



3 Axis Fluxgate Magnetometer System Model WFG-140

Operating Manual and Technical Reference



February 2008

WFG-140 3 AXIS MINIATURE FLUXGATE MAGNETOMETER SYSTEM

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I. INTRODUCTION

The WFG-140 System is a precision 3 axis fluxgate magnetometer packaged in an aluminum and fiberglass package of dimensions 1.5" x 1.5" x 4.65". 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 ± 2.00 G.

An optional temperature sensor can be added to the WFG-140. This sensor is implemented by using an Analog Devices AD592. The temperature output is represented by an analog voltage present on pin A of the system Bendix connector. The temperature output signal is proportional to the absolute temperature; scale factor is 5 mv/°K. At room temperature (20°C or 293°K) the temperature output voltage is 1.465V.

The detailed system specifications of the WFG-140 System are given in section II. Mechanical and electrical performance data is discussed in sections III and IV.

II. SYSTEM SPECIFICATIONS

Noise Level	$<3 \times 10^{-7}$ G RMS/ $\sqrt{\text{Hz}}$
Frequency Response	DC to 400 Hz (-3 db)
Linearity	$\pm 0.2\%$
Initial Offset	$<\pm 0.010$ V
Drift in zero with temperature	$<3 \times 10^{-5}$ G/°C
Drift in scale factor with temperature	$<0.1\%$ Full Scale/°C
Sensitivity	5.0 V/G
Orthogonality between axis	$\pm 0.2^\circ$
Alignment of sensor package with sensor reference surfaces	$\pm 0.2^\circ$
Temperature sensor scale factor	5 mv/°K
Size	Rectangular parallel piped with rounded corners. 1.5" x 1.5" x 4.65"
Weight	100 gms
Power input	+15 VDC @ 60 ma -15 VDC @ -60 ma
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

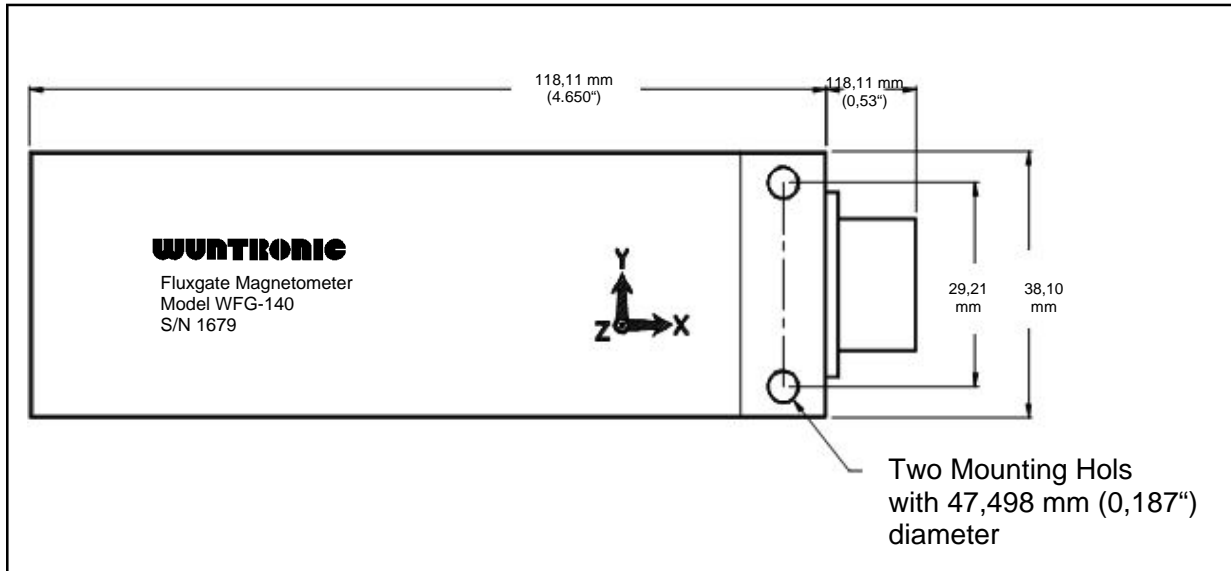
An outline drawing of the WFG-140 System is shown in Fig. 1, which indicates the sensor alignment with respect to the system package. The X axis is aligned parallel to the package long dimension. The Z axis is aligned with the two through holes in the aluminum connector mounts. The system's Y axis is orthogonal to the X and Z directions.

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-140 systems will be orthogonal and aligned to within $\pm 0.2^\circ$ of the coordinate system specified by the outer package alignment surface and alignment holes.

IV. ELECTRICAL FEATURES OF THE SYSTEM

The Model WFG-140 is powered from bipolar $\pm 15\text{VDC}$ supplies. Two internal regulators are present in the WFG-140, which produce $\pm 12\text{VDC}$ for internal use. Connection to the WFG-140 is accomplished by means of a 10 pin Bendix connector. The functions of the input connector pins are shown in Fig. 2 on page 6.



CONNECTOR PIN FUNCTIONS

Wire Color	Function	Bendix PT02-12-10S (Female)
Red	+15VDC	H
Blue	-15VDC	K
Green	temperature	A
Orange/White	Y output	D
Yellow/White	Z output	F
Red/White	X output	E Black
ground		B, G