

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 mm³.

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.

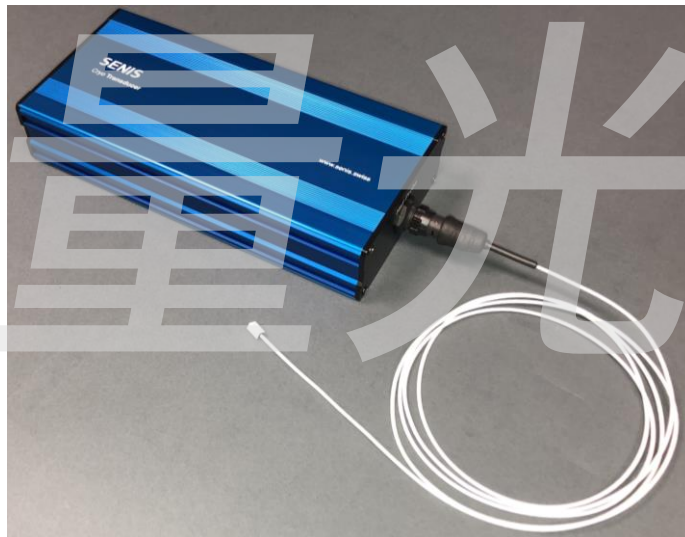


Figure 1: K3A Cryogenic Low Noise Transducer with compact probe head

KEY FEATURES:

- Measures 3D (B_x, B_y, B_z) 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 mm³
- 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

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 Percentage defined with respect to full scale field up to ±5 T.
Calibration accuracy	1 %	0.25 %	Optional: 0.25 %, a corresponding High-field DC Calibration table is provided
Offset	< 0.5 mT		
Offset fluctuation and drift	< 2 μ T (<1 ppm full scale)		@ Room temperature
Long term stability of sensitivity	< 1 % over 10 years		
Temperature coefficient	< 25 ppm/K		
Noise spectral density @ $f > 1$ Hz	< 0.06 μ T/Hz ^{1/2}		Region of 1/f-noise
Noise spectral density	< 0.04 μ T/Hz ^{1/2}		Region of white noise (@ $f \gg f_c$)
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.

OUTLINE DIMENSIONS:

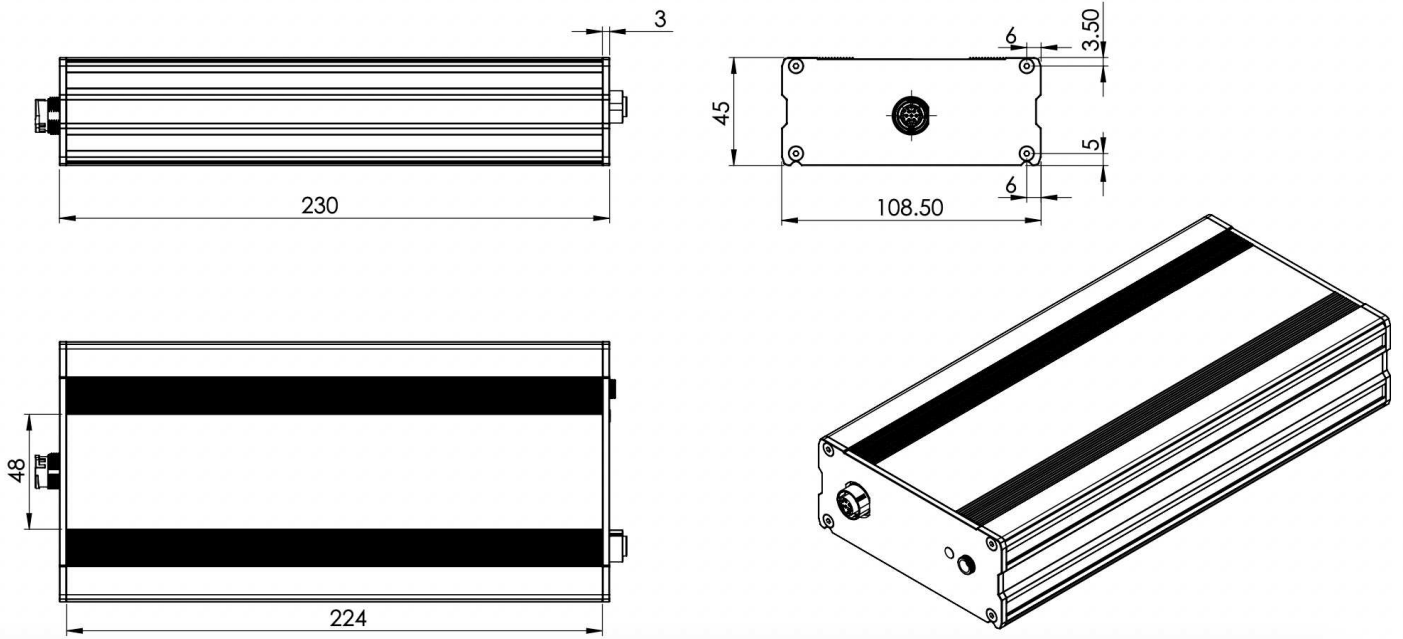


Figure 2: Dimensions of transducer box (all dimensions are in millimeters)

Cryogenic probe:

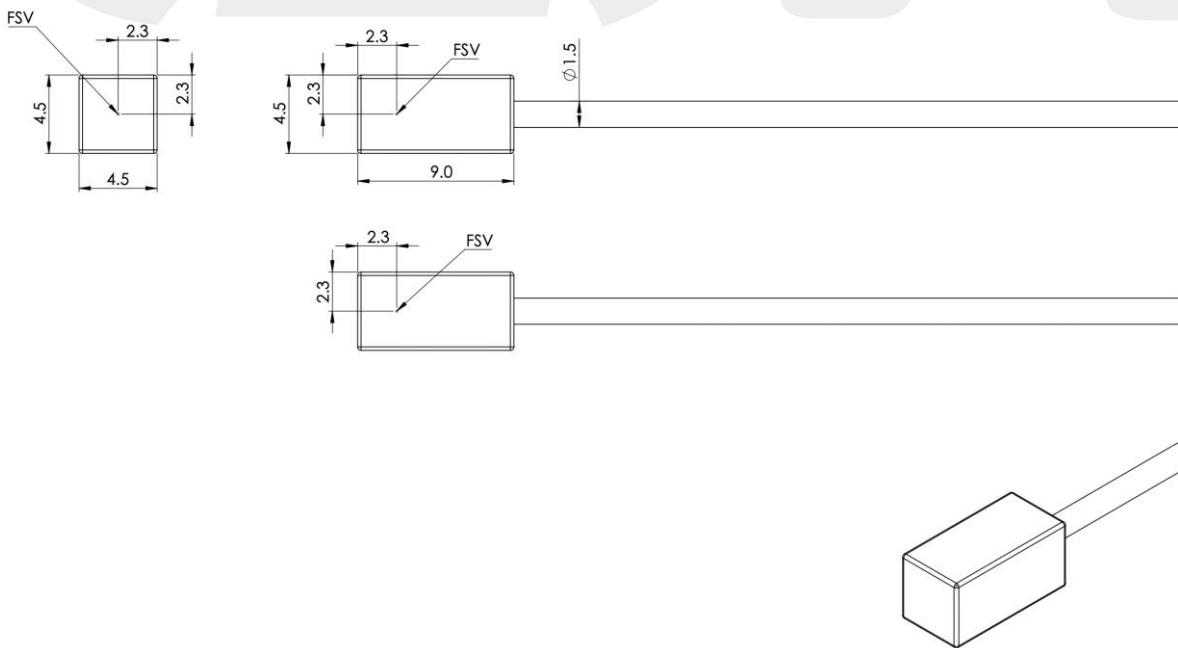


Figure 3: Field Sensitive Volume position (all dimensions are in millimeters).