

posirot[®]
Magnetic Angle Sensors,
explosion protected



Angle sensor, explosion protected



- **Measurement range 0°... 360°**
- **Protection class IP65**
- **Robust stainless steel housing**
- **Measurement with 10 mm shaft or contactless**
-  **II 3D Ex tc IIIC T80°C Dc X**
(X = examined with low impact energy of 4J)

Product versions



Analog output (dust-EX-proof)



PRAS5EX - Magnetic Angle Sensor Version with analog output (dust-EX-proof)

Specifications

		Order options	
Mechanical connection	Shaft 10 mm Contactless with external magnet	1	V K
Measurement range	0 ... 15° to 0 ... 360° (in 15° increments)	2	15 / 30 / 45 / ... / 345 / 360
Output	Voltage 0.5 ... 10 V Voltage 0.5 ... 4.5 V ratiometric Current 4 ... 20 mA, 3 wire	3	U2 U6 I1
Signal characteristics	Signal increasing CW, clockwise Signal increasing CCW, counterclockwise	4	CW CCW
Resolution	0.03% (60 ... 360°); 0.1% (15 ... 45°)		
Repeatability	±0.03% (60 ... 360°); ±0.1% (15 ... 45°)		
Linearity	±0.3% f.s. (typical)		
Connection	5-pin connector M12 axial (compatible with 4-pin connector) 5-pin connector M12 radial (compatible with 4-pin connector)	5	M12A5 M12R5
Housing material	Stainless steel EN 1.4404 (AISI 316L)	6	VA
Mounting	Screws M8		
Protection class	Housing: IP65 Dust-EX-proof:  II 3D Ex tc IIIC T80°C Dc X (X = examined with low impact energy of 4J)		
Life cycle of bearings (shaft version)	100 x 10 ⁶ revolutions (<1000 r.p.m.)		
Revolutions per minute (mechanical)	1000 r.p.m.		
Allowable shaft load	120 N radial / 120 N axial		
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	-20 ... +40°C		
Weight	390 g approx., 890 g with shaft		
EMC	DIN EN 61326-1:2013		
Dust-EX-proof	DIN EN 60079-0 (September 2019) DIN EN 60079-31 (December 2014)		

Order code

PRAS5EX – **1** – **2** – **3** – **4** – **5** – **6**

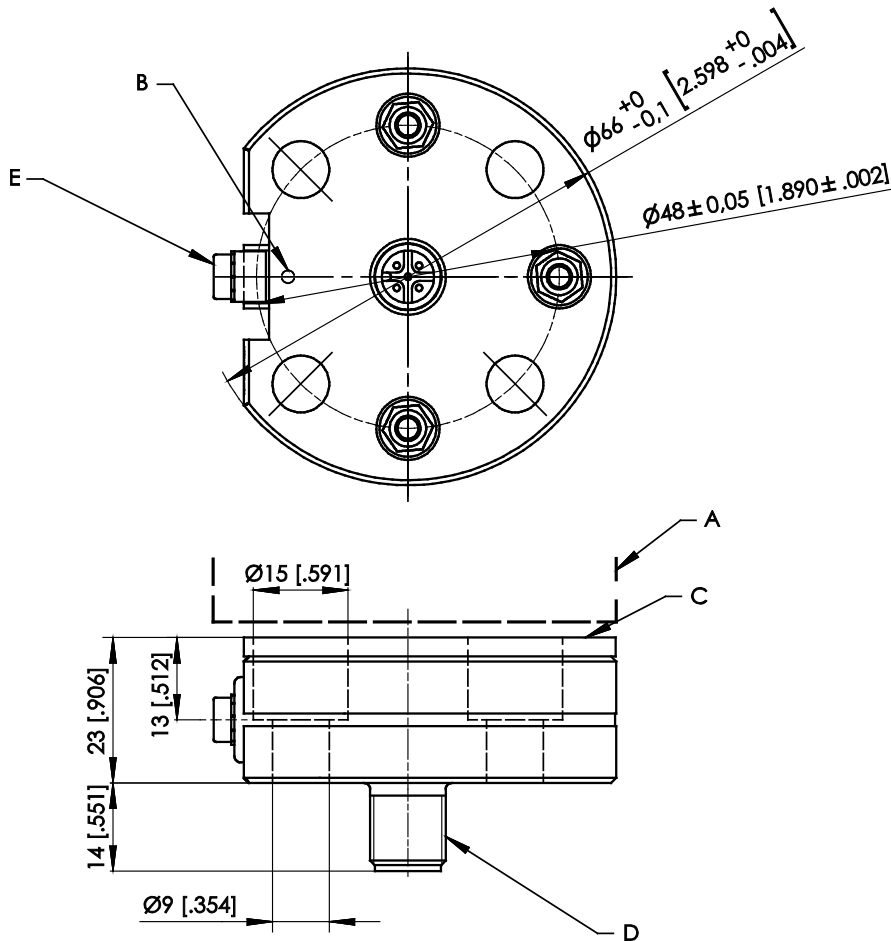
Order example: PRAS5EX – V – 360 – I1 – CW – M12A5 – VA

