CryoMag®

Three-Axis Magnetic Field Sensors

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CryoMag sensors provide high precision measurements of static and alternating magnetic fields at temperatures down to 2K. They are available with standard 3-axis probe, or 3 single-axis sensor heads.

These sensors are ideal for use in cryostats for superconducting radio frequency cavities, in quantum computing applications, and other low temperature environments and applications.

Features

- Operating temperature down to 2K
- Noise level down to <20pTrms/√Hz at 1Hz
- Frequency response from DC to 1kHz
- 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 IE = 3 x individual single axis sensor heads	70 = ±70µT 100 = ±100µT 250 = ±250µT 500 = ±500µT

For example: CryoMag-IE250 = A ±250µT range 3-axis CryoMag with individual sensor heads.

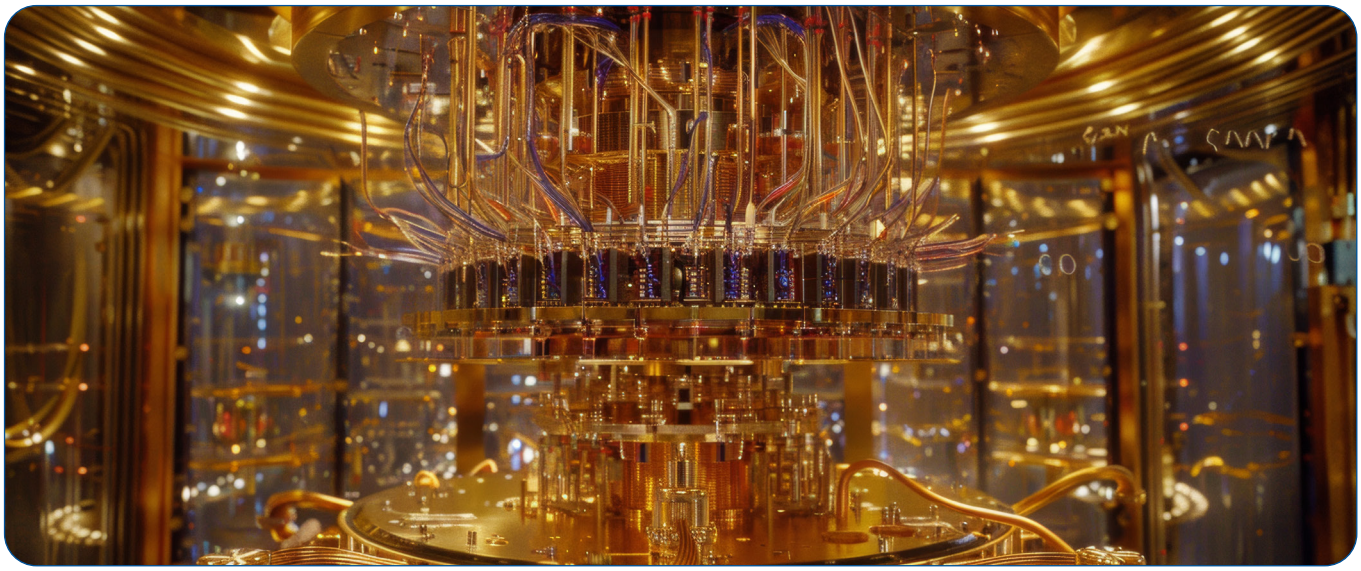
CryoMag® Specification

Performance (-40 to +70 °C)				
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	<±125ppm	<±175ppm	<±200ppm
Linearity error	0.0015% (least squares fit)			
Frequency response	DC – 1kHz ±5%			
Bandwidth (-3dB)	>2kHz (-11dB/octave roll-off)			
Noise	<20pTrms/√Hz at 1Hz			
Zero field offset	±30nT	±30nT	±40nT	±50nT
Offset Temperature Coefficient	+0.8nT/°C	+0.8nT/°C	+1.5nT/°C	+1.5nT/°C
Perming (magnetisation hysteresis)	<2nT at 1x Full-scale, when powered			
Orthogonality error between axes CryoMag CryoMag-IE	 <±0.1° N/A			
Excitation breakthrough	<5mV pk-pk at 15.625kHz typical			
Start-up time	<100ms			
Warm-up time	15 minutes to meet specifications for scaling <30 minutes to meet specifications for noise			

Environmental		
Operational temperature range	Probe + probe harness	-271 to +70°C
	Electronics + interconnection block	0 to +70°C (dynamic cable) -40 to +70°C (static cable)
Storage temperature range	-40 to +60°C	
Vacuum	10e-6 mBar	
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 and RoHS	

