Dual Axis Inclinometer Sensor

AngleStar DAI-20 combines the function of two clinometers in one package. The unique dome shaped design features a capacitance based sensor which produces output signals directly proportional to the relative tilt in two axes.

Designed for high volume applications, AngleStar DAI-20 is priced to compete with much less capable mercury switches and other low cost level sensors.

There are four output connections providing a choice of ratiometric, pulse width modulation (PWM) digital output. A mating connector (sold separately) provides the user with an easy plug-in connection. Null and scale factor are adjustable.

**Features**
- New microprocessor-based electronics
- Two clinometers in one package
- Adaptable design DC powered
- Ratiometric and PW digital output in one model
- Trimmable outputs

**Applications**
- Platform leveling
- Measure pitch and roll
- Tip over protection for manlifts
- Automatic leveling systems

**Wheel alignment**

**Performance Specifications**

- **Range**: ±20°
- **Threshold / Resolution**: 0.01
- **Linearity**
  - Null to 10°: ±0.2°
  - 10° to 12°: ±2.5%
  - 12° to 15°: ±3.0%
  - 15° to 20°: Monotonic
- **Null Repeatability**: ±0.1
- **Frequency Response (-3db)**: 0.25 Hz (0.50 Hz available, consult factory)

**Environmental**

- **Temperature Range**
  - Operating: -20° to 65°C
  - Storage: -55° to 65°C
- **Temperature Coefficient of Null**: 0.01%/°C
- **Temperature Coefficient of Scale Factor**: 0.10%/°C

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**Electrical**

- **Voltage Supply (nominal)**: 9 VDC
- **Voltage Supply Range**: Regulated 5.0 to 15.0 VDC
- **Current**: 10 mA
- **Analog Output**
  - Scale Factor* @ 9 VDC: 100 mV/degree ±10%
  - Load Resistance (min): 10K Ohms
- **Null Output**: 1/2 supply voltage ±10%
- **Pulse Width Output**
  - Null: 50% (duty cycle)
  - Scale Factor: 0.7% / degree (nominal)
  - Duty Cycle: t2 / (t1 + t2), t1 and t2 varies from 0.2 to 0.7 msec
- **Frequency**: 100 Hz nominal

Physically the sensor is composed of two hermetically sealed domes spaced about 1/8” apart. The lower, polyester plastic dome has 4 capacitive plates while the aluminum, upper dome acts as a ground. A fluid with a high dielectric constant is sealed within the dome sandwich, leaving an air bubble space about the size of a quarter. The bubble is centered at level position and will move from one side to the other as the device is tilted.
Technical Specifications Cont...

**Dimensions in (mm)**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>X Dimension</th>
<th>Y Dimension</th>
</tr>
</thead>
<tbody>
<tr>
<td>DAI-20</td>
<td>Clinometer w/ case</td>
<td>3.120 (99.25) max.</td>
<td>0.390 (99.06)</td>
</tr>
<tr>
<td>DAI-20-PCB</td>
<td>Clinometer w/ standoffs</td>
<td>2.340 (79.44) max.</td>
<td>0.390 (99.06)</td>
</tr>
<tr>
<td>DAI-20-CON</td>
<td>Mating Molex connector</td>
<td>0.870 (22.10)</td>
<td>0.558 (14.17)</td>
</tr>
</tbody>
</table>

**Dual Axis Block Diagram**

**How to Order**

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Note: Connector is recommended for model DAI-20 (Clinometer w/ case).