

## INSTALLATION ADJUSTMENT SERVICE HIGH-LOW MANIFOLD SYSTEMS TM-186-1508015-PRV

IMPORTANT! Provide serial numbers for all valves when ordering parts!! Small valve manufactured after July 2007 starting with serial #TM2039272



### Maximum Operating Pressure 125PSI (860 KPA) for Hot and Cold Water.

### CAUTION

All thermostatic water-mixing valves have limitations. They will not provide the desired accuracy outside of their flow capacity range. Consult the capacity chart on page 8. Minimum flow must be no less than as shown.

## **REMEMBER!** THIS IS A CONTROL SYSTEM WHICH MUST BE CLEANED AND MAINTAINED ON A REGULAR BASIS (SEE MAINTENANCE GUIDE AND RECORD MGR-1000).

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## ADJUSTMENT AND SERVICE

Leonard Type TM Thermostatic Water Mixing Valves are simple in design and may be easily cleaned, adjusted and repaired. If the installation is accessible, servicing may be completed without disconnecting the valves. **NOTE:** High Low Manifold Systems include Thermostatic Water Mixing Valves, which must be regularly maintained to provide best performance. Frequency of cleaning depends on quality of local water conditions and usage. See Maintenance Guide and Record MGR-1000.

#### WARNING

These mixing valves are equipped with an adjustable high temperature limit stop factory set at approximately 120°F (49°C) with an incoming hot water supply temperature of 150°F (65.5°C). If the hot water supply temperature of the job is greater than 150°F (65.5°C), the valves when turned to full HOT will deliver water in excess of 120°F (49°C) and the limit stops **MUST BE RESET BY THE INSTALLER!** 

### TO RESET ADJUSTABLE HIGH TEMPERATURE LIMIT STOP:



### IMPORTANT! BOTH MIXING VALVES MUST BE SET AT THE SAME OPERATING TEMPERATURE.

#### SEE PAGES: 7 & 8 FOR COMPLETE PARTS BREAKDOWN

Check for significant variations in outlet flow. Thermostatic valves will NOT provide the desired accuracy outside of their flow capacity range. Minimum flows must be no less than shown (see Flow Capacities, page 8).

If installed on a recirculated hot water system, make certain the valve is piped according to Leonard Required Piping Method (see page 4 & 5).

# **REMEMBER!** THIS IS A CONTROL DEVICE WHICH MUST BE CLEANED AND MAINTAINED ON A REGULAR BASIS. (SEE MAINTENANCE GUIDE AND RECORD, MGR-1000).

## SETUP INSTRUCTIONS



- 1. TM-186-PRV High-Low Unit **Must** be piped in accordance with appropriate Piping Method shown on page 4.
- 2. Shut down circulator pumps, close valve V3 and V4. Adjust screw S1 on the reducing pilot fully clockwise and record water pressure reading on gauge G1.
- 3. Carefully adjust screw S1 on the reducing pilot fully counter-clockwise (CCW) until all spring tension is relieved.
- 4. Close outlet valve V1 and V2. Open outlet valves V3, and make sure it's in the full open position.
- 5. Open enough fixtures to flow at least 30 GPM downstream of this assembly (no water will flow at this time). Vent trapped air in the PRV cover above the valve labeled A by loosening highest point of tube fitting and on cover. Retighten both fittings.
- 6. Carefully adjust screw S1 to 20 PSI less than the pressure recorded in step 2 (read pressure on gauge G1). Water should now be flowing at 30 GPM.
- 7. Set outlet temperature of mixing valve A to the safe required level (read temperature on gauge T1).

- 8. Turn off enough fixtures to flow 10 GPM downstream of the assembly.
- 9. Open outlet valve V2, close V3, (V1 should remain closed).
- 10. Set outlet temperature of mixing valve labeled B to the same temperature as step 7, (read temperature at gauge T1).
- 11. Turn off enough fixtures to flow 2 GPM downstream of the assembly.
- 12. Open outlet valve V1 and close valve V2.
- 13. Set outlet temperature of mixing valve labeled C to the same temperature as step 7, (read temperature at gauge T1).
- 14. Turn circulator pump on. Open outlet valves V2 and V3. System is operational.
- 15. Important! Now proceed to balance circulated tempered water system (see page 4).

