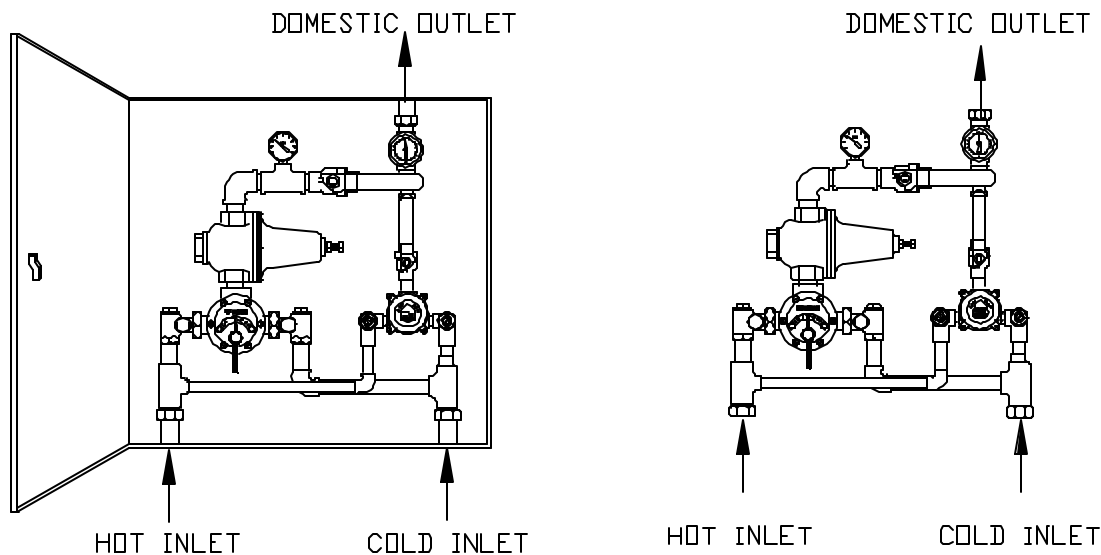




# INSTALLATION ADJUSTMENT SERVICE HIGH-LOW MANIFOLD SYSTEMS TM-415, TM-815, TM-186-415 & TM-186-815

IMPORTANT! Provide valve serial numbers (stamped on cover of valves) when ordering parts!!



## INSTALLATION

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.
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 #2/PRV** (see page 3).
6. Refer to page 4 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@leonard](mailto:info@leonard) valve.com WEB: <http://www.leonardvalve.com>

# ADJUSTMENT AND SERVICE

Leonard 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.

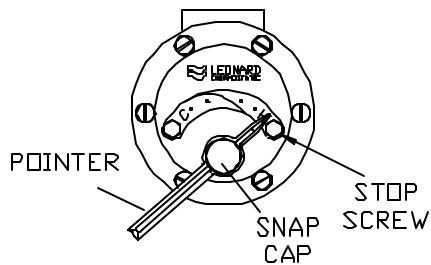
**NOTE:** High Low Manifold Systems include Thermostatic Water Mixing Valves which must be regularly maintained to provide best performance. Frequency of cleaning depends on quality of local water conditions and usage. See Maintenance Guide and Record MGR-1000.

## 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!**

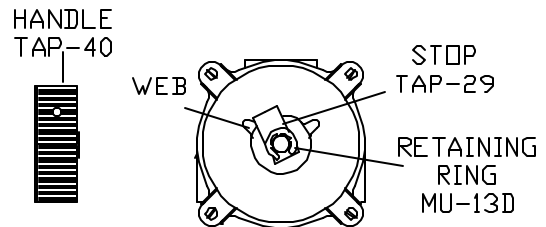
## TO RESET ADJUSTABLE HIGH TEMPERATURE LIMIT STOP:

### LARGE MIXING VALVE (TM-50,80)



1. Remove SNAP CAP, SCREW & WASHER. Remove POINTER.
2. 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.
3. 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.
4. 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 (TA)



1. While valve is running, turn handle to maximum hot temperature.
2. Remove TAP-40 handle, MU-13D retaining ring and TAP-29 stop.
3. Replace handle on stem and turn stem until desired maximum temperature is reached.
4. Replace stop so it rests against the web on the LEFT side of cover. Replace retaining ring and handle.
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.

