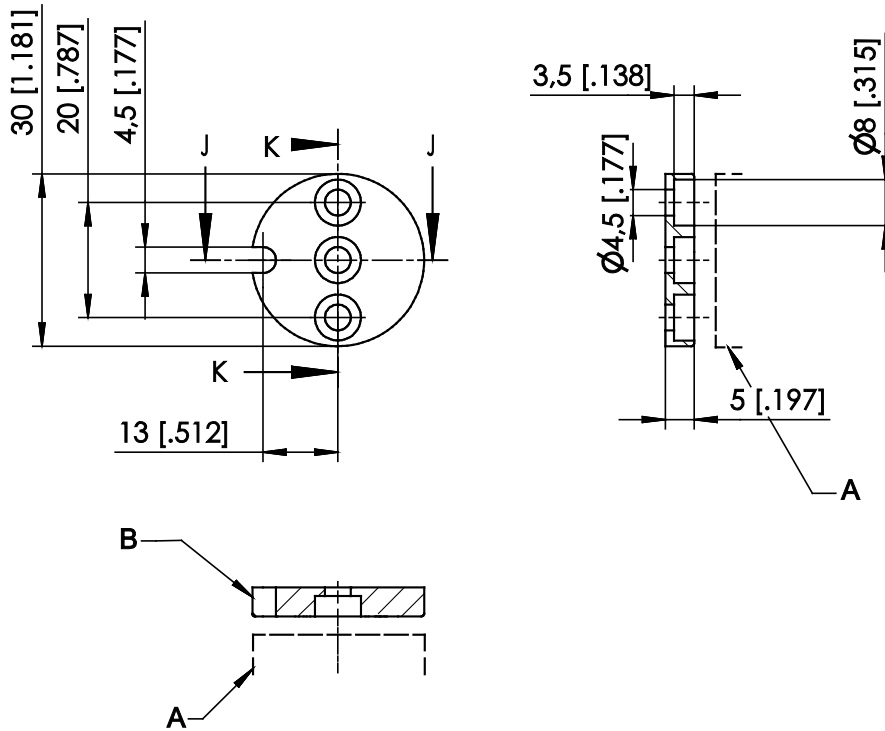
Dimensions



- A – Position magnet
- B – Measuring area
- C – Marking

Dimensions in mm [inch]. Weight without cable approx. 8 g.
Dimensions for information only.
For guaranteed dimensions consult factory.

Position magnets
PRMAG20



A – Sensor
B – Marking

Order code	Weight	Material	Moment of inertia
PRMAG20	approx. 12 g	zinc coated steel, plastic	1.3 kgmm ²

