



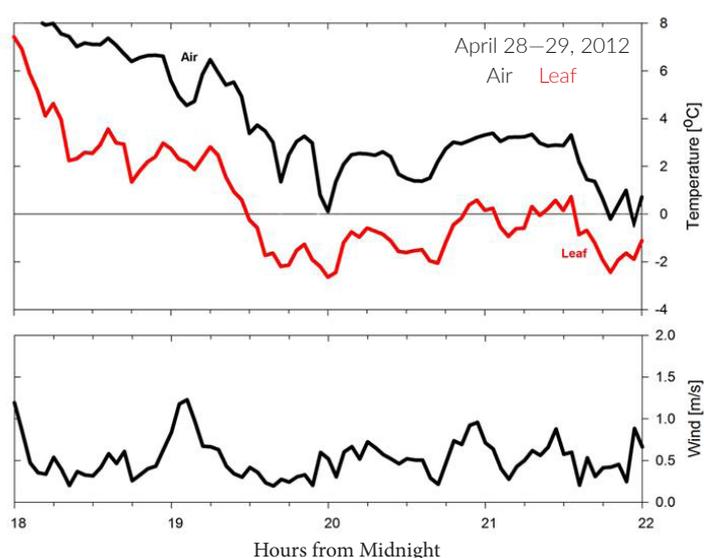
RADIATION FROST DETECTORS

SF-110-SS & SF-421-SS

Effective prediction of leaf temperatures for orchards



Temperature Response



Leaf temperature approximations measured with an Apogee SF-110 compared to air temperature (top panel) and wind speed (bottom panel) on the evening of April 28, 2012. Leaf temperatures were below air temperature after 8 P.M. and reached freezing 6 hours before the air temperature.

Product Specifications

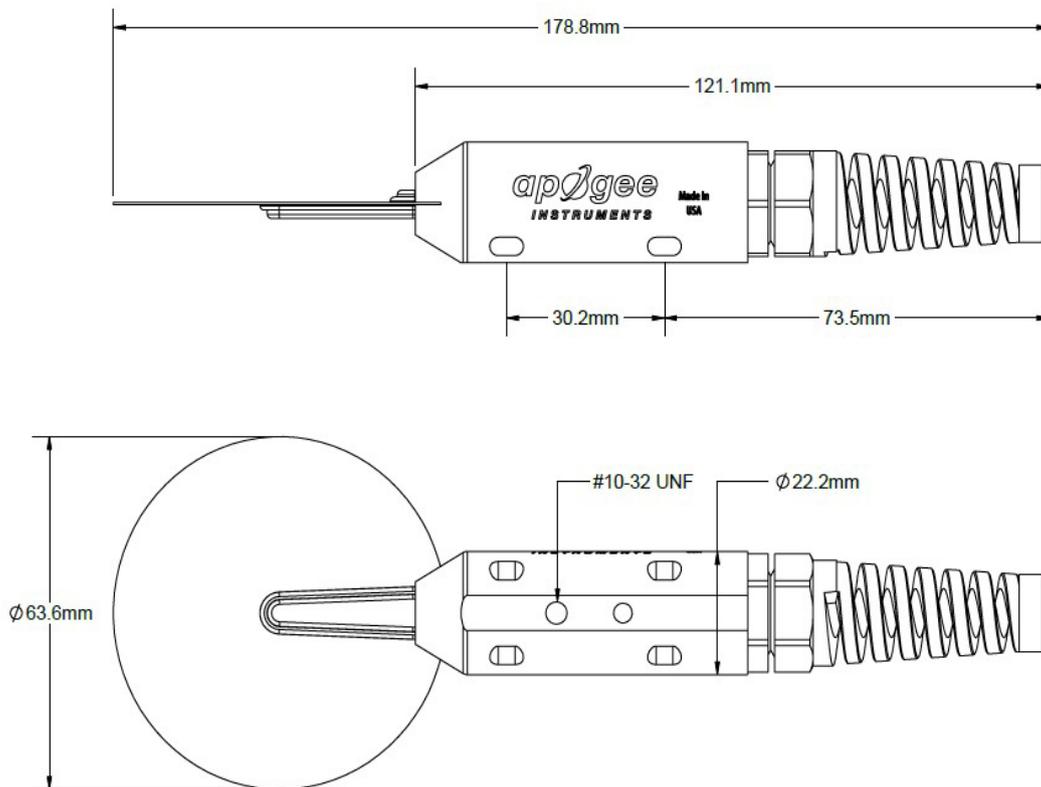
Measurement Range	-50 to 70 C	
Measurement Uncertainty	0.1 C (from 0 to 70 C), 0.2 C (from -25 to 0 C), 0.4 C (from -50 to -25 C)	
Measurement Repeatability	Less than 0.05 C	
Long-term Drift (Non-stability)	Less than 0.02 C per year (when used in non-condensing environments where the annual average temperature is less than 30 C; continuously high temperatures or continuously humid environments increase drift rate)	
Equilibration Time	10 s	
Self-heating	Less than 0.01 C (typical, assuming pulsed excitation of 2.5 V DC), 0.08 C at 5 C (max. assuming continuous input excitation of 2.5 V DC)	Less than 0.01 C
Operating Environment	-50 to 70 C; 0 to 100 % relative humidity	
Input Voltage Requirement	2.5 V DC excitation	5.5 to 24 V DC
Output Voltage Range	0 to 2.5 V DC (assuming input excitation of 2.5 V DC)	—
Current Draw	0.1 mA DC at 70 C (max. assuming continuous input excitation of 2.5 V DC)	1.56 mA (quiescent), 1.93 mA (active)
Dimensions	17.5 cm length, 2.2 cm pipe diameter, 6.0 cm disk diameter	
Mass	75 g	
Warranty	4 years against defects in materials and workmanship	



Monitor Radiation Frost Events

On calm, clear nights leaf temperatures can drop well below air temperature. A radiation frost occurs when frost forms on the surface before the air temperature reaches freezing. The Apogee radiation frost detector contains a high accuracy thermistor mounted in a rugged housing. The thermistor mimics a leaf, which provides estimates of leaf temperatures when monitoring radiation frost events.

Dimensions



Features

Wide Range, Accurate Measurements

Thermistor accuracy is ± 0.1 C across a range of 0 to 70 C, providing accurate measurements at temperatures near zero where frost damage is likely to occur.

Output Options

Analog and digital output options include an unamplified voltage output or SDI-12 communication protocol.

Typical Applications

Applications include leaf temperature estimates in crop fields, orchards, and vineyards. Leaf temperatures returned by the detector can then be used to alert growers to the potential of frost damage to crops.



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