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

**SEE PAGES: 6 & 7 FOR COMPLETE PARTS BREAKDOWN**

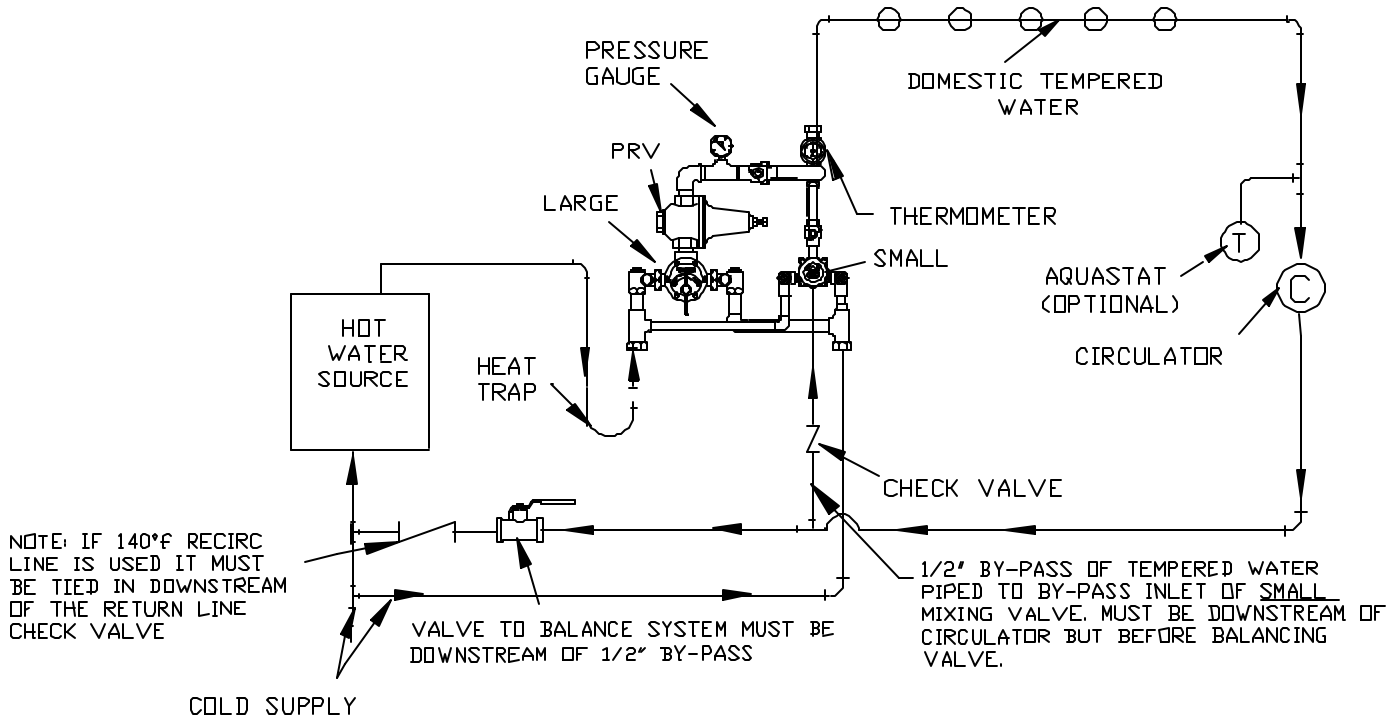
Check for significant variations in outlet flow. Thermostatic valves will NOT provide the desired accuracy outside of their flow capacity range. Minimum flows must be no less than shown (see Flow Capacities, page 8).

If installed on a recirculated hot water system, make certain the valve is piped according to Leonard Required Piping Method #2 PRV (see page 3).

