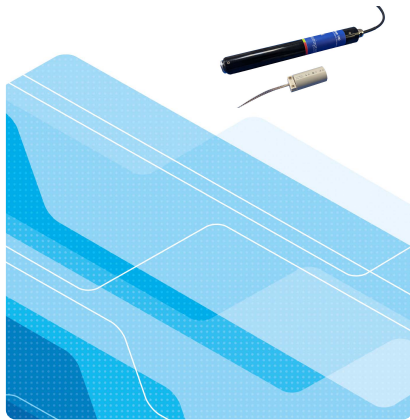


CryoMag® Three-Axis Magnetic Field Sensor



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Bartington®
Instruments

CryoMag® Three-Axis Magnetic Field Sensors



CryoMag® Three-Axis Magnetic Field Sensor

The CryoMag sensor provides high precision measurements of static and alternating magnetic fields.

CryoMag is a two-part Magnetometer that has been adapted to operate at temperatures down to 2-4K, making it ideal for use in cryostats for superconducting radio frequency cavities, in quantum computing applications, and other low temperature environments and applications.



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Features

- Operating temperature down to 2K
- Noise level down to <20pT/m√Hz at 1Hz
- Frequency response from DC to 16kHz
- Measuring ranges of ±70, ±100, ±250 and ±500μT

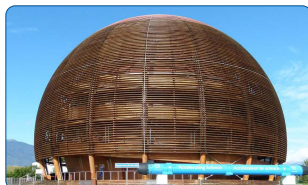
Typical Applications

- Magnetic field monitoring in cryostats and other low temperature environments
- Use as feedback sensors in active magnetic field cancellation systems

Product Identification

Product Name	Sensor Head Type	Measuring Range
CryoMag	No code = Standard 3-axis Probe	70 = ±70μT 100 = ±100μT 250 = ±250μT 500 = ±500μT

For example: CryoMag 250 = A ±250μT range CryoMag.



CryoMag® Three-Axis Magnetic Field Sensors

CryoMag® Specification

Performance				
Number of axes	Three			
Polarity	+ve when pointing North			
Analogue outputs	±10V single-ended (0V = zero-field)			
Full Scale Measuring Ranges	±70μT	±100μT	±250μT	±500μT
Scaling calibration error	±0.5%			
Scaling Temperature Coefficient	±100ppm	±120ppm	±170ppm	±200ppm
Linearity error	0.005% (near zero-field)			
Frequency response	DC to 16kHz (±20%)			
Bandwidth (15dB)	±20kHz (±11dB/octave roll-off)			
Noise	<20pT/m√Hz at 1Hz			
Zero field offset	±30nT	±30nT	±60nT	±100nT
Offset Temperature Coefficient	±0.5nT/°C	±0.5nT/°C	±1nT/°C	±1nT/°C
Perming (magnetisation hysteresis)	±2nT at 1μT full scale, when powered			
Orthogonality error between axes	±0.5°			
Excitation breakthrough	±5 mV pk-pk at 15.625kHz typical			
Start-up time	<10 seconds			
Warm-up time	<15 minutes to meet specifications for scaling & noise			

Environment		
Operational temperature range	Probe + probe harness Electronics + interconnection block	±71 to +70°C 0 to +70°C (dynamic cable) +0 to +70°C (static cable)
Storage temperature range	-40 to +60°C	
Vacuum	10 ⁻⁷ Atmosphere (Medium Vacuum)	
IP Rating	Probe + interconnection Block	IP40
	Electronics Enclosure	IP65 (Unmated Connector)
Humidity - electronics	Up to 90% RH, non-condensing	
Compliance	BS EN 61326-1:2013, IEC60947-1 and RoHS 2	

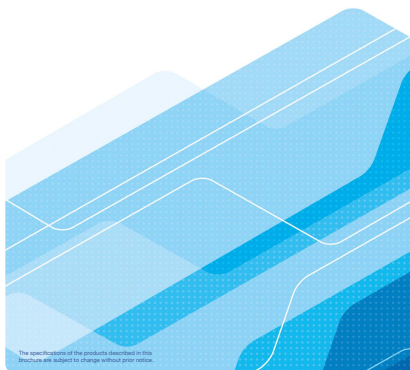
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Mechanical	
Construction	Two-Part
Probe Enclosure Material	PEEK (CF3)
Probe Dimensions	21mm Diameter x 50mm Long
Probe Harness Material	24-Wire Cryogenic Loom Dielectric: 1mm Beryllium-Copper (BeCu) Cores; Polyester Insulation 3.5mm Max Loom Diameter (Fitted)
Dimensions - Electronics Enclosure	25.4mm Diameter x 220mm Long
Weight	300g
Connectors	Fischer AL1731-DEU 1031 AC10 SPR 11-11 G-12
Bartington Helmholtz Jig	Helmholtz Carier PM45B3

Electrical	
Positive supply voltage (range)	+12 to +17V
Current drawn (max, mA)	600mA (3mA/1000μT on each axis)
Over-voltage protection	Varistor
Reverse polarity protection	Diode - 40V max
Current limit	None
Power Supply Noise Rejection Ratio	50dV/V (105 dB)
Negative supply voltage (range)	-12 to -17V
Current drawn (max, mA)	33 mA (3mA/1000μT on each axis)
Over-voltage protection	Varistor
Reverse polarity protection	Diode - 40V max
Current limit	None
Power Supply Noise Rejection Ratio	50dV/V (105 dB)
Output Signals X, Y and Z axes	Magnetic field strength
Output Impedance	20 ohms typical
Maximum load capacitance (C _{LOAD})	< 1μF
Maximum cable length	1.5m (but supply must be adequate to achieve ±12V at Magnetometer)
Over-voltage protection	Varistor
Reverse polarity protection	None
Current limit	protected against short circuit to 0V

Cable	
Interconnect Cable	Mag 13MSMC Cable PM3077

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

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