Mechanical	
Construction	Two Part
Probe Enclosure Material Standard IE	 PEEK GF30 FR4 + Stycast 1266 Epoxy
Probe Dimensions Standard IE	 21mm Diameter x 50mm Long 7 x 5 x 38mm typical
Probe Harness Material	24-Way Cryogenic Loom (Standard CryoMag) 4-Way Cryogenic Loom (CryoMag-IE) Dia 0.1mm Beryllium-Copper (BeCu) Cores; Polyester Insulation 3.5mm Max Loom Diameter (Folded)
Dimensions – Electronics Enclosure	25.4mm Diameter x 220mm Long
Weight	320g typical
Connector	Fischer AL-1731-DEU-1031-A010-SR-11-11-G-12

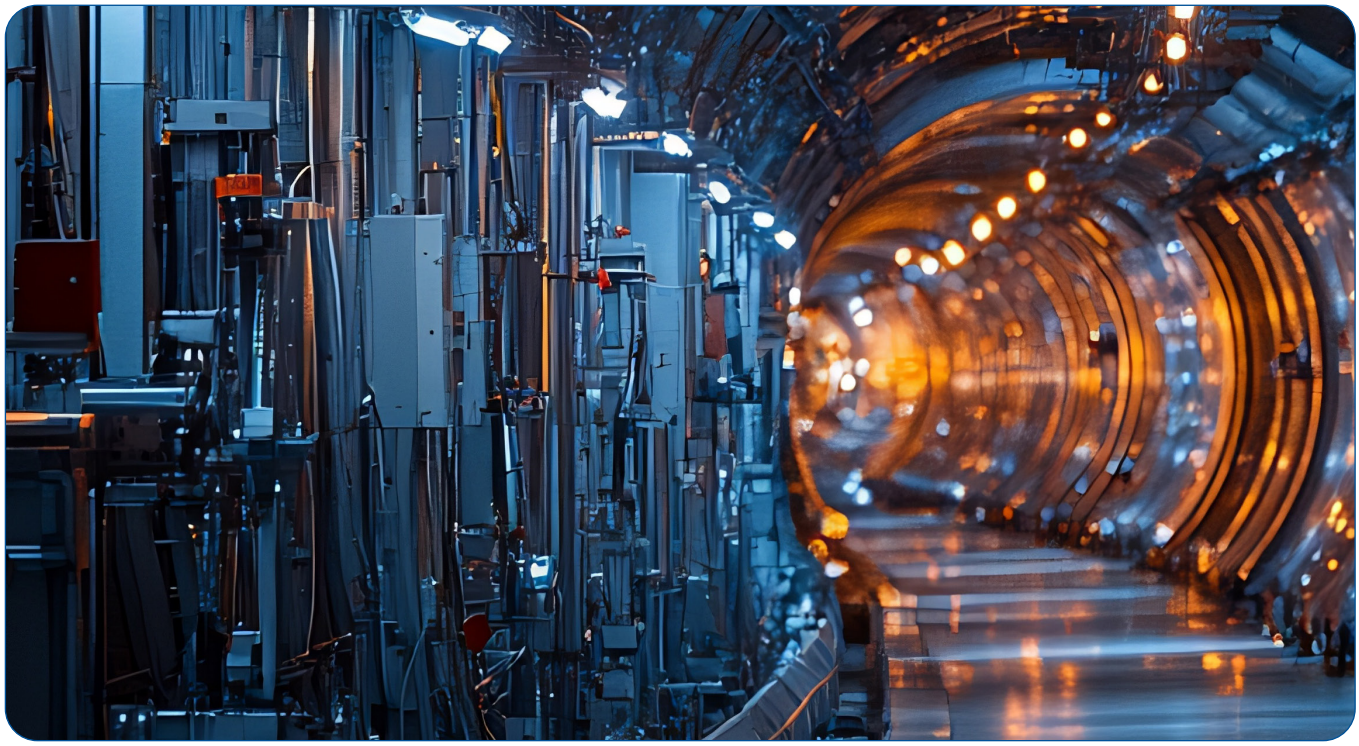
Electrical	
Supply Voltage	±12 to 17V
Zero Field Current Consumption – Positive	35 to 41mA
Zero Field Current Consumption – Negative	13 to 17mA
Power Supply Rejection Ratio	120dB
Power-on surge	+90mA, -25mA, 20ms
Analogue Output	±10V
Output Impedance	10Ω
Maximum cable length	1.5km

