

The Fredericks Company

0714-5701-99
Single Axis, Mid-Range
Angle, Electrolytic Tilt
Sensor.



<i>Angle Range</i>	$\pm 12^{\circ}$
<i>Resolution</i>	<i>10-arc sec.</i>
<i>Null Repeat</i>	<i>12-arc sec.</i>

The **0714-5701-99** Sensor has been used successfully in applications that demand a high accuracy for wider-angle ranges. This sensor provides excellent stability, good repeatability at null and angles, over time and a wide range of temperatures. The hermetic glass to metal construction and solid platinum electrodes guarantee a long operating life and consistent operating characteristics.

Applications Include:

- ◆ Automobile Wheel Alignment
- ◆ Aircraft Avionics
- ◆ Geophysical Monitoring
- ◆ Machine Tool Leveling
- ◆ Medical Positioning and Monitoring

Operating Specifications:

Operating Range (max.)..... $\pm 12^\circ$
 Linear Range..... ± 5 degrees
 Null Voltage..... ≤ 0.030 Volts
 Null Current (max.)..... 11.0 mA (continuous)
 Null Impedance (nom)¹.... 1000 Ohms (25° C)
 (measured left to right electrode) see figure 2
 Null Repeatability..... ≤ 12 arc seconds
 Resolution..... < 10 arc seconds
 Symmetry (typ.)..... ≤ 20 %
 Operating Temperature..... -20° C to $+50^\circ$ C
 Storage Temperature..... -50° C to $+100^\circ$ C
 Time Constant(1)²..... ≤ 1 sec
 Materials..... non-magnetic
 Temperature coefficient.. ± 0.5 arc minutes / ° C
 at null (when properly mounted)

¹ Impedance of the electrolyte may be changed to limit null current.

² Viscosity of the electrolyte may be modified to meet individual requirements to reduce vibration.

Physical Dimensions:

Vial length.....2.437" (61.9mm)
 Vial diameter.....0.5" (12.7mm)
 Lead length.....0.187" (4.7mm)
 Lead spacing.....0.75" (19.1mm)

Sensor Test Circuitry

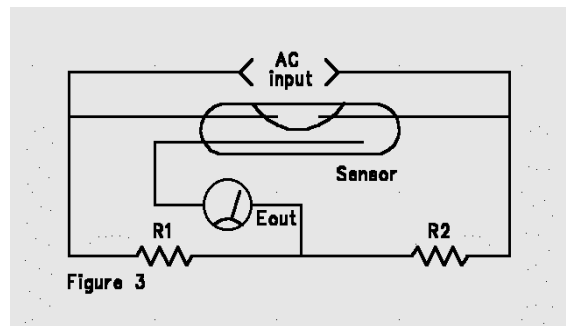
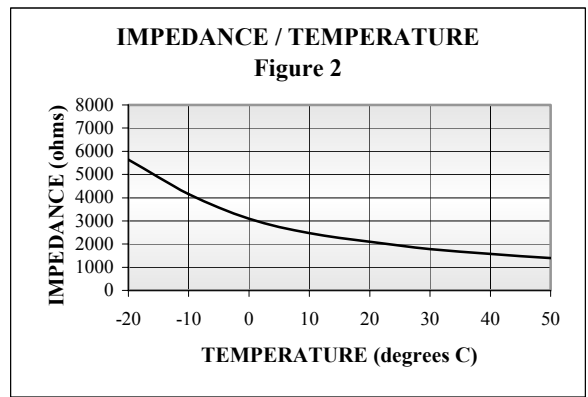
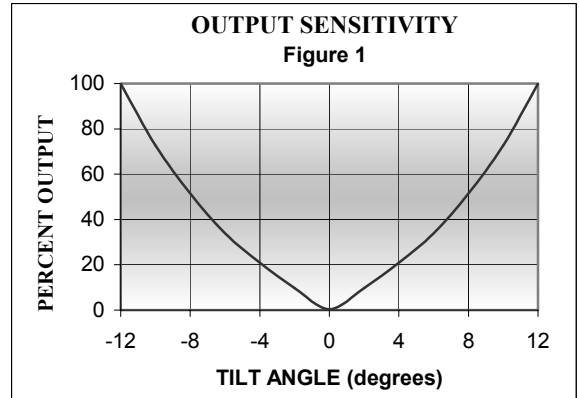
Tests were conducted by exciting the left and right electrodes with an AC signal of 400 Hz and an rms voltage to produce the maximum current at null as per operating specifications. Output readings are taken between the center electrode and the center of the balanced resistors R1 and R2. Tests were conducted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

Description of Test Values

*AC input voltage = Null Current (max) times
 Null Impedance (nom)*

*E_{out} = Angle of tilt from null (Direction of tilt
 determined by phase of E_{out})*

R1 = R2 = 1/2 Null Impedance (nom)



Caution! – Ensure that all test and operating circuits are entirely free of direct current. Direct current will cause level damage and/or instability.