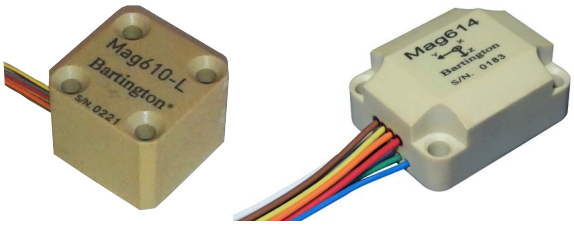
High Temperature Fluxgate Probes



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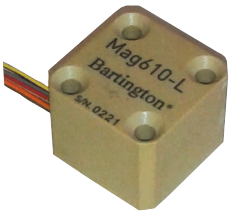
High Temperature Three-Axis Fluxgate Probes

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) and 215°C (Mag611). They are ideally suited for integration into magnetic ranging tools. A low noise version of Mag610 is also available for increased measurement precision.

Ambient temperature electronics can be supplied, packaged and unpackaged.



Mag610

Mag614-FL

Features

- Designed to survive high levels of shock and vibration
- Compact probe heads in different sizes for easy integration into other systems
- Environmentally sealed and protected to IP68
- Low noise option: <30pTrms /√Hz at 1Hz (Mag610 only)

Typical Applications

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

Product Identification

Mag610 and Mag611 probes are identified with a code indicating a Standard or Low noise level. No code indicates a product with a higher noise level. Mag614-FL probes are available in Standard noise only.

Product name	Code	Noise level (over full temperature range)
Mag610 Mag611 Mag614	No code = Basic	<1000pTrms /√Hz at 1Hz
	S = Standard	<300pTrms /√Hz at 1Hz
	L = Low noise (Mag610 only)	<30pTrms /√Hz at 1Hz

A “Mag611-S” is a Mag611 probe with a Standard noise level; “Mag610” with no code is a Mag610 probe with a higher noise level.

Specifications

Performance	**Mag610**	**Mag611**	**Mag614-FL**
Number of axes	Three (right hand XYZ co-ordinate system)		
Polarity	+ve non-inverting when pointing North		
Bandwidth (-3dB)	>100Hz		>3kHz
Measurement noise floor* Basic	<1nTrms /√Hz at 1Hz		N/A
Standard	<300pTrms /√Hz at 1Hz		15 to 300pTrms /√Hz at 1Hz
Low (Mag610 only)	<30pTrms /√Hz at 1Hz	N/A	N/A
Output scaling (value depends on electronic drive and sense circuit)	113µT/mA typical		105µT/mA typical
Scaling error	±5% at 25°C		
Scaling temperature coefficient	<+150ppm/°C		<+100ppm/°C
Offset	±500nT max. at 25°C, ±1000nT at 215°C when scaled for 100µT range electronics		±500nT max. at 25°C, when scaled for 100µT range electronics
Offset temperature coefficient			<±1nT/°C
Start-up / settling time	99% of final value in 0.5s		
Orthogonality error	<2° max		<3° max
Alignment error to enclosure side	<2°	<2°	<3° target
Linearity error	0.005% (Least Squares Fit)		
Frequency response	<1% amplitude error DC to 10 Hz		<5% amplitude error DC to 1kHz
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
Protection / sealing; operating pressure	IP68, up to 3 bar		
Mechanical shock	1.3ms 150G peak shock		
Compliance	RoHS compliant	RoHS exempt	RoHS compliant

Mechanical	Mag610	Mag611	Mag614-FL
Dimensions (WxHxL)	23 x 23 x 21.4mm		24.7 x 19.7x11mm
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)	614-FL
Primary resistance	5.2Ω ±20%
Primary inductance	140µH ±20%
Secondary resistance	27.4Ω ±20%
Secondary inductance	1.2mH ±20%
Recommended primary coil drive current	130mA peak AC coupled
Recommended excitation frequency	32kHz

Room Temperature Drive Electronics

Packaged and Unpackaged room temperature drive electronics can be purchased for Mag610 and Mag611 probes. There is an 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 RTUDE	Room temperature unpackaged drive electronics for use with the Mag614
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	±100uT when calibrated with probe
Bandwidth (-3dB)	>500 Hz minimum
Scaling	100mV/µT
Start-up time	1s
Warm-up time	15mins
Frequency response	DC to 50 Hz ±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	
Protection	IP64	N/A Conformal coating

