positilt®
Inclination Sensors

PTAM4

Inclination sensor for underwater applications

- **Measurement range up to ±180°**
- **Single or dual axis measurement**
- **Protection class IP68 (10 bar), continuous use**
- **Analog output, linear**
- **Stainless steel housing type EN 1.4404 (AISI 316L)**
- **Wear-free MEMS technology, shock resistant**

Product versions

Analog output

Analog output, tare function

V / mA

PTAM4 - Inclination sensor in MEMS technology

Version with analog output

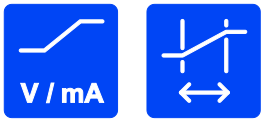
Specifications

			Order options
Number of axes of inclination	1 axis: Inclination in X axis 2 axes: Inclination in X and Y axes	1	**1** **2**
Measurement range	1 axis: ±15 ... 180° (selectable in 15° increments) 2 axes: ±15 ... 60° (selectable in 15° increments)	2	**15 ... 180** **15 ... 60**
Output	Voltage 0.5 ... 10 V Voltage 0.5 ... 4.5 V Current 4 ... 20 mA, 3 wire	3	**U2** **U8** **I1**
Resolution	0.05°		
Linearity	±0.5°		
Mounting	Screws M6		
Signal characteristics	Signal increasing CW Signal increasing CCW	4	**CW** **CCW**
Output delay	0.1 s ... 10 s / 90%	5	**Tx.x**
Connection	Cable, standard length 2 m	6	**KAB2M**
Housing material	Stainless steel EN 1.4404 (AISI 316L)	7	**VA**
Protection class	IP68 (10 bar), continuous use	8	**WP2**
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 ... +85°C (up to +30°C in sea water)		
Weight	approx. 1250 g (without cable)		
EMC	DIN EN 61326-1:2013		

Order code

PTAM4 – 1 – 2 – 3 – 4 – 5 – 6 – 7 – 8

Order example: PTAM4 – 1 – 60 – I1 – CW – T1.0 – KAB2M – VA – WP2



PTAM4 - Inclination sensor in MEMS technology

Version with analog output, tare function

Specifications

			Order options
Number of axes of inclination	1 axis: Inclination in X axis 2 axes: Inclination in X and Y axes	1	**1** **2**
Measurement range	1 axis: ±15 ... 180° (selectable in 15° increments) 2 axes: ±15 ... 60° (selectable in 15° increments)	2	**15 ... 180** **15 ... 60**
Output	Voltage 0.5 ... 10 V, tare function Voltage 0.5 ... 4.5 V, tare function Current 4 ... 20 mA, 3 wire, tare fuction	3	**U2/PMZ** **U8/PMZ** **I1/PMZ**
Resolution	0.05°		
Linearity	±0.5°		
Mounting	Screws M6		
Signal characteristics	Signal increasing CW Signal increasing CCW	4	**CW** **CCW**
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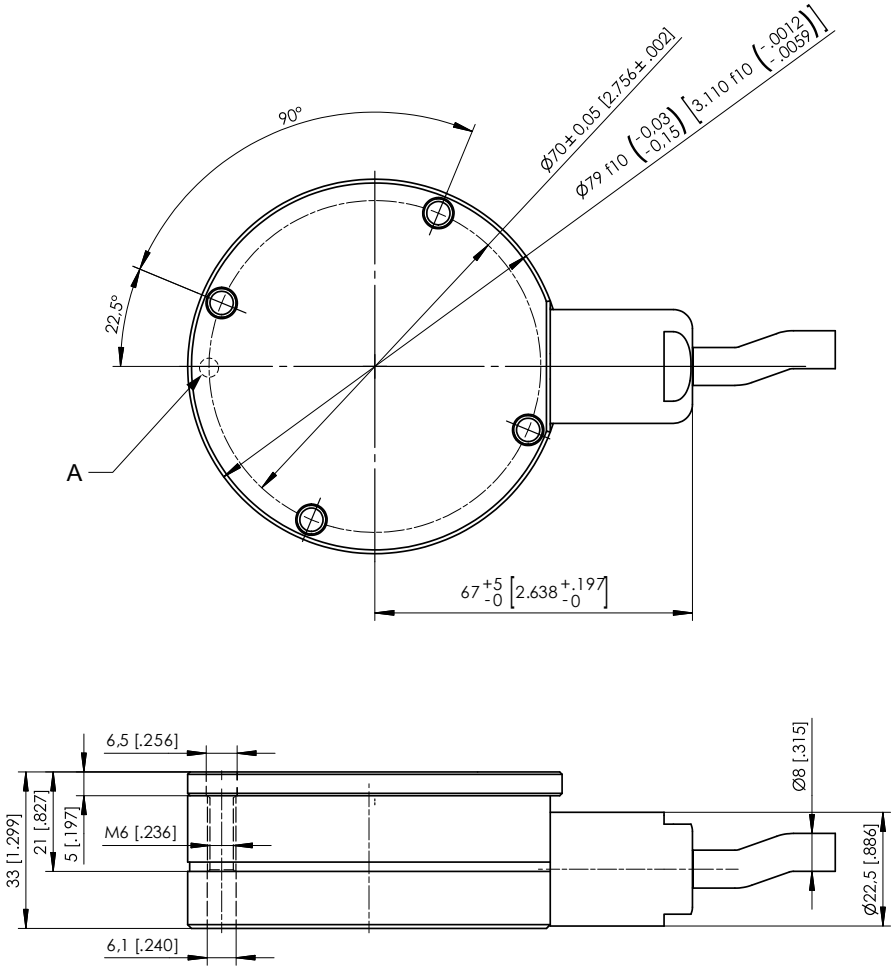
Order code

PTAM4 – 1 – 2 – 3 – 4 – 5 – 6 – 7 – 8

Order example: PTAM4 – 1 – 60 – I1/PMZ – CW – T1.0 – KAB2M – VA – WP2

Dimensions



IP68 / 100 m, continuous use. Avoid fouling!

