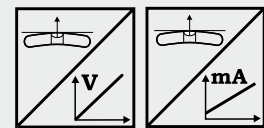




**Analog Inclination Sensor for 1 axis or 2 axes in MEMS technology**

- Measurement range  $\pm 180^\circ$  for 1 axis or  $\pm 60^\circ$  for 2 axes
- Protection class IP67 / IP69K
- Analog output linear
- Aluminium or stainless steel housing
- Wear free, high resolution
- High shock resistance
- Servo flange mounting



<b>Specifications</b>	Output	U2	Voltage 0.5 ... 10 V / $U_B = 18 \dots 36$ V
		U8	Voltage 0.5 ... 4.5 V / $U_B = 10 \dots 36$ V
		I1	Current 4 ... 20 mA / $U_B = 18 \dots 36$ V
	Measurement range		$\pm 180^\circ$ for 1 axis or $\pm 60^\circ$ for 2 axes
	Resolution		0.05°
	Linearity		$\pm 0.5^\circ$
	Settling time		0.1 s ... 10 s / 90 %, configurable
	Protection class		IP67 / IP69K
	Material		Aluminium or stainless steel
	Connection		5 pin connector M12 axial or radial
	Shock (non-operational)		EN 60068-2-27:1993, 100 g/11 ms, 100 shocks
	Vibration (non-operational)		EN 60068-2-6:1995, 20 g/10 Hz-2 kHz, 10 cycles
	EMC, temperature		Refer to output specification

**Order code PTAM2**



**Model name**

**Axis of inclination**

- 1 = Inclination with regard to X axis (mounting X)  $< 180^\circ$
- 2 = Inclination with regard to X and Y axis (mounting XY)  $< 60^\circ$

**Measuring range [in °]**

- 15 ... 180 =  $\pm 15^\circ \dots \pm 180^\circ$  in 15° increments

**Output**

- U2 = 0.5 ... 10 V
- U8 = 0,5 ... 4,5 V
- I1 = 4 ... 20 mA

**Characteristic**

- CW = Increasing signal for CW inclination
- CCW = Increasing signal for CCW inclination

**Output delay 0 ... 90 %**

- Tx.x = 0.1 s ... 10 s

**Connection**

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

**Order code connector cable**

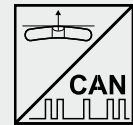
**KAB-...M-M12/4F/G-LITZE**

**Order example: PTAM2 - 1 - 180 - I1 - CW - T1.0 - M12R5**



**Digital Inclination Sensor with 1 or 2 axes in MEMS technology**

- Measurement range  $\pm 180^\circ$  for 1 axis or  $\pm 60^\circ$  for 2 axes
- Protection class IP67 / IP69K
- CANopen output
- Aluminium or stainless steel housing
- Wear free, high resolution
- High shock resistance
- Servo flange mounting



Specifications	Output	CANopen (profile „Inclination Sensor“)
	Measurement range	$\pm 180^\circ$ for 1 axis or $\pm 60^\circ$ for 2 axes
	Resolution	0.05 °
	Linearity	$\pm 0.5^\circ$
	Settling time	0.1 s ... 10 s / 90%, configurable
	Protection class	IP67 / IP69K
	Material	Aluminium or stainless steel
	Connection	5 pin connector M12 axial or radial
	Shock (non-operational)	EN 60068-2-27:1993, 100 g/11 ms, 100 shocks
	Vibration (non-operational)	EN 60068-2-6:1995, 20 g/10 Hz-2 kHz, 10 cycles
EMC, temperature	Refer to output specification	

