

POSIROT[®]

Magnetic Angle Sensors (Dust-Ex-proof)

PRAS3EX
Magnetic Angle Sensor

Datasheet



Copyright

© ASM GmbH
Am Bleichbach 18-24
85452 Moosinning
Germany

The information presented in this data sheet does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice. No liability will be accepted by ASM for any consequence of its use. Publication thereof does not convey nor imply any license under patent or industrial or intellectual property rights. Applications that are described herein for any of these products are for illustrative purpose only.


ASM makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

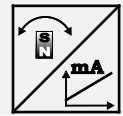
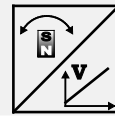
Analog output	4
Specifications	4
Order code	5
Dimensions	6
Connector M12, axial	6
Connector M12, radial	7
Output specification	8
Analog output	8
Characteristics for magnetic angle sensors	10
Accessories	11
Mounting plates	11
Mounting possibilities PRAS2/PRDS2 and PRAS3/PRDS3	11
Connector cable M12, 4 pin	15

Analog output



Sensor features

- Measurement range 0 ... 360°
- Protection class IP65
- Analog output
- With 10 mm shaft or 6 mm hollow shaft
-  II 3D Ex tc IIIC 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)
Protection class	IP65
Housing material	Stainless steel
Mounting	Clamps, mounting plate
Connection	5-pin connector M12 (compatible with 4-pin connector)
Temperature range	-20 ... +40°C
Life cycle of bearings	100 x 10 ⁶ revolutions (<1500 r.p.m.)
Revolutions per minute (mech.)	1000 r.p.m.
Allowable shaft load	100 N radial / 100 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
Weight	330 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

PRAS3EX – 1 – 2 – 3 – 4 – 5

1 Shaft

V = 10 mm shaft
H = 6 mm hollow shaft

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

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

3 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)

4 Signal characteristics

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

5 Connection

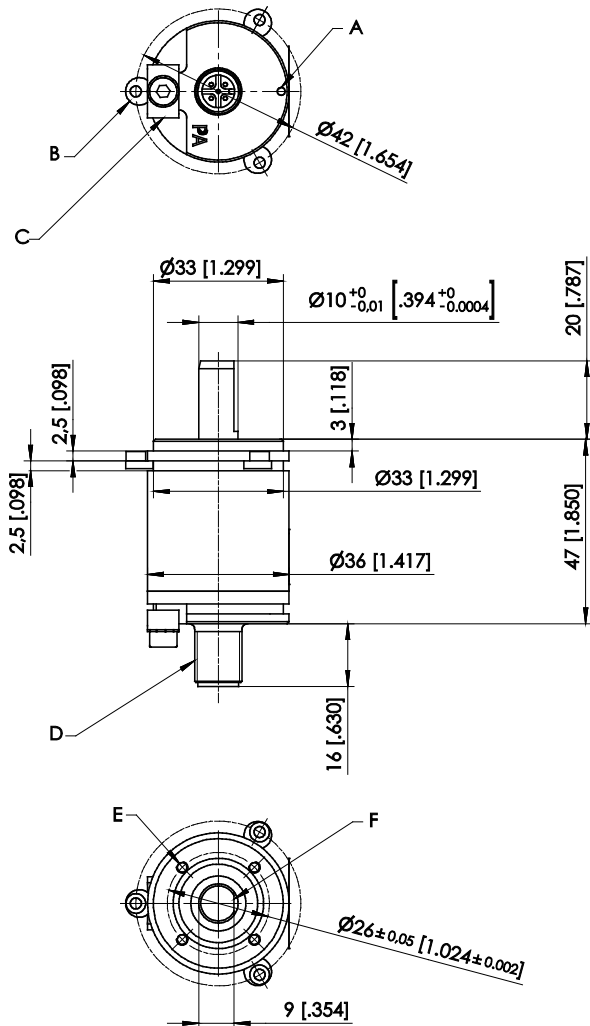
M12A5 = 5-pin connector M12 axial (compatible with 4-pin connector)
M12R5 = 5-pin connector M12 radial (compatible with 4-pin connector)

