

OPERATION AND CALIBRATION OF BLUE M MEMORY RING DIAL SYSTEM

Blue M's patented Memory Ring Dial System is supplied with many Blue M temperature control systems. The Memory Ring allows accurate and repeatable temperature settings throughout range of unit. All dials are factory calibrated to commercially acceptable standards.

NOTE: This is a dual scale dial. Care must be taken to read the correct scale when selecting operating temperature.

USING THE MEMORY RING AND REFERENCE NUMBERS:

1. Turn unit ON according to basic unit instructions.

2. Unlock dial (refer to Dial Lock Section), and rotate knob until pointer index mark is aligned with desired temperature, $+175^{\circ}\text{C}$, in this case. Refer to Figures 1 and 2.

3. Allow unit to stabilize (approximately 1 hour without temperature change, as measured by an independent temperature indicator of known accuracy).

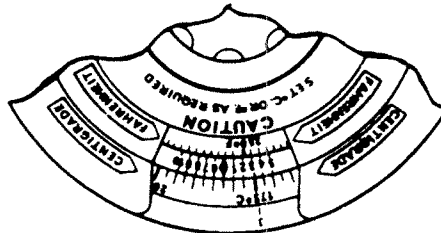
4. If temperature measured within chamber does not agree with dial setting, rotate pointer knob slightly in desired direction to bring unit to required temperature.

NOTE: Rotate knob CLOCKWISE to INCREASE temperature; rotate COUNTERCLOCKWISE to DECREASE temperature.

5. Allow unit to stabilize (approximately 15 minutes).

6. Repeat steps 4 and 5 until unit stabilizes at exactly $+175^{\circ}\text{C}$.

7. Note which reference number is lined up with $+175^{\circ}\text{C}$. Assume that the number three lines up in this example. Refer to Figure 3.



8. Using a pencil or ball-point pen, make a small mark on Memory Ring above $+175^{\circ}\text{C}$, mark, and write correction number "3" above mark.

9. In future, when control is turned to $+175^{\circ}\text{C}$, the correction number 3 will appear in pointer window. It will coincide with number 3 on dial pointer and indicate proper setting for $+175^{\circ}\text{C}$.

10. All temperatures may be calibrated in the same manner. The dial may be calibrated in normal use by marking a correction number when proper temperature is reached.
- NOTE:** If any desired temperature setting cannot be accommodated in pointer window, recalibration of control dial may be required.