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

# REQUIRED METHOD OF PIPING (RECIRCULATED DOMESTIC WATER SYSTEMS)

## METHOD #2/PRV \*

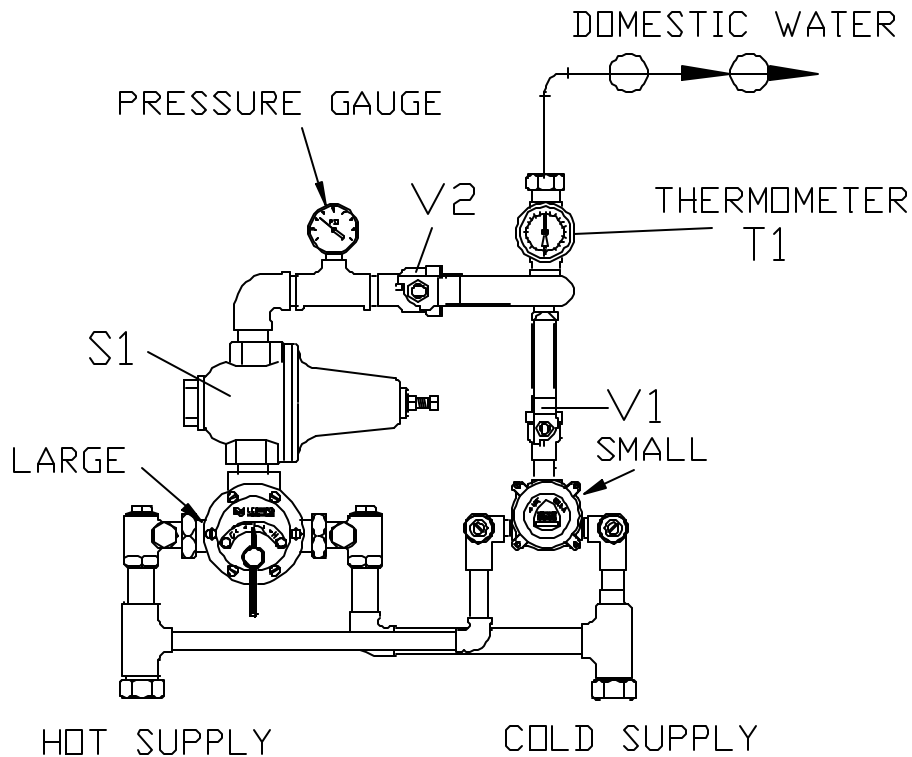


## PROCEDURE TO BALANCE RECIRCULATION SYSTEM

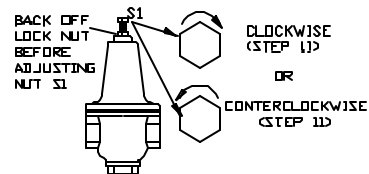
1. MAKE SURE NO WATER IS BEING DRAWN IN THE BUILDING. OPEN BALANCING VALVE APPROXIMATELY HALF WAY AND START CIRCULATOR.
2. OBSERVE TEMPERATURE UNTIL IT STABILIZES.
3. CLOSE BALANCING VALVE SLIGHTLY IF TEMPERATURE IS TOO HOT, OR OPEN IT SLIGHTLY IF TEMPERATURE IS TOO COLD AND ALLOW TEMPERATURE TO STABILIZE. REPEAT UNTIL DESIRED RECIRCULATED TEMPERATURE IS SET.

**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

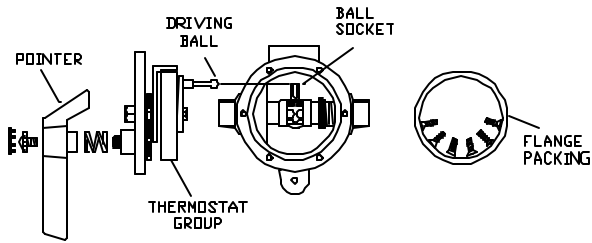


1. TM High-Low Unit MUST be piped according to Method #2 PRV (see page 4). To balance recirculated domestic water systems, see page 4.
2. Make sure full hot and cold supplies to this assembly are operating. The temperature of the hot water source must be properly set and maintained.
3. The circulator (if used) must be turned OFF before setup.
4. Turn on enough fixtures for a flow of at least 8 GPM (30 l/min.) downstream from this system. Make sure each fixture is set to deliver full "HOT" water.
5. Close outlet Valve V1 set the smaller TM valve to full "COLD".
6. Make sure Valve V2 at the large Type TM Valve is in the full open position.
7. Set outlet temperature of the large Type TM Valve to the required level.
8. Open outlet Valve V1 at the small TM Valve.
9. Turn off enough fixtures downstream from this unit to reduce flow to approximately 1 GPM (3.8 l/min.)
10. After reducing flow observe the temperature at Thermometer T1. Note: the temperature should drop 15 to 20°F (8 to 11°C) from step 7.
11. If the temperature dropped MORE THAN 20°F (11°C), turn nut S1 clockwise until it has dropped 15 to 20°F (8 to 11°C).
12. If the temperature has dropped LESS THAN 15°F (8°C), turn nut S1 counterclockwise until it has dropped 15 to 20°F (8 to 11°C).
13. Shut outlet valve V2 at the large TM valve.
14. Set outlet temperature of the small TM valve to the same temperature as the large TM Valve.
15. Open outlet Valve V2. System is operational.

