

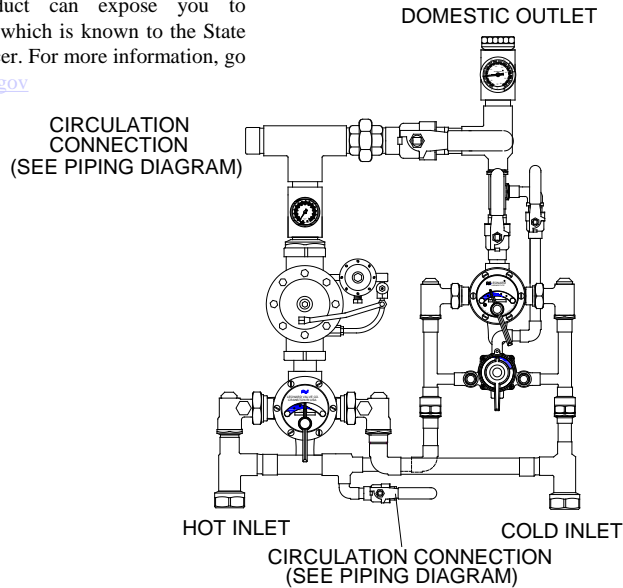
INSTALLATION ADJUSTMENT SERVICE HIGH-LOW MANIFOLD SYSTEMS TM-186-1508015-PRV

IMPORTANT! Provide serial numbers for all valves when ordering parts!!

THIS BULLETIN IS FOR VALVES BUILT AFTER NOVEMBER 2003 ONLY!
SEE BULLETIN G-16 FOR PRIOR TO THIS DATE.



WARNING: This product can expose you to chemicals including lead, which is known to the State of California to cause cancer. For more information, go to www.P65Warnings.Ca.gov



INSTALLATION

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Type TM manifold systems are factory pre-assembled and tested and include large and small thermostatic water mixing valves which function as a system to meet both high and low demand for tempered water. 2. System should be installed at a location where it can easily be cleaned, adjusted or repaired. | <ol style="list-style-type: none"> 3. System supplies must be connected as shown (Hot-left, Cold right). Exercise caution when soldering. 4. Flush pipes thoroughly after system has been connected. 5. If this assembly is installed on a recirculated hot water system it MUST be piped according to REQUIRED PIPING METHOD (see page 4). 6. Refer to page 3 of this bulletin for correct Setup Instructions. |
|--|---|

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).

1360 Elmwood Avenue, Cranston, RI 02910 USA
 Phone: 401.461.1200 Fax: 401.941.5310
 Email: info@leonardvalve.com
 Web Site: <http://www.leonardvalve.com>

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.

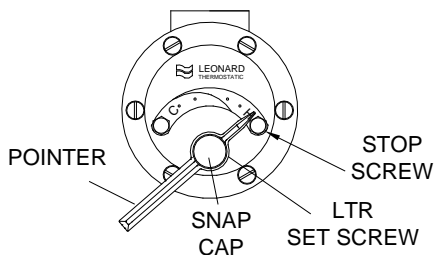
NOTE: High Low Manifold Systems include Thermostatic Water Mixing Valves, which must be regularly maintained to provide best performance. Frequency of cleaning depends on quality of local water conditions and usage. See Maintenance Guide and Record MGR-1000.

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!**

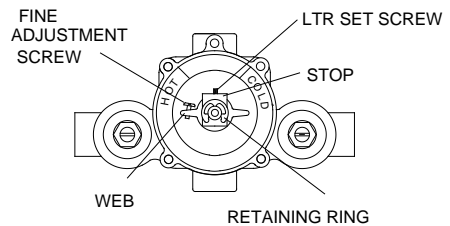
TO RESET ADJUSTABLE HIGH TEMPERATURE LIMIT STOP:

LARGE MIXING VALVE (TM-150, 80)



1. Loosen LTR set screw.
2. Remove SNAP CAP, SCREW & WASHER. Remove POINTER.
3. Temporarily place POINTER on the spline rod, turn RIGHT for warmer temperature, turn LEFT for cooler temperature. When valve is delivering warmest temperature desired, remove the pointer.
4. Replace POINTER on the spline rod so that its RIGHT edge is resting against the STOP SCREW located on the RIGHT SIDE OF THE COVER.
5. The new maximum temperature has now been set. Test this temperature by holding a thermometer under the flow of water to be certain it is as desired.

