

AFG 100
AXIAL FLUXGATE PROBE
OPERATING MANUAL
COMPATIBLE WITH THE GM07/08 GAUSSMETER RANGE

VERSION 1.0 - 2012



APPLICATIONS

- Measurement of the earth's magnetic field, navigation.
- Detection of fields from power lines.
- Current measurement.
- Magnetic signatures.
- Material and package inspection.
- Residual Field measurement (shielding effectiveness).

INTRODUCTION

The AFG100 is a fluxgate magnetometer probe for use with the GM07 and GM08 gaussmeter for the measurement of weak magnetic fields up to $100\mu\text{T}$. The probe can be used in any application where the sensitivity and stability of conventional magnetic field sensors is too low, e.g. for the measurement of earth's magnetic field or the measurement of ferrous objects at larger distances.

AFG100 compatibility with GM07 and GM08 models

The AFG100 can be used immediately with Hirst Magnetic Instruments Ltd GM07 and GM08 Gaussmeter models with serial numbers: GM07-0924 and GM08-0691 and above.

If you wish to use a GM07 or GM08 with an earlier serial number, please contact Hirst Magnetics at sales@hirst-magnetics.com to check compatibility. Please include AFG100 compatibility as a reference, and include your GM07 or GM08 serial number.

USING THE AFG100 FLUXGATE PROBE

The AFG100 is compatible with Hirst's GM07 and GM08 range of meters. It is both versatile and simple to use, with a few simple steps to getting going.

NOTE. Always plug in and disconnect the probe with the power to the meter switched off.

There are three methods available for measuring with the probe, dependent on whether absolute/ relative measurements are needed and the zeroing technique chosen.

1. Insert the probe, power on the meter and select the FUNCTION required for measurement, E.G. DC, AC, etc.



FOR ABSOLUTE MEASUREMENTS (METHOD1)

2. Perform an AUTOZERO in a low Gauss environment. This will ensure the meter is zeroed correctly before measurements are taken. (e.g. Hirst's ZGC002 Zero gauss chamber, oriented orthogonally to the Earth's magnetic field.)
3. Apply the field of interest and select the correct range for the measurement.

FOR RELATIVE MEASUREMENTS USING A NULL FUNCTION FOR ZEROING (METHOD2)

2. Perform the AUTOZERO (UTILITIES MENU) inside a zero gauss chamber.
3. The probe should then be removed from the zero gauss chamber and then a NULL applied on the meter in the relative field to zero the meter.
4. The desired field can now be applied and probe will now read the field relative to the NULLED field.

If "Near Limit" is displayed then the meter is too close to its power supply rails for an accurate measurement to be taken. A smaller NULLED field must be used or method 2 must be used for the zero.

FOR RELATIVE MEASUREMENTS USING AUTOZERO FUNCTION FOR ZEROING (METHOD3)

For lower field readings the AUTOZERO should be performed in the relative field. This method should be used on high gain ranges with a large relative field, for example, measuring very small fields relative to the earth's magnetic field.

2. Perform the AUTOZERO (UTILITIES MENU) in the lower relative field to zero the meter.
3. The desired field can now be applied and probe will now read the field relative to the zeroed field.

NOTE: The nulled field + relative field + reading (total absolute field) should not exceed +/- 100 μ T.

HOLD BUTTON

The hold button performs the standard function as described in the GM07/08 manual.

ENVIRONMENT

Avoid high strength AC and DC fields even with the probe and meter un-powered, as these can damage internal circuitry and produce a permanent self-magnetisation of the sensor and electronics.

SPECIFICATION

Ranges	Digits displayed	Accuracy
100 μ T	-99.99 μ T to +99.99 μ T	0.25% +/- 5nT
10 μ T	-9.999 μ T to +9.999 μ T	0.25% +/- 5nT
1 μ T	-999.9 nT to +999.9 nT	0.25% +/- 5nT
100nT	-99.99 nT to +99.99 nT	0.25% +/- 5nT

Bandwith	0 to 1 KHz (-3 dB)
Operating Temperature	-40°C to +85°C
Length of detection coil	22mm
Analogue output	+/- 3V full scale

This product complies with the Low Voltage Directive (LVD) and Electromagnetic Compatibility (EMC) directive.

