

POSIROT[®]

Magnetic Angle Sensors (Dust-Ex-proof)

PRAS2EX
Magnetic Angle Sensor

Datasheet



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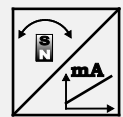
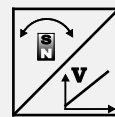
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Analog output



Sensor features

- Measurement range 0 ... 360°
- Protection class IP65
- Analog output
- Non-contact with external position magnet
-  II 3D Ex tc IIC T80°C Dc X (X = examined with low impact energy of 4J)



Specifications

Output	Voltage 0.5 ... 10 V Voltage 0.5 ... 4.5 V, ratiometric Current 4 ... 20 mA, 3 wire
Measurement range	0 ... 15° to 0 ... 360° (in 15° increments)
Resolution	0.03% (60 ... 360°); 0.1% (15 ... 45°)
Repeatability	±0.03% (60 ... 360°); ±0.1% (15 ... 45°)
Linearity	±0.3% f.s. (typical)
Rated distance sensor / magnet	Depending on the position magnet
Protection class	IP65
Housing material	Stainless steel
Mounting	Clamps, mounting plate
Connection	5-pin connector M12 (compatible to 4-pin connector)
Temperature range	-20 ... +40°C
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
Weight	180 g approx.
EMC	DIN EN 61326-1:2013
Dust-EX proof	DIN EN 60079-0 (June 2014), DIN EN 60079-31 (December 2014)

Order code

PRAS2EX - 1 - 2 - 3 - 4

1 Measurement range (0 ... 15° to 0 ... 360°, in 15° increments)

15 / 30 / 45 / ... / 345 / 360

2 Output

U2 = Voltage 0.5 ... 10 V (excitation voltage 18 ... 36 V DC)
U6 = Voltage 0.5 ... 4.5 V ratiometric (excitation voltage 5 V DC)
I1 = Current 4 ... 20 mA, 3 wire (excitation voltage 18 ... 36 V DC)

3 Signal characteristics

CW = Signal increasing CW, clockwise
CCW = Signal increasing CCW, counterclockwise

4 Connection

M12A5 = 5-pin connector M12 axial (compatible with 4-pin connector)
M12R5 = 5-pin connector M12 radial (compatible with 4-pin connector)

