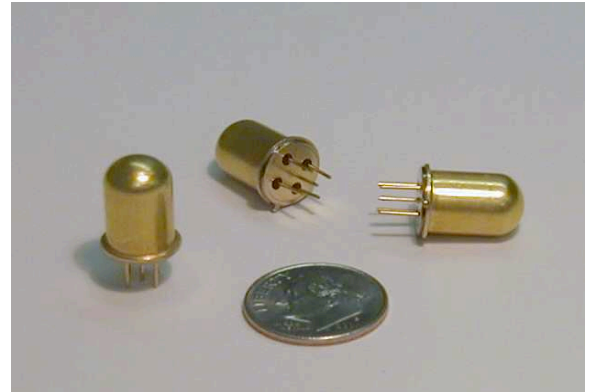


The Fredericks Company

0717-4304-99 TrueTilt[□], Dual Axis, Wide Angle, Electrolytic Tilt Sensor

| | |
|----------------------|-----------------------|
| <i>Angle Range</i> | $\pm 60^{\circ}$ |
| <i>Resolution</i> | <i>.2 arc minutes</i> |
| <i>Repeatability</i> | $\pm .1$ degrees |



Patent 6,249,984

The 0717-4304-99 TrueTilt[□] Sensor[™] represents a new advancement in electrolytic tilt sensor technology. Robust all metal construction provides durability as well as superior dimensional tolerances, which equates to excellent sensor-to-sensor electrical performance. This sensor is ideal for economical, commercial market applications requiring high production quantities and first-rate accuracy.

Applications Include:

- Wheel Alignment
- Navigation and GPS Compensation
- Automotive Roll Over
- Game Controllers and Joysticks
- Medical and Physical Feedback Instruments

0717-4304 TrueTilt[®], Dual Axis, Wide Angle, Electrolytic Tilt Sensor

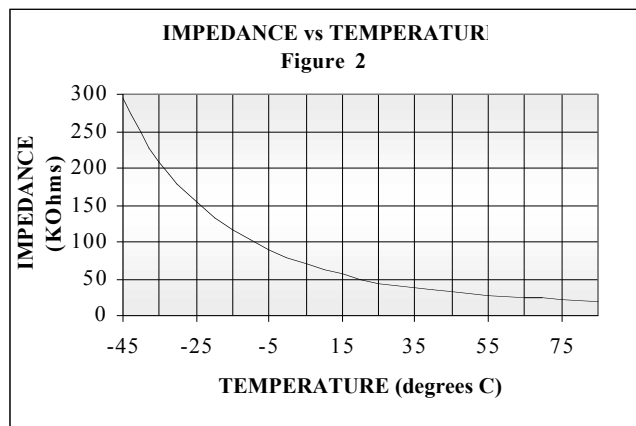
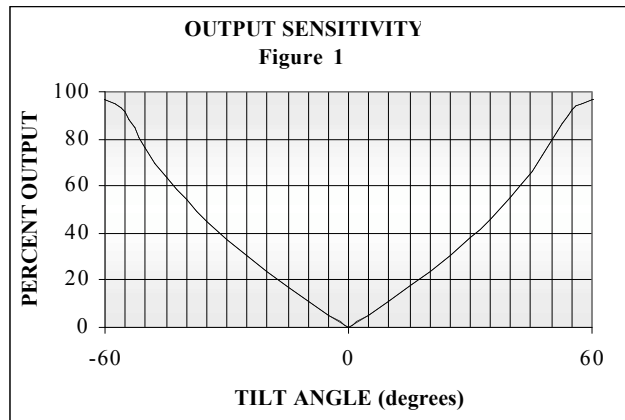
Operating Specifications:

| | |
|---|---------------------|
| Operating Range (max.)..... | $\pm 60^\circ$ |
| Linear Range..... | $\pm 25^\circ$ |
| Null Voltage..... | ≤ 0.025 Volts |
| Null Current (max.) | 0.2 mA (continuous) |
| Null Impedance (nom) | 40 K Ohms (25° C) |
| (measured left to right electrode) see figure 2 | |
| Repeatability..... | 0.1° |
| Resolution..... | < 0.2 arc minutes |
| Symmetry (typ.)..... | 5% |
| Null Offset (max.)..... | 5.0° |
| Mech. Crosstalk / Deg. (to 20°)..... | 0.025° |
| Temperature Coefficient | |
| Null..... | 20 arc sec / °C |
| Scale..... | 0.1 % / °C |
| Stability @ 24 Hrs..... | 0.1° |
| Operating Temperature | -40° C to +85° C |
| Storage Temperature..... | -55° C to +100° C |
| Time Constant (1) | ≤ 100 msec |
| Material | magnetic |

NOTE: Output sensitivity's scale factor may be modified to individual requirements upon special order.

Physical Dimensions:

| | |
|------------------------------------|----------------|
| Height..... | 0.530"(13.5mm) |
| Diameter - Cap..... | 0.340"(8.64mm) |
| Diameter - Flange..... | 0.400"(10.2mm) |
| Lead length..... | 0.20"(5.0mm) |
| Lead diameter..... | 0.020"(0.5mm) |
| Lead spacing (center to outer).... | 0.1" (2.5mm) |



Sensor Test Circuitry

Tests were conducted by exciting the outer electrodes of a single axis 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 test circuitry in figure 3. Output curve is shown in figure 1.

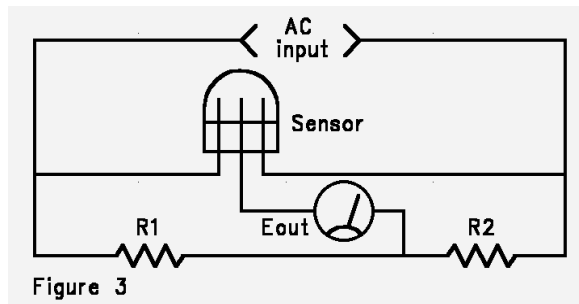
Description of Test Values

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 = _ 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.