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# SERIES 'PTRP'

## TEMPERATURE PILOT

### INSTALLATION INSTRUCTIONS

INSTRUCTION PART NO. 2448000 REVISION A

#### UNPACKING AND INSPECTING

After receiving pilot, unpack and inspect to ensure it was not damaged in shipping. The capillary and armor should never be cut, kinked, mashed or twisted. It may be coiled on a 1-½" radius or larger, but never less than 1-½".

**Caution:** When servicing or installing this regulator in a tank, all steam and /or water pressure must be turned off and the tank drained completely. When servicing or installing this regulator in other pressurized vessels, all steam and/or water must be turned off and the lines and vessels relieved of any pressure.

#### ASSEMBLE PILOT TO MAIN VALVE

- 1) Place gasket on pilot adaptor flange taking care to note specific and proper orientation.
- 2) Assemble pilot to pilot adaptor making sure bolting is tightened evenly.

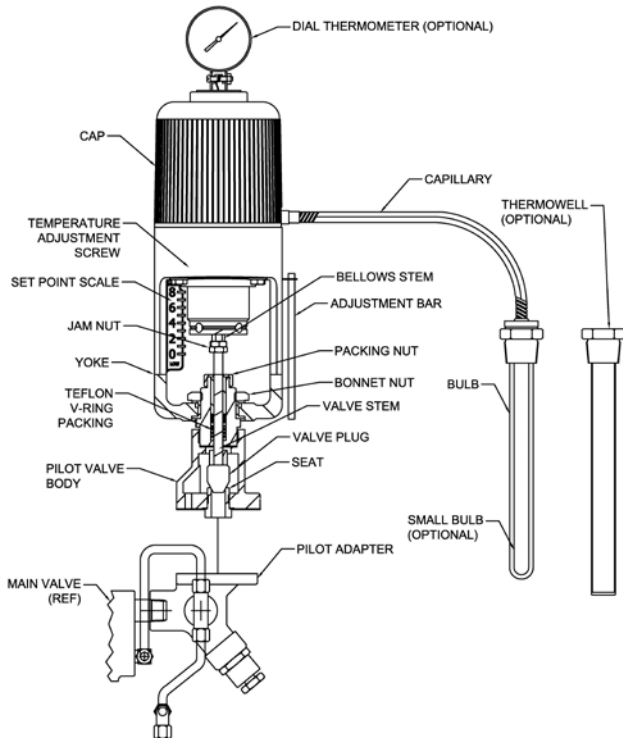


Figure 1.

#### CONNECTING THERMOSTATIC BULB TO SYSTEM

- 1) Remove the union hub or Thermowell from the sensing bulb and install this hub or Thermowell into the process piping or tank.
- 2) If using a Thermowell, liberally coat the sensing bulb with the heat transfer paste supplied with the Thermowell.
- 3) Now slip the sensing bulb through the hub or into the well until fully seated. Tighten the coupling nut. Do not over tighten.

Each Watson McDaniel Company Product is warranted against defects in material and workmanship for one year from date of shipment. This warranty extends to the first retail purchaser only. All defective material must be returned to the person from whom you purchased the Product, transportation prepaid, free of any liens or encumbrances, and if found to be defective will be repaired free of charge or replaced, at the warrantor's or seller's option. If the material is replaced, any replacement will be invoiced in the usual manner and after inspection of alleged defective material an adjustment will be made for depreciation caused by purchaser's use. In no event will Watson McDaniel Company be liable to do more than refund the original contract price. Incidental and consequential damages are excluded, whether under this warranty or otherwise. All implied warranties, including warranties of merchantability and fitness for a particular purpose, are disclaimed and excluded.