SMALL MIXING VALVE (TM-15)



1. Turn off hot and cold supplies at screwdriver checkstops.
2. Remove snap cap screw and washer. Remove HANDLE, Loosen LTR screw, then remove, RETAINING RING and STOP.
3. Temporarily place POINTER on the spline rod, turn LEFT for warmer temperature, turn RIGHT for cooler temperature. When valve is delivering warmest temperature desired, remove the pointer.
4. Push stop on rod so that its LEFT edge is resting against the fine adjustment screw on cover.
5. Turn fine adjustment screw, if necessary, (clockwise for lightly higher temperature, counter clockwise for slightly lower temperature).
6. The new maximum temperature has now been set. Test this temperature by holding a thermometer under the flow of water to be certain it is as desired.

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

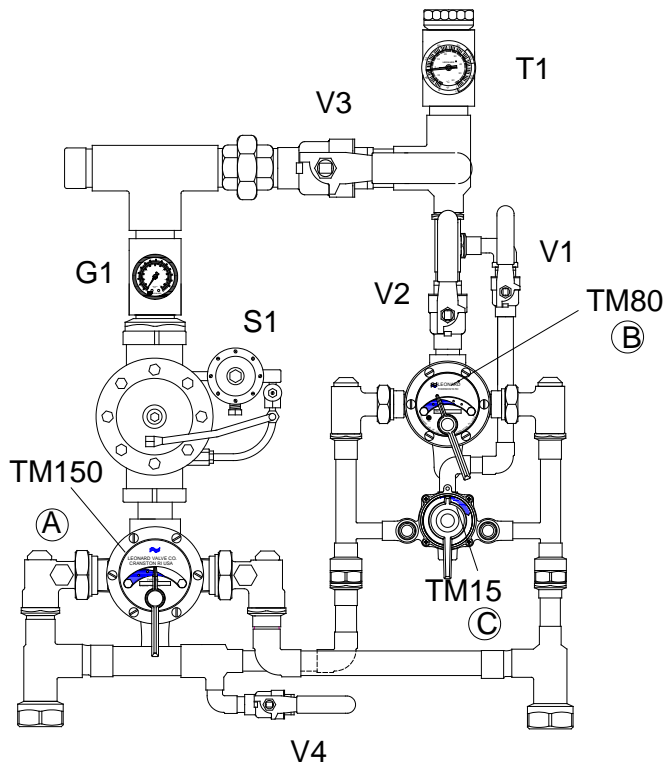
SEE PAGES: 6 & 7 FOR COMPLETE PARTS BREAKDOWN

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 10).

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

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

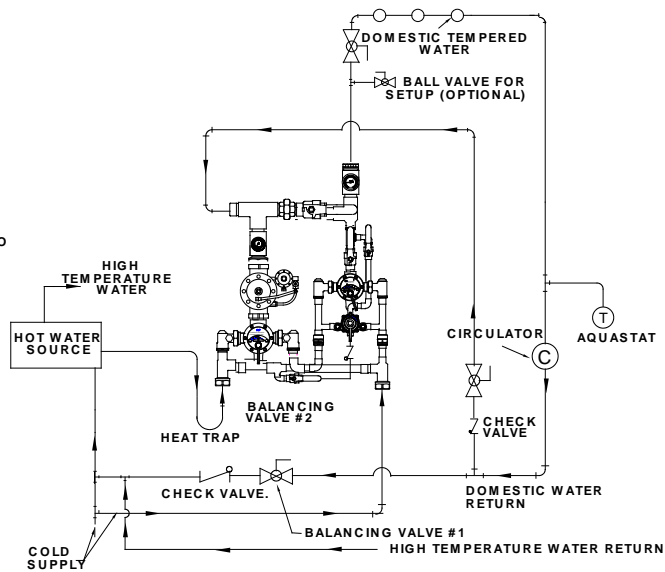


1. TM-186-PRV High-Low Unit **Must** be piped in accordance with appropriate Piping Method shown on page 4.
2. Shut down circulator pumps, close valve V3 and V4. Adjust screw S1 on the reducing pilot fully clockwise and record water pressure reading on gauge G1.
3. Carefully adjust screw S1 on the reducing 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

METHOD #4

NOTE: THIS PIPING METHOD IS USED FOR MODERATE FLOW SYSTEMS WHERE THE CIRCULATED FLOW IS EIGHT (8) TO TWENTY FIVE (25) GPM.



