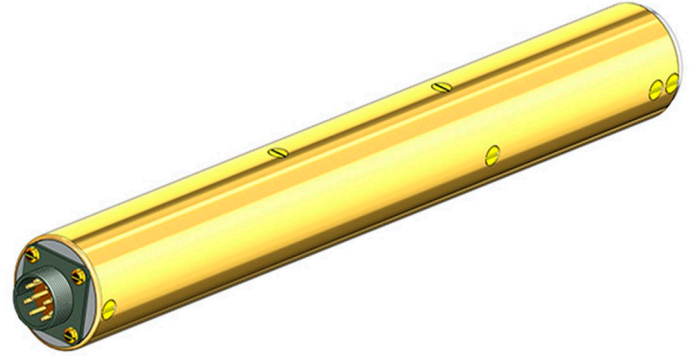


# Digital high-temperature 2-axis capacitive tilt sensors (inclinometer)

## Features

- 2-axis system
- Shock survival 3500G
- Extended temperature range up to 135° C
- Low power consumption
- Linear characteristic of the output signal
- No temperature hysteresis of the measured signal
- High service life, no maintenance
- Low zero drift
- Low moment of inertia
- Heat-compensated
- High measurement accuracy:  $\pm 0.05^\circ$  (in the entire temperature range up to +135° C)



## Applications

- Indicating pitch and roll of vehicles, sail boats, and aircraft.
- Monitoring boom angle of cranes and material handlers.
- Measuring the "look angle" of a satellite antenna towards a satellite.
- Measuring the angle of drilling in well-logging applications.

The tilt sensor refers to control and measuring equipment, to devices for determining the spatial position of objects relative to the horizon. This tilt sensor contains a cylindrical chamber partially filled with a non-conductive liquid formed by the inner cylindrical surface of the housing and two plane-parallel plates with electrodes. The electrodes are placed on the outer surface of the plates relative to the chamber and are connected to an electronic circuit located in the upper layer forming the sensor housing. The electronic circuit includes an output signal converter and an associated microcontroller that performs the functions of both a digital output processing device and an output protocol shaper. As the sensor is tilted, the liquid level covering the electrodes changes. This leads to a change in the electrical conductivity between the electrodes.

Based on the measured values of these changes, the angle of inclination can be calculated. Liquid-filled sensing elements are capable of measuring tilt angles with very high accuracy. This design increases the compactness and reliability of the sensor, provides high measurement accuracy in the range of angles 0-360 degrees. Accurate measurements of the angle of inclination relative to the horizontal position are very important for many motion control or safety systems. Tilt angle sensors allow you to easily and effectively control the position in space without the need for complex mechanical structures. Due to the long service life, such sensors can be used in almost all applications. The most widespread application, in view of its design and accuracy indicators, is reflected in geophysical instrumentation in the field of inclinometry throughout the construction of the well.

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PHISICAL		
Outside Diameter (OD)	mm	28
Length	mm	215
ELECTRICAL		
Supply voltage	V	5.4 ... 6 <sup>(1)</sup>
Current consumption	mA	<15
Connector		PC10 <sup>(2)</sup>
Protocol		(3)
ENVIRONMENTAL		
Temperature Operating	°C	-40°...135°
Shock survival (0.5 ms, half sine)	g	3500
PERFORMANCE		
Number of axes	pcs.	2
Measuring range of inclination	deg	0-180
Resolution of inclination	deg	0.01°
Inclination absolute accuracy	deg	±0.05°
Measuring range of roll	deg	0-360
Resolution of roll	deg	0.05°
Roll absolute accuracy	deg	±0.5°
Digital interface	UART <sup>(4)</sup>	
Enclosure material	non - magnetic	
Operating mode setting time	sec	<0.3

1. Range expansion is possible
2. Wires are possible
3. Upon agreement
4. Speed by agreement

