

# MAINTENANCE PROCEDURE TA-1

## REPLACING THE THERMOSTATIC ELEMENT TRAC Style 'A' Temperature Regulators

When the valve fails to respond to temperature changes at the thermo. bulb (within the range stamped on the nameplate) and adjustments made using the temperature adjusting wheel have no effect on process temperature, the thermostatic element has lost its thermal charge. A "dead" element is not repairable and must be replaced.

In most cases the thermostatic element can be replaced with the valve remaining in the pipeline. The valve needs to be removed only when access to the bellows housing is limited or ship procedures require the unit control temperature to be set and tested at another location.

Once it has been determined that the thermostatic element must be replaced, several important steps must be followed in sequence:

1. Shut off fluid supply to the temperature regulating valve. In many installations the bulb is installed in a process loop separate from the temperature regulating valve and the bulb is not inserted into a thermo. well; in these cases, also shut off fluid supply to the process loop and if possible, isolate the thermo. bulb so that the entire process loop does not have to be drained. If a finned bulb is being utilized to regulate air temperature no isolation of the bulb is required.

Tag the fluid supply and temperature regulating valve OUT OF SERVICE according to ship's procedures.

2. Mark or measure the current position of the adjusting wheel (12).

Note: To speed the process of resetting the control temperature- the installer may return to the marked position, which will set the valve at the approximate midpoint of the range stamped on the nameplate. Final temperature setting will be described later in this procedure.

3. Slowly loosen the four screws (1) holding the bulb end flange in the pipe line or tank and allow it to drain. When there is no flow or pressure remaining in the pipe line or tank, proceed to remove the four screws (1) and remove the bulb assembly.
4. Remove the compression on the adjusting spring (9) by screwing down the temperature adjustment wheel (12) to a position just above the flats on the adjusting stem (8).
5. Disconnect the thermostatic element from the adjusting stem (8) by turning the adjusting stem (8) clockwise using a 5/8" open end wrench on the flats on the adjusting stem (8), until the bellows assembly (7) is free of the adjusting stem (8). The thermostatic element is now disconnected from the adjustment mechanism and can be removed.
6. Remove the bracket mounting screws (5) and nuts (11) and remove the old thermostatic element.

7. Before installing the new thermostatic assembly, check the valve for stroke and function by pulling up on the adjustment wheel (12) and then allowing the adjusting spring (9) to press down on the adjusting stem (8). No movement or stiff movement indicates that the packing is binding the stem (16).

If the packing is binding the stem (16), loosen the packing nut (17) or replace packing, as required. If the stem (16) moves freely, proceed to install the new thermostatic assembly.

8. Unscrew the stop nut- adjusting stem (14). Apply 5/8" open end wrench on the flats on the adjusting stem (8) and use a 7/8" open end wrench on the stop nut- adjusting stem (14) to unscrew the nut. Allow the stop nut- adjusting stem to drop over the stem adjustment piece and locknut (15).

**Caution:** Before any attempt is made to install the new thermostatic element, the assembly must be refrigerated or chilled in ice or water bath at a minimum temperature of 20 deg. F. below the lowest temperature of the range indicated on the label, and held at this temperature until the assembly is mounted to the bracket.

Style 'A' thermostatic elements for valve sizes 1/2" thru 6" with ranges starting below 100 Deg.F. have wood stop plates held in place by 2 screws and nuts which are to be removed only after the entire unit is chilled. Do not remove this plate until the bellows can be fully compressed into the housing by hand. If removed before being chilled, the bellows will expand beyond its limits and may be rendered inoperable.

9. While observing the caution described above, determine that the bellows (7) is completely chilled and remove the stop plate (if required). Immediately place the thermostatic element on to the bracket (10) Align the clearance holes of the bellows housing (6) and the bracket (10) and secure the bracket mounting screws (5) and nuts (11). If possible, maintain the bulb (4) in cold water or ice while installing the new thermostatic element.
10. Remove the bulb (4) from cold water or ice and allow the thermostatic element to come to ambient temperature. The installer will be able to see the bellows assembly (7) expand as the temperature of the thermostatic element increases.

Note: Allowing the bellows assembly to expand will make it easier to connect the adjustment stem to the bellows assembly described in the next step.

11. Move the adjusting stem (8) up by pushing up on the adjusting wheel (12) to engage the male threaded part of the adjusting stem (8) into the female threaded part of the bellows assembly (7).

Once the threads are engaged by hand, use a 5/8" open end wrench on the flats on the adjusting stem (8) to complete the connection. The installer may apply a 3/4" open end wrench to the flats of the tube holding nut on top of the bellows housing while tightening.

12. Reconnect the stop nut- adjusting stem (14) to the adjusting stem (8). Apply 5/8" open end wrench on the flats on the adjusting stem (8) and use a 7/8" open end wrench on the stop nut- adjusting stem (14) to tighten the nut. Ensure that the stem adjustment piece and locknut (15) seat properly in the counterbore of the adjusting stem (8).

**Caution:** The standard thermostatic element can be installed horizontally, vertically, or at any other angle as long as the bulb mounting flange is uppermost. When mounting the bulb horizontally, be sure that the word "TOP" stamped on the bulb mounting flange is on top.

13. With the thermostatic element and bellows housing (6) installed on the valve bracket (10), the bulb (4) can be installed into the bulb bushing welded or brazed into the process piping (or duct mounting for finned bulbs). Use a new gasket (3) for this installation (finned bulbs do not require a gasket or bulb bushing).

While observing the caution described above, slip the new gasket (3) onto the bulb (4), insert the bulb (4) into the process piping connection (or duct mounting for finned bulbs), and install the four screws (1).

