T640 Series

DC-Operated Tilt Sensor with unfiltered and low pass filter outputs

Features

- Ranges ±30º, ±60º & ±90º
- Essentially zero temperature coefficient of damping ratio
- Filtered and unfiltered outputs simultaneously available
- Integral temperature compensation
- DC input - DC output
- Signal ground isolated from power ground
- High reliability

Introduction

The range of Solid State Tilt Sensors manufactured by Sherborne Sensors measure angle with high accuracy utilising a micromachined (MEMS) silicon sensor incorporating gas damping. Unlike fluid damped devices the gas damping employed is essentially independent of temperature. The transducer also incorporates positive mechanical stops confering excellent shock resistance.

The Tilt Sensor is compensated for the effects of temperature on both sensitivity and zero.

Typical applications include data acquisition systems, road bed analysis, platform levelling, structural monitoring, pipeline levelling, ship ballast transfer systems and many other applications requiring precision tilt measurement.

In addition to the instruments offered in this bulletin, Sherborne Sensors design and develop Tilt Sensors for specific applications. These custom designed units can be manufactured and tested to conform to customers specific requirements.
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unfiltered and low pass filter outputs

Designed for operation from an unregulated DC power supply, the T640 series features a MEMS technology solid-state sensor with integral air damping. Electrical termination is via a military style, bayonet lock electrical connector. The tilt sensor has a high useable frequency response and is fitted with a 5Hz low pass filter as standard. Available with electrical connector (T643) or solder pins (T645).

General Specification

Input
Ranges ±30°, ±60° & ±90°
Input Voltage .................. +6 to 32Vdc Unregulated
Input Current .................... 100mA dc max.

Output at 25°C
Full Range Output .......... ±5V dc ±2%
Zero Offset ................... ≤ ±2% FRO
Nonlinearity .................... ≤ ±0.5% FRO
Hysteresis ...................... ≤ 0.02% FRO
Resolution ...................... ≤ 0.001% FRO
Cross Axis Sensitivity ......... ≤ ±1% FRO
Noise Output .................. 5mV rms (DC to 10kHz) max
Damping Ratio ................ 0.7 (±0.2) @ 25°C
Output Impedance .......... < 1Ω
Filtered output response ... <3dB at 5Hz, 2-pole

Environmental
Temp. Operating .............. -40°C to +100°C
Temp. Compensated ........... 0°C to +50°C
Temp. Storage ................. -55°C to +130°C
Thermal Sensitivity Shift .... ≤ ±0.03% FRO/°C
Thermal Zero Shift ............ ≤ ±0.03% FRO/°C
Shock .................................. 200g for 2ms
........................................... (1/2 sine wave)
Acceleration ...................... Will withstand constant 20 times
rated range in all 3 axes without
damage

Humidity/Immersion .......... IP65
EMC Emissions .................. EN 55022: 1998, 30 MHz to 1 GHz
A2: 2001, ±4 kV
.................................... EN61000-4-3: 2002, 10 V/m
.................................... EN61000-4-4: 2004, ± 1 kV
.................................... EN61000-4-4: 2004, ± 2 kV
.................................... EN61000-4-6 1996 inc A1: 2001, 3
Vrms
.................................... EN61000-4-6: 1996 inc A1: 2001, 10
Vrms
.................................... EN61000-4-8: 1994 Incorporating
Amendment A1: 2001, 30 A/m

Insulation Resistance .......... ≥ 20 MΩ at 50V dc

Physical
Weight ...................... 120 grams max

Electrical Connections
Connector Type ................. Type Bayonet lock, MIL-C-26482, 6
pin, Shell Size 10
Pin A – supply +
Pin B – supply 0v
Pin C – signal ground
Pin D – signal output (filtered)
Pin E – signal output (unfiltered)
Pin F – not connected

DESIGNATION & ORDERING CODE

T64[ ]-0001-[

Series Number

CONNECTOR TYPE
3 = Electrical Connector
5 = Solder Pin Outlet

0 = Standard

RANGE
30 = ±30°
60 = ±60°
90 = ±90°

Please specify Mating Connector 3CON-0009 if required.