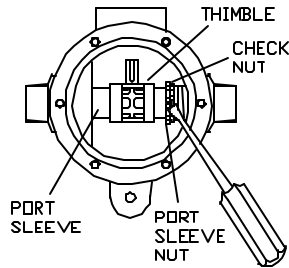


\* NOTE! FOR OPTIONAL OUTLET SETUP PIPING ARRANGEMENT, SEE PAGE 8.

## INSTRUCTIONS FOR SERVICING LARGER TM VALVE

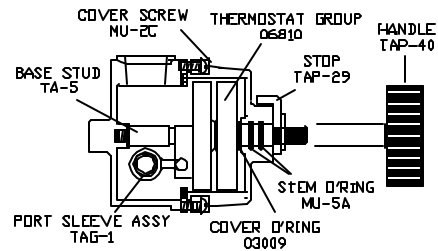


1. Remove snap cap, screw and washer, friction spring and pointer. Shut off hot and cold supplies to this valve.
2. Remove cover screws and cover, to which the thermostat group is attached.

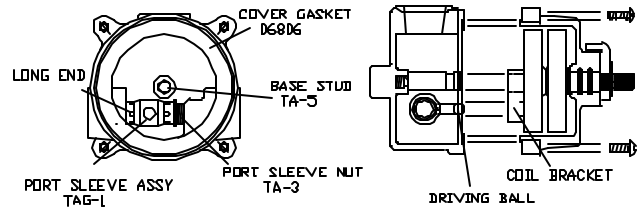


3. To clean port sleeve (do not slide freely on the port sleeve): unscrew the check nut as far as it will go, then screw the port sleeve nut into the base. The port sleeve and thimble may then be lifted out.
4. Clean with a non-corrosive cleaning solution. **DO NOT USE ABRASIVES!** The port sleeve should be reassembled in the valve with the shoulder to the left.
5. When reassembling, make sure driving ball of thermostat group engages the ball socket of the port sleeve assembly.

## INSTRUCTIONS FOR SERVICING SMALLER TA VALVE



1. Remove handle. Turn off hot and cold supplies at screwdriver checkstops. Remove MU-2C cover screws to release cover and thermostat group.



ONE SET OF PORT SLOTS MUST BE ASSEMBLED TOWARD VALVE FRONT

2. To clean port sleeve assembly TAG-1. Remove base stud TA-5. Back off TA-3 port sleeve nut into the base. Slide TAG-1 port sleeve assembly toward nut and lift assembly out. Clean in water with a soft cloth (DO NOT USE ABRASIVES). Reassemble with long end in base and short end at port sleeve nut. Tighten port sleeve nut (do not over tighten to distort port sleeve). Port sleeve assembly must move freely from side to side.
3. To clean 06810 thermostat group remove handle, retaining ring and stop. Push thermostat group's stem through cover. DO NOT PULL COILS OUT OF SHAPE! Clean and brush off deposits in a non-corrosive solution.
4. To reassemble place thermostat group on base stud and BE SURE DRIVING BALL ON TAG-1 IS INSERTED IN HOLE ON LOWER COIL BRACKET. Turn stem to assure that parts are properly connected. Replace cover, gasket, cover and cover screws.

