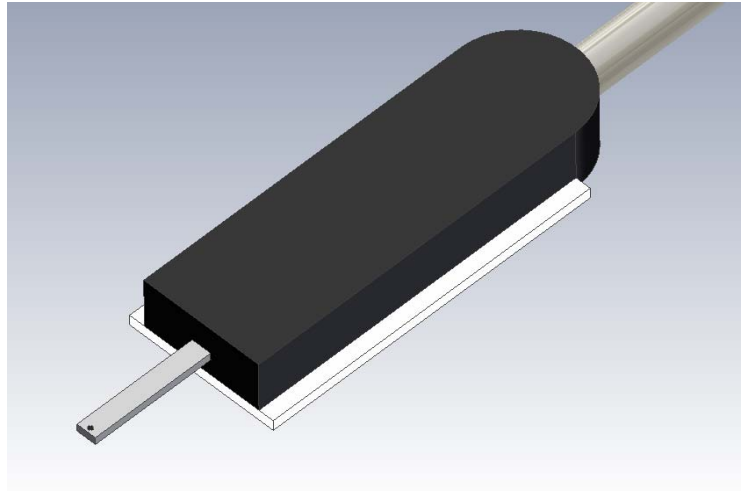


SENIS's **T-H3A-xx** is a single-chip integrated 3-Axis Hall-Probe System. The core of the device represents a silicon sensor chip (based on CMOS technology), which contains Hall elements, biasing circuits, amplifiers and a temperature sensor. This probe system gives a high-level analogue voltage output for each of the three components of the measured magnetic flux density, and for the chip temperature.



KEY FEATURES OF THE T-H3A-xx PROBE SYSTEM

The unique advantages of the probe include:

- Measurement of all three magnetic field components with a high angular accuracy and high spatial resolution;
- Virtually no planar Hall Effect;
- Negligible inductive loops, and
- The probe provides a temperature signal for an efficient compensation of temperature effects.

The sensor chip is embedded in the probe package and connected to the CaH cable, which makes the T-H3A-xx probe both mechanically and electrically robust (see Figure 1). The device is glued onto a reference ceramic plate suitable for an appropriate fixing of the probe.

The **T-H3A-xx** Hall probe is available as a *Module H* of a SENIS Magnetic Field Transducer (see Transducer data-sheets on http://www.senis.ch/new-transducer_data_sheets.html).

Two connection options of the probe to the module E of the transducer are available:

- Detachable *CaH* cable connection to the transducer's electronic module (connector D-SUB25/F);
- Fixed (non-detachable) *CaH* cable connection to the transducer's electronic module.

The **T-H3A-xx** is also available as a separate unit for OEM customers.