Order example

PRAS3EX – V – 360 – I1 – CW – M12A5

Dimensions

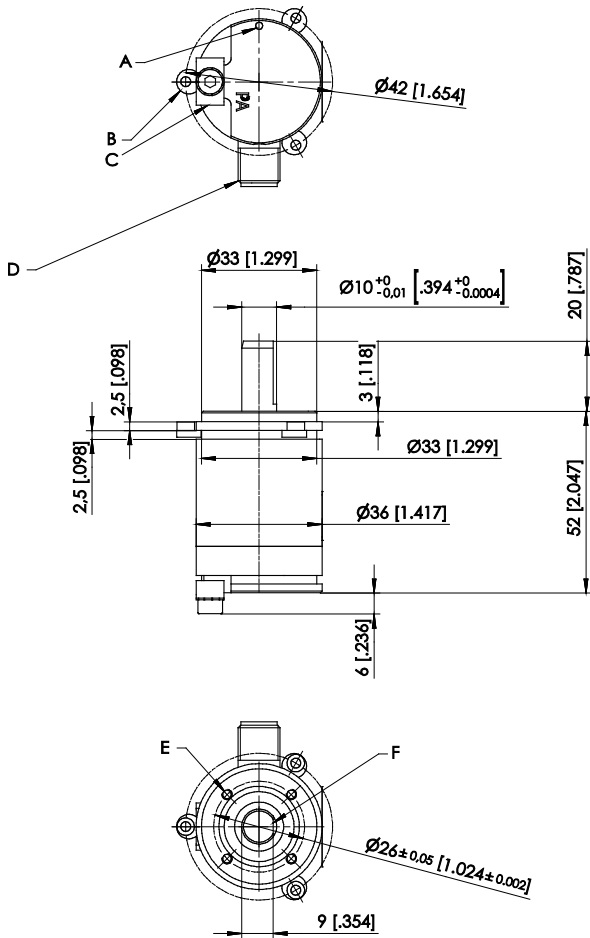
Connector M12, axial



- A – Marking
- B – Mounting clamps PRTP-BFS1
- C – Earthing
- D – Connector M12
- E – 4x M3 – 5 [0.197] deep,
screw hole orientation to marking not defined!!
- F – Flat

Dimensions in mm [inch]. Weight approx. 290 g.
Dimensions informative only.
For guaranteed dimensions consult factory.

Connector M12, radial

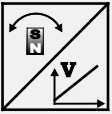
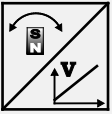
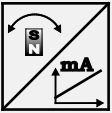


- A – Marking
- B – Mounting clamps PRTP-BFS1
- C – Earthing
- D – Connector M12
- E – 4x M3 – 5 [.197] deep
 screw hole orientation to marking not defined!
- F – Flat

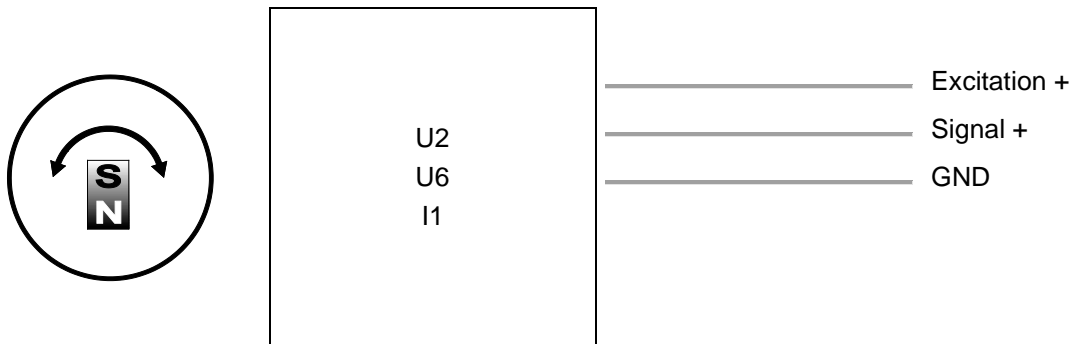
Dimensions in mm [inch]. Weight approx. 330 g.
 Dimensions informative only.
 For guaranteed dimensions consult factory.