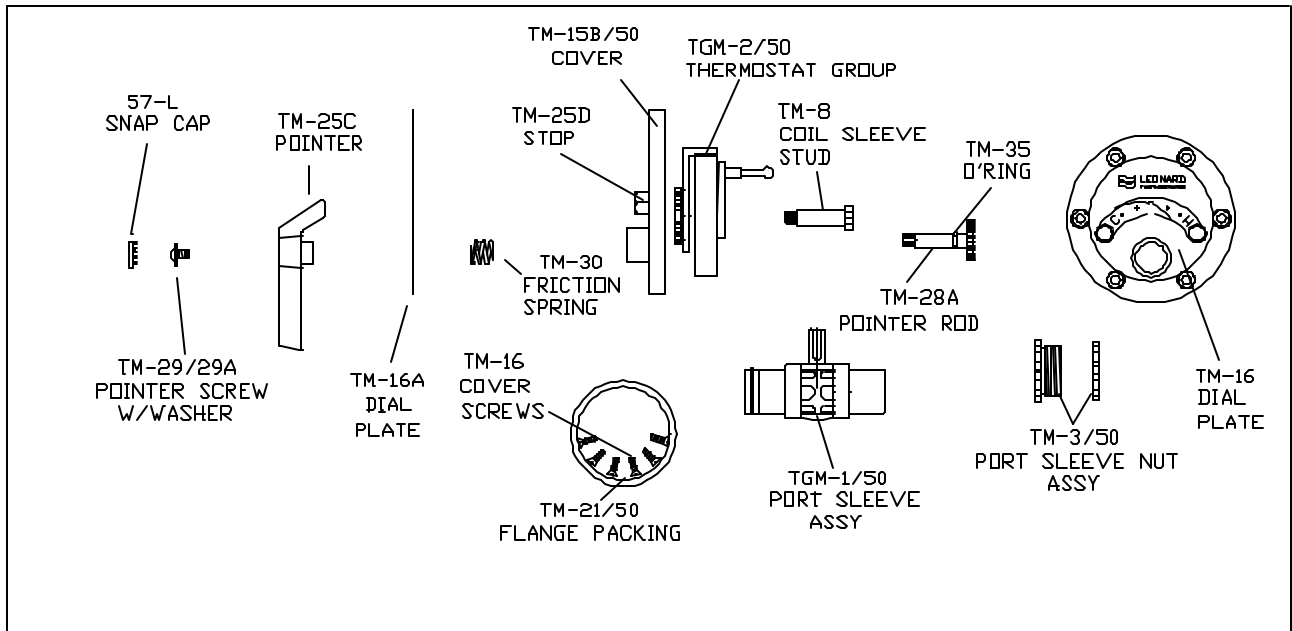
## TROUBLESHOOTING INSTRUCTIONS

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

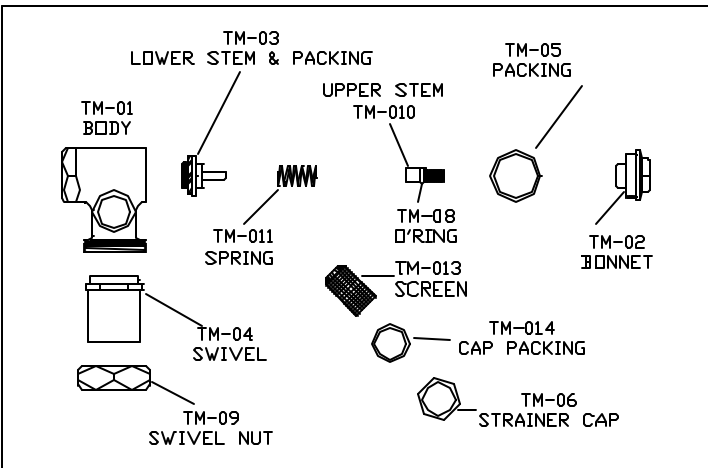
		Large Valve:	Small Valve:
PACKING & GASKETS	<ol style="list-style-type: none"> <li>1. Leaks at stem.</li> <li>2. Leak between valve cover and base.</li> </ol>	Kit # 1/50	MU-5A stem o'ring (2ea). 03009 cover o'ring, 06806 cover gasket
PORT SLEEVE/BRIDGE ASSEMBLY	<ol style="list-style-type: none"> <li>3. Valve delivers either all hot or all cold water, or will not mix consistently.</li> </ol>	Kit # R/50 or TGM-1/50	Kit #R/TA/N (Rebuilding Kit) or TAG-1 port sleeve assembly
THERMOSTAT GROUP	<ol style="list-style-type: none"> <li>4. After cleaning or replacing port sleeve Assembly, valve performance is not consistent.</li> </ol>	Kit # R/50 or TGM-2/50	Kit #R/TA/N (Rebuilding Kit) or 06810 Thermostat Group
CHECKSTOPS	<ol style="list-style-type: none"> <li>5. Hot water by-pass into cold line (or cold into hot).</li> <li>5. Supplies cannot be shut off completely. Supplies leak at checkstop bonnets.</li> </ol>	Kit #2/50	Kit #4/LVC (Checkstop Kit)