**Bestellcode PTDM2**

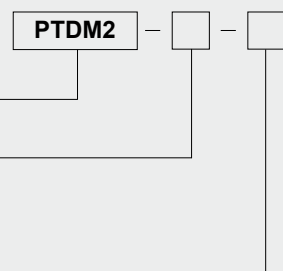
**Model name**

**Output**

- CANOP = CANopen
- CANJ1939 = CAN SAE J1939

**Connection**

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

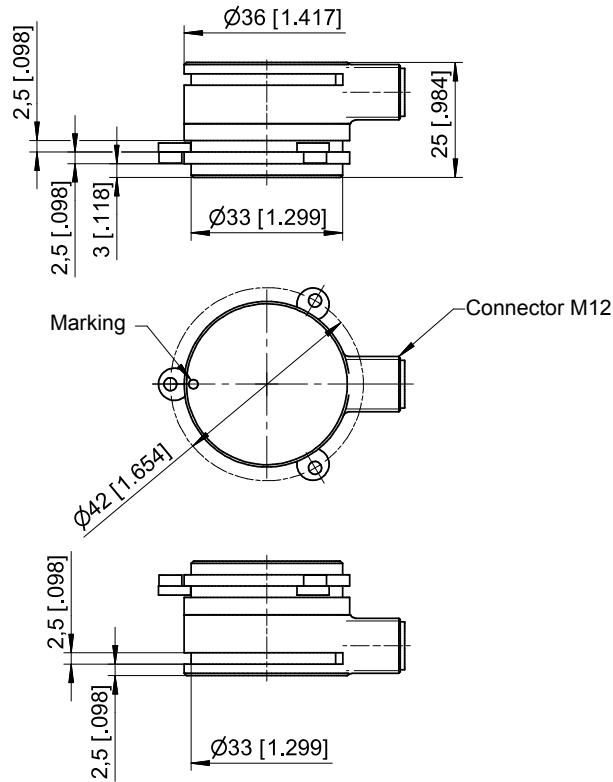


**Order example: PTDM2 - CANOP - M12R5**

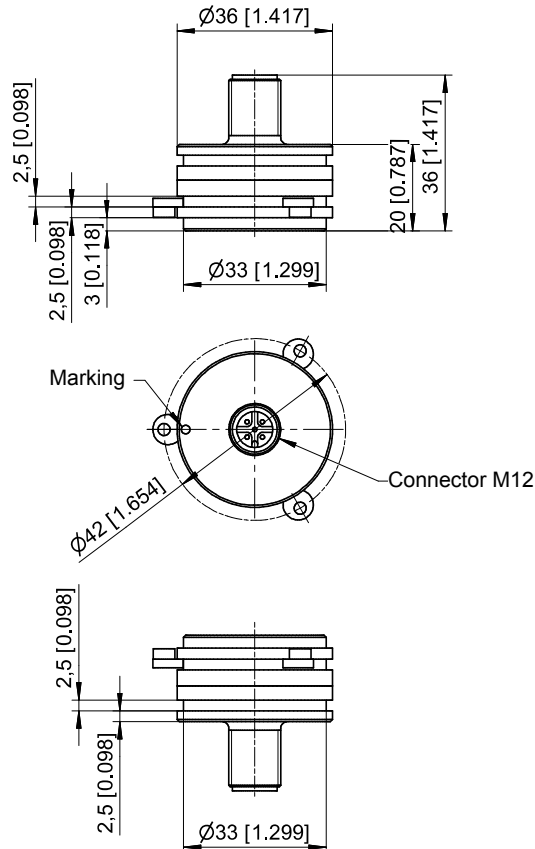
**POSITILT®**  
**PTAM2/PTDM2**  
**Inclination Sensor**



**Outline drawing**  
**M12 radial**



**Outline drawing**  
**M12 axial**



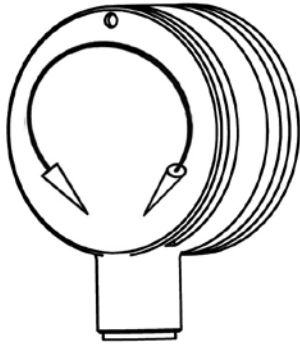
Dimensions in mm [inch]

Dimensions informative only.  
 For guaranteed dimensions consult factory.

**POSITILT®**  
**PTAM2/PTDM2**  
**Inclination Sensor**



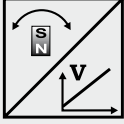
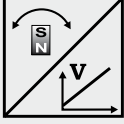
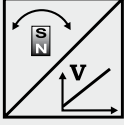
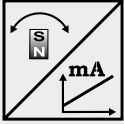
Orientation of the  
inclination axis