Dimensions in mm [inch]. Weight without cable approx. 1250 g.
Dimensions informative only.
For guaranteed dimensions please consult factory.

A - Marking

Output specification

Analog output

U2 Voltage output 0.5 ... 10 V 	Excitation voltage	18 … 36 V DC
	Excitation current	typical 12 mA max. 16 mA
	Output voltage	0.5 ... 10 V DC
	Output current	2 mA max.
	Measuring rate	1 kHz standard
	Stability (temperature)	±100 x 10^{-6} / °C f.s. (typical)
	Protection	Reverse polarity, short circuit
	Operating temperature	-40 … +85 °C
	EMC	DIN EN 61326-1:2013

U8 Voltage output 0.5 … 4,5 V 	Excitation voltage	18 … 36 V DC
	Excitation current	typical 12 mA max. 16 mA
	Output voltage	0.5 … 4,5 V DC
	Output current	2 mA max.
	Measuring rate	1 kHz standard
	Stability (temperature)	±100 x 10^{-6} / °C f.s. (typical)
	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	18 … 36 V DC
	Excitation current	typical 32 mA max. 36 mA
	Load R_L	500 Ω max.
	Output current	4 … 20 mA
	Measuring rate	1 kHz standard
	Stability (temperature)	±100 x 10^{-6} / °C f.s. (typical)
	Protection	Reverse polarity, short circuit
	Operating temperature	-40 … +85 °C
	EMC	DIN EN 61326-1:2013

Analog output (cable output, seawater resistant submarine cable)

Signal wiring 1 axis	Output signals	Cable color
	$+U_V$ (Excitation)	white
	Analog output X axis	green
	GND	brown
	Do not connect!	grey

2-achsig	Output signals	Cable color
	$+U_V$ (Excitation)	white
	Analog output X axis	green
	GND	brown
	Analog output Y axis	yellow
	Do not connect!	grey

Analog output, tare function

U2/PMZ Voltage output 0.5 ... 10 V 	Excitation voltage	18 … 36 V DC
	Excitation current	typical 12 mA max. 16 mA
	Output voltage	0.5 ... 10 V DC
	Output current	2 mA max.
	Measuring rate	1 kHz standard
	Stability (temperature)	±100 x 10^{-6} / °C f.s. (typical)
	Protection	Reverse polarity, short circuit
	Operating temperature	-40 … +85 °C
	EMC	DIN EN 61326-1:2013
U8/PMZ Voltage output 0.5 … 4,5 V 	Excitation voltage	18 … 36 V DC
	Excitation current	typical 12 mA max. 16 mA
	Output voltage	0.5 … 4,5 V DC
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	Excitation current	typical 32 mA max. 36 mA
	Load R_L	500 Ω max.
	Output current	4 … 20 mA
	Measuring rate	1 kHz standard
	Stability (temperature)	±100 x 10^{-6} / °C f.s. (typical)
	Protection	Reverse polarity, short circuit
	Operating temperature	-40 … +85 °C
	EMC	DIN EN 61326-1:2013

Analog output, tare function (cable output, seawater resistant submarine cable)

Signal wiring 1 axis	Output signals	Cable color
	$+U_V$ (Excitation)	white
	Analog output X axis	green
	GND	brown
	ZERO (Option)	grey

2 axes	Output signals	Cable color
	$+U_V$ (Excitation)	white
	Analog output X axis	green
	GND	brown
	Analog output Y axis	yellow

Tare function ZERO (PMZ)

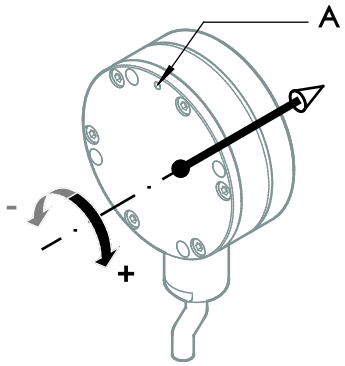
Programming the zero point by the customer:

The tare function “ZERO“ allows to program the zero point of the output range by using a signal ZERO available at the connector. This Signal ZERO must be connected with GND via a push button. At first the sensor must be brought into the zero position. Pushing the button for 2 seconds sets the actual position as the zero point. The values are available as well after switching off the sensor.

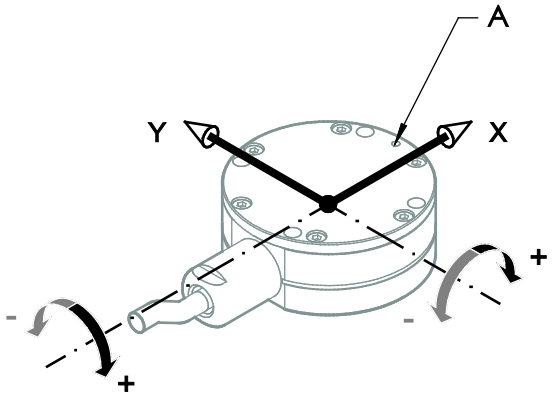
Position of the inclination axis and characteristic of the linear output PTAM4

Sensor position as shown equals 0°.

PTAM4
1 axis



PTAM4
2 axes



A: Marking

Output signal