See pages 6 & 7 for Parts Breakdowns

# LARGE TM VALVE PARTS

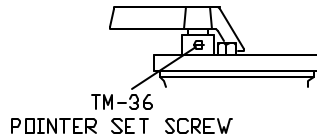


## CHECKSTOP PARTS



### LOCK-TYPE POINTER (SUFFIX LTR)

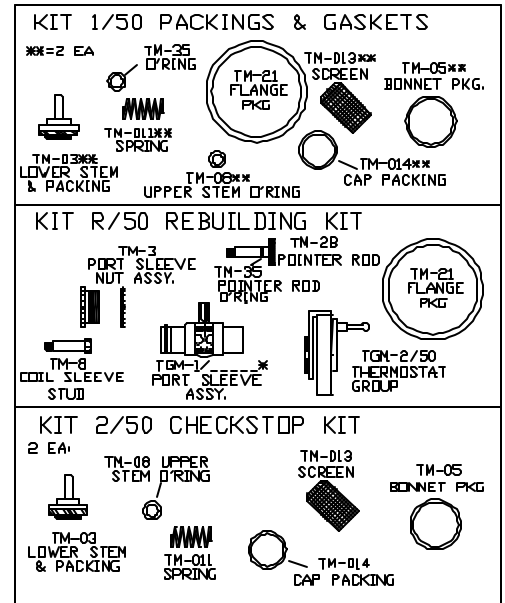
Some TM valves are furnished with lockable pointers. See part noted



### TO CLEAN THERMOSTAT GROUP

If a deposit has collected on the thermostat group (TGM-2), brush in a non-corrosive cleaning solution.

