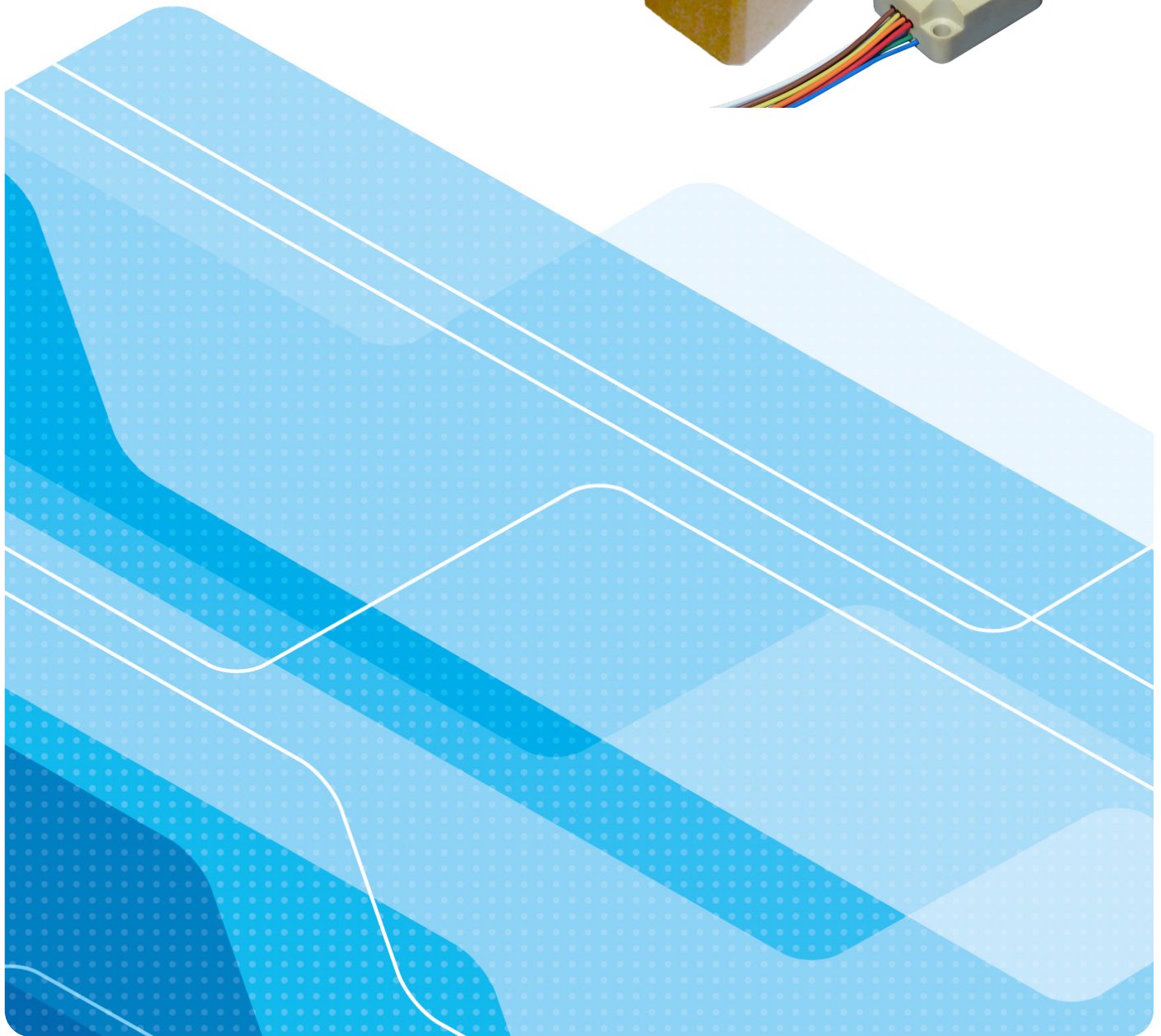
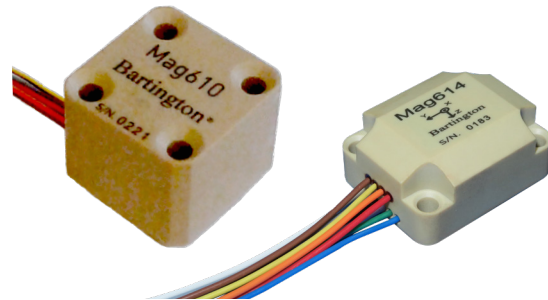


