

Black bulb environmental warmth thermostat



Air temperature has long been used as a convenient measure of warmth but there are many cases where it is unsatisfactory and misleading. For example, air temperature as a measure is unsatisfactory where surrounding surfaces are warm or where there is high air velocity.

A person's bodily heat loss and hence his feeling of warmth depends on Air Temperature, Radiant Temperature of Surroundings and Air Velocity.

Only by taking account of all three variables can a true measurement of human comfort be achieved. Various indices of comfort have been devised in the course of studies on environmental warmth. The index known as globe temperature is a practical measurable indicator and has been found to correlate well with subjective assessments of warmth.

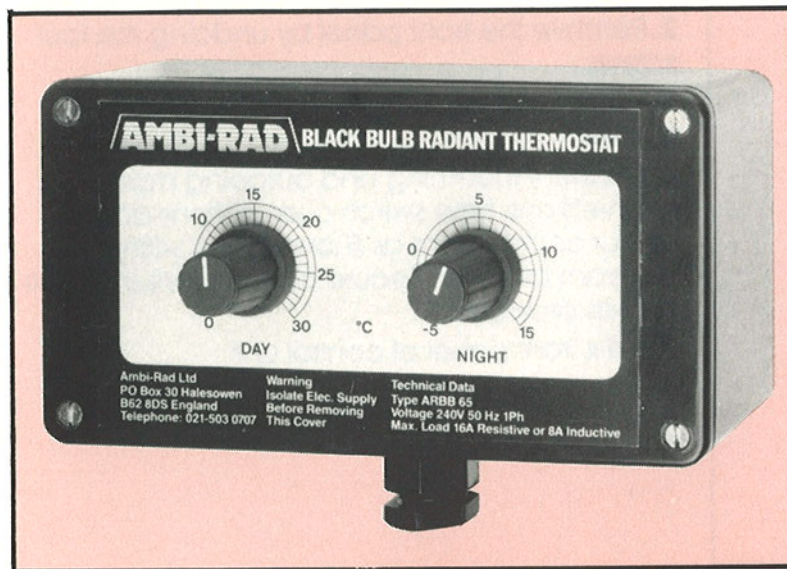
The AMBI-RAD Black Bulb Thermostat is based on the principle of the Globe thermometer. For convenience of installation the Globe is in the form of a hemisphere of high thermal conductivity material with a blackened surface. Encapsulated within the hemisphere is a highly temperature sensitive element. The rear of the hemisphere is well insulated.

Because of its high sensitivity and its ability to respond to radiation, air temperature and air velocity the AMBI-RAD Black Bulb Thermostat is able to constantly adjust the heating system to the instantaneous thermal needs of the building.

By recognising the true heat requirements of the human body – continuous comfort 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.

The "black bulb sensor" is installed within the heated room or building at a height of 1.5m from the floor. The signal from the sensor is fed back to an electronic control unit via a three core cable which can be up to 200m in length. The control unit can be located in, for example, a plant room, controls cabinet, supervisors office etc where it is protected from unauthorised adjustment.

The control unit incorporates separate knobs for the selection of 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

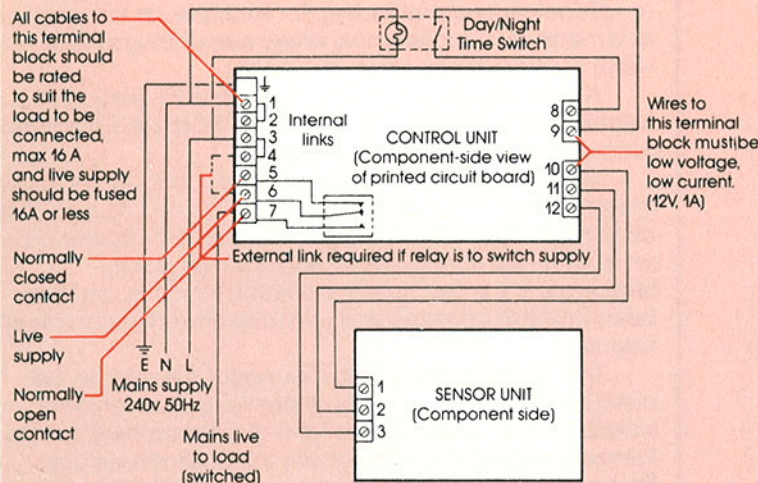
Model	ARBB 65
Range of adjustment	0-30°C
Calibration Accuracy	1% of scale range
Sensitivity	better than 0.5°C
Power Supply	220/240 ~ 50Hz or 110v ~ 50/60Hz to order
Power Consumption	5VA
Supply Voltage Variation	+ 10% - 15%
Switching Contacts:	
Mode	Single Pole
Maximum Voltage	240v AC
Maximum Current AC	16A resistive 8A inductive