Accessories:

Position magnets (see page 11)

Dimensions

Non-contact, connector M12, axial



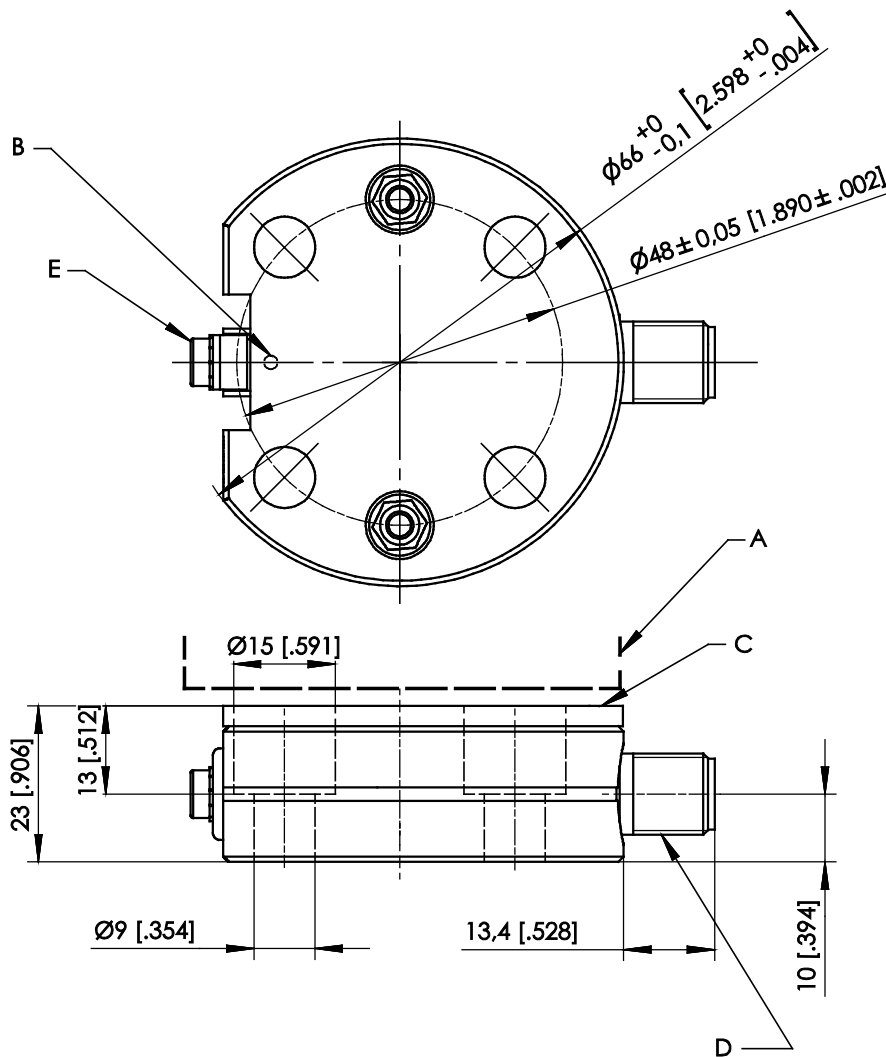
- A – Position magnet
- B – Marking
- C – Measuring area
- D – Connector M12
- E – Earthing

Dimensions in mm [inch]. Weight approx. 390 g.

Dimensions informative only.

For guaranteed dimensions consult factory.

