



## ±25° Single-Axis Mid-Range Electrolytic Tilt Sensor

Part Numbers: 0703-1602-99, 0703-1603-99

### Operating Specifications

Operating Range	±25°
Linear Range	±10°
Axes of Measurement	1
Linearity (±10°)	≤1%
Repeatability	±0.005°
Resolution (with 16-bit ADC)	≤0.001°
Null Offset	±2°
Long Term Stability/Drift	≤0.005°
Null Temperature Coefficient	≤0.0002°
Scale Temperature Coefficient	0.075% per °C
Operating Temperature	-40 °C to 85 °C
Storage Temperature	-55 °C to 125 °C
Null Impedance	50 kΩ
Time Constant (63.2% of final output)	≤1 s
Materials	Contains magnetic metals
Maximum Current at Null	0.2 mA (continuous)

### Physical Characteristics

Length (0703-1602-99, 0703-1603-99)	40.6 mm (1.598")
Width (0703-1602-99)	7.60 mm (0.300")
Width (0703-1603-99)	19.5 mm (1.160")
Height (0703-1602-99, 0703-1603-99)	14.2 mm (0.560")
Hole Diameter (0703-1602-99)	3.70 mm (0.145")
Weight (0703-1602-99, 0703-1603-99)	6 g

### Ordering Information

Part Number	Description
0703-1602-99	Tilt Sensor, ±25°, 1 Axis
0703-1603-99	Tilt Sensor, ±25°, 1 Axis, Tableless

### Compatible With

Part Number	Description
1-6200-005	Signal Conditioner, SPI
1-6200-006	Signal Conditioner, RS-232
1-6200-007	Signal Conditioner, Analog/PWM
1-6200-008	Signal Conditioner, RS-485
1-6200-012	Signal Conditioner, Analog/RS-232

### Related Products

Part Number	Description
0703-0711-99	Tilt Sensor, ±3°, 1 Axis
0729-1751-99	Inclinometer, ±60°, 2 Axis, SPI
0729-1752-99	Inclinometer, ±60°, 2 Axis, RS-232
0729-1753-99	Inclinometer, ±60°, 2 Axis, Analog and PWM
0729-1754-99	Inclinometer, ±60°, 2 Axis, RS-485
0729-1755-99	Inclinometer, ±60°, 2 Axis, Analog
0729-1759-99	Inclinometer, ±60°, 2 Axis, RS-232
0729-1760-99	Inclinometer, ±60°, 2 Axis, RS-485
0729-1765-99	Inclinometer, ±25°, 2 Axis, Analog/RS-232
F203-00A-212-00	Inclinometer, ±3°, 2 Axis, Analog/RS-232
F225-00T-003-01	Inclinometer, ±25°, 2 Axis, UART/TTL

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### Description

The Fredericks 0703-1602-99 (mounting holes) and 0703-1603-99 (no mounting holes, also called tableless) single-axis mid-range electrolytic tilt sensor has a robust, all metal construction providing durability while maintaining superior tolerances and sensor to sensor performance. It is an economical tilt sensor ideal for a versatile range of applications in many industries.

This is a passive electrolytic tilt sensor that requires signal conditioning electronics to provide an output. For a list of compatible signal conditioners, see the Compatible With section.

### Key Features and Benefits

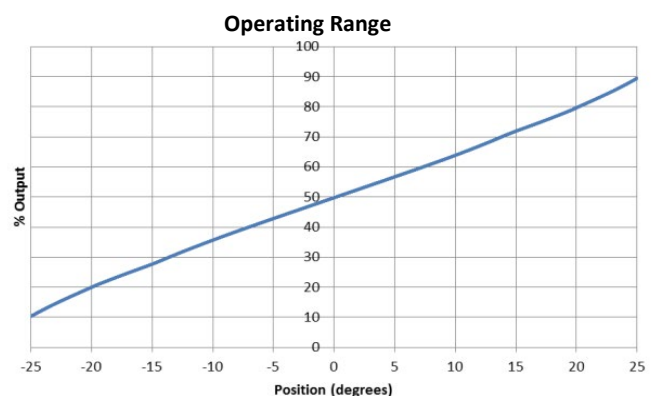
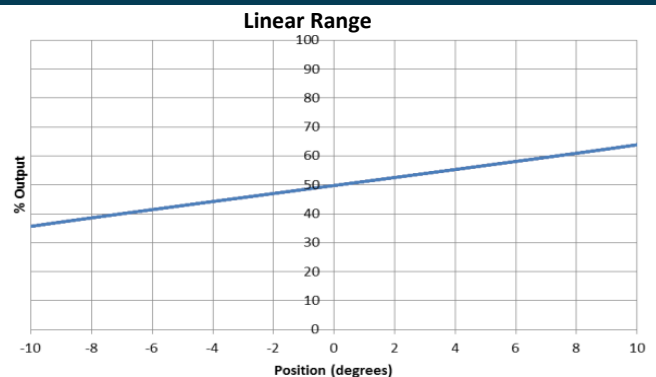
- ≤0.005° repeatability, ≤0.0003° resolution, very high accuracy
- ≤0.005° long term drift with an extremely long life
- Minimal drift compared to MEMS devices
- -40 °C to 85 °C operating temperature for industrial applications
- Live text and video chat technical support

### Applications

- [Geotechnical and structural monitoring](#)
- [Construction tools, laser leveling](#)
- [Construction machinery and equipment](#)

View the full list at [www.frederickscompany.com/markets](http://www.frederickscompany.com/markets).