HALL PROBE DIMENSIONS & CHARACTERISTICS

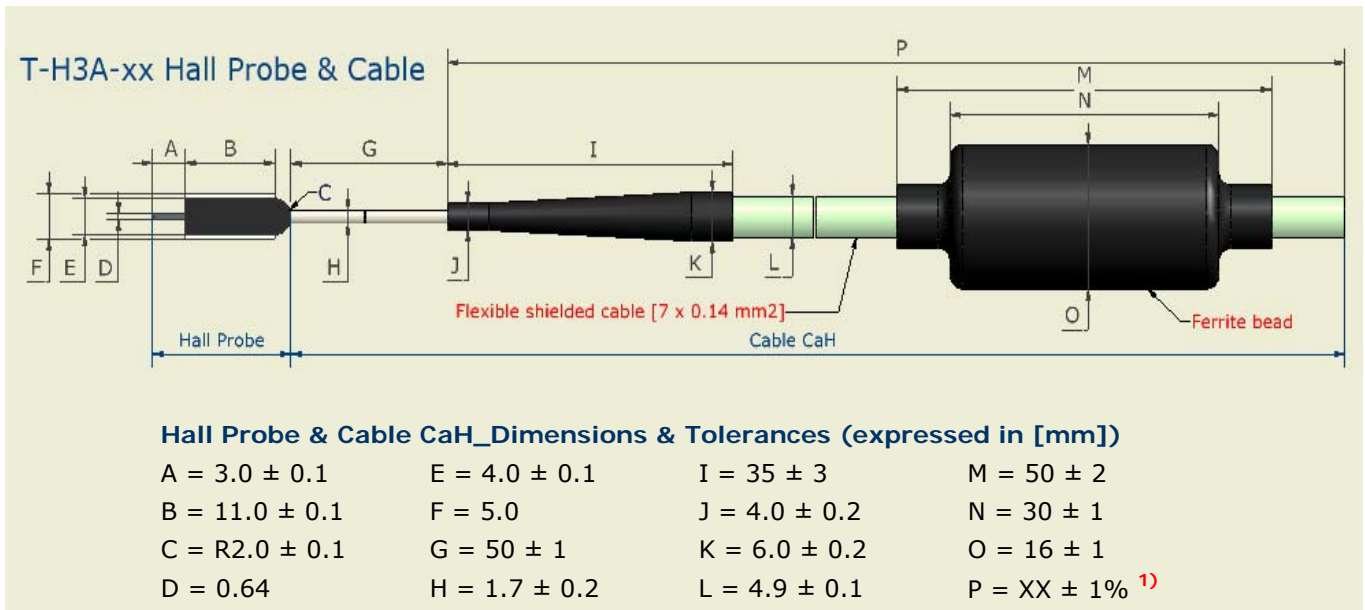


Figure 1: The dimensions of SENIS T-H3A-xx Hall probe and cable (Module H)

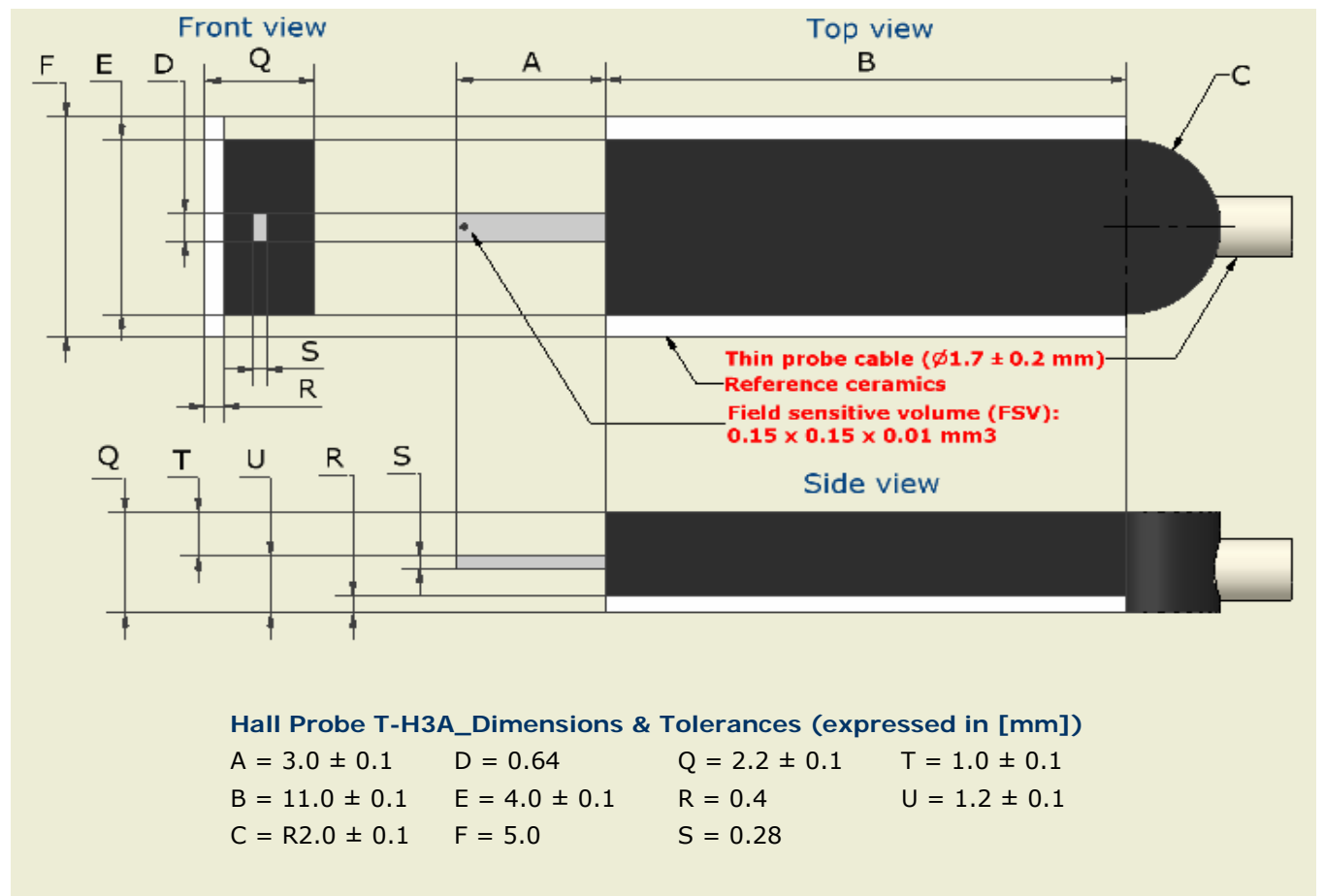


Figure 2: Three orthogonal projections of the SENIS T-H3A Hall probe (with appropriate Probe dimensions and tolerances)

CLOSE-UP OF THE PROBE TIP

The T-H3A-xx Hall probe was designed with the goal to enable measurements where the probe's Field Sensitive Point (FSP) needs to be placed very close to the target, or where the geometry of the environment allows only a limited access. For these applications, the T-H3A-xx Hall probe was devised in the way that the FSP can be placed as closely as 150 μm to the target area (see Fig.3).

