The Fredericks Company

DATA SHEET

0703-0703-99

Single Axis Narrow Angle Null Indicating Electrolytic Tilt Sensor

Patent 6,688,013

TrueTilt™

Description

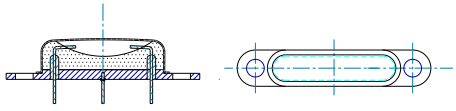
The **0703-0703-99** TrueTilt™ Sensor uses patented technology and construction to provide an accurate and robust narrow angle sensor at an attractive price. The precision-machined parts provide excellent sensor-to-sensor repeatability and reliability. Features include highly sensitive output, exceptional time and temperature stability, and superior roll axis properties. Unparalleled performance and features compared to any other commercially available product!

- *Linear Range* *+/-0.25°*
- *Angle Range* *readability to ± 2°*
- *Resolution* *1 arc second*
- *Null Repeat* *≤ 5-arc seconds*

Applications Include

» Construction Laser Instruments and Transits
» Aircraft Avionics
» Geophysical and Structural Monitoring
» Machine Tool/ Platform Leveling
» Medical Positioning and Monitoring

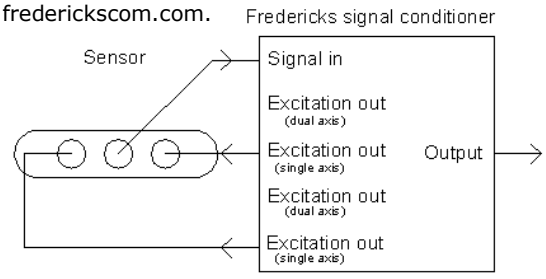
Physical Dimensions



Overall length…1.600” (40.6mm)	Height…0.335” (8.5 mm)
Width……..0.300” (7.6mm)	Hole Ctr…1.340” (34 mm)
Hole Dia……0.145” (3.7mm)	Lead Spac…0.400 (10.1 mm)

Description of Test Values

Tests were conducted by exciting the outer electrodes of the sensor in a single axis mode using the Fredericks Universal signal conditioner. Output curve and linearity specifications are shown above. Information on electrolytic tilt sensor signal conditioning is available on the Fredericks web site at www.frederickscom.com.

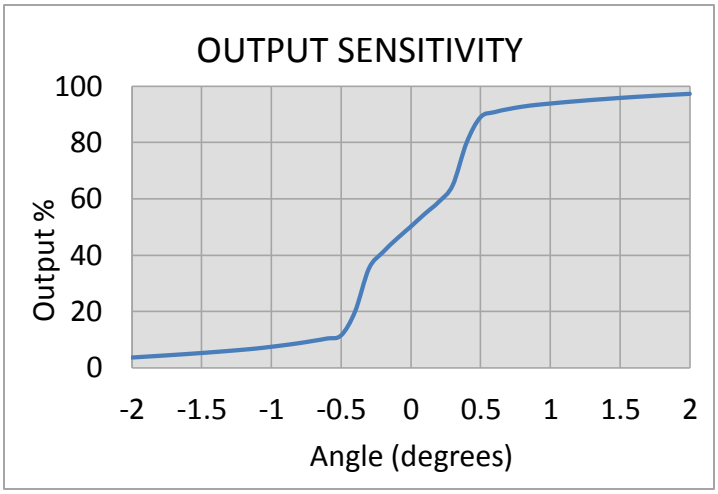


Caution!-Ensure that all test and operating circuits are entirely free of direct current. Direct current will cause level damage and/or instability.
Note!-The housing (center pin) is the active output signal. The unit must be electrically isolated.

Operating Specifications

Linear Range	± 0.25°
Angle Range	+/-2°
Null Voltage	≤ 0.025 Volts
Null Current (max.)	0.2 mA (continuous)
Null Impedance (nom) (measured left to right electrode) see figure 2	50k Ohms (25° C)
Null Repeatability	≤ 5 arc seconds
Resolution	< 1 arc second
Symmetry	≤ 20 %
Roll Sensitivity (null)	< 20 arc sec @± 3° roll
Operating Temperature	-20° C to +50° C
Storage Temperature	-50° C to +100° C
Time Constant (@66%) [1]	≤ 1 second
Materials	magnetic
Temperature coefficient at null (when properly mounted)	±0.75 arc seconds / ° C

[1] Viscosity of the electrolyte may be modified to meet individual requirements to minimize vibration effects. Consult the factory.



Sensor Test Circuitry

Tests were conducted by exciting the left and right electrodes with an AC signal of 400 Hz and an rms voltage to produce the maximum current at null as per operating specifications. Output readings are taken between the center electrode and the center of the balanced resistors R1 and R2. Tests were conducted at a temperature of +25° C. See sensor test circuitry in figure 3. Output curve is shown in figure 1.

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