**1 axis**



**2 axes**

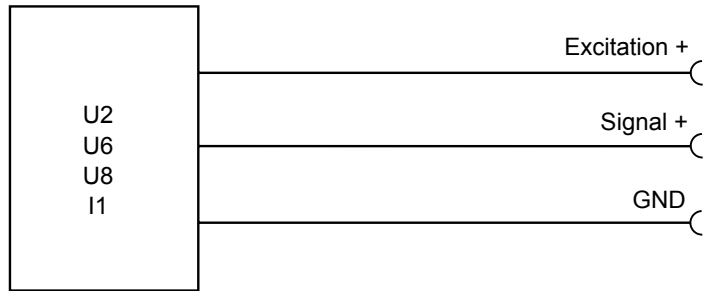
<p><b>U2</b> Voltage Output 0.5 ... 10 V</p> 	Excitation voltage	18 ... 36 V DC
	Excitation current	12 mA typ., 16 mA max.
	Output voltage	0.5 ... 10 V DC
	Output current	2 mA max.
	Measuring rate	1 kHz standard
	Stability (temperature)	$\pm 100 \times 10^{-6} / ^\circ\text{C}$ f.s. (typ.)
	Operating temperature	-40 ... +85 °C
	Protection	Reverse polarity, short circuit
	EMC	EN61326-1:2006
<p><b>U6</b> Voltage Output 0.5 ... 4.5 V DC</p> 	Excitation voltage	5V DC $\pm 10$ %
	Excitation current	16 mA typ., 20 mA max.
	Output voltage	0.5 ... 4.5 V DC
	Output current	2 mA max.
	Measuring rate	1 kHz standard
	Stability (temperature)	$\pm 100 \times 10^{-6} / ^\circ\text{C}$ f.s. (typ.)
	Operating temperature	-40 ... +85 °C
	Protection	Reverse polarity, short circuit
	EMC	EN61326-1:2006
<p><b>U8</b> Voltage output 0.5 ... 4.5 V</p> 	Excitation voltage	10 ... 36 V DC
	Excitation current	12 mA typ., 16 mA max.
	Output voltage	0.5 ... 4.5 V DC
	Output current	2 mA max.
	Measuring rate	1 kHz standard
	Stability (temperature)	$\pm 100 \times 10^{-6} / ^\circ\text{C}$ f.s. (typ.)
	Protection	Reverse polarity, short circuit
	Operating temperature	-40 ... +85 °C
	EMC	EN61326-1:2006
<p><b>I1</b> Current Output 4 ... 20 mA</p> 	Excitation voltage	18 ... 36 V DC
	Excitation current	32 mA typ., 36 mA max..
	Load resistor	500 $\Omega$ max.
	Output current	4 ... 20 mA
	Measuring rate	1 kHz standard
	Stability (temperature)	$\pm 100 \times 10^{-6} / ^\circ\text{C}$ f.s. (typ.)
	Operating temperature	-40 ... +85 °C
	Protection	Reverse polarity, short circuit
	EMC	EN61326-1:2006

Other outputs available on request.

**POSITILT<sup>®</sup>**  
**PTAM**  
**Analog outputs U2, U6, U8 and I1**

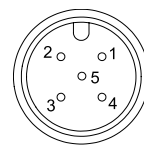


**Output signals**



Signal Wiring	Output signals	Connector pin	Cable color
	Excitation +	1	brown
	Output X	2	white
	GND	3	blue
	Output Y	4	black
	Do not connect!	5	gray


**Connection**



View to sensor connector


M12A5 / M12R5

**Description**      Inclination sensor with CANopen interface according to CiA 410.

<p><b>CANopen Interface</b></p> 	Communication profile	CANopen CiA 301 V 4.02, Slave
	Device profile	Encoder CiA 410 V 1.2
	Configuration services	LSS, CiA Draft Standard 305 (transmission rate, node ID)
	Error Control	Node Guarding, Heartbeat, Emergency Message
	Node ID	Adjustable via LSS or via object dictionary, default: 127
	PDO	1 TxPDO, 0 RxPDO, static mapping
	PDO Modes	Event-/Time triggered, Remote-request, Sync cyclic/acyclic
	SDO	1 Server, 0 Client
	Certified	Yes
	Transmission rate	50 kBaud to 1 MBaud, adjustable via LSS or via object dictionary, default: 125 kBaud
	Bus connection	M12 connector, 5 pin
	Integrated bus terminating resistor	optional
	Bus, galvanic isolation	No

<p><b>Specifications</b></p>	Excitation voltage	11 ... 36 V DC
	Excitation current	16 mA typical, 50 mA max.
	Measuring rate	1 kHz standard
	Stability (temperature)	$\pm 100 \times 10^{-6} / ^\circ\text{C}$ f.s.
	Repeatability	1 LSB
	Operating temperature	-40 ... +85 °C
	Protection	Reverse polarity, short circuit
	EMC	EN61326-1:2006

**Description**      Inclinometer according to standard SAE J1939. Configuration of operating parameters by proprietary-A-Message (peer-to-peer connection). Process data exchange by proprietary-B-Message (broadcast).