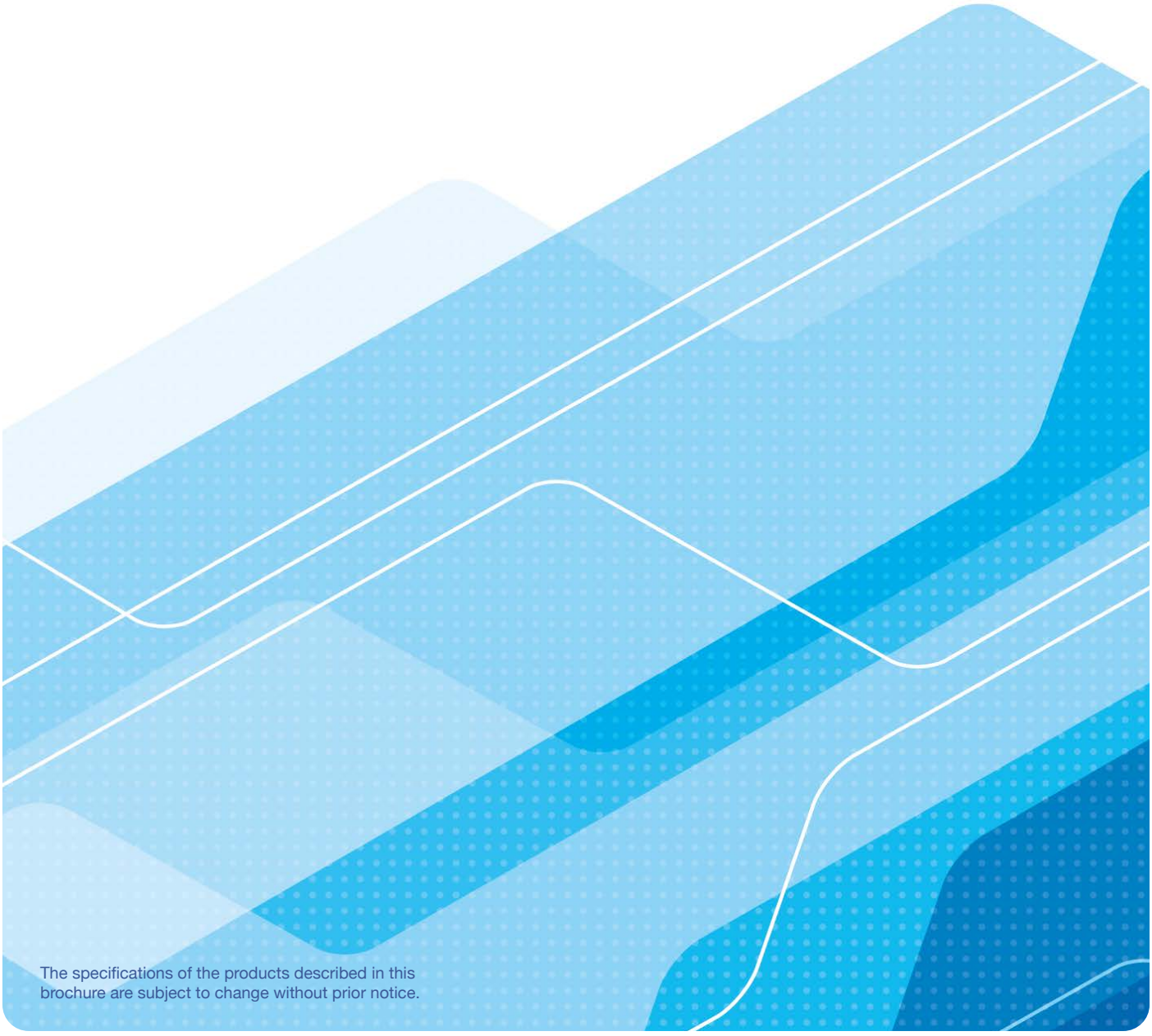
Mechanical	RTPDE	RTUDE
Dimensions (mm)	Ø26x114	19.3x73
Integral cable length	1m	
Enclosure material	Aluminium alloy	N/A
Input connector (Sensor)	Hirose RM15-TRD-10S	Solder pads
Output connector	Hirose RM15-TPD-10S on a 1m screened cable	Hirose RM15-TPD-10S on a 1m screened cable

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

Mag614-FL RTUDE Specifications

Electrical	
Supply voltage	±11V to ±15.5V DC
Current consumption	+75.5mA, -16mA
Power supply rejection ratio	ripple up to 50mV without any degradation of performance
Analogue output	±10V (unbalanced, single ended)
Output impedance	10Ω
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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