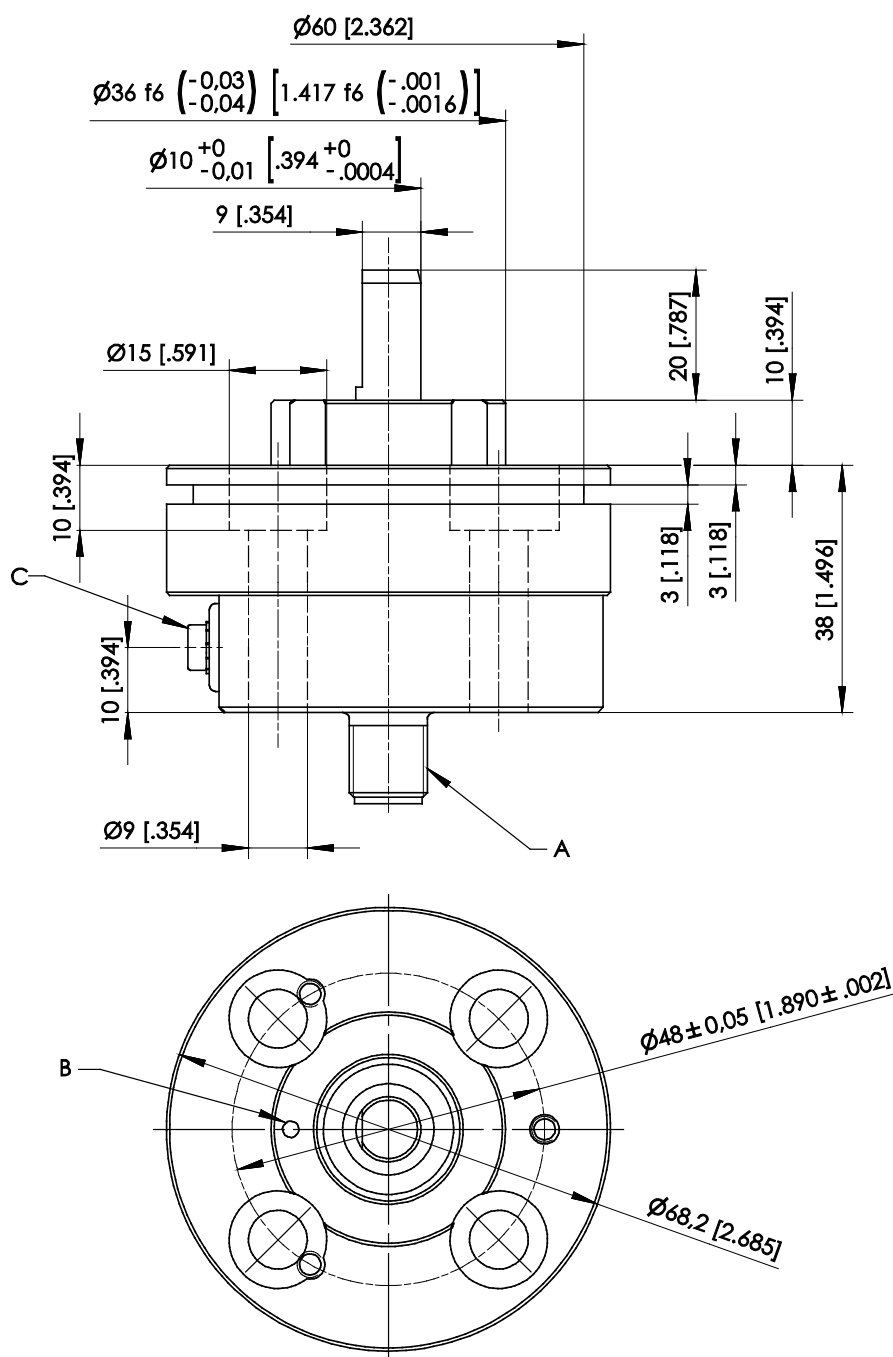
Non-contact, connector M12, radial



- A – Position magnet
- B – Marking
- C – Measuring area
- D – Connector M12
- E – Earthing

Dimensions in mm [inch]. Weight approx. 390 g.
Dimensions informative only.
For guaranteed dimensions consult factory.

