

# MODEL 117

## MAGNETOMETER SENSOR

### FEATURES

- Complete 3-axis system
- Low noise level
- Measures up to  $\pm 0.65$  Gauss
- High resolution fluxgate sensors
- Compact size, rugged construction
- +5 VDC and -5 VDC

### APPLICATIONS

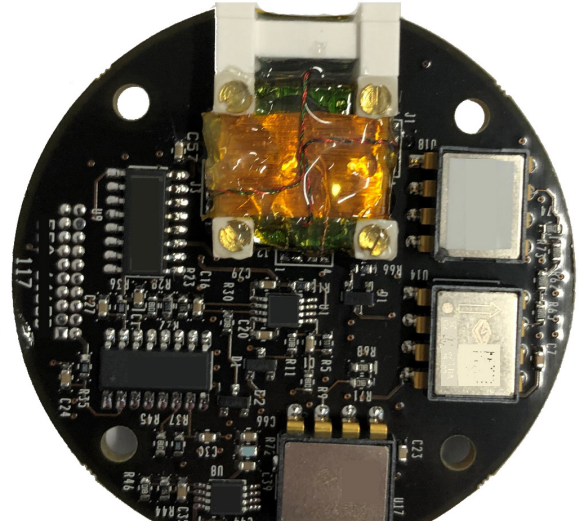
- Fluxgate compass systems
- Magnetic fuses
- Measurement of magnetic signatures and magnetic fields generated by power lines

As a magnetic compass, the Model 117 can provide direction accuracy to better than  $0.1^\circ$ . Some applications combine the Model 117 with a precision 3-axis accelerometer to provide roll, pitch and yaw angles accurate to  $0.1^\circ$ .

In magnetic anomaly detection situations, the low noise level of the Model 117 enables very small magnetic signatures to be measured.

#### System Calibration and Connection

Before shipment, we calibrate the Model 117 system in our set of mu metal shields (to determine zero offset) and precision Helmholtz coils (to measure scale and axis alignment factors). As an option, a calibration sheet can be provided with each unit to enable external correction of these system parameters if desired. In addition, calibration of offset and scale factor variation can also be obtained over any temperature excursion in the  $-40$  to  $+125^\circ\text{C}$  range.



The system provides 3 analog output voltages proportional to the magnetic field in three orthogonal directions. Full scale output is  $\pm 4.0$  volts; this voltage represents a magnetic field of  $\pm 0.65$  Gauss. Output scale factor is adjusted to an accuracy of  $\pm 0.1\%$ .

The output polarity sense of the axes is such that a field increase in the direction of the arrows produces an increase in the voltage output for that axis. In general, the magnetic axis of the Model 117 systems is orthogonal and aligned within  $\pm 0.2^\circ$  of the right-handed coordinate system specified by the outer package alignment surface and alignment holes.

### ELECTRICAL

Input Voltage Range	± 5 VDC
Current Draw	<90 mA @ ± 5 VDC
Total Power Consumption	< 1.5 W

### ENVIRONMENTAL

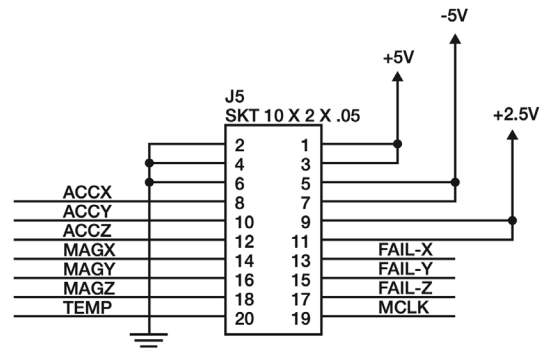
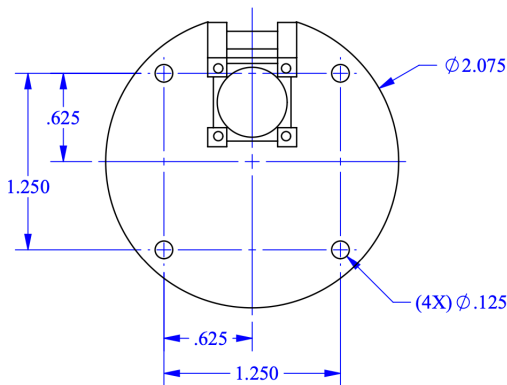
Operating Temperature Range	0°C to +70°C
Storage Temperature Range	-55°C to +160°C
Shock	1000 G 1 ms half sine wave
Vibration	10 G RMS random 50 Hz to 500 Hz

### PERFORMANCE

Range	± 0.65 G
Noise Level	0.3 nT RMS/Hz <sup>1/2</sup> 3 µG RMS/Hz <sup>1/2</sup>
Sensitivity	± 4 V/G
Linearity @ full-scale	± 0.1% full-scale
Frequency Response	DC to 400 Hz (-3 db)
Orthogonality between axis	± 0.2°
Alignment of sensor package with sensor reference surfaces	± 0.2°
Offset versus Temperature	< 5 nT/°C (<0.05 mG/°C)
Temperature Scale Factor	<± 0.02% Full Scale/°C

### PHYSICAL

Diameter	2.075" ( 52.70 mm)
Input/Output Connections	Bendix P/N PT02A-12-10S, P/N PT06A-12-10P (SR) (see J5 below)



**Model 117** Specifications are subject to change without notice.