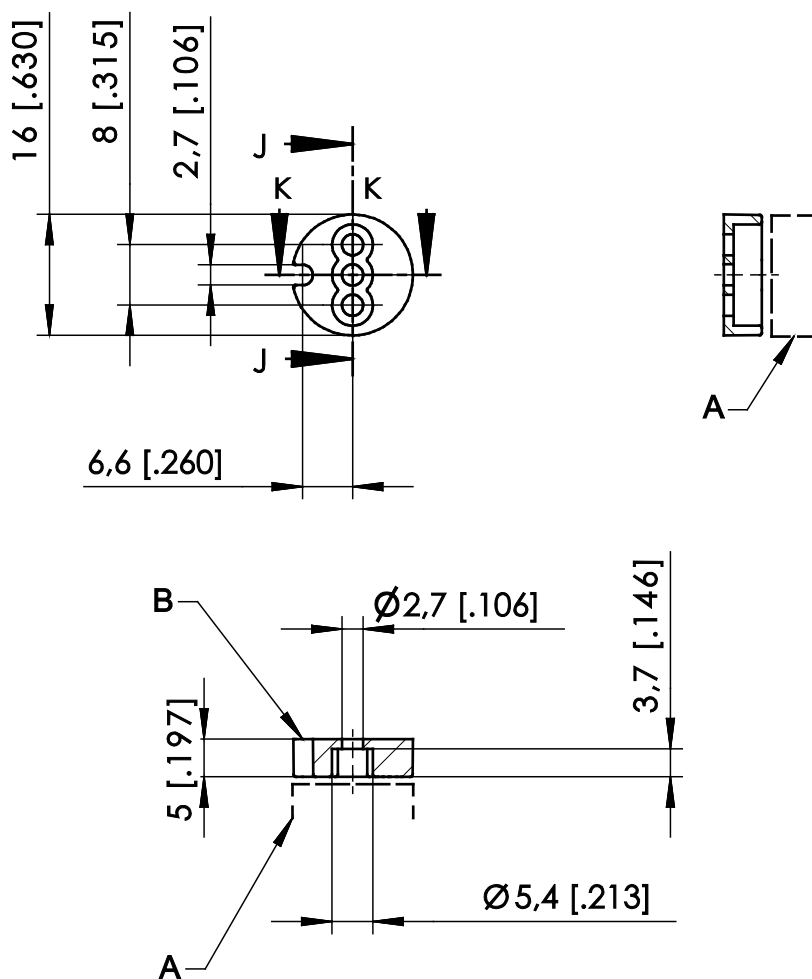
A misalignment of the position magnet has an effect on the linearity.

Dimensions in mm [inch].

Dimensions informative only.

For guaranteed dimensions please consult factory.

PRMAG21



A – Sensor
B – Marking

Order code	Weight	Material	Moment of inertia
PRMAG21	approx. 3 g	zinc coated steel; plastic	0.1 kgmm ²

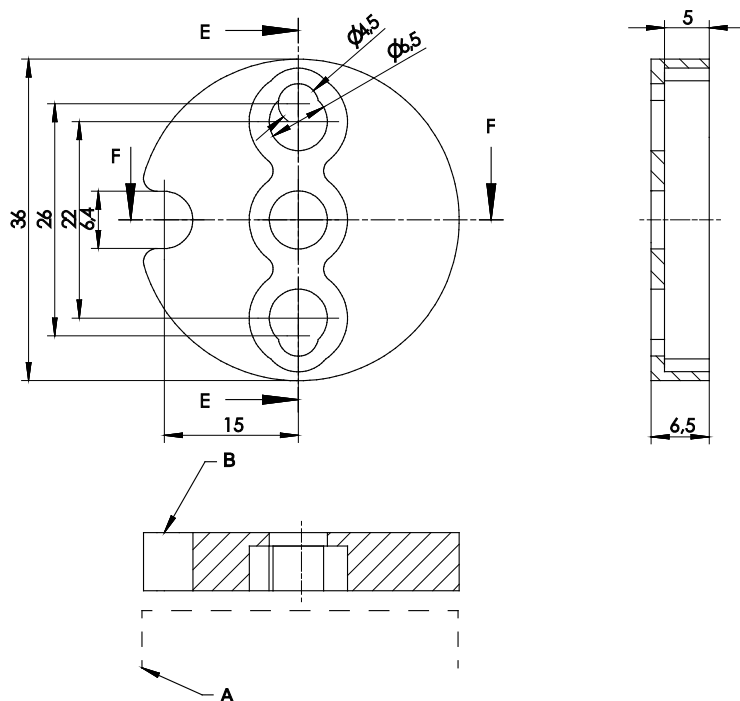
A misalignment of the position magnet has an effect on the linearity.

Dimensions in mm [inch]

Dimensions informative only.

For guaranteed dimensions please consult factory.