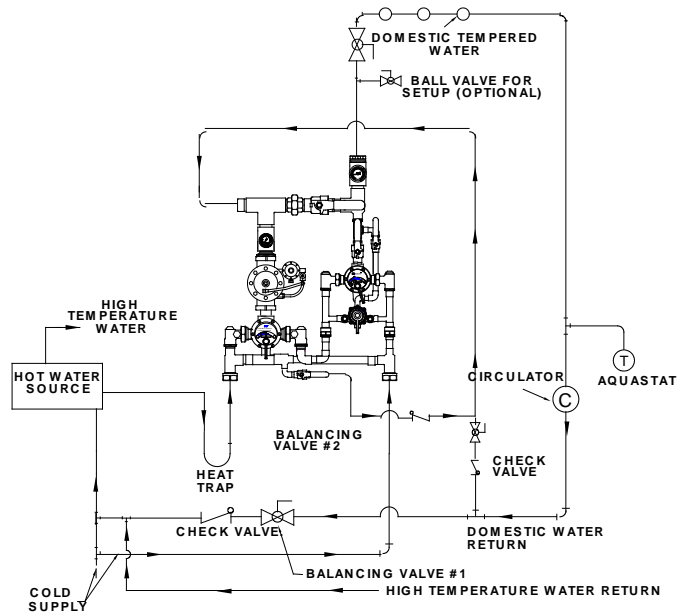
* MODERATE FLOW SYSTEM MAY BE DEFINED AS THOSE IN WHICH A RECIRCULATION FLOW OF EIGHT (8) TO TWENTY FIVE (25) GALLONS PER MINUTE IS REQUIRED TO MAINTAIN A GIVEN TEMPERATURE

PROCEDURE TO BALANCE SYSTEM :

1. MAKE SURE NO WATER IS BEING DRAWN IN THE BUILDING. OPEN BALANCING VALVE #1 APPROXIMATELY HALF WAY AND START CIRCULATOR. KEEP BALANCE VALVE #2 CLOSED AT THIS TIME
2. OBSERVE TEMPERATURE UNTIL IT STABILIZES.
3. CLOSE BALANCING VALVE #1 SLIGHTLY IF TEMPERATURE IS TOO HOT, OR OPEN IT SLIGHTLY IF TEMPERATURE IS TOO COLD. ALLOW TEMPERATURE TO STABILIZE, REPEAT UNTIL DESIRED CIRCULATION TEMPERATURE IS SET.
4. IF UNABLE TO REACH DESIRED TEMPERATURE WITH VALVE #1 IN THE FULL OPEN POSITION, OPEN BALANCE VALVE #2 IN SMALL INCREMENTS (i.e. 1/8, 1/4, 3/8, ETC) UNTIL DESIRED TEMPERATURE IS ACHIEVED.

METHOD #5

NOTE: THIS PIPING METHOD IS USED FOR HIGH FLOW SYSTEMS WHERE THE CIRCULATED FLOW IS TWENTY FIVE (25) GPM OR GREATER.



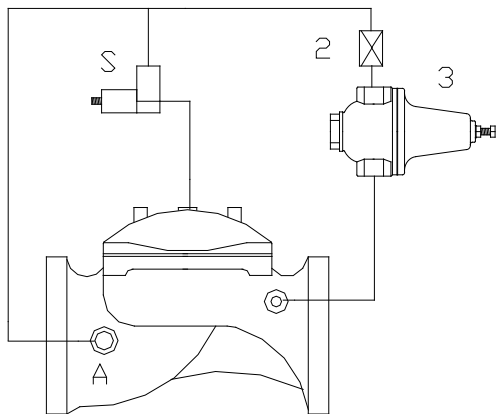
*HIGH FLOW SYSTEMS INCLUDE THOSE WHICH ARE REQUIRED TO RECIRCULATE A FLOW GREATER THAN (25) TWENTY FIVE GALLONS PER MINUTE SUCH SYSTEMS REQUIRE PIPING WHICH MAY INTRODUCE SIGNIFICANTLY MORE "HOT" WATER INTO THE SYSTEM DURING PERIODS OF NO DRAW

PROCEDURE TO BALANCE SYSTEM :

1. MAKE SURE NO WATER IS BEING DRAWN IN THE BUILDING. OPEN BALANCING VALVE #1 APPROXIMATELY HALF WAY AND START CIRCULATOR. KEEP BALANCE VALVE #2 CLOSED AT THIS TIME
2. OBSERVE TEMPERATURE UNTIL IT STABILIZES.
3. CLOSE BALANCING VALVE #1 SLIGHTLY IF TEMPERATURE IS TOO HOT, OR OPEN IT SLIGHTLY IF TEMPERATURE IS TOO COLD. ALLOW TEMPERATURE TO STABILIZE, REPEAT UNTIL DESIRED CIRCULATION TEMPERATURE IS SET.
4. IF UNABLE TO REACH DESIRED TEMPERATURE WITH VALVE #1 IN THE FULL OPEN POSITION, OPEN BALANCE VALVE #2 IN SMALL INCREMENTS (i.e. 1/8, 1/4, 3/8, ETC) UNTIL DESIRED TEMPERATURE IS ACHIEVED.

