

Mag690
Low Cost Three-Axis Magnetic Field Sensor

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This compact, versatile, fluxgate sensor is ideal for integration into large component systems where high performance is essential. It is also suitable for use in projects requiring large numbers of sensors where unit cost is critical.



Features and options

- Noise level of $<20\text{pTrms}/\text{VHz}$ at 1Hz
- Frequency response from DC to 1kHz
- Measuring ranges: $\pm 100\mu\text{T}$, $\pm 500\mu\text{T}$ or $\pm 1000\mu\text{T}$
- Connector, flying lead and unpackaged versions

Typical applications

- Detection of magnetic materials
- Surveillance
- Navigation
- Traffic monitoring

Product identification

Product name	Package	Range
Mag690	<i>No code</i> = Circular connector MX = Molex style connector FL = Flying Lead U = Unpackaged	100 = $\pm 100\mu\text{T}$ 500 = $\pm 500\mu\text{T}$ 1000 = $\pm 1000\mu\text{T}$

Example: Mag690-FL100 is a $\pm 100\mu\text{T}$ sensor with flying lead.

Mag690 Specifications

Performance

Number of axes	Three (right hand XYZ coordinate system)		
Polarity	+ve non-inverting output when pointing North		
Full-scale measuring range	±100µT	±500µT	±1000µT
Bandwidth at -3dB	>1kHz		
Internal noise	Between 10 and 20pTrms/√Hz at 1Hz		
Scaling	100mV/ µT	20mV/ µT	10mV/ µT
Start-up time	150ms		
Warm-up time	15mins		
Offset error	±100nT	±500nT	±1000nT
Offset temperature coefficient	±1nT/°C	±5nT/°C	±10nT/°C
Scaling temperature coefficient	±100ppm/°C		±200ppm/°C
Calibration error	±1%		
Orthogonality error	<1°		
Alignment error (to mounting face)	<2°		
Linearity error	0.01% (least squares fit)		
Frequency response	Maximal flat response (±5%) from DC to 100Hz		
Hysteresis	<2nT for exposure to up to 2 x full scale		
Excitation Breakthrough	<10mV pk-pk at 16kHz		

Environmental

Operating temperature range	-40°C to +70°C
Storage temperature	-40°C to +85°C
Environmental protection: Mag690 Mag690-MX/Mag690FL Mag690-U	IP67 IP67 (excluding connector) Conformal coating

Mechanical

	Mag690	Mag690-MX	Mag690-FL	Mag690U
Dimensions excl. cable	122 x 32 x 32mm			94 x 26 x 22.1mm
Weight (approximate)	210g	185g	175g	20g
Enclosure material	Black acetal and polyurethane potting compound			N/A
Connector	Deutsch QC24-2007X on 500mm lead	AMP 3-640441-7 on 500mm lead	N/A	AMP 3-640456-7
Mating connector	Deutsch QC26-2007X with #20 crimp sockets	AMP 640456-7	N/A	AMP 3-640441-7
Cable bending radius	41mm		N/A	
Mounting arrangement	4 x M2.5 tapped holes in corners			2 x M2.5 on coil block


Electrical

Voltage Input	±12V to ±17V
Current consumption (max)	45mA, -18mA (+1.4mA/100 µT on each axis)
Power-on surge	+200mA at +12V, -40mA at -12V
Analogue output	±10V (unbalanced, single ended ref. 0V)
Output impedance	10Ω
Maximum load capacitance	>1µF
Maximum cable length	1.5km (±12V at the pins)

Accessories

	Mag690	Mag690-MX	Mag690-FL	Mag690U
Cables	Optional extra	Optional extra	N/A	Optional extra
Mating connectors	Not supplied	Not supplied	N/A	Not supplied

Compatible with

- PSU1 Power Supply Unit
 - Magmeter Power Supply and Display Unit
 - Spectramag-6 Data Acquisition Unit
 - SCU1 Signal Conditioning Unit
 - Mag-03DAM Data Acquisition Module
 - Decaport Analogue Interface Module
 - DAS1 Data Acquisition System
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