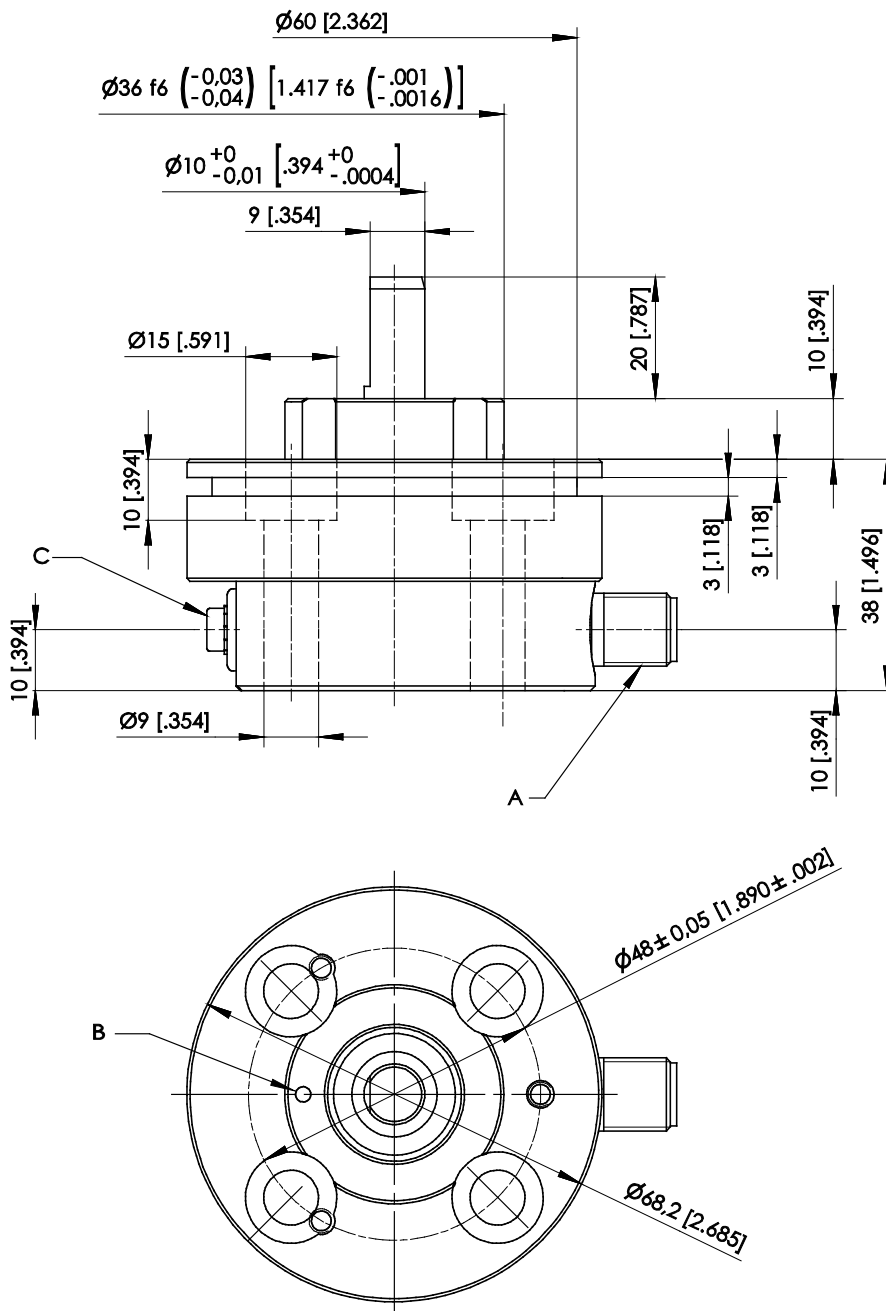
With shaft, connector M12, axial



- A – Connector M12
- B – Marking
- C – Earthing

Dimensions in mm [inch]. Weight approx. 890 g.
Dimensions informative only.
For guaranteed dimensions consult factory.

With shaft, connector M12, radial



A – Connector M12
B – Marking
C – Earthing

Dimensions in mm [inch]. Weight approx. 890 g.
Dimensions informative only.
For guaranteed dimensions consult factory.