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

PRESSURE REDUCING VALVE



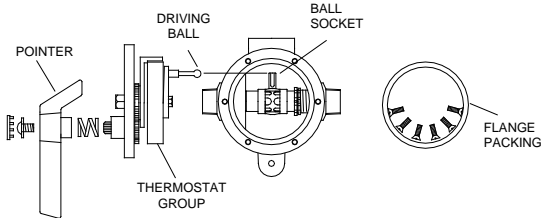
PARTS LIST

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

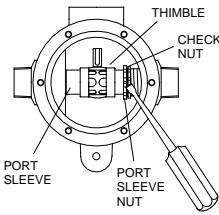
TROUBLESHOOTING

<u>SYMPTOM</u>	<u>CAUSE</u>	<u>REMEDY</u>
Valve fails to open	<ul style="list-style-type: none"> Insufficient inlet pressure No downstream demand Insufficient spring compression on pressure reducing pilot Trapped air 	<ul style="list-style-type: none"> Check/create inlet pressure Create demand/flow Turn adjusting screw on pressure reducing pilot 3 clockwise Bleed air from cover and bleed air from tubing at highest point
Valve Fails to Close or Regulate	<ul style="list-style-type: none"> Filter A plugged. Orifice fitting 2 plugged Regulated pressure pulsates or hunts. Debris trapped in main valve / Diaphragm in main valve Leaking / Scale on stem Pressure reducing pilot 3 not serviceable 	<ul style="list-style-type: none"> Remove in-line filter A and clean screen Remove orifice fitting 2 and clean Bleed air from cover and bleed air from tubing at highest point De-pressurized the system and remove valve cover and diaphragm to inspect/remove debris. Replace pressure reducing pilot

INSTRUCTIONS FOR SERVICING LARGER TM VALVE

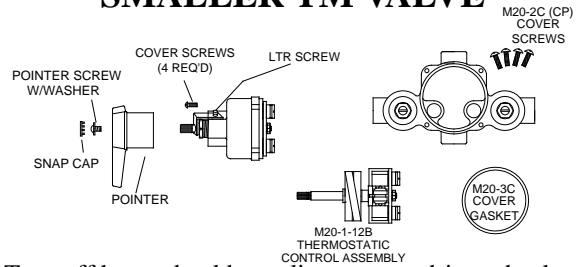


1. Shut off hot and cold supplies to this valve, remove snap cap, screw and washer, friction spring, and loosen LTR set screw on cover, remove pointer.
2. Remove, cover screws and cover, to which the thermostat group is attached.

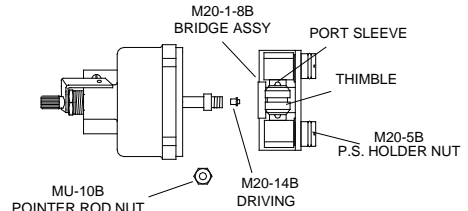


3. To clean port sleeve assembly (the thimble must slide freely on the port sleeve): unscrew the check nut as far as it will go, then screw the port sleeve nut into the base. The port sleeve and thimble may then be lifted out.
4. Clean with a non-corrosive cleaning solution. **DO NOT USE ABRASIVES!** The port sleeve should be reassembled in the valve with the shoulder to the left.
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.

INSTRUCTIONS FOR SERVICING SMALLER TM VALVE



1. Turn off hot and cold supplies at screwdriver checkstops. Remove handle. Remove M20-2C cover screws to release cover and thermostatic control assembly.



2. To remove bridge assembly, remove pointer rod nut (MU-10B) and pull bridge assembly off control rod. Do not misplace M20-14B driving stud.
3. To clean submerge bridge assembly in clean water or non-corrosive cleaning solution. **DO NOT USE ABRASIVES!** Be certain thimble moves freely on port sleeve. Note! Driving stud (M20-14B) must engage slot in thimble when reassembling.
4. To clean thermostat group, loosen gland nut and remove cover. Brush in a non-corrosive cleaning solution.
5. To disassemble bridge assembly, see drawing next page (remove M20-5B holder nuts with screwdriver in slots provided).

