



# Model 520 and 520A

## 3-Axis Fluxgate Magnetometers

### Features

- Simultaneous measurement of magnetic fields along three orthogonal axes
- Low noise level
- Small three-axis probe allows use in restricted spaces
- 4 selectable full-scale ranges
- Low Drift-- less than 10-5G/°C
- Precision offset capability (520A Model only) with full-scale range up to  $\pm 1000$  mG
- Optional cryogenic probes available



### Applications

- Measurement of magnetic fields inside steel and mu metal enclosures
- Measurement (and zeroing) of the magnetic fields trapped in superconducting (SRM) shields
- Measurement of the Geomagnetic field and the magnetic properties of materials
- Measurement of AC fields including power line-generated magnetic fields
- Measurement of magnetic fields at cryogenic temperatures

The Model 520 Fluxgate Magnetometer is a versatile instrument that enables measurement of magnetic fields from  $3 \times 10^{-7}$  G (one millionth of the Earth's magnetic field) up to 1200 mG. The field is measured simultaneously along three orthogonal directions and is displayed on three front-panel 3-1/2 digit liquid crystal displays.

The full-scale reading can be changed in four steps from 1000 mG to 1 mG. On the 1 mG scale, the least significant digit corresponds to a field change of  $10^{-6}$  G. The three axes outputs can also be simultaneously monitored by oscilloscope or strip chart at provided BNC connectors.

The 520 Fluxgate System can be employed to measure time variances as well as static fields. The system frequency response is flat from DC to 250 Hz, enabling measurement of power line generated fields, biologically generated fields and other small, time-varying fields.

The 520 and 520A Fluxgate Systems consist of a magnetic field measuring probe connected by a 15-foot interconnect cable to a power supply and electronic readout console. The small probe size (1" width, 1" height, and 2.6" in length) enables magnetic measurements to be made in restricted spaces.

### Model 520A Offset Capability

In addition to the features of the Model 520, the 520A adds precision 3-axis offset capability. This capability enables the nulling out of steady fields on all axes up to  $10^{-4}$  T (1000 mG) with no degradation in the instrument drift or noise level. This feature is essential when measuring small field changes in the presence of a large static field. This application can be used, for example, to test materials for small magnetic impurities or measure small changes in the Geomagnetic field.

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Systems

PHYSICAL	
Width	520 and 520A: 8.5" (215.9 mm)
Length	520 and 520A: 15" (381 mm)
Height	520: 3.5" (88.9 mm) 520A: 5.25" (133.35 mm)
Weight	520: 8 lbs (3,629 g) 520A: 11 lbs. (4,990 g)
Probe Size (width, height, length)	1" (25.4 mm) x 1" (25.4 mm) x 2.63" (66.68 mm)
Probe weight (shielded enclosure)	4 oz. (113.4 g)
Cable	Shielded 8 conductor 15' length
Cable connectors	Bendix PT06 style

ELECTRICAL	
AC Power Requirements	115V 0.5 Amp or 220V 0.25 Amp (selectable)
Fuse	0.8A SB

ENVIRONMENTAL		
Noise Level	0.03 nT RMS/Hz <sup>1/2</sup> @ 5 Hz 0.3 μG RMS/Hz <sup>1/2</sup> @ 5 Hz	
Frequency Response	flat from DC to 250 Hz	
Linearity over ±1 Oe	< 0.1%	
Drift in zero with zero temperature	< 10 <sup>-5</sup> G/°C	
Drift in full scale output with temperature	< 0.01%/°C	
Sensitivity	Full-Scale Range	Output Sensitivity
	1000 mG	10 V/G
	100 mG	100 V/G
	10 mG	1 V/mG
	1 mG	10 V/mG
Orthogonality between axis	± 0.2°	
Orthogonality between axes and reference surface (probe housing)	± 0.2°	
Offset capability selectable (Model 520A only)	Low range: 0 to ± 1 mG High range: 0 to ± 1200 mG	



Specifications within this document are subject to change without notice.

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