14. Slowly open fluid supply to the temperature regulating valve. In those installations where the bulb is installed in a process loop separate from the temperature regulating valve, slowly open fluid supply to the process loop also. Open all isolation (shutoff) valves to their normal operating state.

15. If attempting to set the valve to the original temperature setting, screw the adjustment wheel (12) up to the location marked or measured in step 2. From this point the temperature setting can be fine tuned as described below:

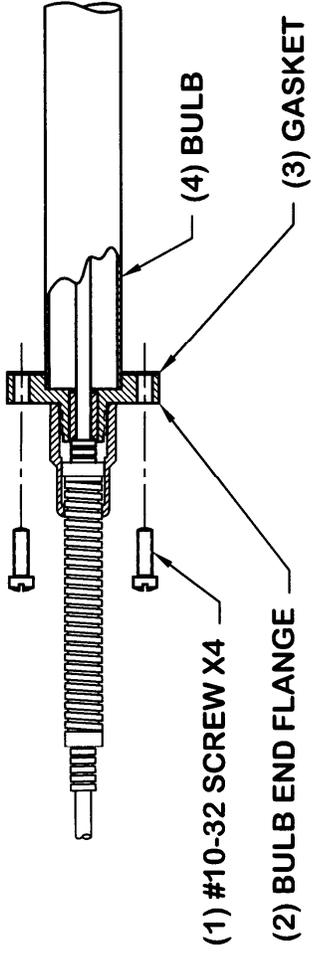
The valve can be set to control at any temperature (within the limits of the temperature range stamped on the nameplate) by making a simple adjustment to the valve.

To raise the set temperature: Decrease spring compression by turning the adjusting wheel clockwise (looking from the top of the regulator).

To decrease the set temperature: Increase spring compression by turning the adjusting wheel counterclockwise (looking from the top of the regulator).

Wait until the temperature at the bulb stabilizes at one steady reading. It may be necessary to adjust the adjustment wheel incrementally to obtain the desired set temperature.

**Note:** No adjustment to valve stroke should be necessary if the stem adjustment was not changed during the installation of the new thermostatic element.



(5) BRACKET MOUNTING SCREWS

(6) BELLOWS HOUSING

(7) BELLOWS ASSEMBLY

(8) ADJUSTING STEM

(9) ADJUSTING SPRING

(10) BRACKET

(11) BRACKET MOUNTING NUTS

(12) ADJUSTING WHEEL

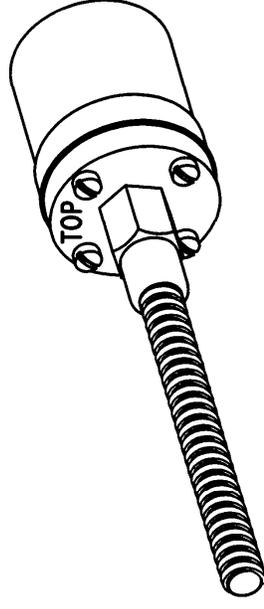
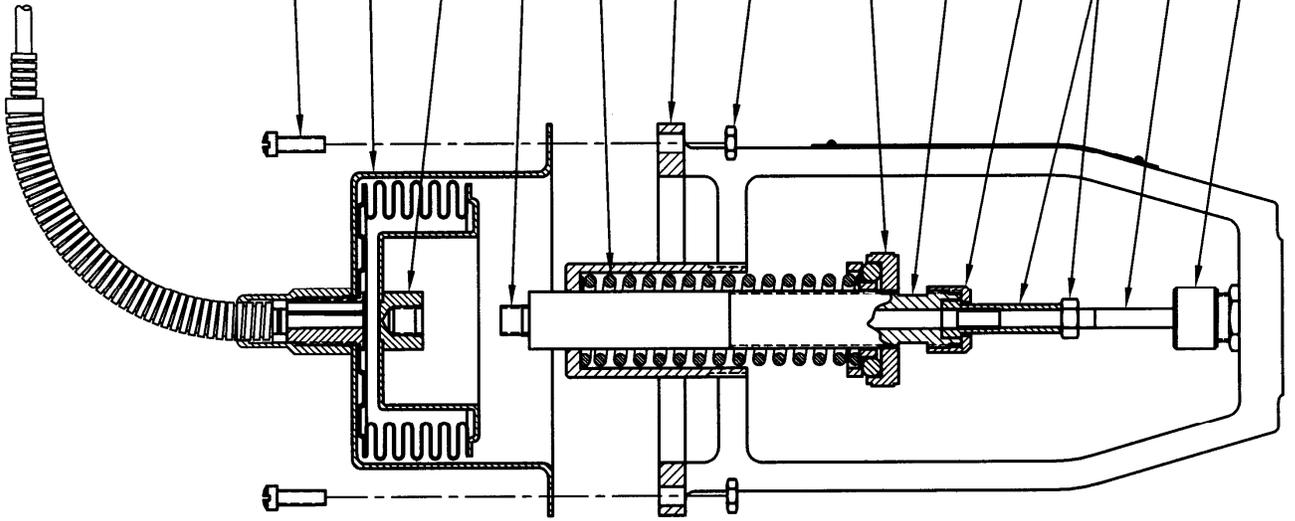
FLATS ON ADJUSTING STEM

(14) STOP NUT- ADJUSTING STEM

(15) STEM ADJUSTMENT PIECE AND LOCKNUT

(16) STEM

(17) PACKING NUT



"TOP" MUST BE ON TOP  
 FOR HORIZONTAL BULB MOUNTING