\* NOTE! FOR OPTIONAL OUTLET SETUP PIPING ARRANGEMENT, SEE PAGE 10



CONTACT LEONARD FOR ADDITIONAL PIPING METHODS DESIGNED FOR LOWER FLOW RECIRCULATED SYSTEMS AND FOR OTHER SPECIAL INSTALLATIONS.

### PRESSURE REDUCING VALVE



PARTS LIST

- A In line, Filter
- 2 Control Orifice
- 3 Pressure Reducing Pilot
- S Opening Speed Control

## TROUBLESHOOTING

| <b>SYMPTOM</b>                      | CAUSE   | <u>REMEDY</u>   |  |  |  |  |
|-------------------------------------|---|---|--|--|--|--|
| Valve fails to                      | Insufficient inlet pressure   | Check/create inlet pressure   |  |  |  |  |
| open                                | No downstream demand  | Create demand/flow  |  |  |  |  |
|                                     | Insufficient spring compression on pressure reducing pilot                        | Turn adjusting screw on pressure reducing pilot 3 clockwise                                       |  |  |  |  |
|                                     | Trapped air   | Bleed air from cover and bleed air from tubing at highest point                                   |  |  |  |  |
|                                     | Filter A plugged.   | Remove in -line filter A and clean screen   |  |  |  |  |
| Valve Fails to<br>Close or Regulate | Orifice fitting 2 plugged   | Remove orifice fitting 2 and clean  |  |  |  |  |
|                                     | Regulated pressure pulsates or hunts.   | Bleed air from cover and bleed air from tubing at highest point                                   |  |  |  |  |
|                                     | Debris trapped in main valve / Diaphragm<br>in main valve Leaking / Scale on stem | De-pressurized the system and<br>remove valve cover and<br>diaphragm to inspect/remove<br>debris. |  |  |  |  |
|                                     | Pressure reducing pilot 3 not serviceable   | Replace pressure reducing pilot   |  |  |  |  |



- 5. To clean thermostat group brush in a non-corrosive cleaning solution.
- 6. When reassembling, make sure driving ball of thermostat group engages the ball socket of the port sleeve assembly.



remove cover. Brush in a non-corrosive cleaning

#### TROUBLESHOOTING INSTRUCTIONS

Note: Provide, valve serial number when ordering parts for either valve!

|                                |  | TM-150                      | TM-80                     | TM-15   |
|--------------------------------|--|-----------------------------|---------------------------|---|
| PACKING & GASKETS              | <ol> <li>Leaks at stem.</li> <li>Leak between valve cover and base.</li> </ol>   | Kit # 1/125                 | Kit # 1/50Y               | Kit # 1/M20 (Packings<br>& Gaskets)                             |
| PORT SLEEVE/BRIDGE<br>ASSEMBLY | <ol> <li>Valve delivers either all hot or all cold water,<br/>or will not mix consistently.</li> </ol>   | Kit # R/125 or<br>TGM-1/125 | Kit # R/50 or<br>TGM-1/50 | Kit # R/M20 or<br>M20-1-8B Bridge<br>assembly                   |
| THERMOSTAT<br>GROUP            | 4. After cleaning or replacing port sleeve/bridge assembly , valve performance is not consistent.  | Kit # R/125 or<br>TGM-2/125 | Kit # R/50 or<br>TGM-2/50 | Kit #R/M20<br>(Rebuilding Kit) or<br>M20-G2 Thermostat<br>Group |
| CHECKSTOPS                     | <ol> <li>Hot water by-pass into cold line(or cold into hot).</li> <li>Supplies cannot be shut off completely. Supplies leak at checkstop bonnets.</li> </ol> | Kit #2/125                  | Kit #2/50Y                | Kit #4/M20<br>(Checkstop Kit)                                   |

See pages 7, 8 & 9 for Parts Breakdowns

# **TM-150 VALVE PARTS**



## **CHECKSTOP PARTS**

**REPAIR KITS** 

\*"125" FOR TM-150



**REMEMBER!** THIIS IS A CONTROL DEVICE WHICH MUST BE CLEANED AND MAINTAINED ON A REGULAR BASIS (SEE MAINTENANCE GUIDE AND RECORD, MGR-1000).

