

5-9-84 DOB

GENERAL DESCRIPTION:

In a conventional temperature control system, the feedback signal is obtained by means of a separate sensor, such as thermocouple, thermistor, RTD, etc. Normally, the heater used in a conventional system maintains a relatively constant resistance over a wide range of temperatures. The response time in a conventional system depends upon the thermal time constant between the heater and sensor.

The Series 180 heat-sense temperature controller utilizes the principle of change in resistance of the heater with temperature to provide the feedback signal to the controller to maintain a constant temperature of the heater. In other words, the resistance heater supplies the thermal requirements of the system as well as the feedback signal for control. The response time is essentially instantaneous since the heater cannot change temperature without a corresponding change in resistance.

The Series 180 has been developed around the characteristics of a Balco wire-wound heater. The range of resistance for the heater element is from 4.8 ohms to 130 ohms. This resistance is sub-divided into ranges from 4.8 ohms to 65 ohms and 70 ohms to 130 ohms. What this means is that over the given control temperature range, the heater resistance must fall within the limits as stated throughout. The selection of heater value range is done by proper placement of a solderless jumper strip.

An additional feature of the Series 180 is the capability of field conversion from full-wave output to half-wave output or vice versa. The full-wave operation will provide better control in dynamic, changing systems, while for more stable systems half-wave operation is recommended.

An extremely valuable feature of the Series 180 is the capability to field calibrate it. With no special tools required, the control can be on-site calibrated to operate with any Balco wire heater within the specified resistance range.

SPECIFICATIONS:

Set Point Range: Adjustable from 50 to 500°F/10 to 260°C.

Heater Resistance Range: The total resistance range is from 4.8 to 130 ohms. This is split into two usable ranges: 1) from 4.8 to 72 ohms and 2) from 65 to 130 ohms.

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Control Output: 3kw at 115VAC \pm 10%, 50/60 Hz.
6kw at 230VAC \pm 10%, 50/60 Hz.

These power ratings are for full-wave operation. Cut them in half for half-wave operation.

Line Voltage: 115/230VAC \pm 10%, 50/60 Hz., field selectable via solderless jumper wires.

Indication: Separate control power and heater power indicators. They are panel mounted and indicate when power is applied to the control and to the heater respectively.

Half-Wave/Full-Wave Selection

On PC board A007-1305, locate W34/J35. Install the jumper for half-wave operation. Remove the jumper for full-wave operation.

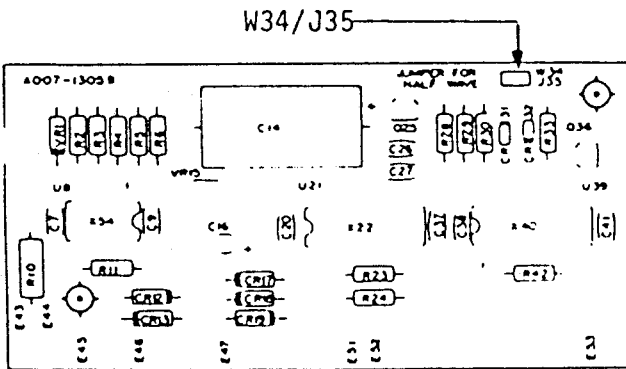


FIG 1

Line Voltage Select:

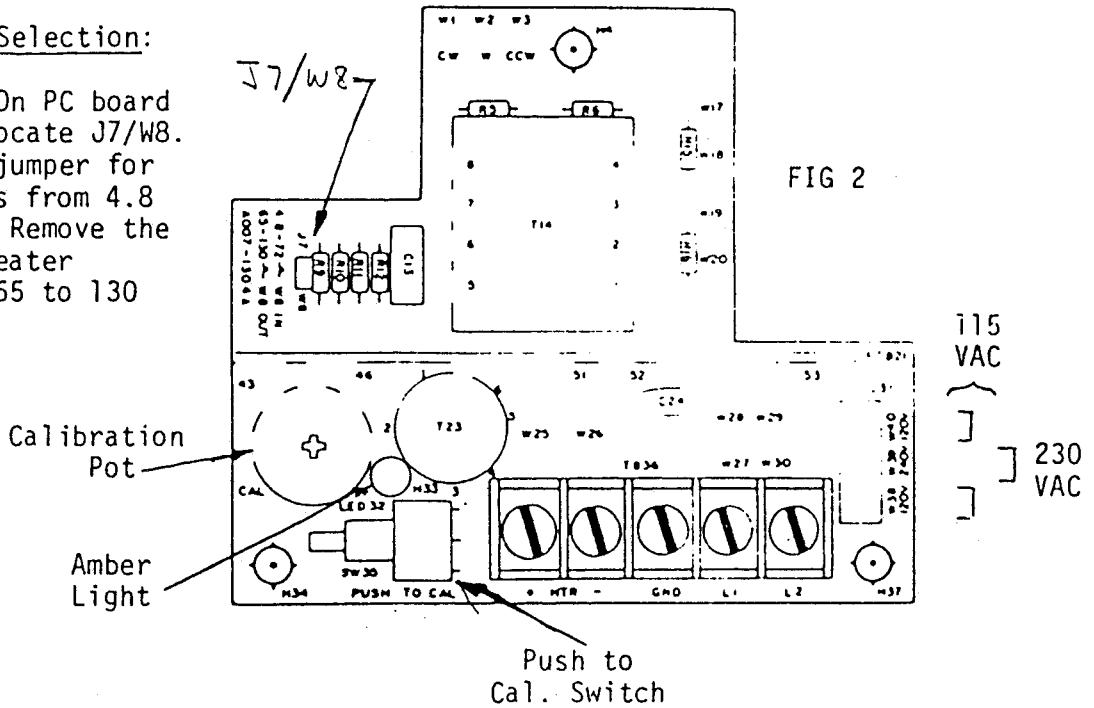
See FIG 2. On PC board A007-1304, locate J31. Install W39 only for 230VAC operation. Install W38 and W40 only for 115VAC operation.



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Heater Size Selection:

See FIG 2. On PC board A007-1304, locate J7/W8. Install the jumper for heater values from 4.8 to 72 ohms. Remove the jumper for heater values from 65 to 130 ohms.



Calibration:

See FIG 2.

The heater must be at ambient (room) temperature.

1. Turn the set point knob to fully C.C.W.
2. Turn the calibration pot to fully C.W.
3. Connect heater to the unit and apply power.
4. Depress the "push-to-cal." switch and hold it in.
5. Turn the set point knob C.W. to ambient temperature (room temperature).
6. Turn "calibration pot" C.C.W. until the amber light is lit.
7. Trim the "calibration pot" to threshold of just turning on the amber light.
8. Release the "push-to-cal." switch and set desired set point temperature on the front panel.