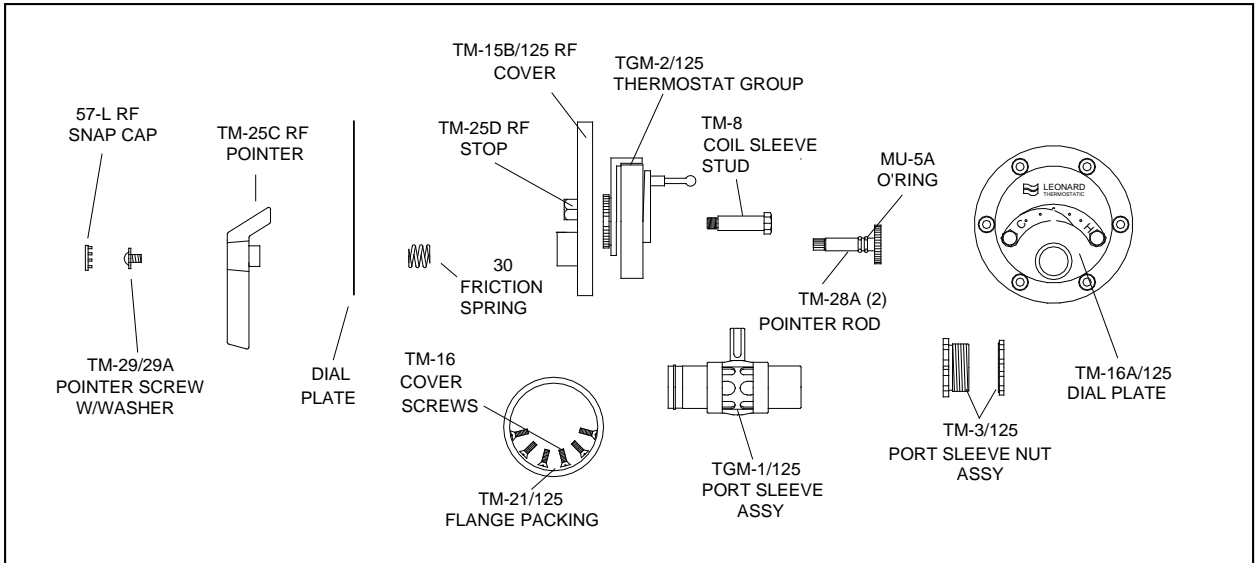
TROUBLESHOOTING INSTRUCTIONS

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

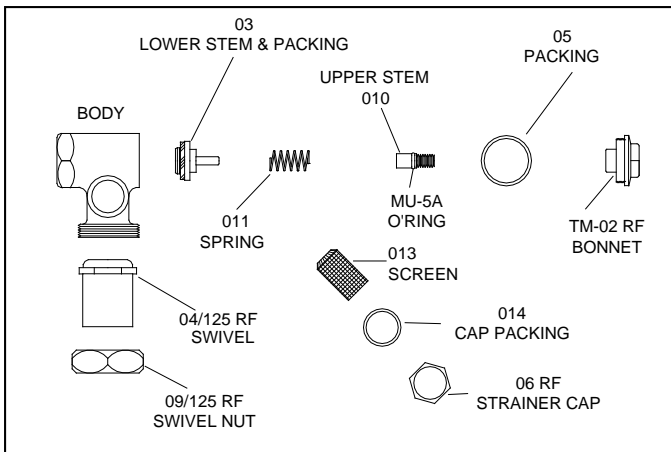
		TM-150	TM-80	TM-15
PACKING & GASKETS	<ol style="list-style-type: none"> 1. Leaks at stem. 2. Leak between valve cover and base. 	Kit # 1/125	Kit # 1/50Y	Kit # 1/M20 (Packings & Gaskets)
PORT SLEEVE/BRIDGE ASSEMBLY	<ol style="list-style-type: none"> 3. Valve delivers either all hot or all cold water, or will not mix consistently. 	Kit # R/125 or TGM-1/125	Kit # R/50 or TGM-1/50	Kit # R/M20 or M20-1-8B Bridge assembly
THERMOSTAT GROUP	<ol style="list-style-type: none"> 4. After cleaning or replacing port sleeve/bridge assembly, valve performance is not consistent. 	Kit # R/125 or TGM-2/125	Kit # R/50 or TGM-2/50	Kit #R/M20 (Rebuilding Kit) or M20-G2 Thermostat Group
CHECKSTOPS	<ol style="list-style-type: none"> 5. Hot water by-pass into cold line(or cold into hot). 6. Supplies cannot be shut off completely. Supplies leak at checkstop bonnets. 	Kit #2/125	Kit #2/50Y	Kit #4/M20 (Checkstop Kit)