**NOTE:** AFTER INSTALLING NEW PARTS IT WILL BE NECESSARY TO RESET THE ADJUSTABLE HIGH TEMPERATURE LIMIT STOP ON EACH VALVE (SEE PAGE2).

# LARGE TM-80 VALVE PARTS



## **CHECKSTOP PARTS**

**REPAIR KITS \***"50" FOR TM-80



**REMEMBER!** THIIS IS A CONTROL DEVICE WHICH MUST BE CLEANED AND MAINTAINED ON A REGULAR BASIS (SEE MAINTENANCE GUIDE AND RECORD, MGR-1000).

**NOTE:** AFTER INSTALLING NEW PARTS IT WILL BE NECESSARY TO RESET THE ADJUSTABLE HIGH TEMPERATURE LIMIT STOP ON EACH VALVE (SEE PAGE2).



**REMEMBER!** THIIS IS A CONTROL DEVICE WHICH MUST BE CLEANED AND MAINTAINED ON A REGULAR BASIS (SEE MAINTENANCE GUIDE AND RECORD, MGR-1000).

**NOTE:** AFTER INSTALLING NEW PARTS IT WILL BE NECESSARY TO RESET THE ADJUSTABLE HIGH TEMPERATURE LIMIT STOP ON EACH VALVE (SEE PAGE2).

#### OPTIONAL OUTLET SETUP PIPING (BY OTHERS)

The addition of this piping arrangement (extra tee and ball valve) eliminates the need to turn showers on and off throughout the building at setup. The flows required in the setup instructions (page 3) are set by using Ball Valve A. (make sure main outlet ball valve is closed).



#### CAUTION! ALL THERMOSTATIC WATER MIXING VALVES AND SYSTEMS HAVE LIMITATIONS! THEY WILL NOT PROVIDE THE DESIRED PERFORMANCE OUTSIDE OF THEIR FLOW CAPACITY RANGE! CONSULT THE CAPACITY CHART BELOW AND OBSERVE MINIMUM FLOWS SHOWN.

### **FLOW CAPACITIES**

|            |        | OUT       | MINIMUM       | SYSTEM PRESSURE DROP (PSIG) |     |     |     |     |     |     |     |     |     |       |
|------------|--------|-----------|---------------|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|
| MODEL IN   | IN     |           | FLOW<br>(GPM) | 5                           |     | 15  | 20  | 25  | 30  | 35  | 40  | 45  | 50  | PSI   |
|            |        |           | (l/min)       | ,3                          | .7  | .97 | 1.4 | 25  | 30  | 35  | 40  | 45  | 50  | BAR   |
| TM-186-    | 1 1/2" | 1 1/2" 2" | 1.0           | 70                          | 90  | 120 | 130 | 150 | 170 | 180 | 185 | 190 | 200 | GPM   |
| 1508015PRV | 1 1/2  |           | (3.7)         | 265                         | 340 | 453 | 491 | 567 | 543 | 680 | 700 | 719 | 757 | l/min |

## TROUBLESHOOTING PRESSURE REGULATING VALVE

When replacement parts are required for the pressure regulating valve, the following information must be given:

(This information is found on the tag attached

Manufacturer of PRV:\_\_\_\_

Type:\_

Serial number:\_\_\_\_\_

SYMPTOM:

PRV leaks by adjusting screw or if no pressure adjustment is possible.

### LIMITED WARRANTY

Leonard Valve Company warrants the original purchaser that products manufactured by them (not by others) will be free from defects in materials and workmanship under normal conditions of use, when properly installed and maintained in accordance with Leonard Valve Company's instructions, for a period of one year from date of shipment. During this period the Leonard Valve Company will at its option repair or replace any product, or part thereof, which shall be returned, freight prepaid, to the Leonard factory and determined by Leonard to be defective in materials or workmanship. There are no warranties, express or implied, which extend beyond the description contained herein. There are no implied warranties of merchantability or of fitness for a particular purpose. In no event will Leonard be liable for labor or incidental or consequential damages. Any alteration or improper installation or use of the product will void this limited warranty.

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