posirot®
Magnetic Angle Sensors

PRAS20R

Angle sensor for indoor applications



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

Product versions

V / mA **Analog output**





PRAS20R - Magnetic Angle Sensor

Version with Analog output, redundant

Specifications

			Order options
Measurement range	0 ... 15° to 0 ... 360° (in 15° increments)	1	**15 / 30 / 45 / ... / 345 / 360**
Output	Voltage 0.5 ... 4.5 V, ratiometric, redundant	2	**U6R**
Signal characteristics	Signal 1 increasing clockwise, signal 2 increasing counterclockwise Signal 1 and signal 2 increasing clockwise Signal 1 and signal 2 increasing counterclockwise	3	**CW/CCW** **CW/CW** **CCW/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 6 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

PRAS20R – 1 – 2 – 3 – 4

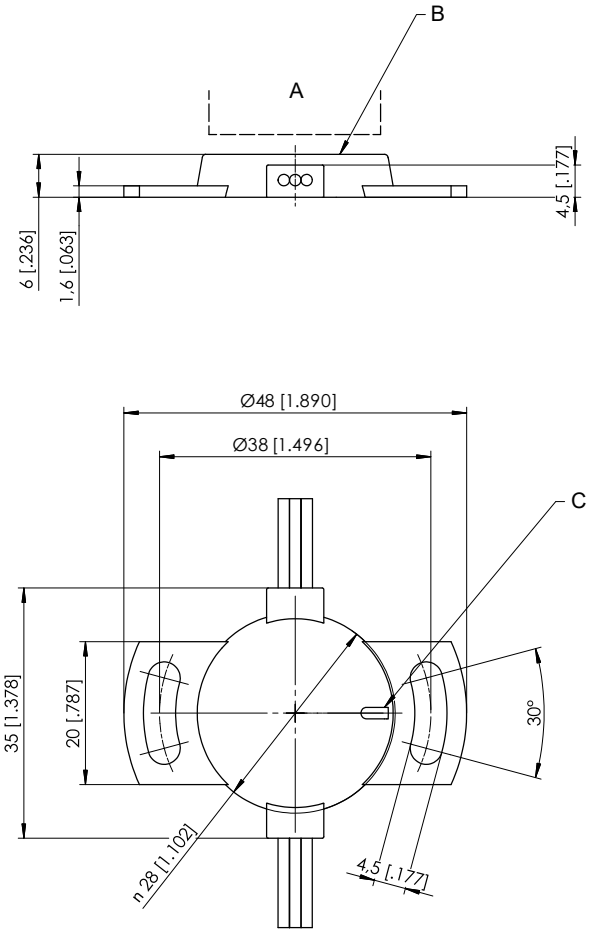
Order example: PRAS20R – 360 – U6R – CW/CCW – A300

Accessories:

Position magnets(see from page 4)

Magnetic shield(see page 11)

