0729-1723-99
Microprocessor Based, Dual Axis, Signal Conditioner Assembly

OVERVIEW

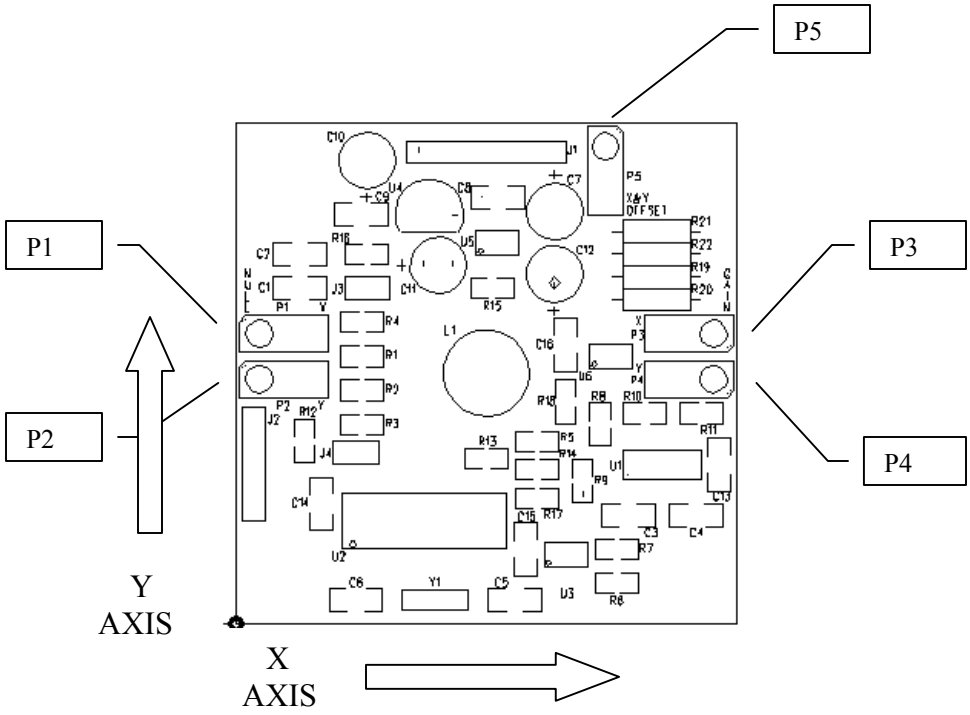
The microprocessor based, dual axis, signal conditioner assembly is designed to operate in the angle range of +/- 45 degrees. It requires a power supply voltage of between 7 to 16 volts dc. The output is 0 to 5 volts relative to the tilt angle for both axis with 2.5 volts indicating a zero angle. The signal conditioner assembly has 2 mounting holes. The spacing is 3.0 inches center to center. Below is diagram of the power and output connections.

Connector:

J1-1 (red) +7 to +16 VDC in
J1-2 (black) Common
J1-3 not used
J1-4 (brown) X axis - analog output
J1-5 (green) Y axis - analog output
J1-6 (blue) X axis - pulse width (optional)
J1-7 (white) Y axis - pulse width (optional)

CALIBRATION

The signal conditioner is calibrated at the factory. After mounting it may be necessary to trim the offset and gain to accommodate variations in mounting. Below is a description of how to make these adjustments. Remove the 4 screws on top of the housing and remove the cover to access the printed circuit board.



Sensor trim adjustments:

P1 – X null
P2 – Y null
P3 – X gain
P4 – Y gain
P5 – Analog dac offset **(factory set, do not adjust)**

P1 and P2 are offset adjustments for the X and Y analog and digital outputs when the board is in the null or non-tilted position.

P3 and P4 are gain adjustments for the X and Y analog and digital outputs when the board is tilted to the specified angle.

P5 is the analog dac offset for the X and Y outputs. **This adjustment is made at the factory and should not be adjusted.**

ADJUSTMENTS - ANALOG

Adjust P1 and P2 for 2.5 volts for the X and Y outputs with the sensor in the null or non-tilted position.

Adjust P3 and P4 for the selected X and Y analog voltage range when the sensor is tilted to the selected angular range

ADJUSTMENTS - DIGITAL (OPTIONAL)

Adjust P1 and P2 for 50% duty cycle on the digital X and Y outputs with the sensor in the null or non-tilted position.

Adjust P3 and P4 for the X and Y outputs to 10 and 90 percent of the selected angular range.

The Fredericks Company

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Sensor Operating Specifications:

Tilt sensor part number…….0717-4304-99

Operating Range (max.)…..……..… ± 45°
Linear Range…….……...…. ± 25°
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

Case Dimensions:
Length……. 2.500"
Width……2.500"
Height……...0.900"
Flange Length……...3.500"
Flange Holes (centerline)……3.000"
Hole Diameter……0.190"

Circuit Board Operating Specifications:

Circuit board part number…….1-6200-002

Power supply voltage (range)……+7 to +16 VDC
Power supply current (typical)…….11.0 mA @ 9VDC

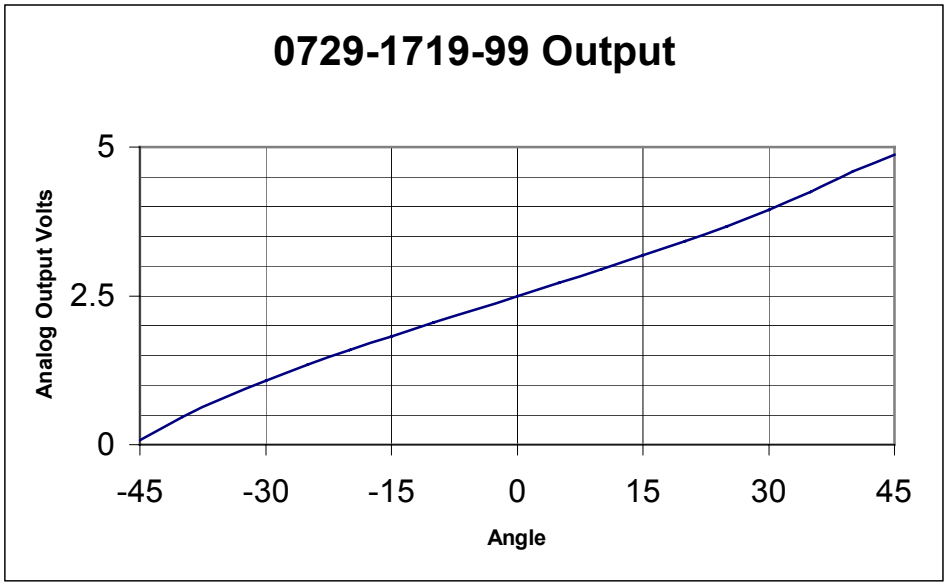
Analog output voltage (max)……Power supply voltage minus 2 Volts
Analog output load current (max)……..1 mA
Analog output resolution (0 to 5 volts output)……..……..1.5 mV

Digital output voltage (typical)…..……..0 to 5 Volts
Digital output load current (max)……..…1 mA
Digital output resolution (percent)……0.1%
(time)…….2.0 usec
Digital output frequency…….488 Hz

Environmental
Temperature range
Operating…..……..-40 to +85 ° C
Storage..……..-55 to +100 ° C

Connector:
J1-1 +7 to +16 VDC
J1-2 Common
J1-3 not used
J1-4 X axis analog
J1-5 Y axis analog
J1-6 X axis pulse width (optional)
J1-7 Y axis pulse width (optional)

Cable length……..60.0"



Power and signal connection guide

Caution: Observe polarity when connecting power to power inputs!