SPECIFICATION

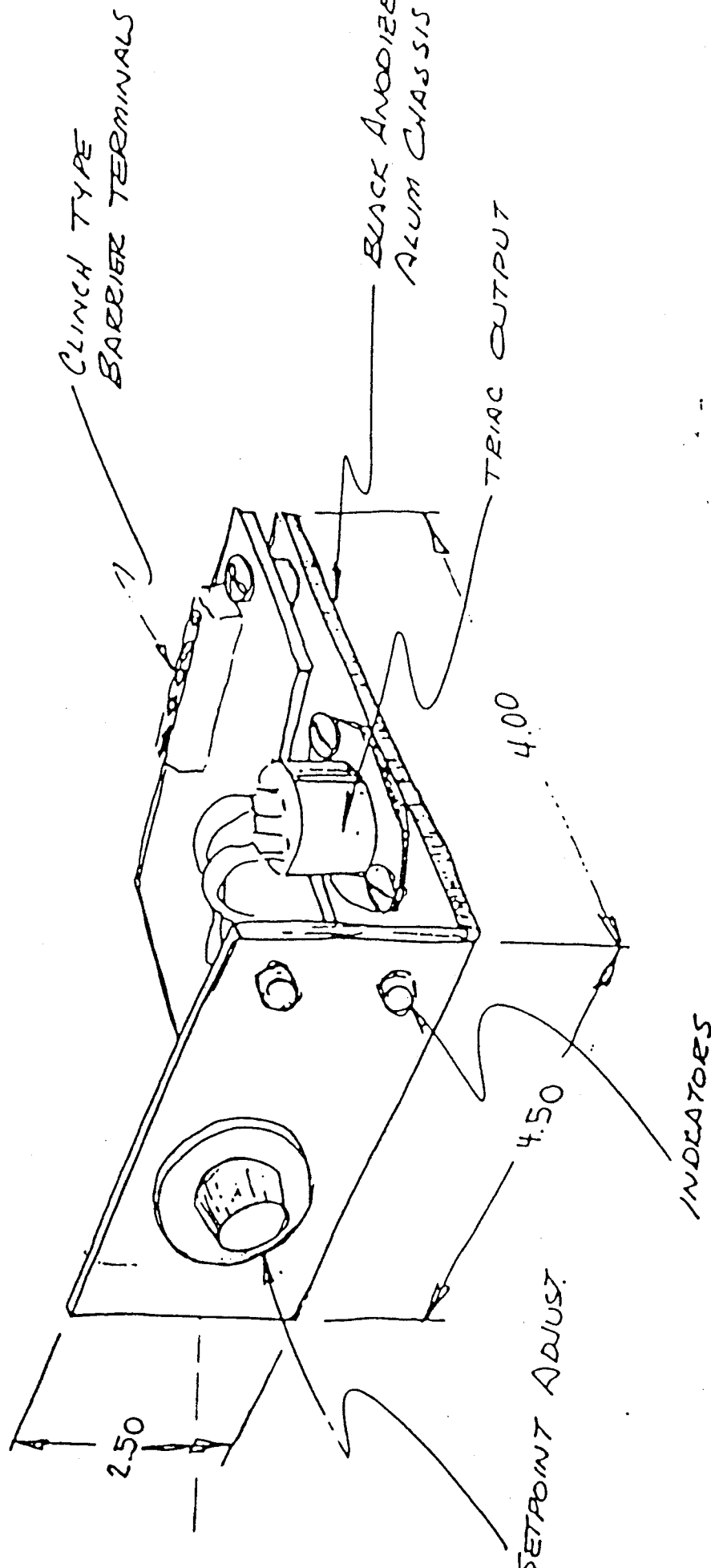
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If this unit is to be calibrated with the heater temperature elevated over ambient temperature, you must know the temperature of the heater.

1. Turn the calibration pot to fully C.W.
2. Depress the "push-to-cal." switch and hold it in.
3. Turn the set point knob C.W. to the elevated temperature of the heater.
4. Turn the "calibration pot" C.C.W. until the amber light is lit.
5. Trim the "calibration pot" to threshold of just turning on the amber light.
6. Release the "push-to-cal." switch.



RFQ # 2220
180P PRELIM

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TWO WIRE CONTROL
OPEN PC CONFIGURATION
HEATER-SENSOR TYPE

- A.=ALUMEL
- B.
- C.
- D.=BALCD WIRE

MAX.
TEMPERATURE
RANGE

0500 = 50°-500°F
10°-260°C

0250 = 50°-250°F
10°-121°C

1250 = 70°-1250°F
20°-700°C

00=(STD)
AA-ZZ=
(CUSTOM)
(LESS 00-
PRIVATE LABEL)

OPTIONS/MODIFICATIONS

- 00 = 230VAC INPUT / PERM. - HALF WAVE
- 01 = 115 VAC INPUT / PERM. - HALF WAVE
- 02 = 115 VAC INPUT / HALF WAVE
- 03 = 115 VAC INPUT / FULL WAVE
- 04 = 230VAC INPUT / HALF WAVE
- 05 = 230 VAC INPUT / FULL WAVE