PRMAG22



A – Sensor
B – Marking

Order code	Weight	Material	Moment of inertia
PRMAG22	approx. 19 g	zinc coated steel, plastic	3 kgmm ²

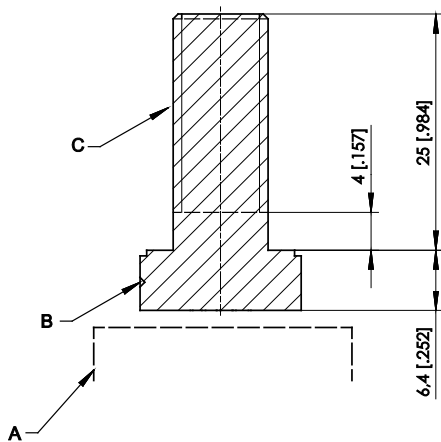
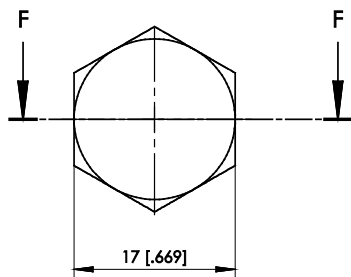
A misalignment of the position magnet has an effect on the linearity.

Dimensions in mm [inch].

Dimensions informative only

For guaranteed dimensions please consult factory.

PRMAG-M10



- A – Sensor
- B – Marking
- C – Thread M10

Order code	Weight	Material	Moment of inertia
PRMAG-M10	approx. 30 g	stainless steel A2	1.3 kgmm ²

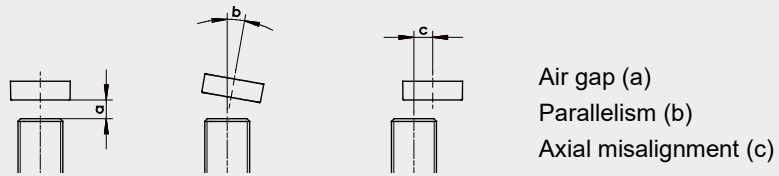
A misalignment of the position magnet has an effect on the linearity.

Dimensions in mm [inch].

Dimensions informative only.

For guaranteed dimensions please consult factory.


Measuring error by misalignment of the position magnet





Sensor	Position magnet	Air gap [mm]	Parallelism [°]	Error by axial misalignment [°]					
				0.2 mm	0.5 mm	1 mm	2 mm	3 mm	4 mm
PRAS20	PRMAG20	0 ... 7	0 ... 5	0.1	0.3	0.7	2	4.6	–
PRAS20R	PRMAG21	0 ... 2	0 ... 5	0.15	0.3	0.9	3.6	9.6	–
	PRMAG22	0 ... 10	0 ... 5	0	0	0.7	1.5	3.8	7
	PRMAG-M10	0 ... 3	0 ... 5	0.1	0.1	0.5	2	7	–

Output specification

Analog output

U2B Voltage output 0.5 ... 10 V 	Excitation voltage	11.5 ... 27 V DC
	Excitation current	typical 12 mA max. 16 mA
	Output voltage	0,5 ... 10 V DC
	Output current	2 mA max.
	Measuring rate	1 kHz standard
	Stability (temperature)	$\pm 50 \times 10^{-6}$ / °C f.s. (typical for 90° ... 360°) $\pm 100 \times 10^{-6}$ / °C f.s. (typical for <90°)
	Protection	Reverse polarity, short circuit
	Operating temperature	-40 ... +85 °C
	EMC	DIN EN 61326-1:2013

U6 Voltage output 10 ... 90 % ratiometric 	Excitation voltage	5 V DC ± 10 %
	Excitation current	typical 8 mA max. 12 mA
	Output voltage	10 ... 90 % of the excitation voltage
	Output current	2 mA max.
	Measuring rate	1 kHz standard
	Stability (temperature)	$\pm 50 \times 10^{-6}$ / °C f.s. (typical for 90° ... 360°) $\pm 100 \times 10^{-6}$ / °C f.s. (typical for <90°)
	Protection	Reverse polarity, short circuit
	Operating temperature	-40 ... +85 °C
	EMC	DIN EN 61326-1:2013