Output specification

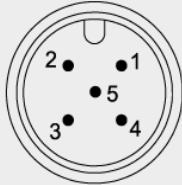
Analog output

U2 Voltage output 0.5 ... 10 V 	Excitation voltage	24 V DC (18 ... 36 V DC)
	Excitation current	typical 10 mA max. 15 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

I1 Current output 4 ... 20 mA, 3 wires 	Excitation voltage	24 V DC (18 ... 36 V DC)
	Excitation current	typical 30 mA max. 35 mA
	Load R _L	500 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

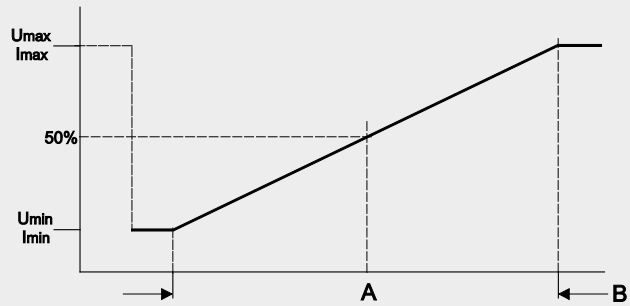
1 channel M12, 5 pin (connector output)

Signal wiring	Output signals	Connector pin no.
Connector M12, 5 pin  View to the sensor connector	Excitation +	1
	Signal	2
	GND	3
	Do not connect!	4
	Do not connect!	5

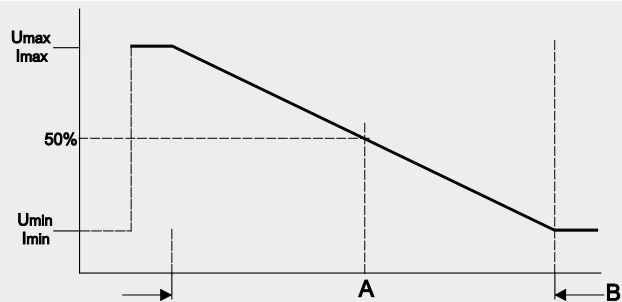
3-wire current 4...20 mA interface: GND has to be connected!

Characteristics for magnetic angle sensors

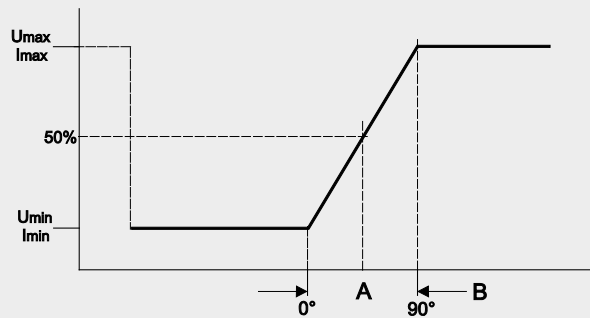
Output signal CW (clockwise increasing)



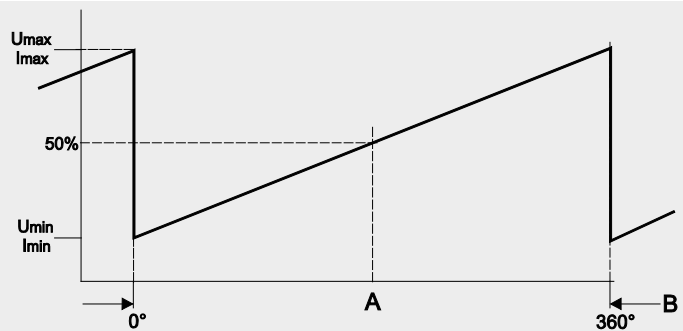
Output signal CCW (counterclockwise increasing)



