



**Bio Instruments S.R.L.**

SENSORS AND SYSTEMS  
FOR MONITORING GROWING PLANTS

**RTH-2z**  
*Wireless*  
*Air Temperature and Humidity Sensor,*  
*Quantum Sensor*



## Description

The RTH-2z wireless sensor is an accurate tool for monitoring photosynthetically active solar radiation, air temperature and relative humidity (RH) in protected crops. The quantum probe measures Photosynthetic Photon Flux (PPF) in  $\mu\text{mol}\cdot\text{m}^{-2}\cdot\text{s}^{-1}$ . The sensor is cosine-corrected, and has a domed diffusion disk and head for improved self-cleaning characteristics and long-term stability. The cosine error for typical applications is less than 2%. The output increases approximately 1% per year because of changes in the optical transparency of the diffusion disk. Quantum sensor is calibrated for sunlight. Average spectral errors associated with different light sources are shown below:

Cool White Fluorescent: 8% high.

Metal Halide: 6% high.

High Pressure Sodium: 0% error.

The probe is connected by a standard 3 meter cable to the waterproof box with electronics, which combines signal conditioner, primary datalogger, RF 2.4 GHz transceiver, and power supply (3xAA Alkaline batteries).

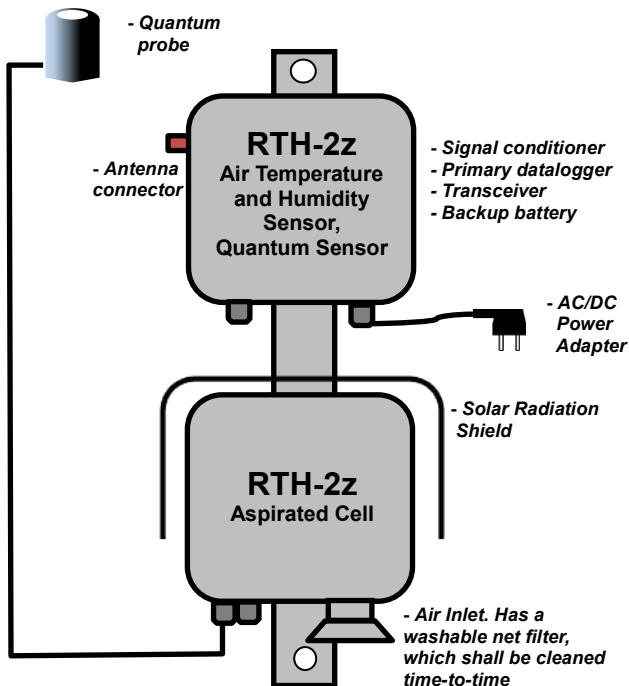
To provide better accuracy of the air temperature and humidity measurement, the effective mini blower

aspirates the appropriate probe. The RTH-2z also calculates vapor pressure deficit and dew point temperature from the RH and temperature measurements. The RTH-2z represents average values of measurements made 10 times evenly during the measurement time interval. For instance, at 30 min time interval, the RTH-2z takes measurements every 3 minutes and, then, calculates and records the average of those ten values measured.

The RTH-2z consists of two boxes: a signal conditioner, datalogger, transceiver and backup battery in the upper box, the blower and the Air Temperature and Relative Humidity probe in the lower box. The lower box is also protected by a radiation shield.

## Communication

The RTH-2z communicates over the radio 2.4 GHz channel with a network data logging unit. Activation of the sensor and measurement settings are described in the Quick Start Guide of the data logging unit (PM-11z Phytomonitor or PC Phyto-Logger).



## Power

The RTH-2z is powered from 100 to 240 VAC power adapter. The Li-ion backup battery provides at least 12 hours of operation in case of external power break.

To activate the sensor:

- a. Open the front lid of the top box.
- b. Remove the isolating slip from the battery compartment.
- c. Close the box.
- d. Mount the RTH-2z using the mounting plate located at the rear side of the enclosure. Front side shall be oriented opposite to sun, i.e. to North in the Northern hemisphere.
- e. Position the Quantum probe with the special holder for mounting on a pole. Keep the probe at vertical position.



- f. The Quantum probe should be mounted with the cable pointing toward the nearest magnetic pole. For example: in the Northern Hemisphere, point the cable toward the North Pole.

In the Southern Hemisphere, point the cable toward the South Pole.

- g. Connect the power adapter to the power outlet (100 to 240 Vac, 50/60 Hz).

## **Maintenance**

The only maintenance required time to time is cleaning of the air filter, located at the bottom of the sensor's box. Unscrew and clean the filter with water and brush using mild detergent if necessary. Let the filter dry out before placing back.

Also, remove dust and other residues from the Quantum probe using soft cloth.

## **Specifications**

### Solar Radiation

Calibration: Natural sunlight

Range of Measurement: 0 to 3000  $\mu\text{mol}\cdot\text{m}^{-2}\cdot\text{s}^{-1}$

Absolute accuracy:  $\pm 5\%$

Resolution: 1  $\mu\text{mol}\cdot\text{m}^{-2}\cdot\text{s}^{-1}$

Operating Environment: -25 to +55 °C

Probe dimensions, mm: 24  $\varnothing$  × 27.5 H

Cable length: 3m

### Temperature

Range: -5 to 50 °C

Resolution: 0.1 °C

Accuracy:  $\pm 0.5$  (5 to 40 °C)

### Humidity

Range: 0 to 100% RH

Resolution: 0.1 %RH

Accuracy:  $\pm 2$  %RH (5 to 90%RH)

$\pm 3$  %RH (above 90%RH)

Power Requirements: 100 to 240 VAC @ 50/60 Hz

## **Customer Support**

If you ever need assistance with your sensor, or if you just have questions or feedback, please e-mail at [support@phyto-sensor.com](mailto:support@phyto-sensor.com). Please include as part of your message your name, address, phone, and fax number along with a description of your problem.



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