



## Dual Axis Analog MEMS Inclinometer

Part Number: **0751-9002-99**

### Operating Specifications

|                               |  |
|-------------------------------|--|
| Interface                     | Analog (0.5 V to 4.5 V)  |
| Supply Voltage                | 7 V DC to 35 V DC  |
| Supply Current                | 8 mA   |
| Operating range               | ±90°   |
| Linear Range                  | ±90°   |
| Axes of Measurement           | 2  |
| Offset (Output at 0°)         | 2.5 V  |
| Sensitivity                   | 35 mV/°  |
| Repeatability                 | ±0.1°  |
| Resolution                    | 0.0035°  |
| Cross-axis (Roll) Sensitivity | ≤3%  |
| Offset Temperature Error      | ±0.2° @ 0 °C to 70 °C<br>±0.6° @ -25 °C to 85 °C                 |
| Sensitivity Temp. Dependency  | -0.8% to 0.3% @ 0 °C to 70 °C<br>-1.5% to 0.5% @ -25 °C to 85 °C |
| Operating Temperature         | -40 °C to 85 °C  |
| Storage Temperature           | -55 °C to 85 °C  |
| Frequency Response            | 18 Hz  |
| Time Constant                 | ≤55 ms   |

### Physical Characteristics

|                        |                            |
|------------------------|----------------------------|
| Housing                | Zinc                       |
| Electrical Connections | 4 Wire                     |
| Cable Length           | 30 cm (11.8")              |
| Weight                 | 60 g (excluding connector) |
| Length                 | 41 mm (1.61")              |
| Width                  | 47 mm (1.85")              |
| Height                 | 13.5 mm (0.53")            |
| Hole Center            | 38 mm (1.50")              |

### Electrical Characteristics

|                               |                |
|-------------------------------|----------------|
| Supply Voltage                | 7 V to 35 V DC |
| Current Consumption           | ≤8 mA          |
| Analog Resistive Output Load  | ≥10 kΩ         |
| Analog Capacitive Output Load | 20nF           |
| Start-up Delay                | 10 ms          |

### Electrical Connections

|        |                                  |
|--------|----------------------------------|
| Red    | Supply (+)                       |
| Blue   | Supply (-)                       |
| Yellow | X Axis Output                    |
| White  | Y Axis Output                    |
| Green  | Factory use only, do not connect |

### Benefits

- Excellent long-term stability
- Sensing element-controlled frequency response
- Outstanding shock durability
- Harsh environment robustness
- Excellent customer support

### Description

The 0751-9002-99 dual axis analog inclinometer sensor utilizes a MEMS sensor for dual axis tilt measurements. It's a durable solution and has an IP67 rating, make it an excellent solution for heavy duty environments such as construction machinery and industrial applications.

### Applications

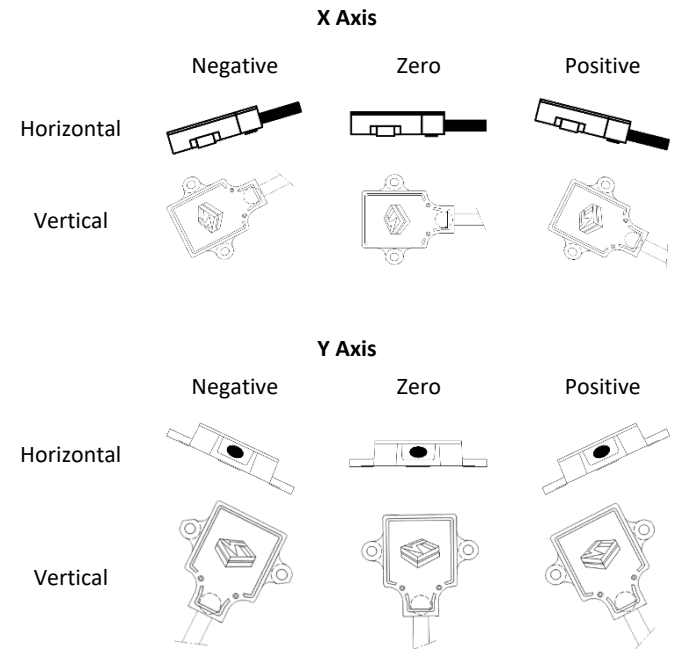
- Solar tracking
- Platform tilt measurement
- Equipment and instrument condition monitoring
- Inclination based position measurement
- Rotational orientation measurement

View a full list of applications on The Fredericks Company website at [www.frederickscompany.com](http://www.frederickscompany.com).

