



**Model WFG-130
3 AXIS MINIATURE FLUXGATE
MAGNETOMETER SYSTEM**

Operating Manual and Technical Reference



WFG-130 3 AXIS MINIATURE FLUXGATE MAGNETOMETER SYSTEM

Table of Contents

I.	Introduction	1
II.	System Specifications	2
III.	Mechanical Features of the System	3
IV.	Electrical Features of the System	3

Figures

Fig. 1	Sensor Coordinate Axes and Mechanical Outline	4
Fig. 2	Connector Pin Functions	5

I. INTRODUCTION

The WFG-130 System is a precision 3 axis fluxgate magnetometer packaged in an aluminum and fiberglass package of dimensions 1.5" x 1.5" x 3.80". The system operates from input voltages ± 15 VDC.

The system provides 3 analog output voltages proportional to the magnetic field in three orthogonal directions. Full scale output is ± 10.0 volts; this voltage represents a magnetic field of ± 5.00 G.

The WFG-130 systems employs an active failure recognition system to detect when any of the three fluxgate sensors stop working properly. The failure system functions by applying a low level magnetic signal (500 Hz) to each fluxgate sensor and then detecting the presence of the signal in each of the fluxgate output channels. The failure tone can be observed in the output of each channel as a 500 Hz 10 millivolt amplitude signal. A failure output logic signal is provided to alert the user should any of the fluxgate sensors stop working. The failure output is present on pin A of the WFG-130 connector. This output is at a TTL high level when the fluxgate sensors are operating properly. This output goes to TTL low when any of the 3 fluxgate sensors fail.

The detailed system specifications of the WFG-130 system are given in section II. Mechanical and electrical performance data is discussed in sections III. and IV.

II. SYSTEM SPECIFICATIONS

Noise Level	$<1 \times 10^{-5} \text{G RMS}/\sqrt{\text{Hz}}$
Frequency Response	DC to 400 Hz (-3 db)
Linearity	$\pm 0.2\%$
Initial Offset	$<\pm 0.020 \text{ V}$
Drift in zero with temperature	$<5 \times 10^{-5} \text{ G}/^\circ\text{C}$
Drift in scale factor with temperature	$<0.1\% \text{ Full Scale}/^\circ\text{C}$
Sensitivity	2.00 V/G
Orthogonality between axis	$\pm 0.2^\circ$
Alignment of sensor package with sensor reference surfaces	$\pm 0.2^\circ$
Fail Tone	500 Hz, 5 mG peak to peak
Fail Tone logic output	Logic low denotes failure
Size	Rectangular parallelepiped with rounded corners. 1.5" x 1.5" x 3.125"
Weight	100 gms
Power input	$\pm 15 \text{ VDC}$
Power consumption	55ma @ +15V, 43ma @ -15V
Connector	Bendix 10 pin connector p/n PT02A-12-10S
Mating connector	Bendix p/n PT06A-12-10P (SR)

III. MECHANICAL FEATURES OF THE SYSTEM

An outline drawing of the WFG-130 system is shown in Fig. 1. To provide ruggedness and environmental sealing, the system's fiberglass cover is epoxied to the aluminum connector mount bulkhead.

The sensor alignment with respect to the system package is shown in Fig. 1. The X axis is aligned parallel to the package long dimension. The Z axis is aligned with the two through holes in the aluminum connector mounts. The system Y axis is orthogonal to the X and Z directions. The system coordinate system is right handed.

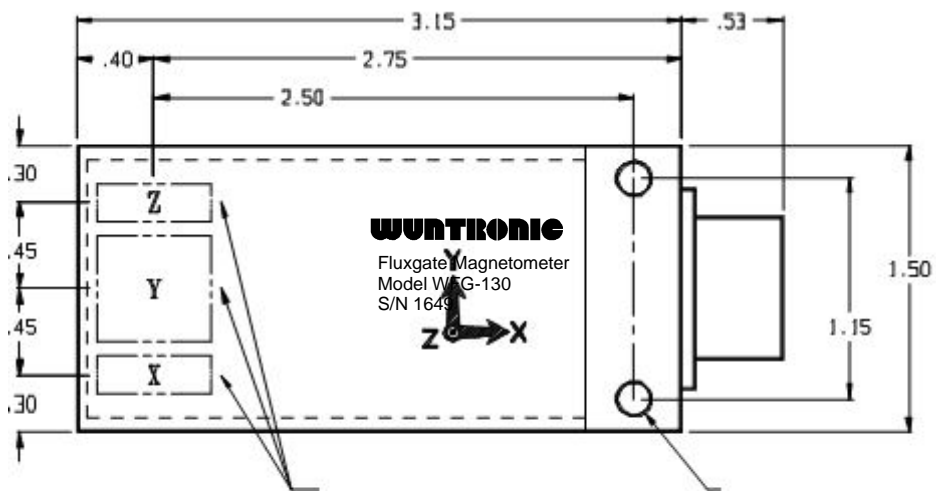
The output polarity sense of the axes is such that a field increase in the direction of the arrows shown in Fig. 1 produces an increase in the voltage output for that axis.

In general, the magnetic axis of the WFG-130 systems will be orthogonal and aligned to within $\pm 0.2^\circ$ of the right-handed coordinate system specified by the outer package alignment surface and alignment holes.

IV. Electrical Features Of The System

The WFG-130 is powered from bipolar ± 15 VDC supplies. Two internal regulators are present in the WFG-130 which produce ± 12 VDC for internal use. Connection to the WFG-130 is accomplished by means of a 10 pin Bendix connector. The functions of the input connector pins are shown in Fig. 2.

All Dimensions in Inch



Sensor Location

Two Mounting Holes
0.187" Diameter

Label Side

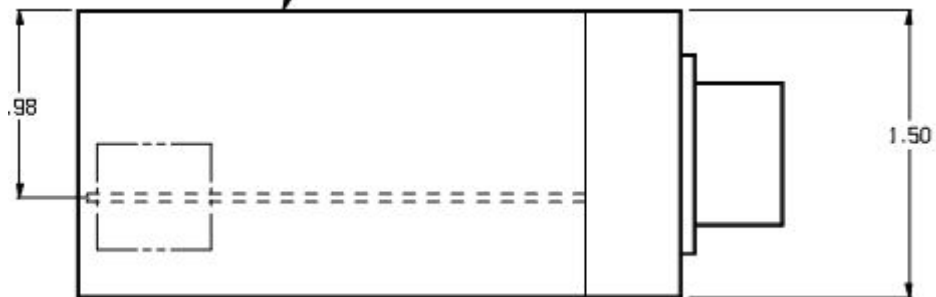


Fig. 2

**WFG-130 Magnetometer
Connector Pin Functions**

Function	Bendix PT02-12-10S (Female)
+15VDC	H
-15VDC	K
Y output	D
Z output	F
X output	E
Ground	B, G
Failure tone	A