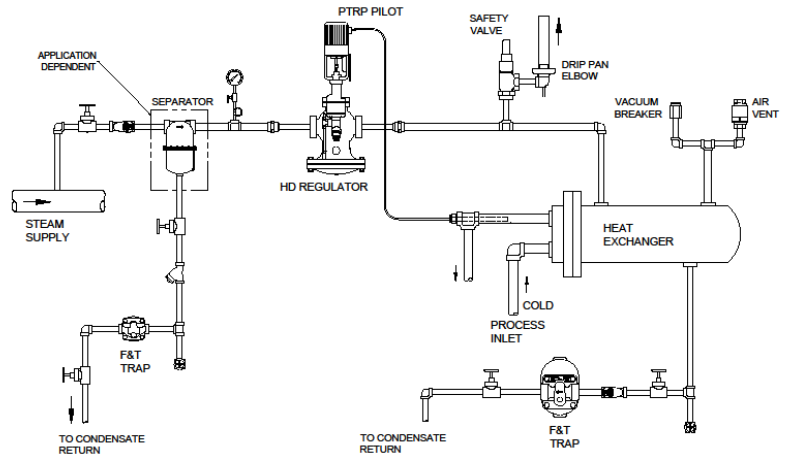


Figure 2.

The location of the sensing bulb is important. **Use of a Thermowell is always recommended, especially in pressurized systems.** The bulb or Thermowell must be totally immersed in an average temperature location which is representative of the whole volume being controlled. It should not be situated near hot or cold spots, nor near the outlet of the valve supplying the heated or chilled fluid.

Keep all bends in the tubing greater than 1-½" radius. Do not subject the tubing to repeated flexing, vibration, heat, cutting, kinking or other abuse. Coil all excess tubing and place in a cool location. If motion or vibration may occur, secure the tubing to the bulb mounting so all moves as one. If vibration or fluid pulsations may be transmitted to the bulb, it must be housed in a Thermowell for protection from fatigue.

Install an accurate thermometer in the system as close to the thermostatic bulb as possible.

If there is any uncertainty about our product, do not proceed with servicing or installation. Please call the factory or our authorized representative.

### REPLACING VALVE STEM PACKING

- 1) Make sure steam supply is safely shut off. Allow sufficient time for the pilot valve to cool completely.
- 2) Remove the actuator assembly from the pilot valve body. See section on "Removing Actuator from Pilot Valve Body Assembly".
- 3) With the pilot valve fully closed, measure and record the location of the two stem lock nuts relative to their distance from the face of the bonnet. This dimension will be required for reassembly.
- 4) Loosen and remove both stem locknuts.
- 5) Remove the packing nut from the valve bonnet.
- 6) Remove all old packing, adapters and spring from the valve bonnet.

#### **DO NOT SCRATCH THE BORE OF THE STUFFING BOX WITH SHARP TOOLS.**

- 7) Clean all surfaces of the stuffing box and stem. Remove all accumulations of mineral deposits or other debris before re-building. A 0.4375 diameter reamer is ideal to remove deposits from bonnet, if the bonnet is removed from the body. A 0.45 diameter brass brush is often also very effective. Do not use abrasives on the valve stem nor in the stuffing box since scratches will cause leakage. The valve stem originally was polished to a 12 micro-inch finish and this polish should be preserved. If the stem is corroded, worn, or marred it must be replaced.
- 8) Blow all debris from the stuffing box and the replacement packing before re-building.

#### **PACKING MUST BE CLEAN & FREE OF FOREIGN MATERIAL.**

- 9) Install new packing as follows (see Figure 3.):
  - 1) Male adapter with flat side in first.
  - 2) V rings with lips in first.  
"V" rings must be carefully installed over the stem threads and into the stuffing box bore to avoid snagging of the lips on the threads of bore entrance. The clean edge on these lips is imperative for proper sealing
  - 3) Female adapter with cavity in against "V" rings and flat side out.
  - 4) Spring
  - 5) Packing Spacer
  - 5) Packing nut
- 10) Tighten packing nut all the way down onto the bonnet to push all rings down into the stuffing box and to obtain proper spring load on the assembled rings.