Order example

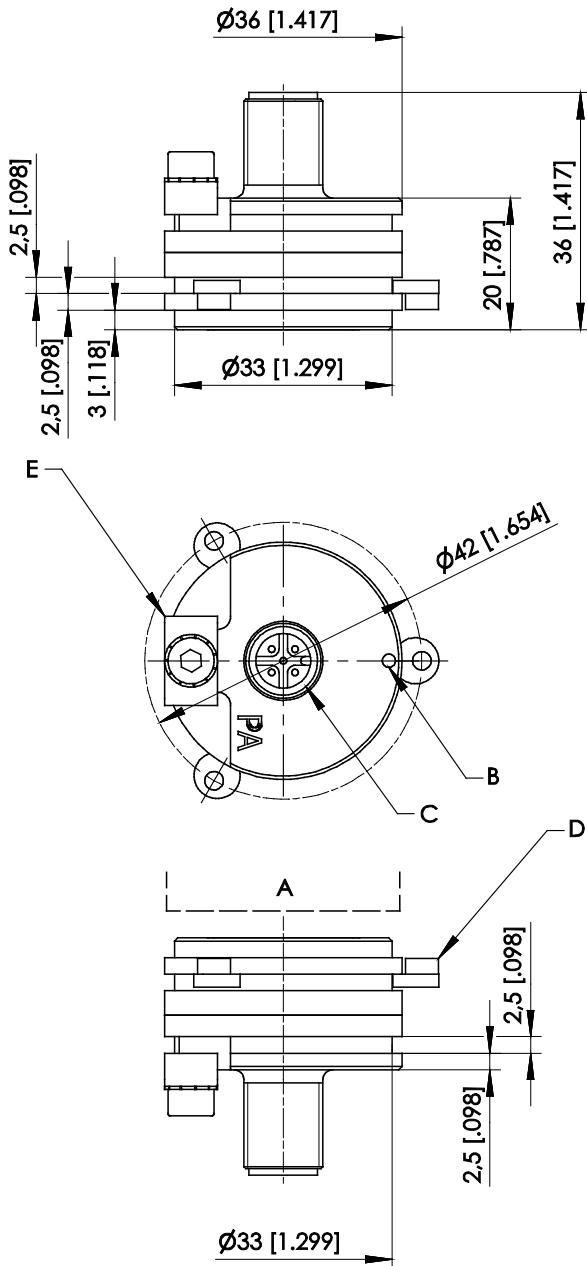
PRAS2EX - 360 - I1 - CW - M12A5

Accessories:

Position magnets (see page 11)

Dimensions

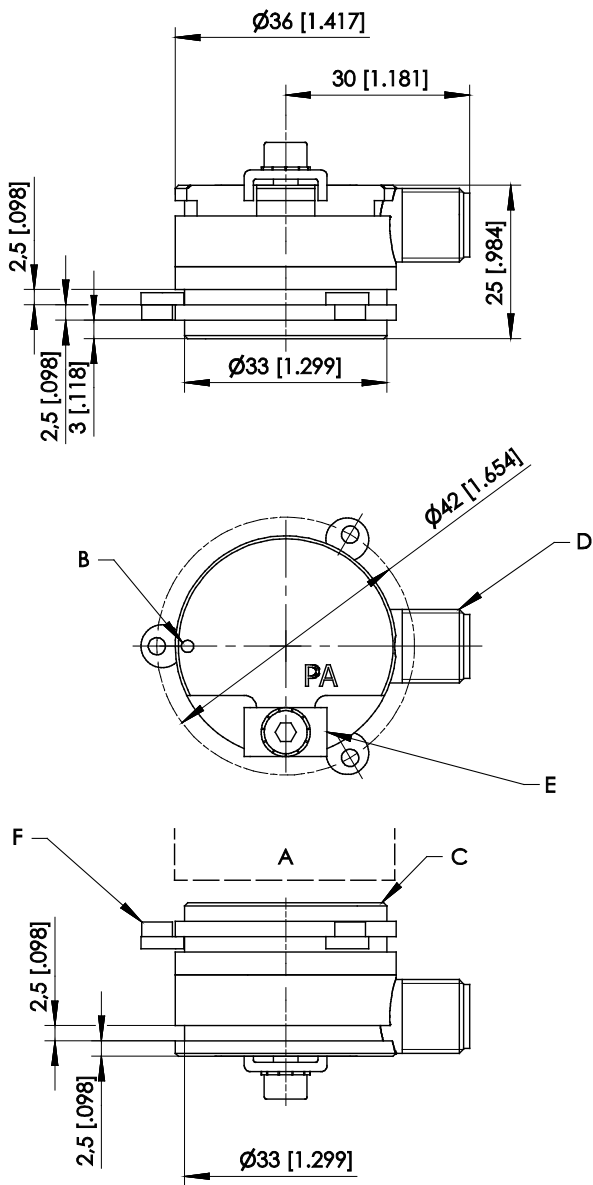
Connector M12, axial



- A – Position magnet
- B – Marking
- C – Connector M12
- D – Mounting clamps PRPT-BFS1
- E – Earthing

Dimensions in mm [inch]. Weight approx. 180 g.
Dimensions informative only.
For guaranteed dimensions consult factory.

Connector M12, radial

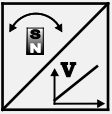
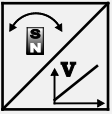
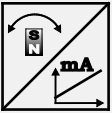


- A – Position magnet
- B – Marking
- C – Measuring area
- D – Connector M12
- E – Earthing
- F – Mounting clamps PRPT-BFS1