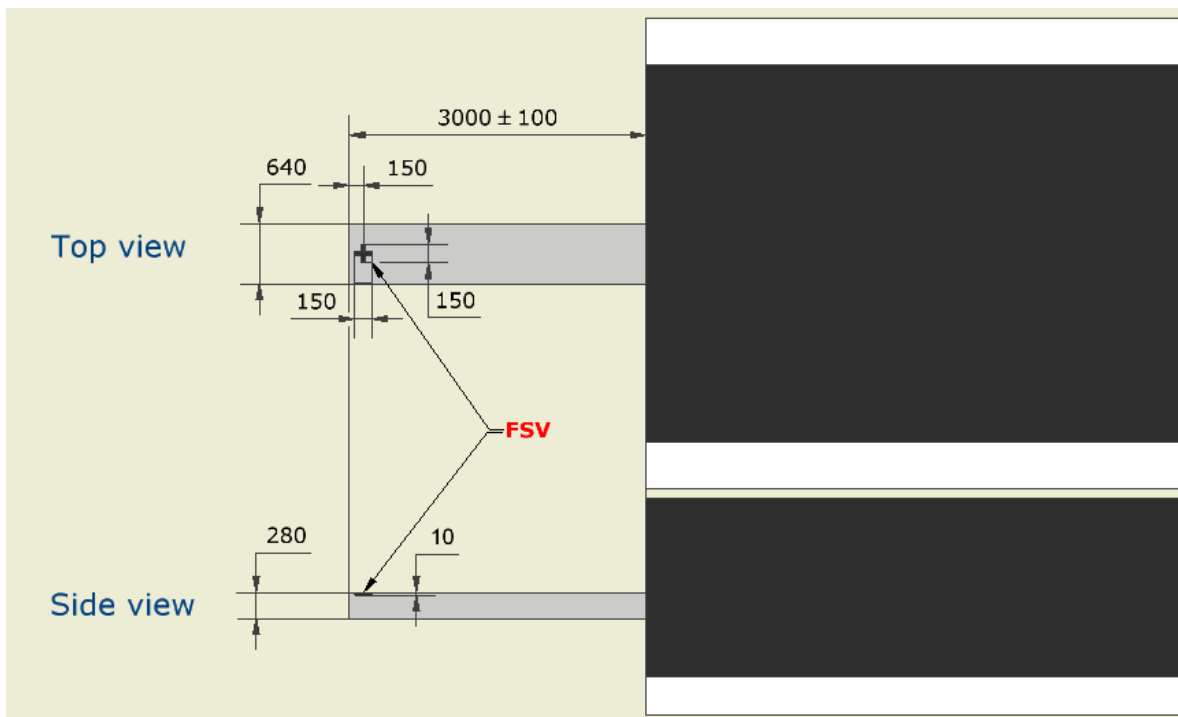


Figure 3: Close-up of the probe tip of the T-H3A Hall probe. All dimensions are expressed in [μm].