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



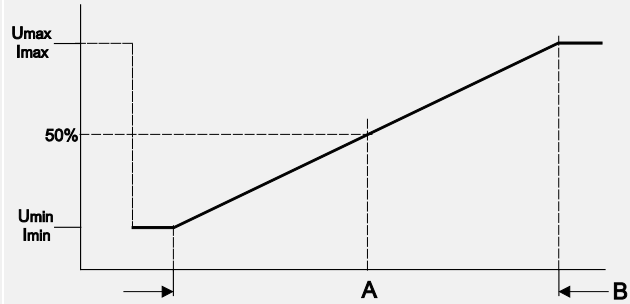
Signal wiring, 1 channel M12, 4/5 pin (connector output)

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

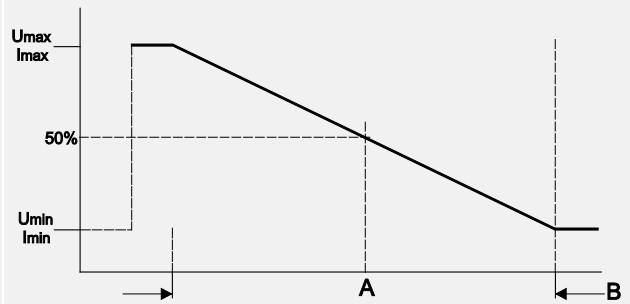
3-wire current 4...20 mA interface: GND has to be connected!

Characteristics for magnetic angle sensors

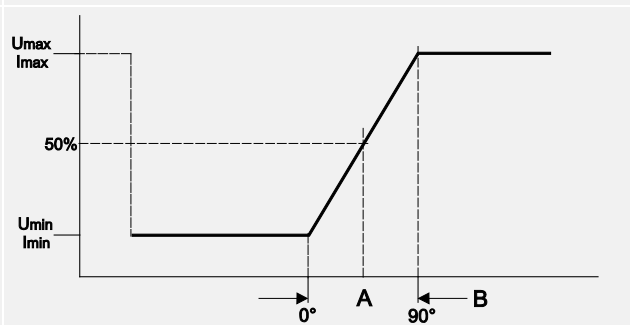
Output signal CW
(clockwise increasing)



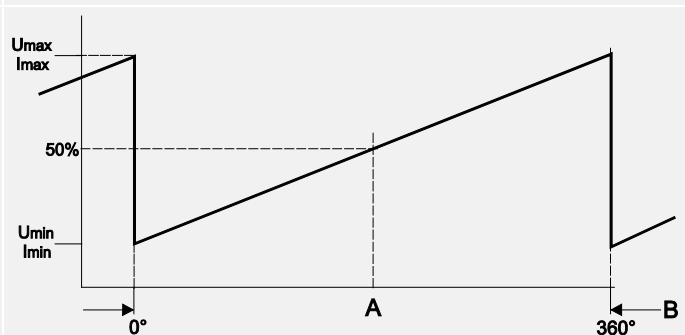
Output signal CCW
(counterclockwise increasing)