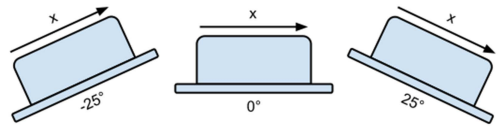
### Linear and Operating Range Behavior





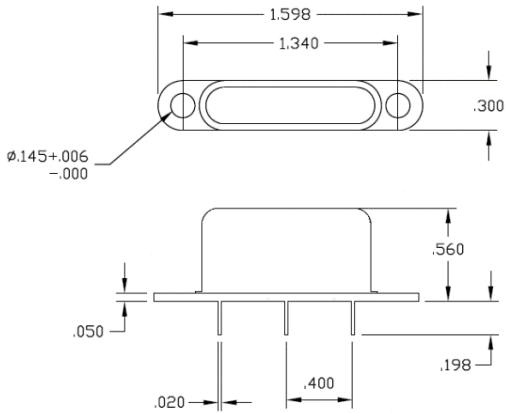
**±25° Single-Axis Mid-Range Electrolytic Tilt Sensor**  
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**Functional Diagram**

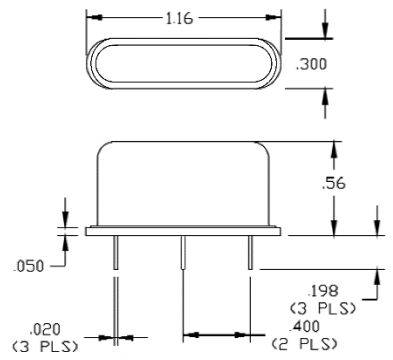


**Dimensional Drawings**

**0703-1602-99**



**0703-1603-99**



**Notes**

When using an excitation circuit not designed by The Fredericks Company, ensure that no direct current passes through the sensor. Direct current will lead to sensor damage, output drift, and general instability. For a description of hardware and software design for this sensor, see [application note AN1000](#).

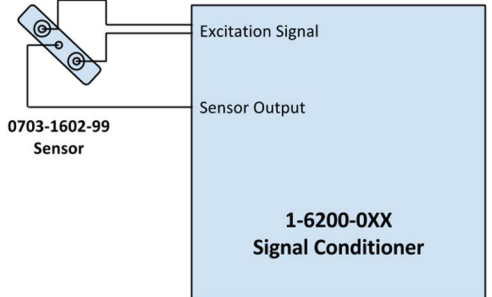
The [0703-1602-99](#), [0703-1603-99](#), and all Fredericks electrolytic tilt sensors must be mounted horizontally (parallel to the surface of the earth and perpendicular to the force of gravity). For best performance, isolate the sensor from vibrations when mounting it.

**Certifications and Ratings**

- RoHS Compliant

**Test Circuit**

All data was acquired with a Fredericks Company Dual Axis 6200 Series Signal Conditioner in single-axis mode at 20 °C. A general diagram of our signal conditioners is provided below. Further information on sensor excitation and excitation circuitry is provided on [The Fredericks Company website](#) and in the [application note AN1000](#).



**Additional Documentation**

- [AN1000 Electrolytic Tilt Sensor Excitation](#)
- [AN1001 Temperature Compensation of Electrolytic Tilt Sensors](#)
- [AN1005 Converting Tilt Angle to Degrees](#)

**Company Information**

**Tilt Measurement Products and Sensors That Set Standards -** Fredericks' comprehensive tilt measurement product portfolio offers [electrolytic tilt sensors](#), [inclinometers](#), and [tilt switches](#). Engineered to outperform competing technology, our tilt sensors are accurate and repeatable with excellent resolution. Our tilt measurement products have no planned obsolescence and serve industries ranging from [construction](#) and [RV leveling](#) to aerospace applications and everything in between.

**A Partnership That Prioritizes Uptime, Lead Time, and Service -** Fredericks guarantees customer satisfaction and our "not too big, not too small" operation is what enables us to offer a true partnership experience. Our dedicated representatives and engineers offer exceptionally responsive service and the fastest lead times in the industry, knowing that uptime is the key to your success with anytime access to our leadership team.

**Contact Us**

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

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