Control Knob functions:

- 1) Day temperature: The left hand knob adjusts the day temperature within the range 0 to 30°C (linear scale).
- 2) Night temperature: The right hand knob adjusts the night temperature within the range -5 to 15°C (linear scale).

MODEL
ARBB 65
BLACK BULB THERMOSTAT

Black bulb temperature controller Wiring diagram



Time switch. Must be of 4 terminal type with separate connections for clockmotor and contacts. Contacts closed for Day temperature, open for reduced (Night) temperature.

If no time switch used, fit manual shorting switch or permanent link between terminals 8 and 9

Warning: Under no circumstances should mains voltage be connected to terminal 8 or 9.

NOTE: Terminals 1 and 2 are both neutral and are linked internally. Terminals 3 and 4 are both live and are linked internally.

Only applies to Serial No.'s 1703 Onwards

Installation instructions and wiring diagram

Instructions for fixing Sensor Unit

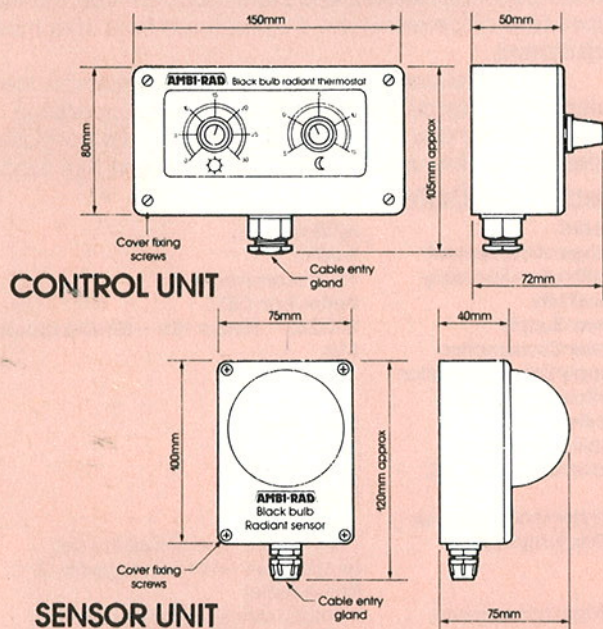
1. A position should be selected 1.5m from the floor where the sensor will be free from undue draughts and if possible between 4 and 5m from one of the heaters to be controlled. Avoid placing the sensor where it will be in an area shadowed from radiant heat (behind racking etc).
2. Remove the cover of 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 0.5mm². Maximum length of cable is 200m if 0.5mm² is used. Secure wires in the cable gland provided.
5. Refit the sensor to the base.

Instructions for fixing the Control Unit.

1. Select a position for the control unit where it will be protected from unauthorised interference or adjustment eg. supervisor's office, controls room etc.
2. Remove the front panel by undoing the four screws.
3. Fix the housing to the wall by means of two screws.
4. Connect incoming and outgoing mains connections, time switch connections and sensor connections as shown in the wiring diagram overleaf. Secure connections in cable glands provided.
5. Refix front panel of control unit.

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model ARBB65 PRINCIPAL DIMENSIONS



Because of our policy of continuous development Ambi-Rad reserve the right to vary the equipment specification without notice.

AMBI-RAD®

radiant heating systems

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