Example angular range 90°



Example angular range 360°

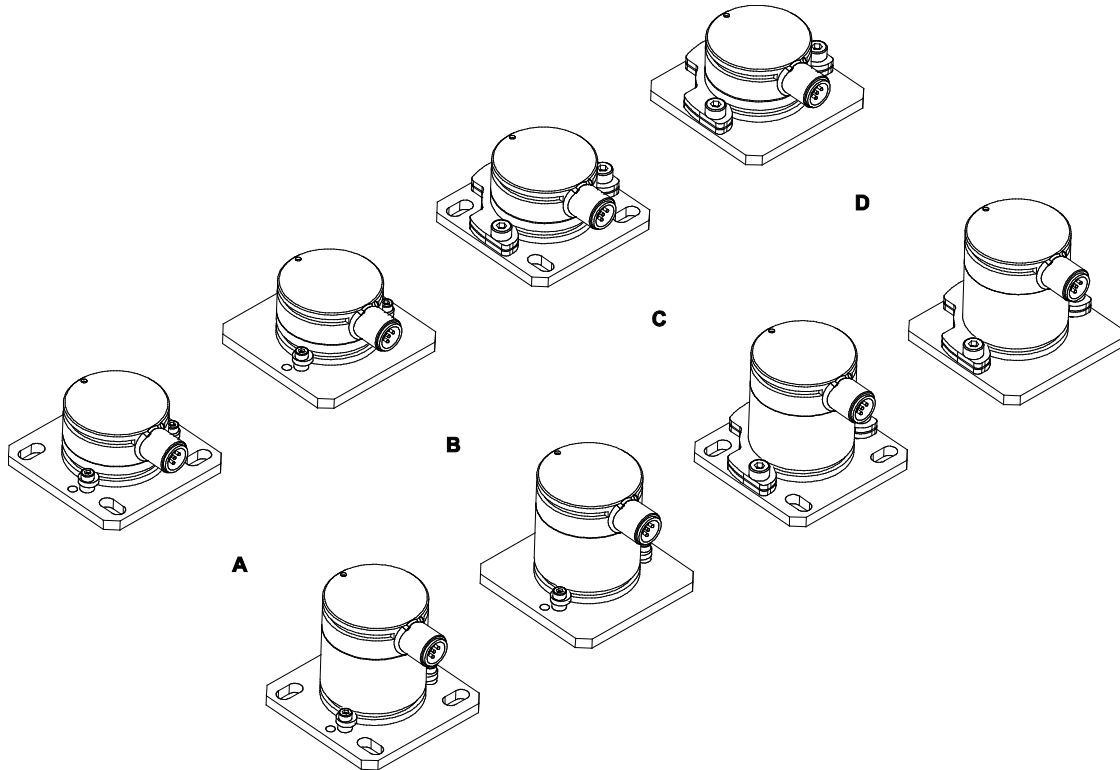


A – Marking
B – Measurement range [°]

Accessories

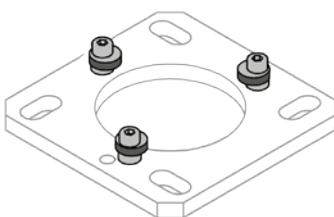
Mounting plates

Mounting possibilities PRAS2/PRDS2 and PRAS3/PRDS3

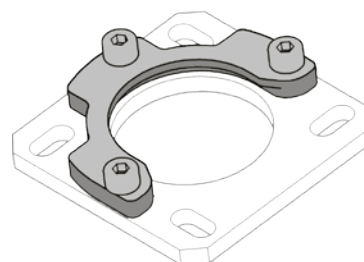


- A. **PRPT-BPL1 + PRPT-BFS1**
(Mounting plates for screw mounting + mounting clamp)
- B. **PRPT-BPL2 + PRPT-BFS1**
(Mounting plates for welding assembly + mounting clamp)
- C. **PRPT-BPL1 + PRPT-BFS2**
(Mounting plates for screw mounting + mounting bracket)
- D. **PRPT-BPL2 + PRPT-BFS2**
(Mounting plates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

Mounting clamp BFS1



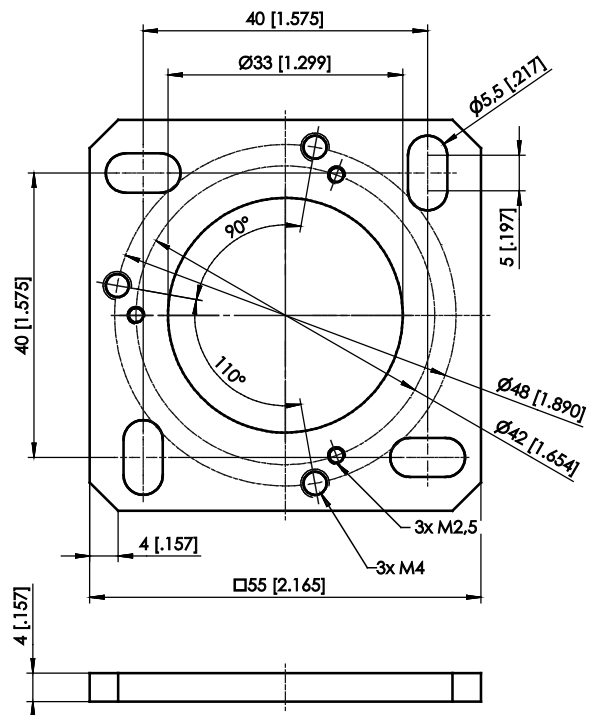
Mounting bracket BFS2



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).