See pages 7, 8 & 9 for Parts Breakdowns

TM-150 VALVE PARTS

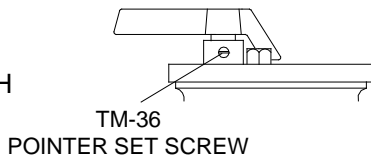


CHECKSTOP PARTS



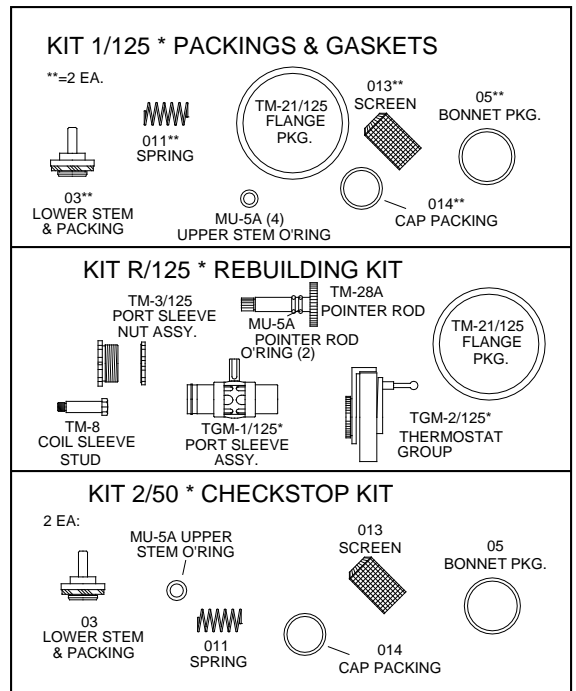
LTR POINTER

TM VALVES ARE FURNISHED WITH LOCKABLE POINTERS.



