



SENSOR DE TERMOPAR DE PRECISION POR INFRAROJO

Model IRTS-P5: Dual thermocouple output; 5:1 FOV; air purge

Measurement of surface temperature is a crucial component of energy transfer. Accurate measurement of the leaf-to-air temperature gradient is essential to the determination of transpiration rate and stomatal conductance in both single leaves and plant canopies. This gradient is often less than 3 °C, which means that leaf temperature should be measured to within 0.3 °C.

To achieve this accuracy, the Apogee Instruments precision IRT uses two, type-K thermocouple outputs. The primary thermocouple is used to measure the target temperature; the secondary thermocouple is used to measure the sensor body temperature. Errors caused by changes in the sensor body temperature are corrected in software with a 12-step subroutine originally designed for Campbell Scientific dataloggers.

Calibration procedures and performance details are described in: **Evaluation and Modification of Commercial Infra-Red Transducers for Leaf Temperature Measurement.**

SPECIFICATIONS

POWER REQUIREMENTS:

None; self-powered

OPERATING ENVIRONMENT:

designed for continuous outdoor use; temperature range: -5° to 45 °C

ACCURACY:

± 0.4 °C from -5 to 45 °C;
± 0.3 °C from 10 to 35 °C;
± 0.1 °C when sensor body and target are at the same temperature;

REPEATABILITY:

0.05 °C from 15 to 35 °C

RESPONSE TIME:

Less than 1 second

OUTPUT SIGNAL:

2, type-K thermocouple wires

OPTICS:

Silicon lens

WAVELENGTH RANGE:

6.5 to 14 microns

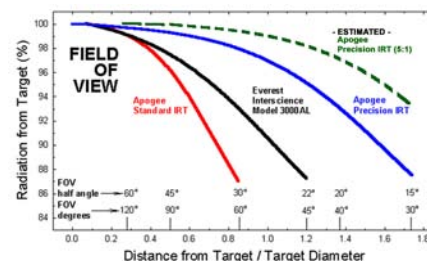
DIMENSIONS:

6 cm long by 2.3 cm diameter

MASS:

Less than 100 g

FIELD OF VIEW For some applications, a narrow field of view (FOV) is important (smokestack temperatures), but a wider FOV has a better signal-to-noise ratio and more appropriately averages the leaf temperature of plant canopies when the sensor is mounted on a weather station. This narrow FOV sensor is useful for measuring leaf temperature during early plant growth because it can be mounted at an angle without seeing the sky.



The FOV of infrared sensors is typically specified by other manufacturers as the half angle, but all sensors are center-weighted and there is not a sharp cut-off at the edges. FOV for this sensor is 5:1. Final data not available at time of printing. Visit the web for recent testing and graphs for this sensor.

EXAMPLE DATA The graphs below show the difference in corrected and uncorrected data over a range of sensor body temperatures.

