

LAT-C

Leaf-&-Air-Temperature (Conifer)



leaf temperature sensor type Δ LA-C on Norway spruce

The LAT-C (Leaf-&-Air-Temperature Conifer type) is a highly precise sensor for continuous measurements of needle surface and ambient air temperatures. Absolute air temperature (T_{air}) is measured via a highly precise micro thermistor probe, while the difference temperature between ambient air and needle surface (ΔT) is captured by means of a very thin thermopile (10-fold). Designed for conifer needles, the ultra-light-weight sensor, with its multiple measurement points, is directly attached to several different needles, providing a spatially integrative temperature signal.

Technical Specifications

Name	LAT-C : Leaf-&-Air Temperature Sensor, conifer type (*)
Application position, suitable for leaf size	Needle surface, needle length > 3mm
Range of the sensor - thermopile ($\Delta T_{leaf-to-air}$) - thermistor (T_{air})	$\Delta T = \pm 20^{\circ}\text{C}$ $T_{air} = -40 \text{ to } 125^{\circ}\text{C}$
Accuracy - thermopile ($\Delta T_{leaf-to-air}$) - thermistor (T_{air})	CR1000: $\pm (0.06\% \cdot \text{reading} + 0.01^{\circ}\text{C})$ CR1000: $\pm 0.2^{\circ}\text{C}$
Resolution - thermopile ($\Delta T_{leaf-to-air}$) - thermistor (T_{air})	Theoretically infinite, depends on data logger. (e.g. CR1000-Logger with approx. 14 bits within $\pm 7.5 \text{ mV}$: 0.0025°C) Theoretically infinite, depends on data logger (e.g. CR1000-Logger with approx. 14 bits within $\pm 2500 \text{ mV}$: 0.05°C)
Size and weight	Length of thermopile 10 cm, ca. 0.5 g
Output signal type - thermopile ($\Delta T_{leaf-to-air}$) - thermistor (T_{air})	At a ΔT range of $\pm 20^{\circ}\text{C}$ signal ranges within $\pm 8.5 \text{ mV}$ electrical resistance (Ω), or voltage (mV) when using a bridge-circuit (bridge-circuit with $20 \text{ k}\Omega$ resistor included in standard delivery)
Power supply - thermopile ($\Delta T_{leaf-to-air}$) - thermistor (T_{air})	Not required Excitation voltage Vex usually 2500 mV
Operating conditions	Air temperature: $-25 \text{ to } 70^{\circ}\text{C}$, air humidity: 0 to 100%

(*) patent pending