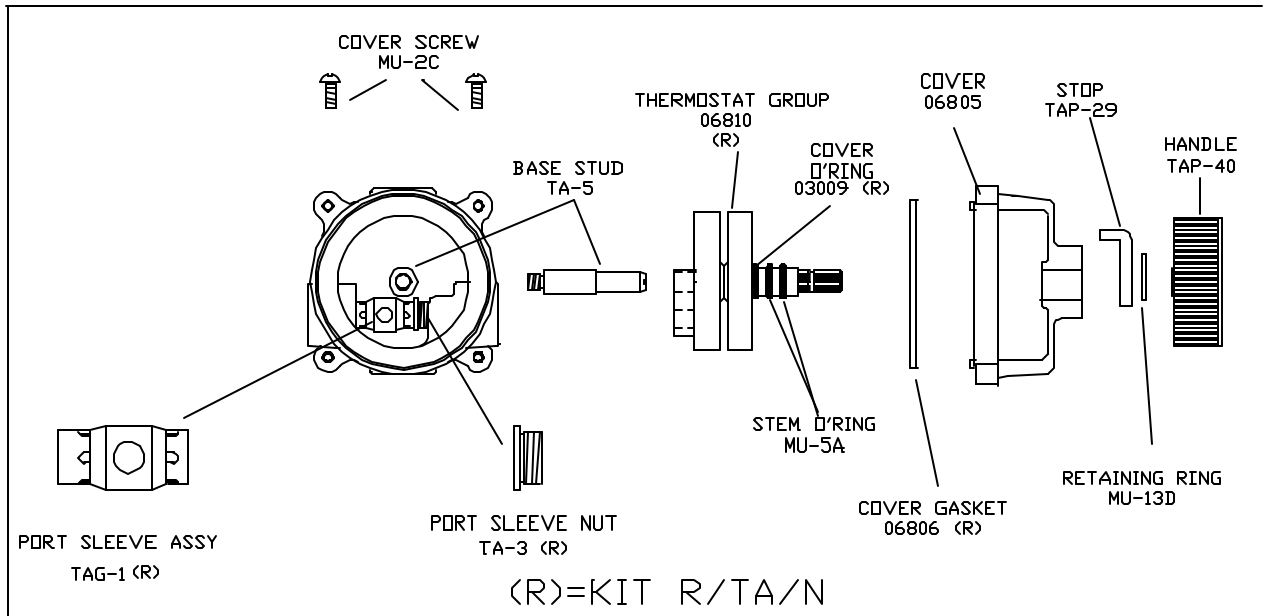
## REPAIR KITS



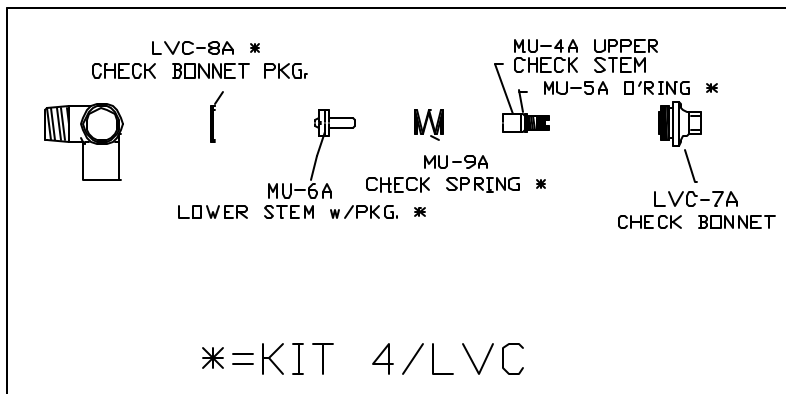
REMEMBER! THIS IS A CONTROL DEVICE WHICH MUST BE CLEANED AND MAINTAINED ON A REGULAR BASIS (SEE MAINTENANCE GUIDE AND RECORD, MGR-1000).

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

# SMALL TA VALVE PARTS



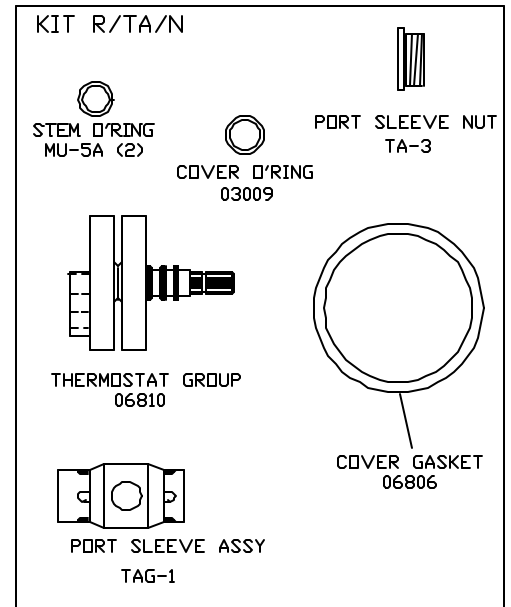
## CHECKSTOP PARTS



## TO CLEAN THERMOSTAT GROUP

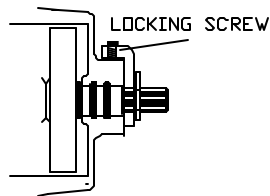
If a deposit has collected on the thermostat group (06810) brush in a non-corrosive cleaning solution.

## REPAIR KIT



## LOCK-TYPE POINTER (SUFFIX LTR)

Some TA valves are furnished with lockable pointers. See part noted.

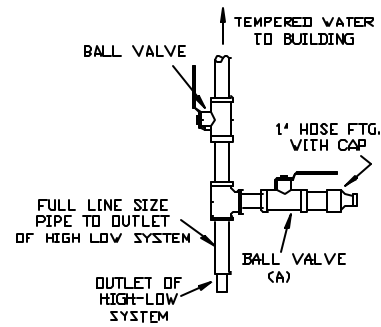


**REMEMBER!** THIS IS A CONTROL DEVICE WHICH MUST BE CLEANED AND MAINTAINED ON A REGULAR BASIS (SEE MAINTENANCE GUIDE AND RECORD, MGR-1000).

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

## OPTIONAL OUTLET SETUP PIPING

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
				.3	.7	.97	1.4	1.7	2.1	2.4	2.8	3.1	3.4	BAR
TM-415	3/4"	1"	0.5 (1.9)	20 76	31 117	41 155	48 182	53 201	60 227	68 257	73 276	77 291	31 307	GPM l/min
TM-815	1"	1 1/4"	0.5 (1.9)	22 83	33 125	44 167	52 197	56 212	64 242	73 276	78 295	83 314	86 326	GPM 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 to the adjusting screw).

#### SYMPTOM:

1. If PRV leaks by adjusting screw or if no pressure adjustment is possible.
2. If low pressure in building
3. If outlet pressure has to be 70 to 100 PSI

Repair Kit:  
Kit R/PRV

Low Pressure Spring LP/PRV  
High Pressure Spring HP/PRV

### 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.