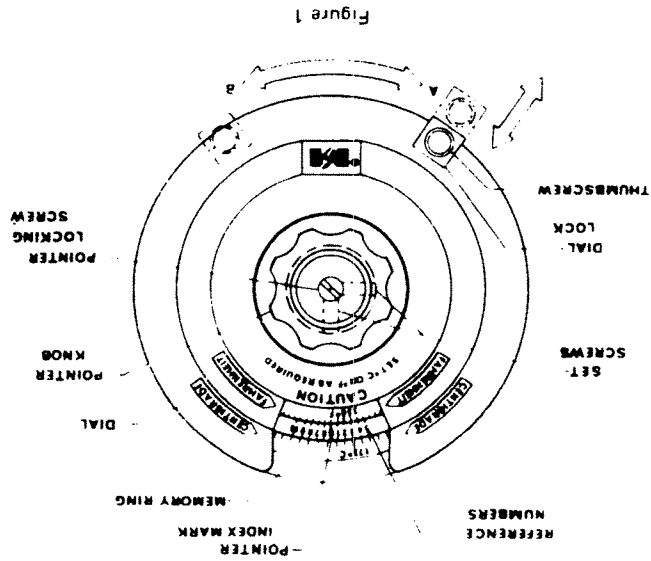


Figure 1

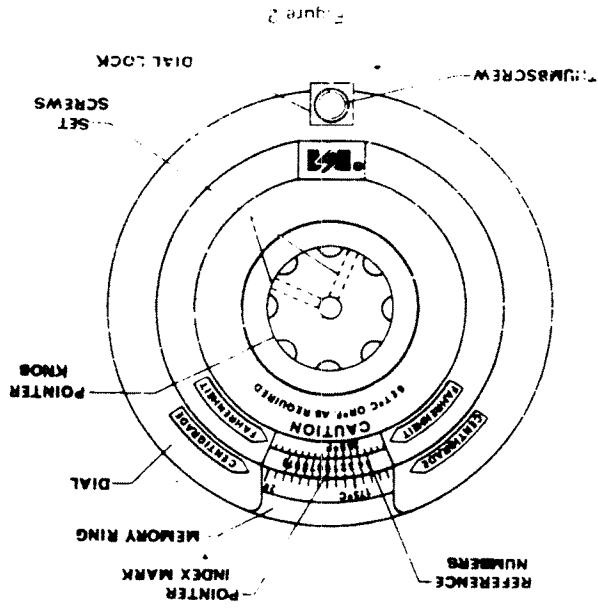


Figure 2

DIAL LOCKS: There are two dial locks utilized on Blue M temperature control units. One is fixed below the center of dial, Figure 2, and one has a two-position dial lock as shown in Figure 1. The movable lock allows 370° rotation of dial.

To lock dial with two position lock, swing it as far to the left or right as possible and push it up towards center of dial until dial is engaged. Tighten thumbscrew to hold dial in position. When thumbscrew is released, lock will fall away from dial.

To engage fixed lock as shown in Figure 2, turn thumbscrew clockwise to lock dial; counterclockwise to release it.

RECALIBRATING CONTROL DIALS

Recalibration should only be necessary after replacing a component in control systems, after extended heavy usage, or if desired temperature cannot be accommodated within pointer window. ALWAYS use an independent temperature indicator of known accuracy when recalibrating dial.

To recalibrate control unit with movable lock, (also identifiable by screw in the middle of the pointer knob), proceed as follows:

1. With unit operating, set pointer index mark to some mid-scale temperature.
2. Lock dial securely.
3. Allow unit to stabilize (approximately 1 hour without temperature change).

4. Loosen the pointer locking screw in center of knob, and loosen two knob set screws (see Figure 1). Loosen dial lock. Dial should now rotate independently of the knob and shaft. Note: it may be necessary to pull knob forward slightly to free dial.

5. Turn dial to align pointer index mark with actual temperature within chamber.

6. Tighten dial lock.

7. While holding pointer knob firmly, tighten pointer locking screw, then two set screws.

8. Allow unit to operate 15 minutes and re-check temperature to be sure that setting was not disturbed during calibration. If setting was changed, allow unit to stabilize and repeat entire procedure.

9. Check reference marks on Memory Ring for accuracy. If necessary, remove marks and follow procedure outlined under "Using the memory Ring and reference Numbers".

To recalibrate unit with fixed lock (also identifiable by lack of a screw in center of pointer knob), proceed as follows:

1. With unit operating, set pointer index mark to some mid-scale temperature, and lock dial.

2. Allow unit to stabilize (approximately 1 hour without temperature change).

3. Loosen setscrews sufficiently to allow knob and dial to rotate independently of shaft.

4. Loosen dial lock.

5. Rotate dial on shaft until the pointer index mark is aligned with actual temperature within chamber.
6. Tighten dial lock.
7. Tighten setscrews in pointer knob.
8. Allow the unit to operate 15 minutes and re-check temperature to be sure that setting was not disturbed during calibration. If setting was changed, allow unit to stabilize and repeat entire procedure.
9. Check reference marks on Memory Ring for accuracy. If necessary, remove marks and follow procedure outlined under "Using the Memory Ring and Reference Numbers".

OPERATION OF BLUE M OTP SYSTEMS WITH MEMORY RING DIAL

Operation and Maintenance of Blue M's Overtemperature Protection Systems (OTP) are basically the same as for the temperature control systems supplied with the Memory Ring Dial, with the following differences:

1. With the unit operating, loosen the dial lock (see Figure 1).
2. Set the OTP control index pointer to a point approximately 5° to 10°C (10° to 20°F) above the desired operating temperature.
3. If "Control Failure" light glows, press reset button.
4. Unit will now operate, with OTP shutting down the unit in the event of an over temperature condition.

Calibration of the unit is the same as that of the temperature control systems, with the following differences:

1. Loosen the dial lock and turn OTP control knob fully clockwise; operate unit until it stabilizes at desired temperature, +175°C, in this case. (see Figure 1)
2. Turn OTP control down (counterclockwise) until the OTP trips and shuts down unit, sounding buzzer.
3. Observe the reference number that is lined up with +175°C, and proceed by following the instructions outlined in "Using the Memory Ring and Reference Numbers" section of this manual, starting with number seven.