High Temperature Fluxgate Probes

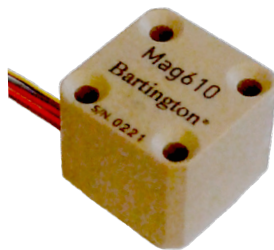




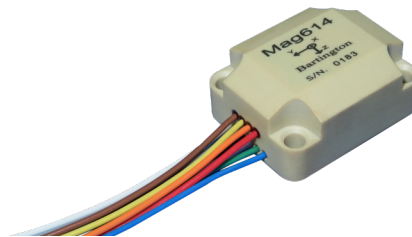
High Temperature Three-Axis Fluxgate Probes

Designed to survive high levels of shock and vibration, these probes are used to measure magnetic fields at temperatures up to 175°C (Mag610, Mag614-FL) and 215°C (Mag611). They are ideally suited for integration into magnetic ranging tools.

Ambient temperature electronics can be supplied, packaged and unpackaged.



Mag610



Mag614-FL

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Features

- Designed to survive high levels of shock and vibration
- Compact probe heads in different sizes for easy integration into other systems

Typical Applications

- Magnetic ranging
- Measurement while drilling (MWD)
- Applications requiring high shock and temperature resistance



Product Identification

Product name	Noise level (over full temperature range)
Mag610 Mag611	$\leq 300 \text{ pTrms } / \sqrt{\text{Hz}}$ at 1Hz
Mag614	15 to 300 pTrms $/ \sqrt{\text{Hz}}$ at 1Hz

Specifications

The following performance specifications are dependent on the drive electronics used. Where performance specifications have been provided, they shall be tested and validated using Bartington's own drive electronics, PC27b, and so are deemed "achievable".

Performance	Mag610	Mag611	Mag614-FL
Number of axes	Three (right hand XYZ co-ordinate system)		
Polarity	+ve non-inverting when pointing North		
Bandwidth (-3dB)	$> 100 \text{ Hz}$		$> 3 \text{ kHz}$
Measurement noise floor*	$\leq 300 \text{ pTrms } / \sqrt{\text{Hz}}$ at 1Hz		15 to 300 pTrms $/ \sqrt{\text{Hz}}$ at 1Hz
Output scaling	113 $\mu\text{T}/\text{mA}$ typical		105 $\mu\text{T}/\text{mA}$ typical
Scaling error	$\pm 5\%$ at 25°C		
Scaling temperature coefficient	$< +150 \text{ ppm}/^\circ\text{C}$		$< +100 \text{ ppm}/^\circ\text{C}$
Offset	$\pm 500 \text{ nT}$ max. at 25°C, $\pm 1000 \text{ nT}$ at 215°C when scaled for 100 μT range electronics		$\pm 500 \text{ nT}$ max. at 25°C, when scaled for 100 μT range electronics
Offset temperature coefficient			$< \pm 1 \text{ nT}/^\circ\text{C}$
Orthogonality error	$< 2^\circ$		$< 3^\circ$ max
Alignment error to enclosure side	$< 2^\circ$	$< 2^\circ$	$< 3^\circ$ target
Frequency response	$< 1\%$ amplitude error DC to 10 Hz		$< 5\%$ amplitude error DC to 1 kHz
Hysteresis	$< 0.1\%$ of range, 10 x range exposure		

* over full temperature range

Environmental	Mag610	Mag611	Mag614-FL
Operating temperature range	0°C to +175°C	0°C to +215°C	-20°C to +175°C
Storage temperature	0°C to +175°C	0°C to +215°C	-40°C to +175°C
Mechanical shock	1.3ms 150G peak shock		
Solder	Sn95.8/Ag3.5/Cu0.7	Sn5/Pb93.5/Ag1.5 (HMP – RoHS exempt)	Sn95.8/Ag3.5/Cu0.7
Compliance	BS EN ISO 61326:2021 EMC & RoHS		