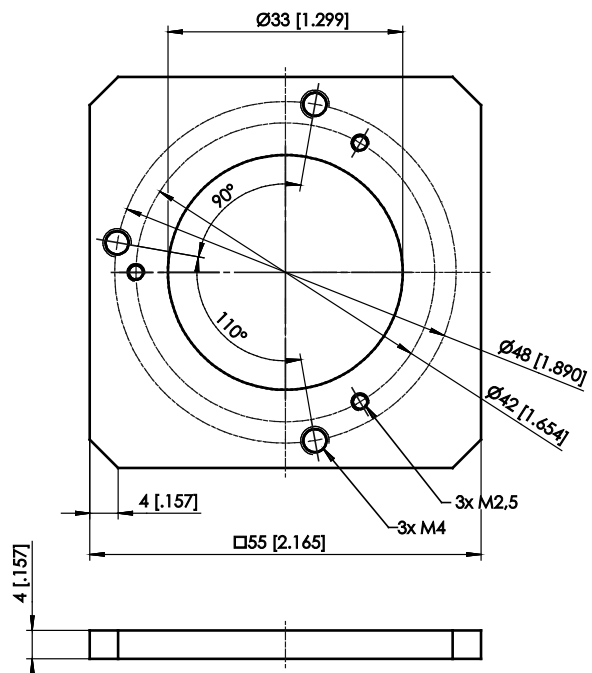


Dimensions in mm [inch]. Weight 30 g approx.
Dimensions informative only.
For guaranteed dimensions please consult factory.

PRPT-BPL2

(Welding assembly)

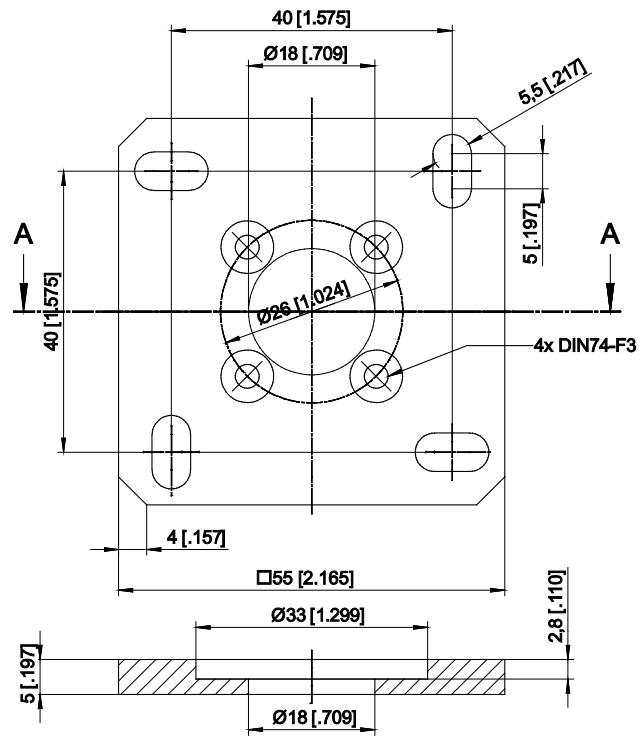
In combination with the mounting clamps PRPT-BFS1 (3 x M2.5) or in combination with the mounting bracket PRPT-BFS2 (3 x M4).



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

PRPT-BPL3

In combination with PRAS3EX
and frontal mounting.



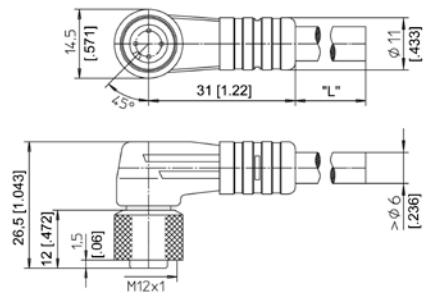
Dimensions in mm [inch]. Weight 30 g approx.
Dimensions informative only.
For guaranteed dimensions please consult factory.

**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**

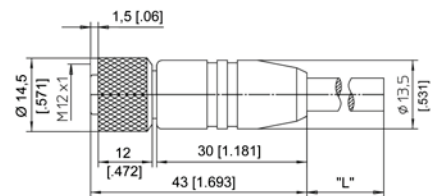
xM = length in m

**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	Plug connection / cable color			
	M12, 4 pin	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