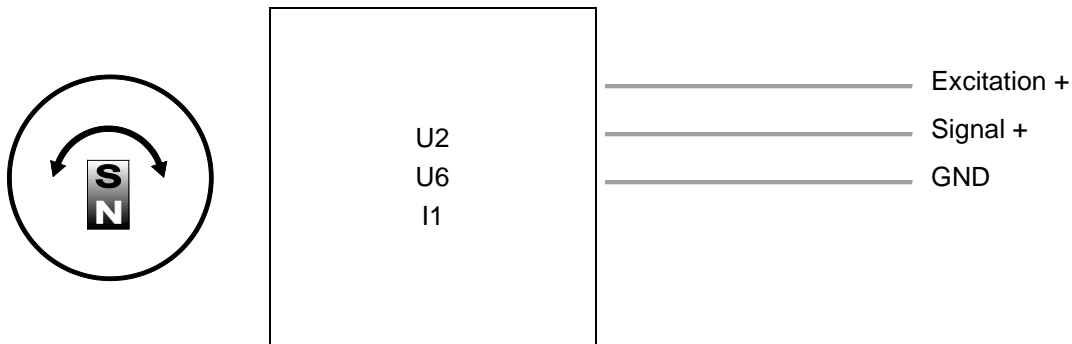
Dimensions in mm [inch]. Weight approx. 180 g.
Dimensions informative only.
For guaranteed dimensions consult factory.

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)	$\pm 50 \times 10^{-6} / ^\circ\text{C}$ f.s. (typical for $90^\circ \dots 360^\circ$) $\pm 100 \times 10^{-6} / ^\circ\text{C}$ f.s. (typical for $<90^\circ$)
	Protection	Reverse polarity, short circuit
	Operating temperature	-40 ... +85 °C
	EMC	DIN EN 61326-1:2013
	U6 Voltage output 10 ... 90 % ratiometric 	Excitation voltage
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)		$\pm 50 \times 10^{-6} / ^\circ\text{C}$ f.s. (typical for $90^\circ \dots 360^\circ$) $\pm 100 \times 10^{-6} / ^\circ\text{C}$ f.s. (typical for $<90^\circ$)
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
	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)	$\pm 50 \times 10^{-6} / ^\circ\text{C}$ f.s. (typical for $90^\circ \dots 360^\circ$) $\pm 100 \times 10^{-6} / ^\circ\text{C}$ f.s. (typical for $<90^\circ$)
	Protection	Reverse polarity, short circuit
	Operating temperature	-40 ... +85 °C
	EMC	DIN EN 61326-1:2013

Signal diagram



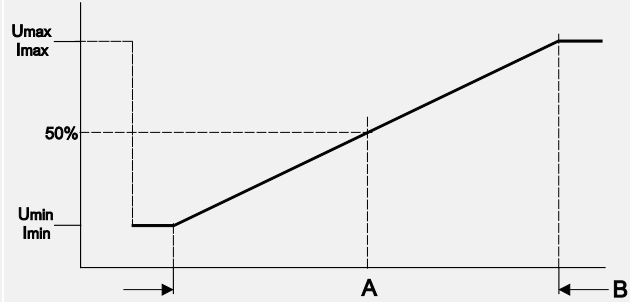
Signal wiring, 1 channel M12, 4/5 pin (connector output)

Signal	PIN	View to the sensor connector
Excitation +	1	
Signal	2	
GND	3	
Do not connect!	4	
Do not connect!	5	

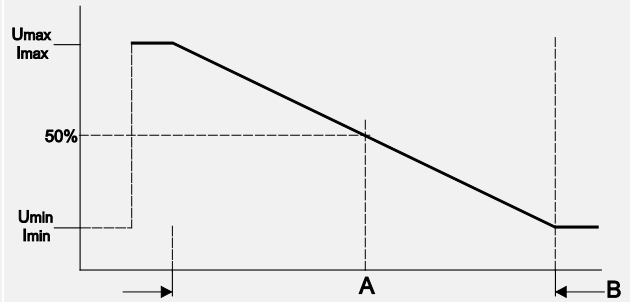
3-wire current 4...20 mA interface: GND has to be connected!