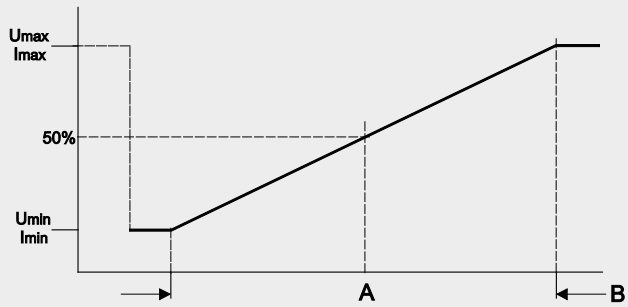
I1B Current output 4 ... 20 mA, 3 wires 	Excitation voltage	10 ... 27 V DC
	Excitation current	typical 32 mA max. 36 mA
	Load R _L	250 Ω max.
	Output current	4 ... 20 mA
	Measuring rate	1 kHz standard
	Stability (temperature)	±50 x 10 ⁻⁶ / °C f.s. (typical for 90° ... 360°) ±100 x 10 ⁻⁶ / °C f.s. (typical for <90°)
	Protection	Reverse polarity, short circuit
	Operating temperature	-40 ... +85 °C
	EMC	DIN EN 61326-1:2013

PRAS20 / PRAS20R / PRAS21

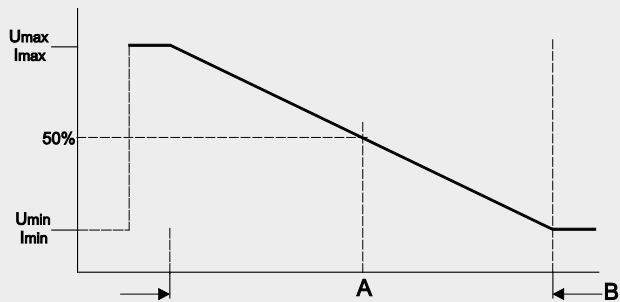
Signal wiring	Output signals	Cable color
Single wires	Excitation +	brown
	Signal	white
	GND	blue

Characteristics for magnetic angle sensors

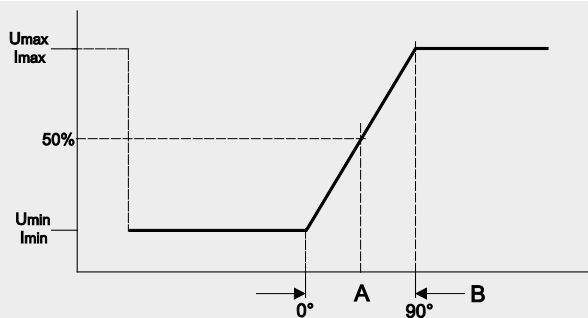
Output signal CW
(clockwise increasing)



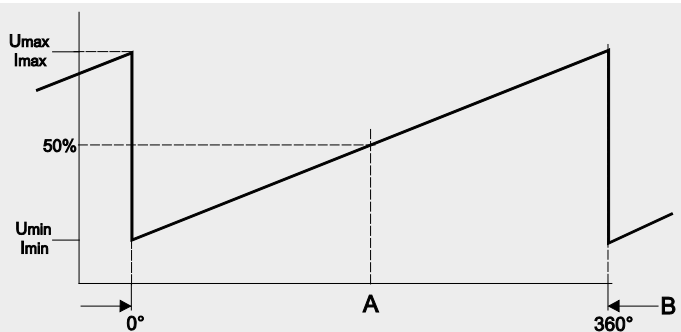
Output signal CCW
(counterclockwise increasing)



Example angular range 90°



Example angular range 360°



A – Marking

B – Measurement range [°]

Accessories PRAS20 / PRAS20R Magnetic shield

An optional shield plate is available for the angle sensors PRAS20 and PRAS20R. It can reduce the effect of residual magnetizing in case the sensor has to be mounted on a ferromagnetic material.

Order code magnetic shield:

PRAS20/26-MSHIELD