Example angular range 90°



Example angular range 360°

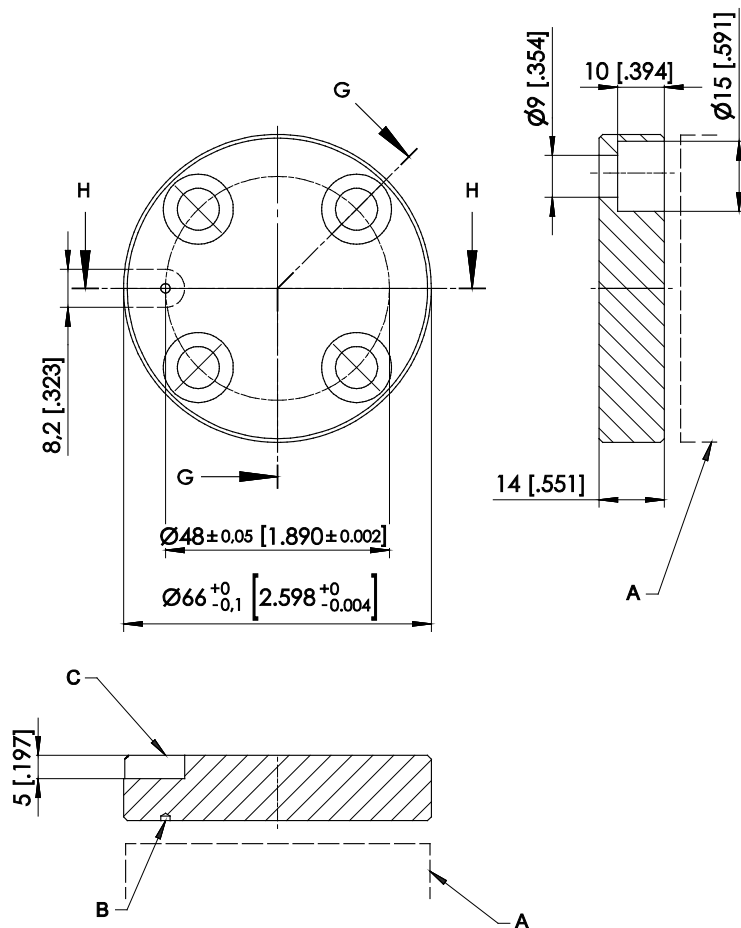


A – Marking

B – Measurement range [°]

Accessories Position magnets

PRMAG5-Z / PRMAG5-Z-VA



A – Sensor
B – Marking
C – Notch

Order code	Weight	Material	Moment of inertia
PRMAG5-Z	approx. 110 g	AlMgSi1	59,9 kgmm ²
PRMAG5-Z-VA	approx. 275 g	stainless steel EN 1.4404 (AISI 316L)	149,9 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.

Connector cable M12, 4 pin

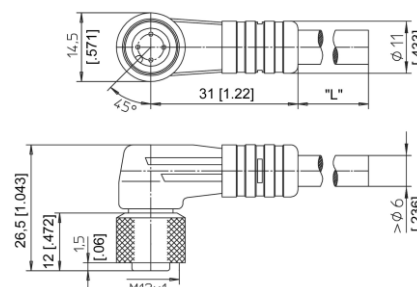
(angular coupling)

shielded connector

Suitable for 5-pin

sensor connectors

The 4-core screened cable is supplied with a mating 4-pin 90° M12 connector at one end and 4 wires at the other end. Available lengths are 2 m, 5 m and 10 m.
Wire: cross sectional area 0.34 mm²
Cable diameter: 5.6 ±0.2 mm



Order code

KAB - xM - M12/4F/W - LITZE

IP69: KAB - xM - M12/4F/W/69K - LITZE

xM = length in m

Connector cable M12, 4 pin

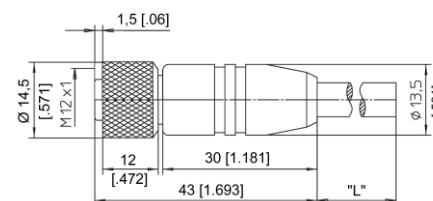
(straight coupling)

shielded connector

Suitable for 5-pin

sensor connectors

The 4-core screened cable is supplied with a mating 4-pin M12 connector at one end and 4 wires at the other end. Available lengths are 2 m, 5 m and 10 m.
Wire: cross sectional area 0.34 mm²
Cable diameter: 5.6 ±0.2 mm



Order code

KAB - xM - M12/4F/G - LITZE

IP69: KAB - xM - M12/4F/G/69K - LITZE

xM = length in m

Signal wiring M12, 4 pin	Plug connection / cable color			
	1	2	3	4
	brown	white	blue	black

Applicable for cable carriers

Maximum movement speed	3 m/s
Maximum acceleration	5 m/s ²
Minimum bending radius	10 x cable diameter