K3A

Cryogenic low noise magnetic field transducer

DESCRIPTION:

The SENIS K3A cryogenic low noise magnetic field transducer accurately measures the amplitude and direction of magnetic fields at cryogenic temperatures down to about 1 K.

With a size of 4.5 x 4.5 x 9 mm, its sensor head is very compact. It features the world's smallest field sensitive volume of less than 0.6 mm^3.

The high precision electronics has very low drift, ultra-high resolution and low noise. The instrument provides an analog voltage for each magnetic field direction. Accurate calibrations (0.25 %) and high field calibrations (up to ±9 T) at cryogenic temperatures are available as an option.

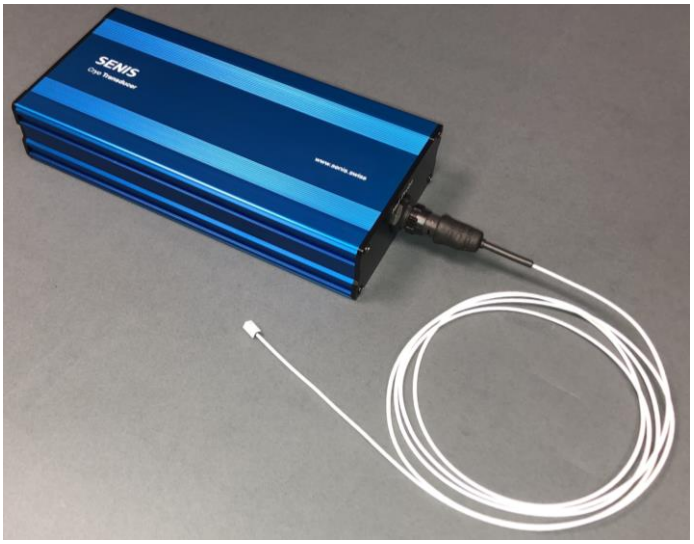

Figure 1: K3A Cryogenic Low Noise Transducer with compact probe head

KEY FEATURES:

- Measures 3D (Bx, By, Bz) magnetic fields at cryogenic temperatures down to about 1 K
- Highly compact sensor head: 4.5 x 4.5 x 9 mm
- World's smallest field sensitive volume of less than 0.6 mm^3
- Stable, low noise, ultra-high resolution and low drift electronics
- Accurate calibration of 0.25 % at fixed temperature down to 5 K available as option
- High field calibration up to ±9 T available as option

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PRODUCT DIMENSIONS AND CHARACTERISTICS:

Magnetic and Electrical Specifications

Parameter	Standard	Optional	Remarks
Measurement range	±2 T	±2 T ±5 T ±9 T	*Standard calibration at room temperature, optional @ any temperature down to (4 ± 2) K.*
Output	±10 V		*Differential output @ ±full scale*
Calibration accuracy	1 %	0.25 %	*Percentage defined with respect to full scale field up to ±5 T.* *Optional: 0.25 %, a corresponding High-field DC Calibration table is provided*
Offset	< 0.5 mT		*@ Room temperature*
Offset fluctuation and drift	< 2 µT (<1 ppm full scale)		
Long term stability of sensitivity	< 1 % over 10 years		
Temperature coefficient	< 25 ppm/K		
Noise spectral density @ *f* > *1 Hz*	< 0.06 µT/Hz$^{1/2}$		*Region of 1/f-noise*
Noise spectral density	< 0.04 µT/Hz$^{1/2}$		*Region of white noise (@ f >> f_C)*
Corner frequency f_C	10 Hz		*where 1/f-noise = white noise*
Frequency Bandwidth	0 - 1 kHz		

Recommended operating conditions

Parameter	Min	Typ.	Max.	Unit
Probe operation temperature	<1	77	320	K
Electronics operation temperature	10	23	35	°C
Supply Voltage mains	115		230	V
Electronics supply voltage		0 - 24		V

Dimensions and weight

Parameter		Unit
Electronic box size	230 x 109 x 45	mm
Electronic box weight	0.8	kg
Interconnecting cable length[1]	2	m
Probe size	4.5 x 4.5 x 9	mm
Size of field sensitive volume	1.5 x 1.3 x 0.3	mm

[1] The output cable length can be customized on a customer request.

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OUTLINE DIMENSIONS:

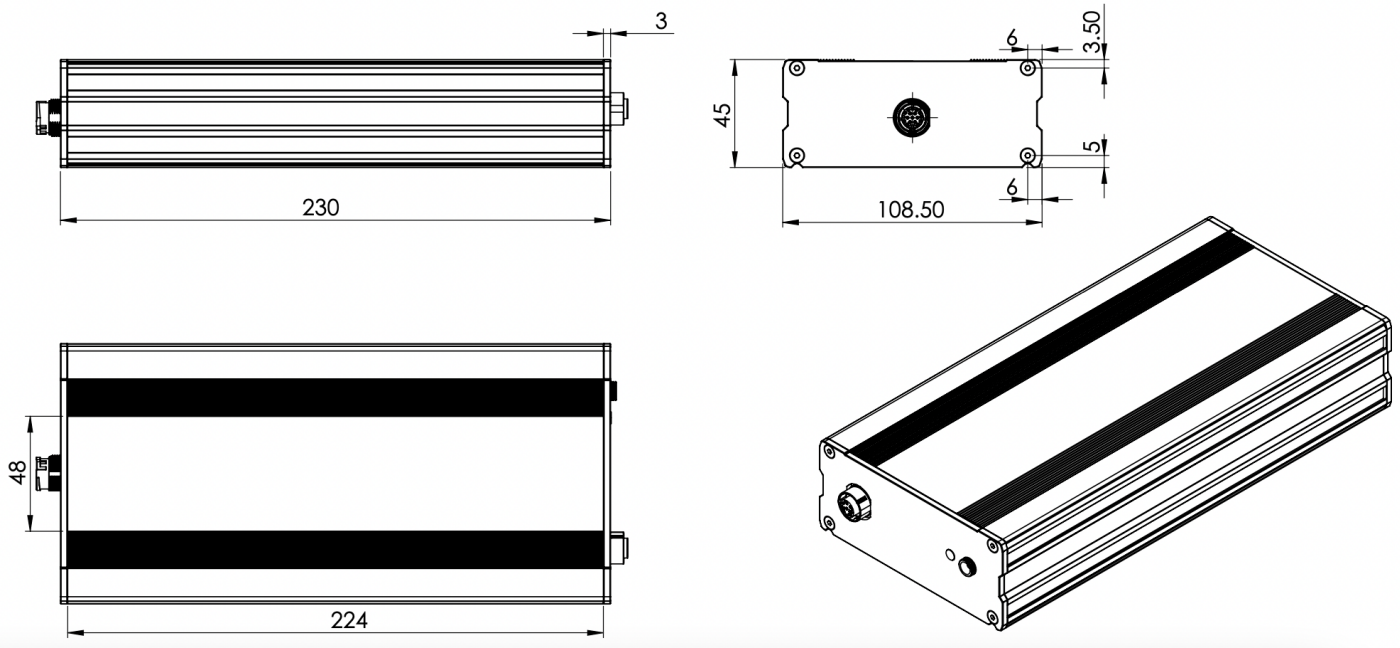

Figure 2: Dimensions of transducer box (all dimensions are in millimeters)

Cryogenic probe:

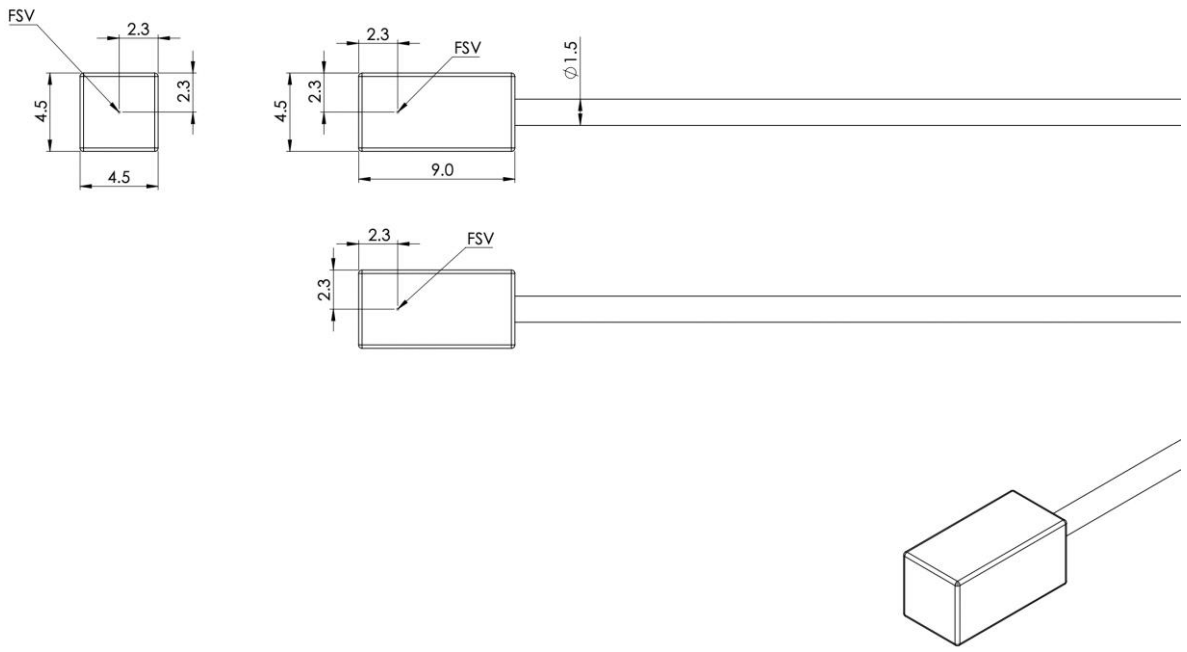

Figure 3: Field Sensitive Volume position (all dimensions are in millimeters).