

Radiant Systems Black Bulb Environmental Warmth Thermostat from Ultimate



Air temperature is a convenient measure of warmth but it is often misleading. Air temperature is unsatisfactory, for example, when surrounding non-plant surfaces are warm or there is high air velocity. Plant temperature is a combination of air temperature, radiant temperature of the surroundings, and air velocity.

Only by taking account of all three variables can a true measurement of good growing conditions be achieved. Various indices of proper growing temperature has been devised in studies on environmental warmth. The index known as Globe temperature is the most accurate and practical measurable indicator. it correlates well with other, more subjective assessments of warmth as well.

The **Radiant Systems Black Bulb Thermostat** is based on the principle of the globe thermometer. For a convenience of installation the Black Bulb's Globe is a hemisphere of high thermal conductivity material with a blackened surface. Inside the hemisphere is a highly sensitive temperature sensing element. The rear of the hemisphere is well insulated against conductivity from the cabinet and mounting surface.

Because of its high sensitivity and its ability to respond to radiation, air temperature, and air velocity the **Radiant Systems Black Bulb Thermostat** constantly adjusts the heating systems to the instantaneous thermal needs of plants.

By recognizing the true heat requirements of plants, optimum growing conditions are maintained, yet at no time is the building overheated. By ensuring that temperature overshoot or overheating never occurs, substantial energy economies are achieved and condensation is minimized.

The **Black Bulb** sensor is installed within the heated greenhouse at bench level. The signal from the sensor is fed back to an electronic control unit via a three core cable which can be up to 656 feet long. The control unit can be located in the greenhouse or nearby office or other building, protected from unauthorized adjustment.

The control unit has separate knobs for separate day and night temperatures. The operating periods for the day and night temperatures are controlled externally by time switches or manual switches (not supplied).

Technical Data

Model	Black Bulb
Range of adjustment	30-86° F
Calibration Accuracy	1% of scale range
Sensitivity	better than 1° F
Power Supply	110v - 50/60Hz
Power Consumption	5VA
Supply Voltage Variation	+10% - 15%
Switching Contacts:	
Mode	Single Pole
Maximum Voltage	110v AC
Maximum Current AC	16A resistive 8A inductive

Control Knob functions:

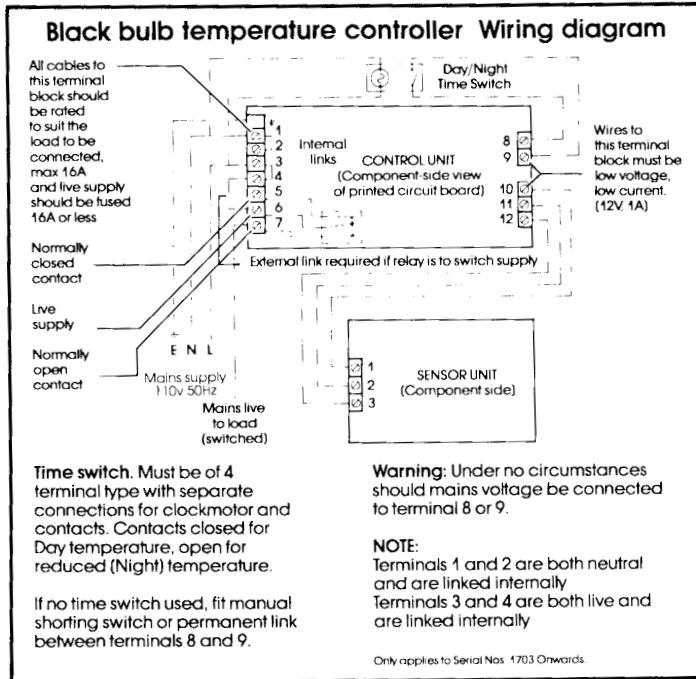
- 1) Day temperature
The left hand knob adjusts the day temperature within the range 30 to 86° F (linear scale)
- 2) Night temperature
The right hand knob adjusts the night temperature within the range -10 to 60° F (linear scale)

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Installation Instructions and Wiring Diagrams

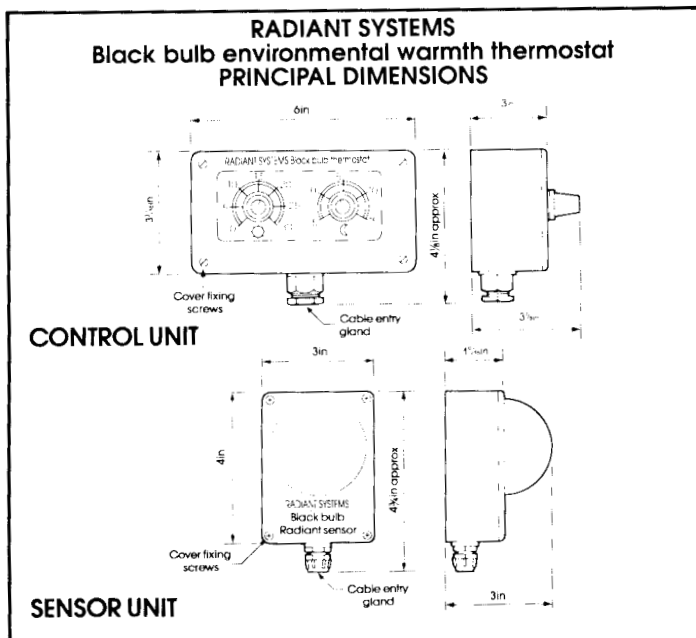


Installing the Sensor Unit

1. Select a convenient position for the Black Bulb at bench level within sight of the heater(s).
2. Remove the cover of the sensor unit by undoing the four screws.
3. Fix the base to the wall with two screws.
4. Connect the sensor using a three core cable of not less than 0.00078in². (Maximum distance between the sensor and control box is 656 feet with this size cable.) Secure wires in the cable gland provided.
5. Refit the sensor to the base.

Installing the Contol Unit

1. Select a position for the control unit where it will be protected from unauthorized interference or adjustment.
2. Remove the front panel by undoing the four screws.
3. Fix the housing to the wall with two screws.
4. Connect incoming and outgoing main connections, time switch connections and sensor connections according to the wiring diagram (left). Secure connections in cable glands provided.
5. Replace front panel of control unit.



Because of our policy of continuous development Radiant Systems reserves the right to vary the equipment specifications without notice