REPAIR KITS

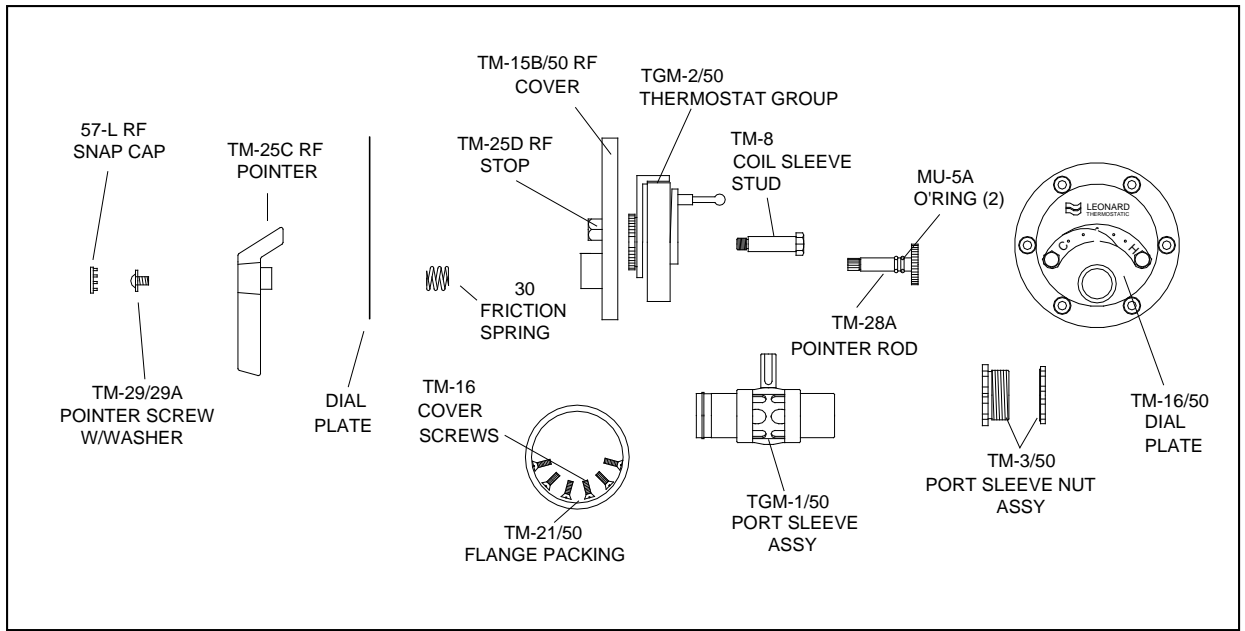
*"125" FOR TM-150



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

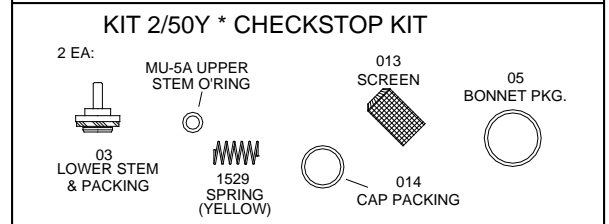
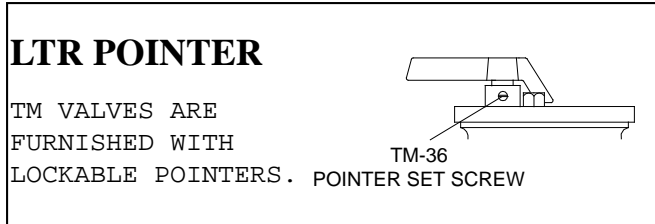
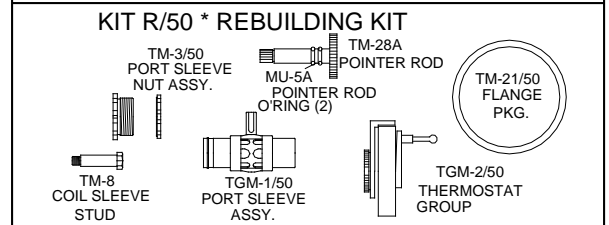
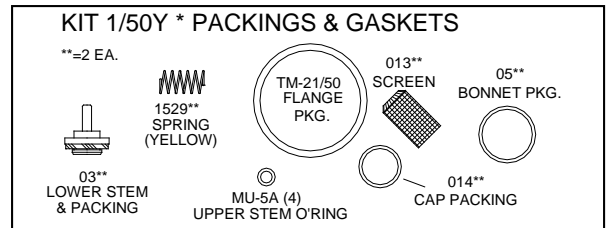
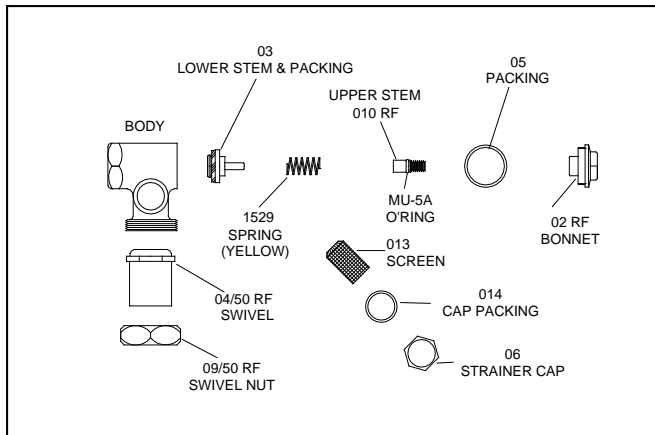
NOTE: AFTER INSTALLING NEW PARTS IT WILL BE NECESSARY TO RESET THE ADJUSTABLE HIGH TEMPERATURE LIMIT STOP ON EACH VALVE (SEE PAGE 2).