Characteristics for magnetic angle sensors

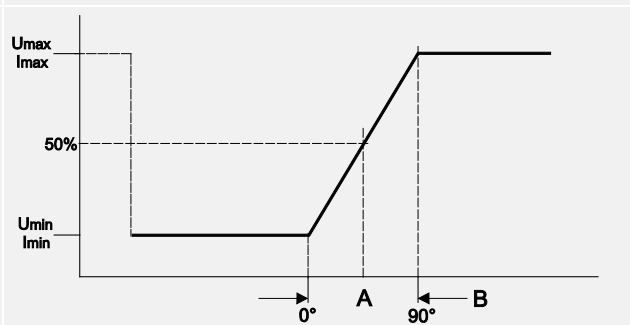
Output signal CW
(clockwise increasing)



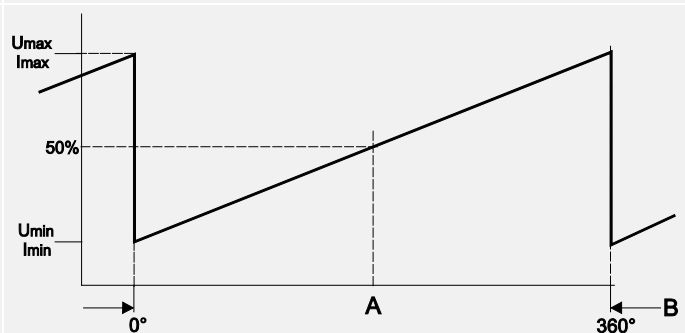
Output signal CCW
(counterclockwise increasing)



Example angular range 90°



Example angular range 360°

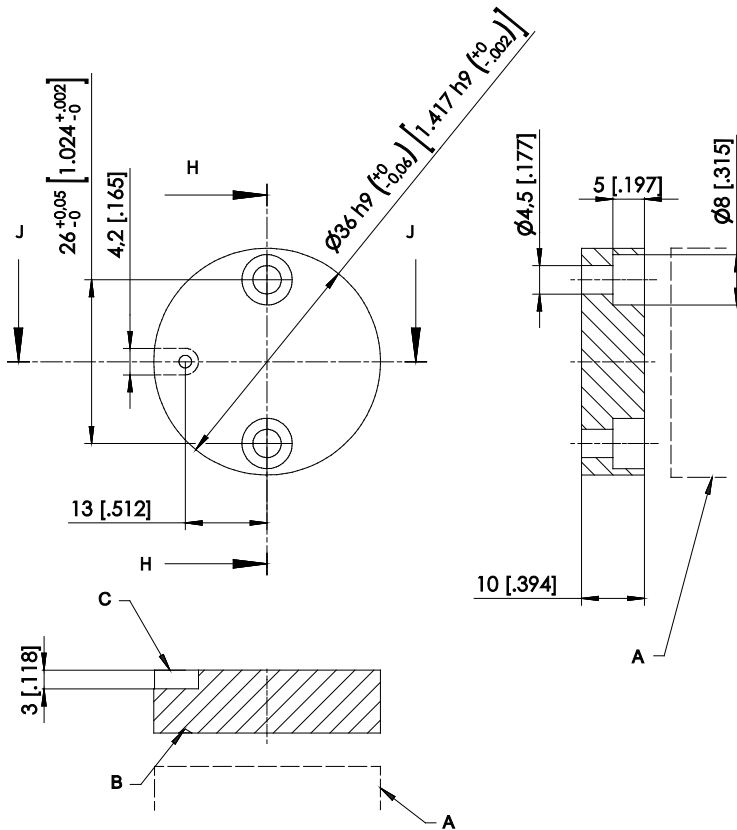


A – Marking
B – Measurement range [°]

Accessories

Position magnets

PRMAG2-VA / PRMAG2-Z-VA



A – Sensor
B – Marking
C – Notch

Order code	Weight	Material	Moment of inertia
PRMAG2-VA	approx. 67 g	stainless steel 1.4404	12 kgmm ²
PRMAG2-Z-VA	approx. 61 g	stainless steel 1.4404	11.5 kgmm ²