Dimensions

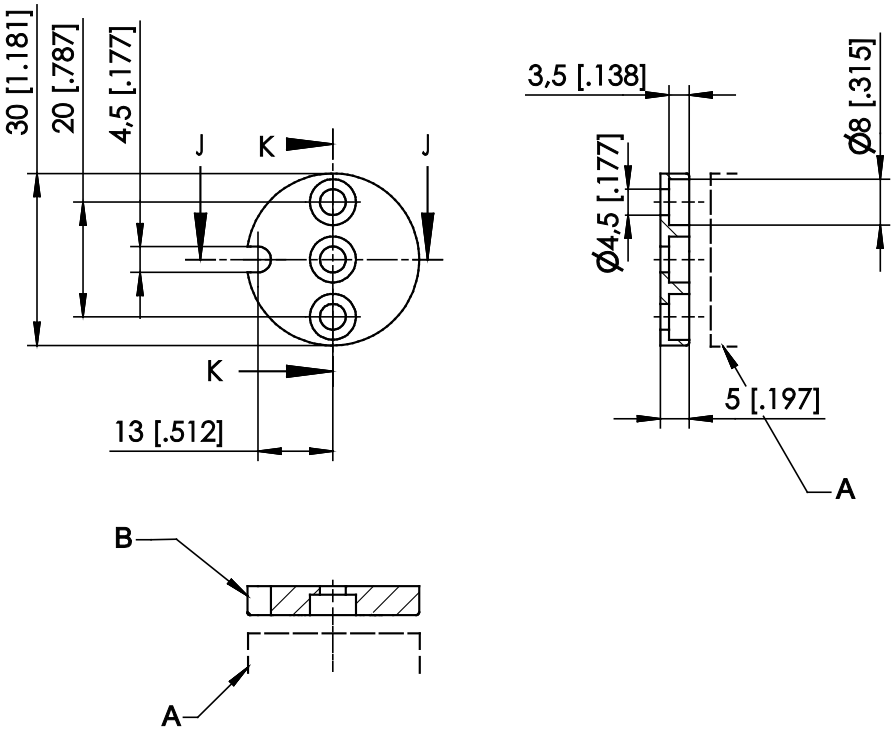


A – Position magnet
B – Measuring area
C – Marking

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

Position magnets

PRMAG20



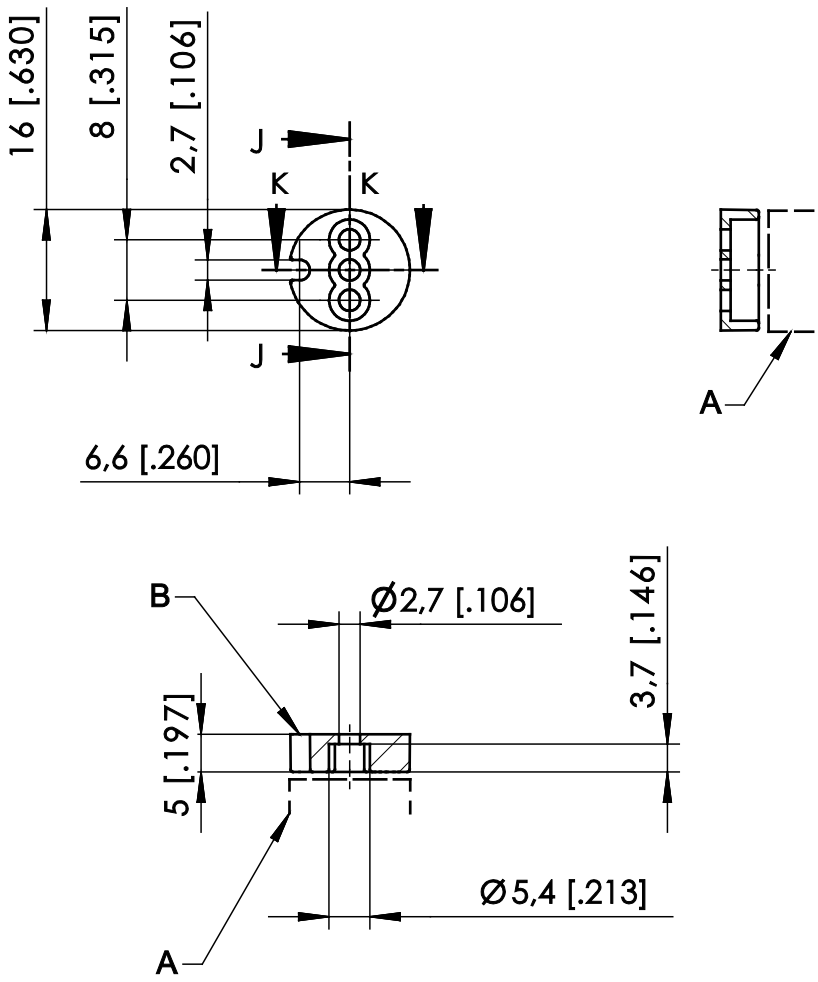
A – Sensor
B – Marking

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



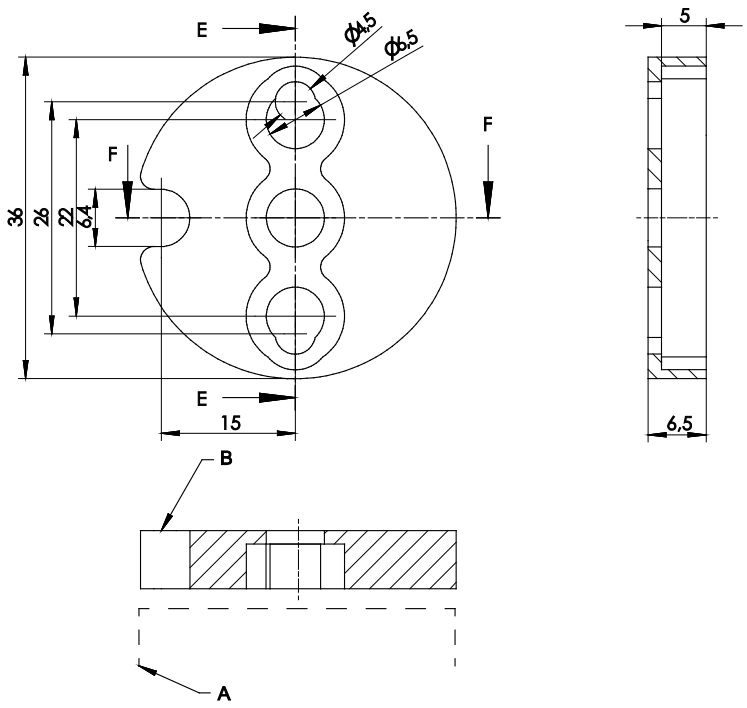
A – Sensor
B – Marking

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



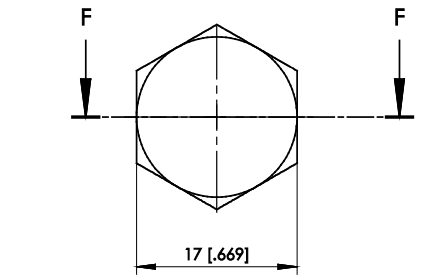
A – Sensor
B – Marking

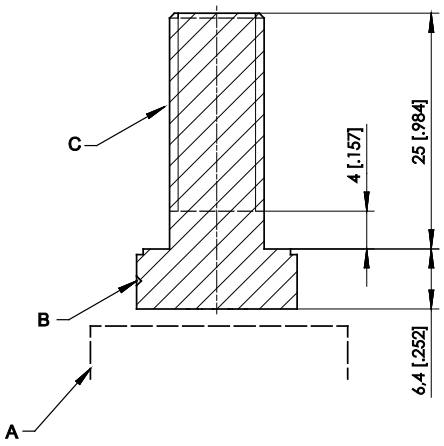
Order code	Weight	Material	Moment of inertia
PRMAG22	approx. 19 g	zinc coated steel, plastic	3 kgmm^2