Mechanical	Mag610	Mag611	Mag614-FL
Dimensions (WxHxL)	23 x 23 x 21.4mm		24.7 x 19.7 x 11mm
Weight	25g (with 1m wires)		27g (with wires)
Connector	RM15-TPD-10P (when supplied with Mag610/611 RTPDE)		N/A
Cable (flying lead version only)	3 x excitation + common, 3 x sense + common (8 wires in total) Captive 28 AWG PTFE wires, 1m long		10 x 0.5m 28AWG coloured PTFEcoated silver-plated copper wires
Mounting	4 x Ø3.6mm CSK holes		4 x Ø3.0mm CSK holes or 4 x M3 through holes (Mag614T/Mag614T-FL variant)

Electrical performance (each axis)	Mag610	Mag611	614-FL
Primary resistance	10.4Ω ±20%		5.2Ω ±20%
Primary inductance	960μH ±20%		140μH ±20%
Secondary resistance	60.0 Ω ±20%		27.4Ω ±20%
Secondary inductance	8.4mH ±20%		1.2mH ±20%
Recommended primary coil drive current	80mA peak AC coupled		130mA peak AC coupled
Recommended excitation frequency	15.625kHz		32kHz

Room Temperature Drive Electronics

Packaged and Unpackaged room temperature drive electronics can be purchased for Mag610 and Mag611 probes. There is an alternate unpackaged version available for use with Mag614 probes.

Product name	Description
Mag610/611 RTPDE	Room temperature packaged drive electronics for use with the Mag610 or Mag611
Mag610/611 RTUDE	Room temperature unpackaged drive electronics for use with the Mag610 or Mag611
Mag614-FL RTUDE	Room temperature unpackaged drive electronics for use with the Mag614-FL



Mag610/611 RTPDE/RTUDE Specifications

Performance	
Number of axes	Three
Measuring range	$\pm 100\mu\text{T}$ when calibrated with probe
Bandwidth (-3dB)	>500 Hz minimum
Scaling	100mV/ μT
Scaling calibration error	$\pm 0.5\%$
Start-up time	1s
Warm-up time	15mins
Frequency response	DC to 50 Hz $\pm 5\%$
Excitation breakthrough	<20mV pk-pk at 15.625kHz typical

Environmental	RTPDE	RTUDE
Operational temperature range	-40 to +70°C	
Storage temperature range	-40 to +70°C	
Ingress protection	IP52	N/A

Mechanical	RTPDE	RTUDE
Dimensions (mm)	Ø26x114	19.3x73
Integral cable length	1m	
Enclosure material	Aluminium alloy	N/A
Input connector (Sensor)	Hirose RM15-TRD-10S	Solder pads
Output connector	Hirose RM15-TPD-10S on a 1m screened cable	Hirose RM15-TPD-10S on a 1m screened cable

Electrical	
Supply voltage	$\pm 12\text{V}$ to $\pm 15\text{V}$ DC
Current consumption	+37mA, -12mA
Power supply rejection ratio	ripple up to 50 mV without any degradation of performance
Analogue output	$\pm 10\text{V}$ (unbalanced, single ended)
Output impedance	10 Ω

Mag614-FL RTUDE Specifications

Electrical	
Supply voltage	$\pm 11\text{V}$ to $\pm 15.5\text{V}$ DC
Current consumption	+75.5mA, -16mA
Power supply rejection ratio	ripple up to 50mV without any degradation of performance
Analogue output	$\pm 10\text{V}$ (unbalanced, single ended)
Output impedance	10 Ω
Excitation breakthrough	<50mVpk-pk at 32kHz

Environmental / Mechanical Parameters	
Operating temperature range	-40°C to +65°C
Storage temperature range	-40°C to +85°C
Dimensions - Electronics	90 x 85 x 30mm
Weight - Electronics	12.5g
Connections	See DR4258/DR4374 for info





The specifications of the products described in this brochure are subject to change without prior notice.

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