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

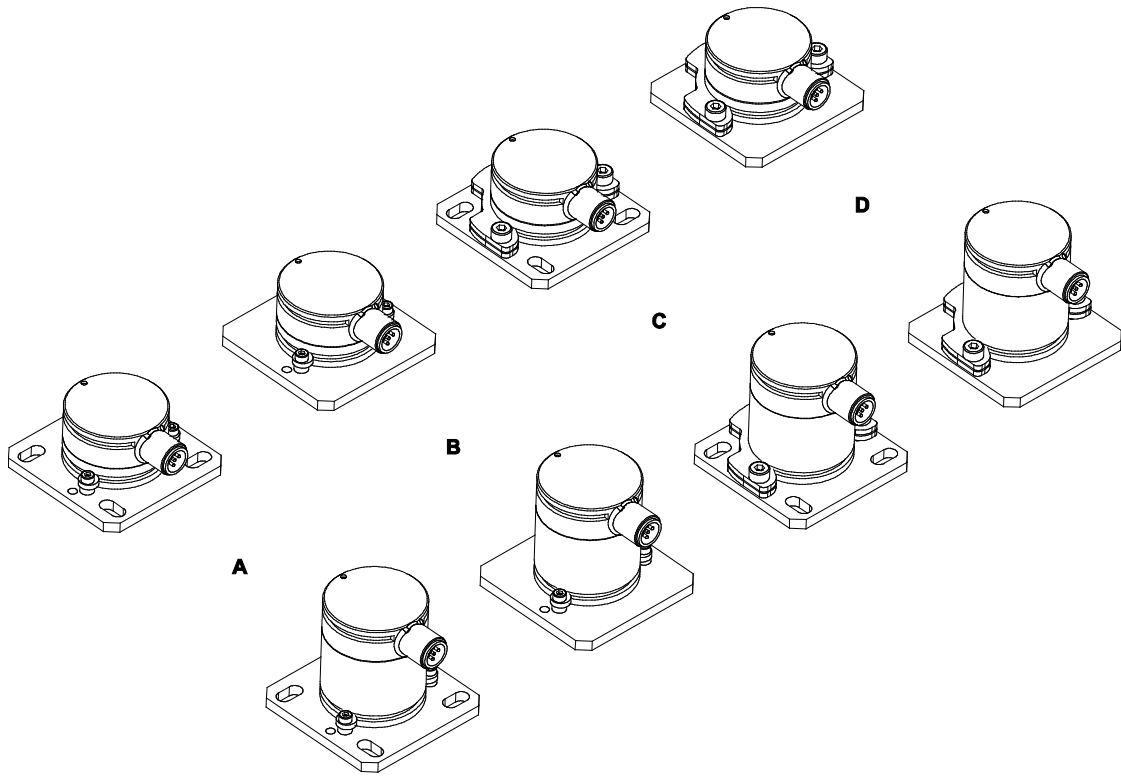
Dimensions in mm [inch].

Dimensions informative only.

For guaranteed dimensions please consult factory.

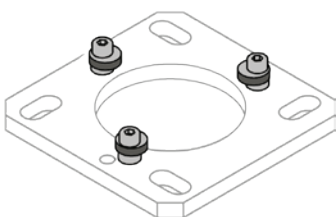
Mounting plates

Mounting possibilities PRAS2/PRDS2 and PRAS3/PRDS3

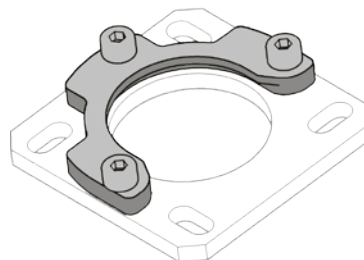


- A. **PRPT-BPL1 + PRPT-BFS1**
(Mounting plates for screw mounting + mounting clamp)
- B. **PRPT-BPL2 + PRPT-BFS1**
(Mounting plates for welding assembly + mounting clamp)
- C. **PRPT-BPL1 + PRPT-BFS2**
(Mounting plates for screw mounting + mounting bracket)
- D. **PRPT-BPL2 + PRPT-BFS2**
(Mounting plates for welding assembly + mounting bracket)