<b>Interface J1939</b> 	CAN specification	ISO 11898, Basic and Full CAN 2.0 B
	Communication profile	SAE J1939
	Baud Rate	250 kBit/s
	Internal termination resistor	120 Ω, configurable
	Address	Address claiming (ACL), default 251d or commanded address

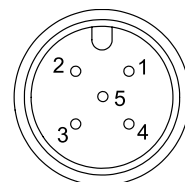
<b>NAME Fields</b>	Arbitrary address capable	1	Yes
	Industry group	0x0	Global
	System	0x0	Non specific
	System instance	0x0	Non specific
	Function	0xFFh	
	Function instance	0x0	Non specific
	ECU instance	0x0	
	Manufacturer	0xD6 (214d)	Manufacturer ID
	Identity number	0XXX	Serial number

<b>Parameter Group Numbers (PGN)</b>	Configuration data	PGN 0x00EF00	Proprietary-A-Message (peer-to-peer)
	Process data	PGN FFnnh	Proprietary-B-Message (broadcast); xx (low byte) customer configurable

<b>Specifications</b>	Excitation voltage	11 ... 36 V DC
	Excitation current	16 mA typical, 50 mA max.
	Measuring rate	1 kHz standard
	Stability (temperature)	±100 x 10 <sup>-6</sup> / °C f.s.
	Repeatability	1 LSB
	Operating temperature	-40 ... +85 °C
	Protection	Reverse polarity, short circuit
	EMC	EN61326-1:2006

<b>Signal wiring / connection</b>	<b>Signal name</b>	<b>Connector pin</b>
	Shield	1
	Excitation +	2
	GND	3
	CAN-H	4
	CAN-L	5

View to sensor connector





**Connector cable for POSIROT® angle sensors**  
4 pins M12

Suitable for 5-pin sensor connectors M12A5 and M12R5

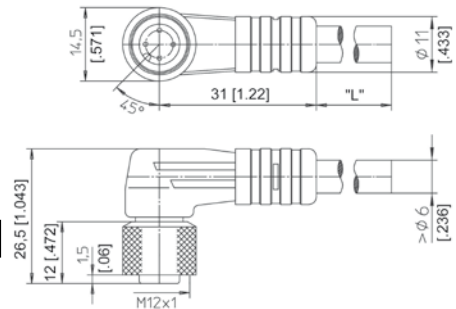
The 4-core screened cable is supplied with a mating 4-pin 90° M12 connector at one end and 4 wires at the other end. Available lengths are 2, 5 and 10 m.

Order code:

**KAB - XM - M12/4F/W - LITZE**

IP69K: **KAB - XM - M12/4F/W/69K - LITZE**

Length in m



**Connector cable for POSIROT® angle sensors**  
4 pins M12

Suitable for 5-pin sensor connectors M12A5 and M12R5

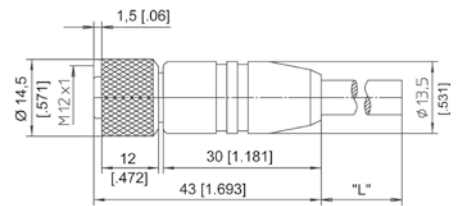
The 4-core screened cable is supplied with a mating 4-pin M12 connector at one end and 4 wires at the other end. Available lengths are 2, 5 and 10 m.

Order code:

**KAB - XM - M12/4F/G - LITZE**

IP69K: **KAB - XM - M12/4F/G/69K - LITZE**

Length in m



Signal wiring M12, 4 pin	Connector pin / cable color			
	1	2	3	4
	Brown	White	Blue	Black

**Connector cable for POSIROT® angle sensors**  
8 pins M12

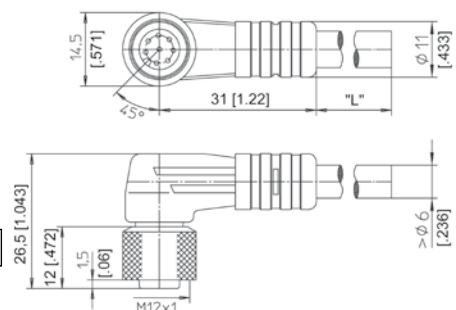
The 8-core screened cable is supplied with a mating 8-pin 90° M12 connector at one end and 8 wires at the other end. Available lengths are 2, 5 and 10 m.

Order code:

**KAB - XM - M12/8F/W - LITZE**

IP69K: **KAB - XM - M12/8F/W/69K - LITZE**

Length in m



**Connector cable for POSIROT® angle sensors**  
8 pins M12

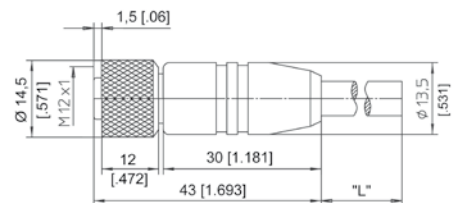
The 8-core screened cable is supplied with a mating 8-pin M12 connector at one end and 8 wires at the other end. Available lengths are 2, 5 and 10 m.

