Leaf-&-Air-Temperature

Type LAT-B3 and LAT-B4 (Broadleaf)

Technical Specifications

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LAT-B3: Magnet-mounted for normal for leaf (<0.7 mm thick)

LAT-B4: magnet and carbon rod mounted for all leaf thicknesses

The LAT-B3 and LAT-B4 (Leaf-&-Air-Temperature Broadleaf type) is a precise dual-probe sensor for continuous measurements of leaf surface and ambient air temperatures. Absolute air temperature (Tair) and leaf temperature (Tleaf) are measured via two precise micro thermistor probes. Sensor-individual matching of the two probes, ensures high measurement precision of leaf-to-air temperature difference (ΔTleaf-air). The leaf-to-air temperature difference (ΔTleaf-air) can be calculated from concurrent values of the two probes. Designed for broad leaves, the sensor is mounted on the leaf by means of a ultra-light-weight magnetic or carbon rod clamp mechanism.

Technical Specifications

Name	LAT-B3	LAT-B4
Positioning	Mounting position: Leaf surface Dual-probe spacing: User-configurable distance between T_{leaf} and T_{air} probes max. 35 mm	Mounting position: Leaf surface Dual-probe spacing: User-configurable distance between T_{leaf} and T_{air} probes max. 35 mm
Suitable leaf size and thickness	Length >1.4 cm and width >0.8 cm thickness < 0.7 mm	Length >1.4 cm and width >0.8 cm thickness > 0 mm
Measurement range	-25 to + 70°C	
Accuracy	Tolerance of leaf-to-air temperature difference (ΔTleaf-air): ± 0.2° in temperature range between -25°C to+70°C Logger dependent, @ 25 °C: e.g. CR300 series: ± 0.01 °C e.g. DL18 Logger: ± 0.03 °C	
Output	Digital: SDI-12 in °C Analog: V DC, Temperature in °C must be calculated using the supplied formula.	
Data recording	For Example: 1. Data logger: e.g. DL 18, or other with suitable analog or with SDI-12 input channels. Cable connection between sensor and logger 2. Lorawan: (e.g. IoP-S-LA), wireless connection via lorawan network 3. NB IoT: (e.g. IoP-S-NA, IoP-S-LTEMA), wireless connection via mobile phone network	
Size and weight	Diameter 12 mm, weight ca. 0.9 g	
Power supply	Excitation voltage Vex usually switched 0.5-2.5 V, power up 100ms max. Power consumption negligible.	
Operating conditions	Air temperature: -25 to 70 °C, air humidity: 0 to 100%	
Cable length	0.5m + 4.5m plug-in extension, plug-in extension up to max. 50 m possible	

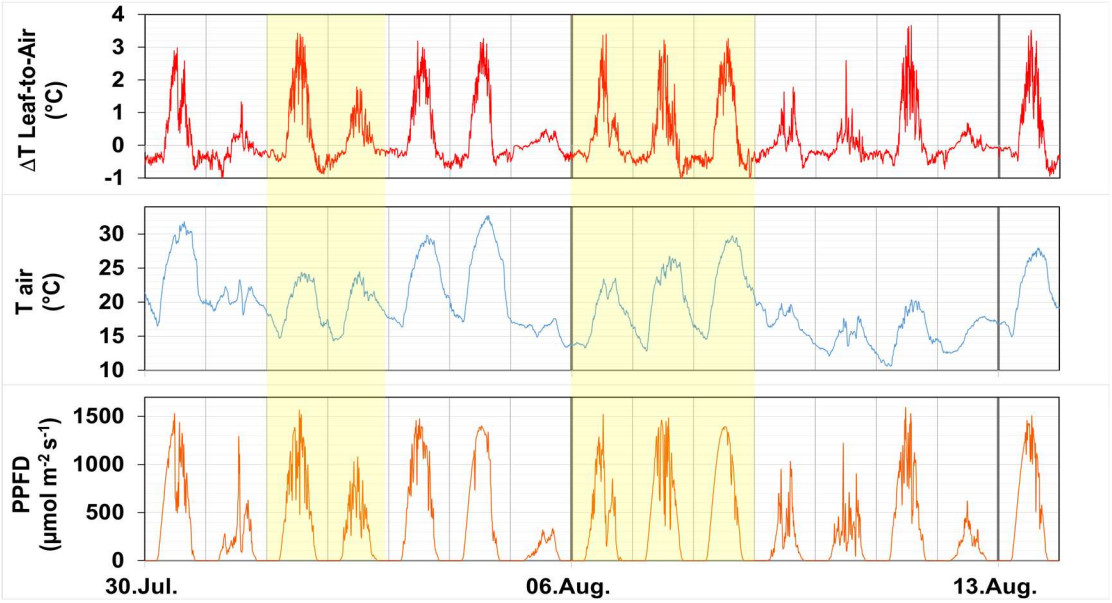

Fig.: Comparison of temperature difference between leaf surface and ambient air (ΔTleaf-air), air temperature (Tair) and solar radiation (PPFD).
Upper: Diurnal variations in temperature difference between upper leaf surface and ambient air (ΔTleaf-air, measured via LAT-B sensor) of a sun exposed leaf of a mature beech tree at the experimental site "Kranzberger Forst" of the TU Munich.
Middle: Diurnal variations in air temperature (Tair, measured via LAT-B sensor), at canopy height (27m above ground)
Lower: Diurnal variations in solar radiation above canopy, given in photosynthetic photon flux density (PPFD)