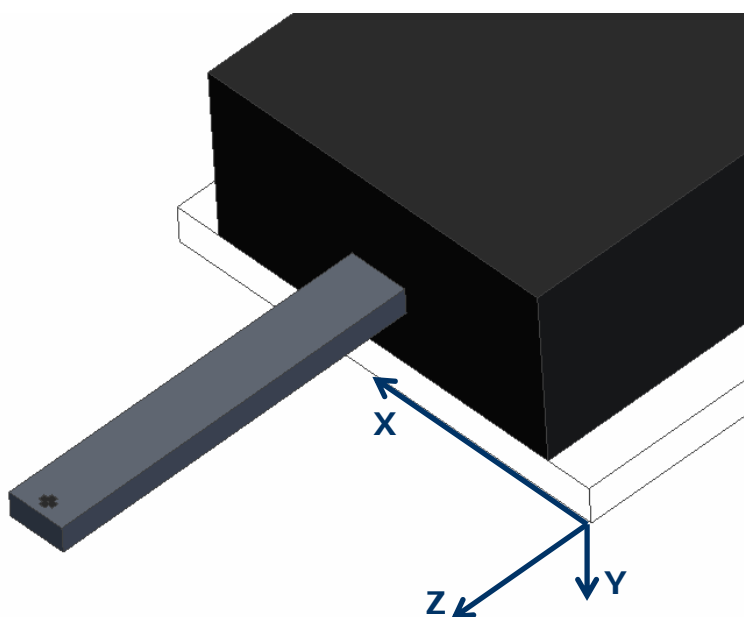


Figure 4: The reference Cartesian coordinate system of the T-H3A probe

Probe Dimensions & Characteristics

Dimension	X [mm]	Y [mm]	Z [mm]
Field sensitive volume (FSV)	0.15	0.01	0.15
Position of the center of FSV (corresponding to FSP, see Fig. 2, 3 & 4.)	2.5 ± 0.1	-1.2 ± 0.1	2.85 ± 0.1
Total Probe external dimensions	<ul style="list-style-type: none"> • 0.64 - Probe tip (thinner part) 	<ul style="list-style-type: none"> • 0.28 - Probe tip (thinner part) 	<ul style="list-style-type: none"> • 3.0 ± 0.1 - Probe tip (thinner part)
	<ul style="list-style-type: none"> • 4.0 ± 0.1 / <u>5.0</u> - Longer, thicker part of the probe / <u>ref. ceramics</u> 	<ul style="list-style-type: none"> • 2.2 ± 0.1 - Longer, thicker part of the probe 	<ul style="list-style-type: none"> • 13.0 ± 0.2 - Longer, thicker part of the probe
Angular accuracy of the axes	± 0.5° with respect to the reference surface		
CaH Cable	Shielded, with a flexible thin part near the probe and a ferrite bead on the thicker part (see Fig. 1)		
¹⁾ Total length of the CaH cable:	<ul style="list-style-type: none"> • Standard: 2 m (Probe notation: T-H3A-2) • Optional: XX m (Probe notation: T-H3A-xx) <p>Note: <i>Various lengths are available upon request.</i></p>		

APPLICATION MANUAL FOR THE PROBE T-H3A-XX**Warning: the Probe Tip is Fragile!**

In order to achieve the small thickness of the probe, a part of the sensor chip is left non-encapsulated. The sensor chip is a $\approx 0.3\text{mm}$ thick bar of mono-crystalline silicon, and can be easily broken. Therefore, avoid any mechanical contact of the probe chip with other objects! Moreover, avoid the immersion of the probe of any liquid, and its exposure to moisture and aggressive gasses.

Considering that we deal with a high-precision device of very small dimensions, following precautions should help to avoid damage to the probe during installation and handling, and ensure that the device's accurate calibration remains preserved.

The mounting of the probe should be carried out by application of very low pressure to its back-end and thin wires. If the probe head is clamped, the user should make sure that the substrate surface in contact with the reference plane of the probe is flat and covers as much of the probe reference surface as possible (see Fig. 5). Do not apply more force than required to hold the probe in its place.

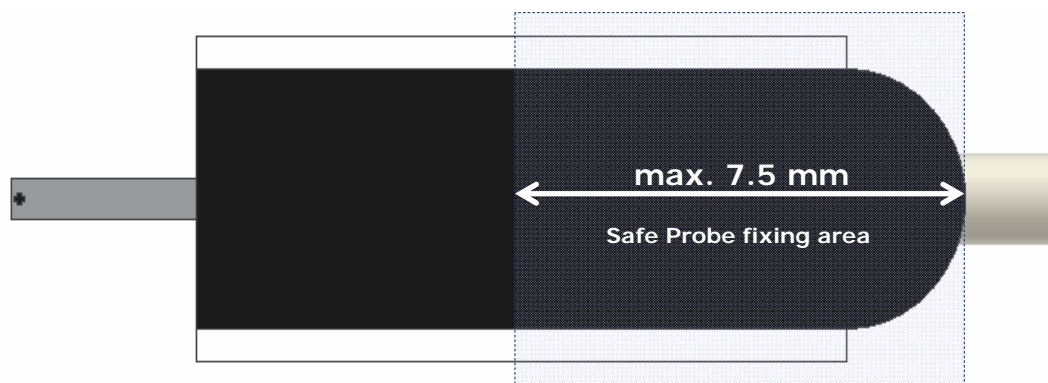


Figure 5: The safe fixing area of the T-H3A-xx Probe head

In order to prevent rupture of the thin wires from the probe head, the user should fix and secure the probe cable in the proximity of the probe. The thin wires of the flexible section of the cable may be folded with care; repeated strong bending should be avoided.