Order code:

**KAB - XM - M12/8F/G - LITZE**

IP69K: **KAB - XM - M12/8F/G/69K - LITZE**

Length in m



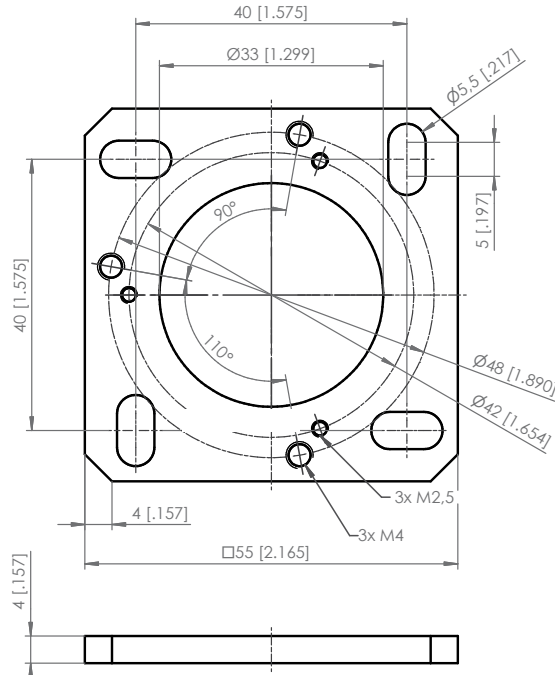
Signal wiring M12, 8 pin	Connector pin / cable color							
	1	2	3	4	5	6	7	8
	White	Brown	Green	Yellow	Grey	Pink	Blue	Red

# POSIROT® / POSITILT® Accessories Mounting Plates



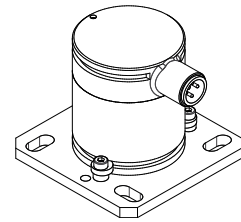
## PRPT-BPL1

(screw mounting)  
For PRAS2, PRDS2,  
PRAS3, PRDS3, PTAM2

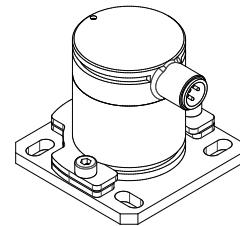


Dimensions in mm [inch]

Weight 30 g approx.  
Dimensions informative only.  
For guaranteed dimensions please consult factory.



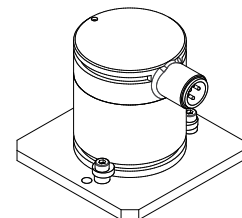
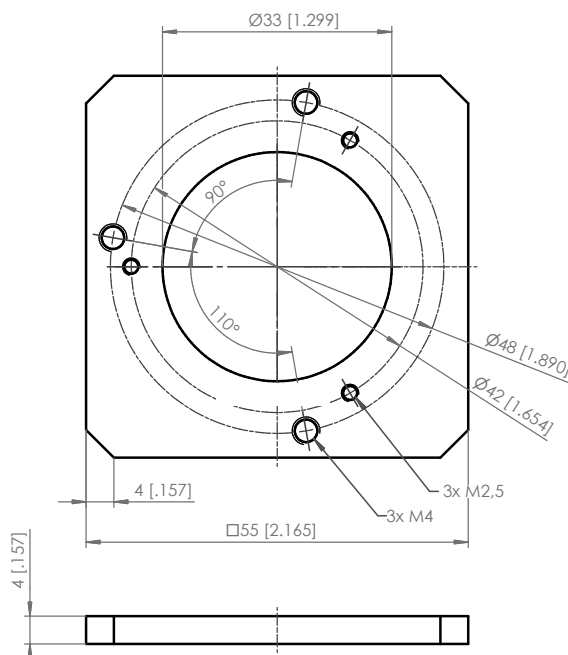
In combination with the  
mounting clamps  
PRPT-BFS1 (3 x M2.5).



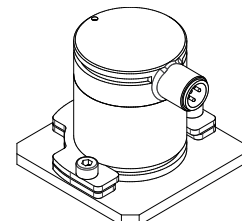
In combination with the  
mounting brackets  
PRPT-BFS2 (3 x M4).

## PRPT-BPL2

(welding assembly)  
For PRAS2, PRDS2,  
PRAS3, PRDS3, PTAM2



In combination with the  
mounting clamps  
PRPT-BFS1 (3 x M2.5).



In combination with the  
mounting brackets  
PRPT-BFS2 (3 x M4).