LARGE TM-80 VALVE PARTS



CHECKSTOP PARTS

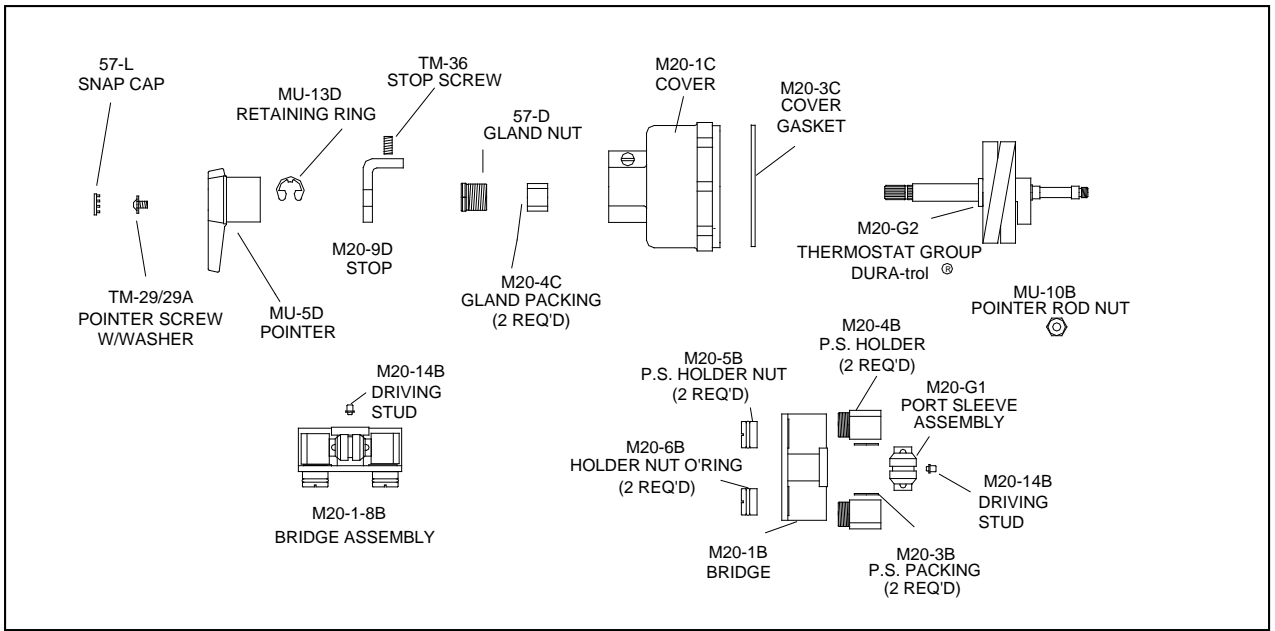
REPAIR KITS *"50" FOR TM-80



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

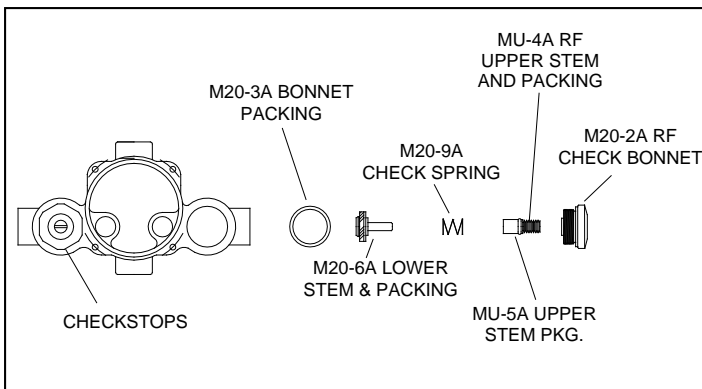
NOTE: AFTER INSTALLING NEW PARTS IT WILL BE NECESSARY TO RESET THE ADJUSTABLE HIGH TEMPERATURE LIMIT STOP ON EACH VALVE (SEE PAGE2).

TM-15 VALVE PARTS



CHECKSTOP PARTS

REPAIR KITS



LTR POINTER

TM valves are furnished with lockable pointers. See part noted

KIT 1/M20 PACKINGS & GASKETS

- MU-4C GLAND PKG. (2 EACH)
- M
- M20-9A CHECK SPRING (2 EACH)
- M20-3A BONNET PKG. (2 EACH)
- M20-3C COVER GASKET
- M20-6B HOLDER NUT O'RING (2 EACH)
- MU-5A O'RING (2 EACH)
- M20-6A LOWER STEM & PKG. (2 EACH)

KIT R/M20 REBUILDING KIT

- M20-3C COVER GASKET
- M20-1-12B-GB THERMOSTATIC CONTROL ASSEMBLY

KIT 2/M20 PORT SLEEVE KIT

- M20-3B P.S. PACKING (2 EACH)
- M20-G1 PORT SLEEVE ASSY.
- M20-6B HOLDER NUT O'RING (2 EACH)
- M20-14B DRIVING STUD

KIT 4/M20 CHECKSTOP KIT

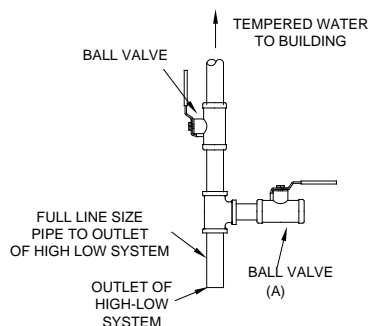
- M20-9A CHECK SPRING (2 EACH)
- M
- M20-6A LOWER STEM & PKG. (2 EACH)
- M20-3A BONNET PKG. (2 EACH)
- MU-5A O'RING (2 EACH)

REMEMBER! THIS 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 PAGE 2).

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

MODEL	IN	OUT	MINIMUM FLOW (GPM) (l/min)	SYSTEM PRESSURE DROP (PSIG)										
				5	10	15	20	25	30	35	40	45	50	PSI
TM-186-1508015PRV	1 1/2"	2"	1.0 (3.7)	.3	.7	.97	1.4	25	30	35	40	45	50	BAR
				70	90	120	130	150	170	180	185	190	200	GPM
				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:

Manufacturer of PRV: _____

Type: _____

Serial number: _____



(This information is found on the tag attached)

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.