

Mag-01 & Mag-01H

Single Axis Fluxgate Magnetometers



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These portable, high performance instruments provide precision measurements of the direction and intensity of static and slowly varying magnetic fields from 0.1nT to 2mT (1mT = 10G). Axial and transverse probes are available, together with unpackaged probes for cryogenic applications.

The Mag-01 provides a maximum resolution of 1nT. The Mag-01H has an additional sensitivity control providing a resolution of 0.1nT and an offset control for up to $\pm 90\mu\text{T}$ in 10 μT steps.

Both instruments are mains or battery powered, with a 4½ digit display and an analogue output. The internal rechargeable battery provides 16 hours continuous use and can be recharged using the mains adapter provided.

These instruments feature superb linearity and accuracy, and very low drift with time and temperature. Calibration is traceable to national standards and a re-calibration service is available.

Applications

- Measurement of induced and remanent magnetisation
- Field uniformity checks of electro- and superconducting magnets at room temperature
- Quality control on degaussed components
- Magnetic field measurement in cryogenic and vacuum chambers



Mag Probes

The following Mag probes are available.

Type	Low field probes (0 to 0.2mT)	High field probes (0 to 2mT)
Axial	Mag B Probe	Mag D and D/S Probe
Transverse	Mag C Probe	Mag E Probe
Cryogenic	Mag F Probe	Mag G Probe
Vacuum - to special order		

Measurement range / resolution (LCD display)				
Magnetometer	Low field probes (B, C and F)		High field probes (D, E and G)	
	Range (μ T)	Resolution (nT)	Range (μ T)	Resolution (nT)
Mag-01	0-20	1	0-200	10
	20-200	10	200-2000	100
Mag-01H (x10 sensitivity)	0-2	0.1	0-20	1
	2-100	1	20-1000	10
	100-290	10	1000-2000	100

Low field probes employ a 30mm length fluxgate element and can detect fields as low as 1nT (Mag-01H). When used in conjunction with the analogue output, a measuring range of $\pm 500\mu$ T to full specification is available.

High field probes employ a shorter 20mm length fluxgate element which limits their resolution to around 2nT (Mag-01H x10).

The special probe type D/S possesses a shorter (9mm) sensing element and, when used in conjunction with the Mag-01(H) specially set up for the purpose, will permit measurements using the analogue output of up to ± 5.3 V, equivalent to ± 5.3 mT, with the probe at a temperature no higher than 25°C. Above this temperature the measuring range of the probe will decrease.

Axial and transverse probes for normal (non-cryogenic) applications (types B, C, D, E) are housed in a robust brass outer case, which accurately defines the probe outline for mechanical registration purposes, and gives a high degree of environmental protection. The sensing element and cable are moulded within the tube using GRP (glass reinforced plastic) to provide hermetic sealing and create a very strong package.

Cryogenic probes are of axial construction only. They are designed for continuous operation down to liquid helium temperature. A minimum number of dissimilar materials are used in their construction to make them tolerant to the stresses induced by shrinkage which are incurred during cooling. The power dissipation has been kept to a minimum. The power levels stated in the product brochure specifications are the maximum values which occur as full scale measurements.

For schematic drawings of the probes, refer to the product page on the Bartington Instruments website.

All fluxgate sensors are manufactured in-house and undergo rigorous testing at all stages of production. Each probe is individually calibrated to a standard which is traceable to the UK National Physical Laboratory. Probes and electronics units are fully interchangeable with a cumulative calibration uncertainty of 0.25%.

Specifications: Mag-01 & Mag-01H Instruments

Performance	
Number of axes	One
Polarity	+ve non-inverting output when pointing North
Measuring range	0 to $\pm 0.2\text{mT}$ or $\pm 2\text{mT}$ depending on probe
Bandwidth	0 to 10Hz, -12dB per octave roll off (DC for x10 sensitivity)
Scaling (analogue output)	Low field probes $100\mu\text{T/V}$ ($10\mu\text{T/V}$ with x10 sensitivity) High field probes 1mT/V (0.1mT/V with x10 sensitivity)
Scaling accuracy	$\pm 0.25\%$
Maximum resolution	1nT (Mag-01), 0.1nT (Mag-01H)
Zero field offset error (at 20°C)	$\pm 5\text{nT}$
Scaling temperature coefficient	<10ppm/°C
Offset temperature coefficient	0.01nT/°C

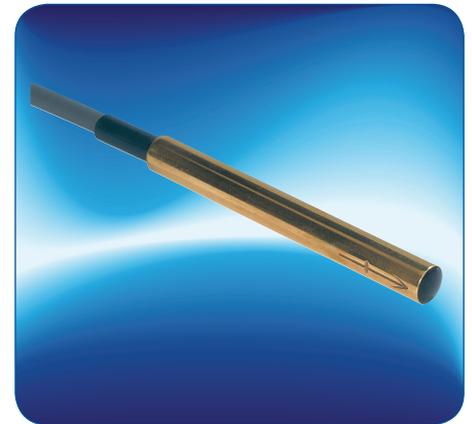
Environmental	
Operating temperature	0°C to +50°C
Relative humidity	0-90% non-condensing

Mechanical	
Enclosure	High impact ABS
Dimensions (W x H x D)	155 x 68 x 170mm
Weight	0.95kg
Front panel On/off switch Probe input Charge indicator Offset control (Mag-01H only) Sensitivity control (Mag-01H only)	Switches on internal battery 6 pole waterproof Fischer connector Illuminated when external supply connected Allows $\pm 90\mu\text{T}$ in steps of $\pm 10\mu\text{T}$ to be added or subtracted from the field at the probe Increases the sensitivity by a factor of 10