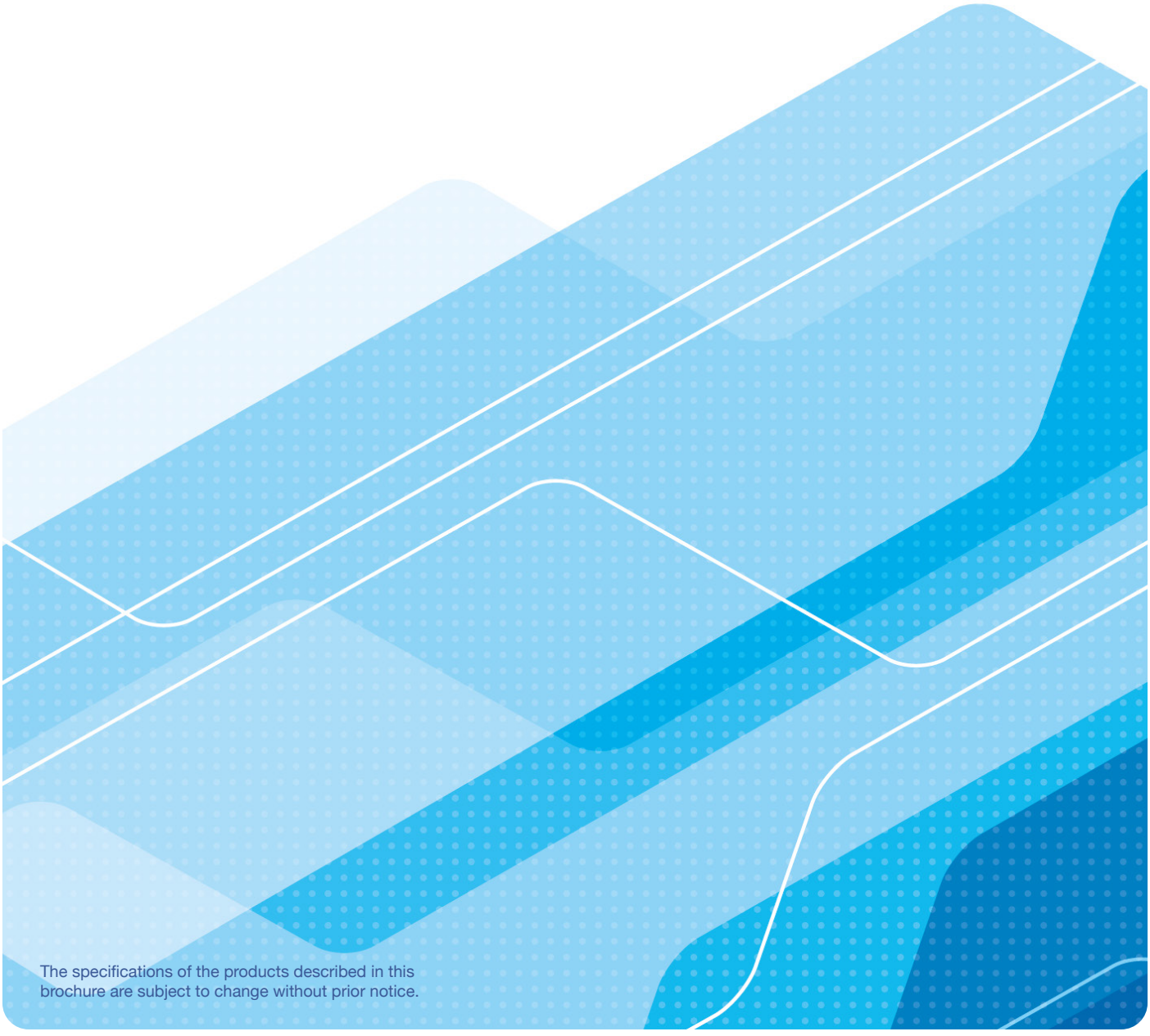


Cable	
Interconnect Cable	CryoMag Cable PM4721

Accessories	
CryoMag sensor head mounting jig	CryoMag-BR

Compatibility	
CU1 Control Unit	Use CryoMag Cable PM4721
DecaPort	Use CryoMag Cable PM4721
DecaPSU	Use CryoMag Cable PM4721 with adaptor cable PM3979
PSU1 and Magmeter-2	Use CryoMag Cable PM4721
SCU1	Use CryoMag Cable PM4721
Spectramag-6	Use CryoMag Cable PM4721





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

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