#### **TIGHTEN FINGER TIGHT ONLY.**

- 11) Replace the stem locknuts and re-position and lock in place as previously measured in step 2. If this dimension is not available, see section on "Reassembling Actuator to Pilot Valve Body Assembly" and use the dimension as shown in figure 4.
- 12) Re-assemble Actuator to Pilot Valve Body as shown in section titled "Reassembling Actuator to Pilot Valve Body Assembly".

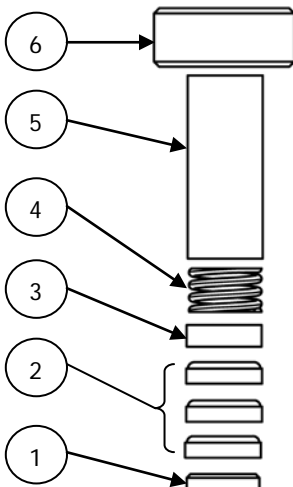


Figure 3.

### REMOVING ACTUATOR FROM PILOT VALVE BODY ASSEMBLY

- 1) Allow the sensing bulb on the actuator to cool to the bottom of the nominal range. Artificially cool with ice if necessary.
- 2) Record the current actuator adjusting screw setting relative to the reference scale.
- 3) Turn the actuator adjusting screw in (up) to reference number 8.
- 4) Hold the hexagonal actuator stem with a 5/16" wrench. With a 3/8" wrench, hold the two stem locknuts as a wrench flat and loosen the valve stem from the hexagonal actuator stem.

#### **DO NOT DIRECTLY GRIP THE ROUND POLISHED PORTION OF THE VALVE STEM.**

- 5) Remove the Bonnet Nut holding the actuator to the valve with a 1-1/2" wrench.
- 6) Unscrew the valve stem from the actuator stem by turning the entire pilot valve body. If the pilot valve body is still in-line, then unscrew by gently turning the valve stem, gripping it ONLY by the 3/8" hex nuts. Do not directly grip the round polished portion of the valve stem.
  - a. Make sure the valve plug is off of the valve seat while turning valve stem to prevent galling of the seating surface.
- 7) The actuator and pilot valve body may now be separated.

### REASSEMBLING ACTUATOR TO PILOT VALVE BODY ASSEMBLY

- 1) Unless already completed, install two locknuts onto valve stem.
  - a. Thread locknuts loosely onto the valve stem.
  - b. Push or pull the valve stem as appropriate to fully CLOSE the pilot valve.
  - c. Set the topmost locknut to the dimension 2-1/8", shown in figure 4.

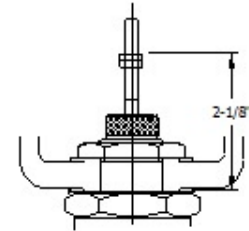


Figure 4.

- a. Tighten the lower locknut up against the upper locknut making sure that the nuts are tight enough against each other to prevent further turning about the valve stem.
- 2) Allow the sensing bulb on the actuator to cool to the bottom of the nominal range. Artificially cool with ice if necessary.
- 3) Record the current actuator adjusting screw setting relative to the reference scale.
- 4) Turn the actuator adjusting screw in (up) to reference number 8.
- 5) Place valve stem up through the Yoke and Bonnet Nut.
- 6) Thread the valve stem into the actuator stem.
  - a. Use a 5/16" wrench to hold or turn the actuator stem.
  - b. Use a 3/8" wrench to hold the valve stem nuts to turn the valve stem.

#### **DO NOT DIRECTLY GRIP THE ROUND POLISHED PORTION OF THE VALVE STEM.**

- If the valve plug can remain open relative to the valve seat, turn the valve stem into the actuator stem until the locknuts are tight against the actuator stem.
  - If the valve plug is closed against the valve seat, then gently turn the actuator down onto the valve stem until the actuator stem is tight against the locknuts.
- 7) Use a 1-1/2" wrench to tighten the Bonnet Nut down onto the bonnet to hold the valve body assembly to the yoke.
  - 8) Return the actuator adjusting screw to the previously recorded reference setting.