### Certifications and Ratings

- RoHS
- IP67 (excluding connector)

### Direction of Measurement



### Orientation Note

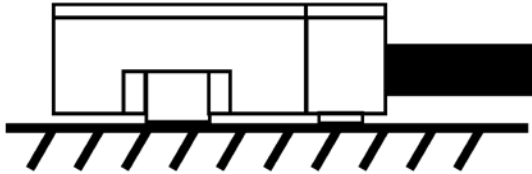
The 0751-9001-99 can measure in 2 different orientations. It is necessary to calibrate the sensor in each axis so the sensor outputs '0' at the zero position before use.

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### Mounting



### Mounting Notes

The 0751-9001-99 must be mounted on a flat, smooth surface with 2 M4 screws.

### Related Products

#### Dual Axis MEMS Inclinometers (Enclosed, IP67)

- 0750-3002-99 ±30° range, RS-485 communications
- 0750-9002-99 ±90° range, RS-485 communications
- 0751-3002-99 ±30° range, analog 0.5 to 4.5 V DC output

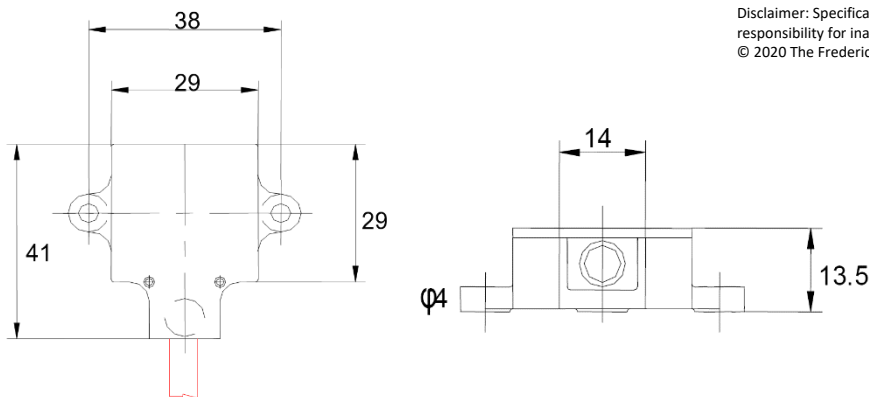
#### Dual Axis Electrolytic Inclinometers (Enclosed, IP67)

- 0729-1755-99 ±60° range, analog 0 to 5 V DC output
- 0729-1759-99 ±60° range, RS-232 communications
- 0729-1760-99 ±60° range, RS-485 communications
- 0729-1760-04 ±10° range, RS-485 communications

#### Dual Axis Electrolytic Inclinometers (PCBA)

- 0729-1751-99 ±60° range, SPI communications
- 0729-1752-99 ±60° range, RS-232 communications
- 0729-1753-99 ±60° range, analog and PWM output
- 0729-1754-99 ±60° range, RS-485 communications

### Dimensional Drawings



### Voltage to Angle Conversion

The analog output can be converted to degrees using the following equation:

$$\alpha = \sin^{-1} \frac{V_{out} - Offset}{Sensitivity}$$

Offset and sensitivity can be found in the operating specifications.

### Company Information

#### Tilt measurement products and sensors that set standards -

Fredericks' comprehensive TrueTilt™ tilt sensor product portfolio offers electrolytic tilt sensors, inclinometers, and tilt switches. Patented and engineered to outperform competing technology, our tilt sensors are not just repeatable, but highly accurate with high resolution. Our tilt measurement products have no planned obsolescence and serve industries ranging from construction and RV leveling to aerospace and everything in between.

#### High performance products designed and manufactured with pride in the USA -

For more than 85 years Fredericks has been a global provider and U.S. manufacturer of high-performance tilt measurement products. Built to last, our products are made with state-of-the-art sensing technology, proven processes, and an intrinsic passion for the trade. Offering simple integration and quality and safety benchmarks, our customers benefit not just from standard-setting reliability, but from our commitment to competitive pricing and performance.

### Contact Us

The Fredericks Company  
2400 Philmont Avenue  
Huntingdon Valley, PA 19006 USA  
email: [sales@frederickscompany.com](mailto:sales@frederickscompany.com)  
web: [www.frederickscompany.com](http://www.frederickscompany.com)  
tel: +1 215 947 2500  
fax: +1 215 947 7464

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