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





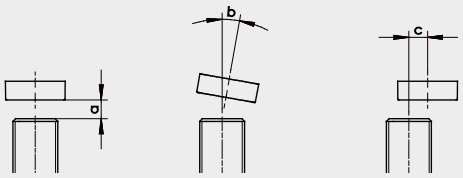
A – Sensor
B – Marking
C – Thread M10

Order code	Weight	Material	Moment of inertia
PRMAG-M10	approx. 30 g	stainless steel A2	1.3 kgmm2

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



Air gap (a)
Parallelism (b)
Lateral offset (c)

Sensor	Position magnet	Air gap [mm]	Parallelism [°]	Error by lateral offset [°]					
				0.2 mm	0.5 mm	1 mm	2 mm	3 mm	4 mm
PRAS20 PRAS20R	PRMAG20	0 ... 7	0 ... 5	0.1	0.3	0.7	2	4.6	–
	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

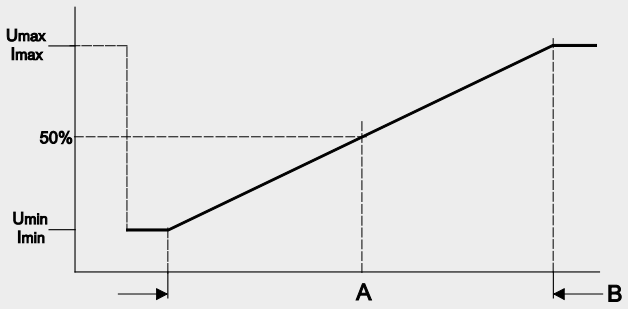
U6 Voltage output 10 … 90 % ratiometric 	Excitation voltage	5 V DC ±10 %
	Excitation current	typical 8 mA max. 12 mA
	Output voltage	10 … 90 % of the excitation voltage
	Output current	2 mA max.
	Measuring rate	1 kHz standard
	Stability (temperature)	±50 x 10^{-6} / °C f.s. (typical for 90° … 360°) ±100 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

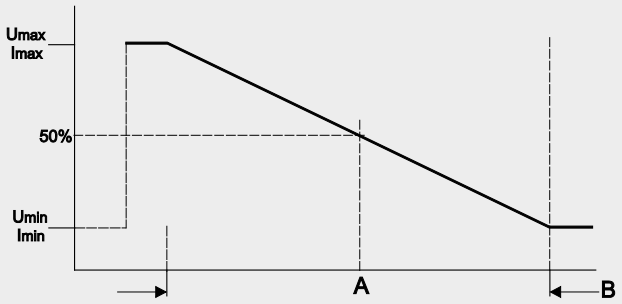
Signal wiring **Single wires**	**Output signals**	**Cable color**
	Excitation +	brown
	Signal	white
	GND	blue

Characteristics for magnetic angle sensors

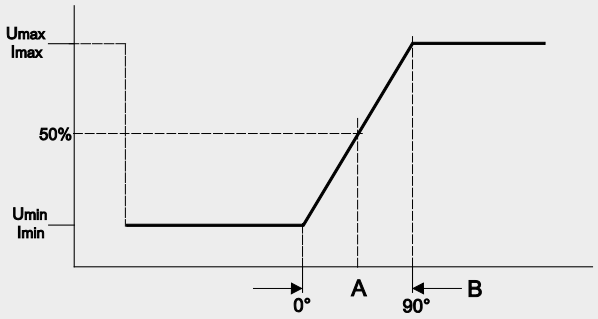
Output signal CW
(clockwise increasing)



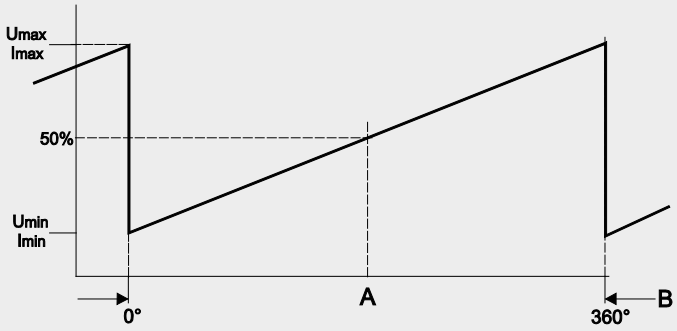
Output signal CCW
(counterclockwise increasing)



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