Electrical	
Power supply	Integral rechargeable lead-acid battery
Battery charger inlet Analogue output low field probes high field probes Output impedance	2.1mm socket 6-18V DC 0.5A max, polarity protected, continuous or intermittent use 4mm insulated sockets 5V full scale 2V full scale 1k Ω
Cable length	5m
Maximum cable length	25m

Specifications: Mag Probes

Performance	
Linearity	0.01%
Scaling accuracy	±1%
Probe alignment error to case	<0.2°
Offset error low field probes high field probes	±5nT ±25nT
Scaling temperature coefficient low field probes high field probes	±10ppm/°C ±30ppm/°C
Sensitive volume of metal cores low field probes high field probes	0.0023cm ³ 0.0015cm ³
Excitation power low field probes high field probes	26mW 16mW
Operating temperature axial and transverse probes cryogenic probes	-30°C to +75°C Liquid helium to +30°C



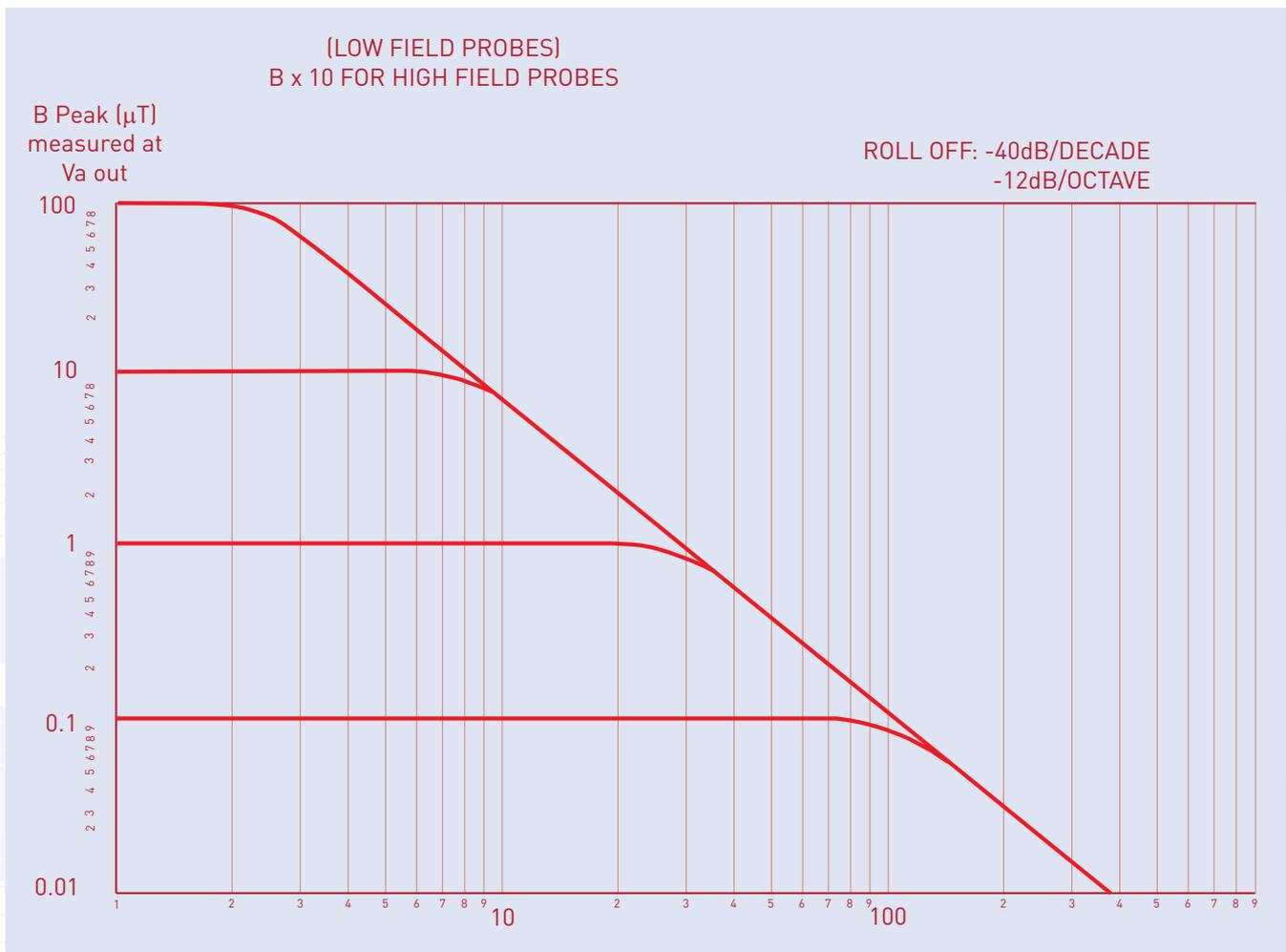
Accessories supplied
AC mains adapter for 110V or 220/240V with outlet adapters
Carrying bag for instrument and B,C,D & E probes
Operation manual
Service manual (available on request)

Optional accessories
Probe Switch Unit (for up to 3 probes)

Analogue Output

Selected -3dB points

B (peak)	-3dB
100 μ T	3.25Hz
10 μ T	11.4Hz
1 μ T	39.5Hz
0.1 μ T	114Hz





Bartington[®]
Instruments

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