Mounting clamp BFS1



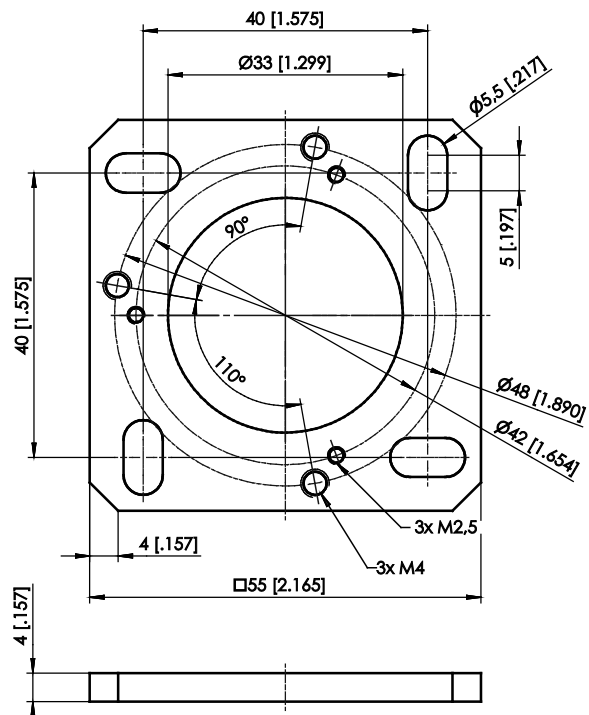
Mounting bracket BFS2



PRPT-BPL1

(Screw mounting)

In combination with the mounting clamps PRPT-BFS1 (3 x M2.5) or in combination with the mounting bracket PRPT-BFS2 (3 x M4).

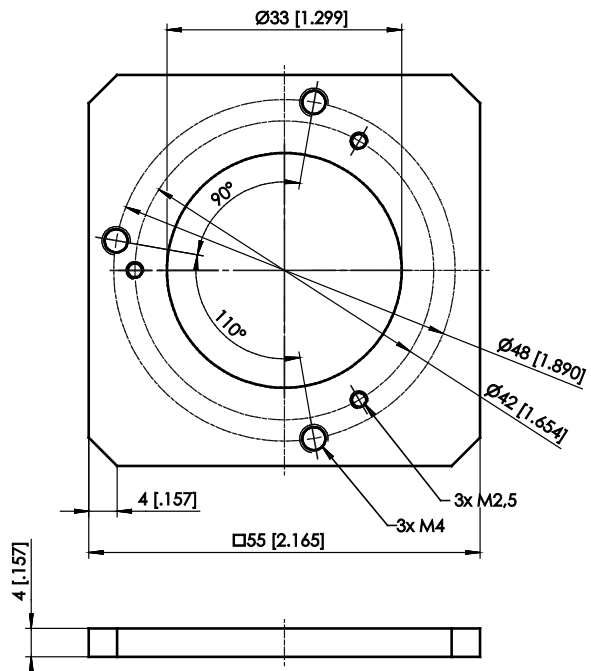


Dimensions in mm [inch]. Weight 30 g approx.
Dimensions informative only.
For guaranteed dimensions please consult factory.

PRPT-BPL2

(Welding assembly)

In combination with the mounting clamps PRPT-BFS1 (3 x M2.5) or in combination with the mounting bracket PRPT-BFS2 (3 x M4).



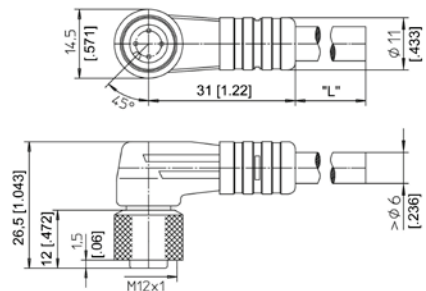
Dimensions in mm [inch]. Weight 30 g approx.
Dimensions informative only.
For guaranteed dimensions please consult factory.

**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**

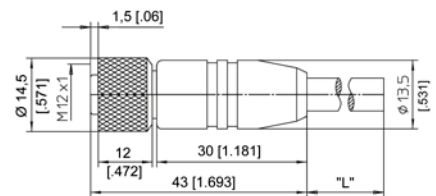
xM = length in m

**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
	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