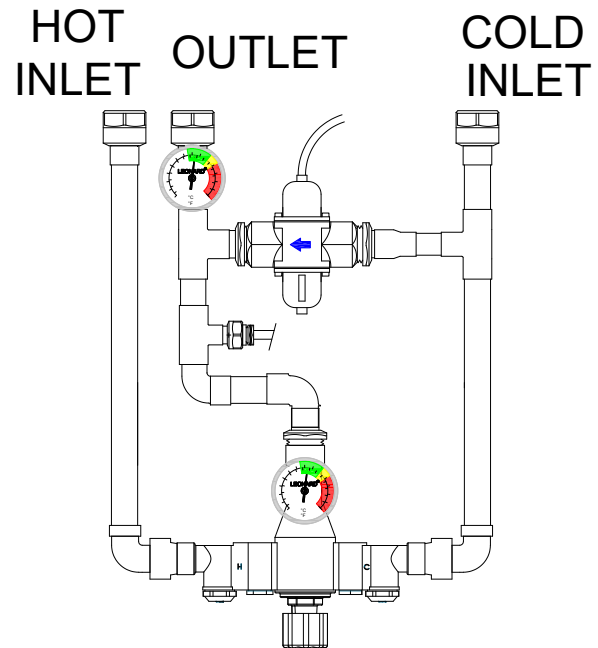
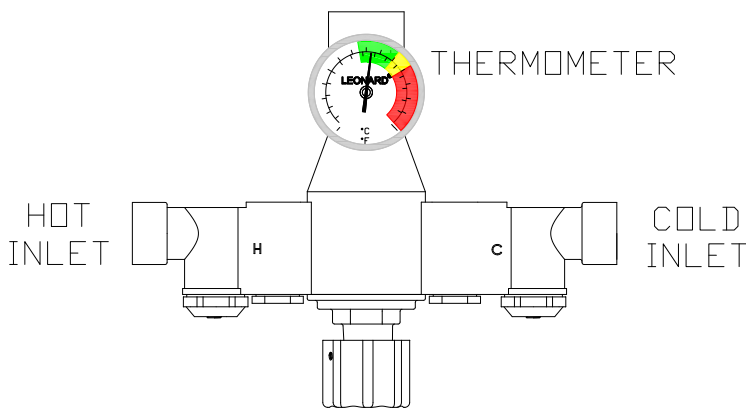


# INSTALLATION SETUP AND OPERATING INSTRUCTIONS EMERGENCY MIXING VALVE SYSTEM EXL-600-LF, EXL-800-LF, EXL-850-LF

Compliance.....ANSI Z

**EXL-600-LF,  
EXL-800-LF**

<sup>358.1</sup>  
**EXL-850-LF**



## INSTALLATION

- |   |   |
|---|---|
| <ol style="list-style-type: none"> <li>1. The installation / field adjustment of the valve are the responsibility of the installer and shall be carried out in accordance with the instructions with this O&amp;M.</li> <li>2. Valve should be installed at a location where it can easily be cleaned, adjusted or repaired.</li> <li>3. The mixing valve has integral checkstops.</li> </ol> | <ol style="list-style-type: none"> <li>4. The inlets are clearly marked on the valve body casting. Connect the hot water into the inlet marked "H" and cold water into the inlet marked "C". <b>The unit will NOT work properly if the inlets are not piped properly.</b></li> <li>5. Use solder or pipe cement sparingly. Supply pipes should be flushed before the valve is connected. Flush outlet pipe and valve as soon as it is connected.</li> </ol> |
|---|---|

**NOTE:** It may be necessary to recirculate the tempered water to the emergency fixture should the piping be exposed to excessive hot or cold conditions. Consult factory for proper piping.

**IMPORTANT!** These systems are designed to provide mixed water from 60 to 90°F (15 to 32°C) for emergency fixture applications only. Call Leonard for systems designed to operate at temperatures outside of this range.

**REMEMBER!** THIS IS A CONTROL SYSTEM WHICH MUST BE CLEANED AND MAINTAINED ON A REGULAR BASIS (SEE MAINTENANCE GUIDE AND RECORD MGR-1001).

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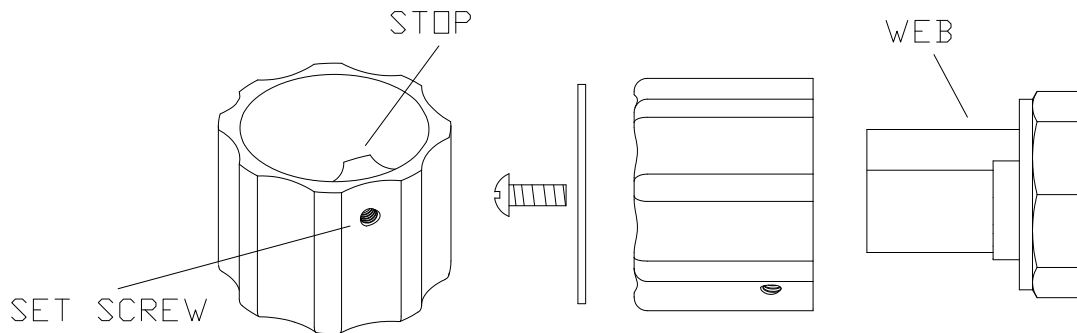
**WARNING:** This product can expose you to chemicals including lead, which is known to the State of California to cause cancer. For more information, go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

# ADJUSTMENT AND SERVICE

Leonard Type EXL 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 valve.

**NOTE:** Thermostatic Water Mixing Valves are REGULATING mechanisms, 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 and ANSI Z358.1).

## TO RESET ADJUSTABLE HIGH TEMPERATURE LIMIT STOP:



1. Remove screw in center of handle, remove handle.
2. Turn emergency fixture on.
3. Replace handle on stem and turn stem until desired maximum temperature is reached.
4. Remove handle.
5. Replace handle so that the "stop" inside the handle is up against the "web" on the valve cover, handle should not be able to be turned any "hotter".
6. Replace handle screw, tighten set screw if desired.

### WARNING

**WARNING!** This Thermostatic Mixing Valve has an adjustable high temperature limit stop which must be checked. If temperature is too high, the installer **MUST RESET** this stop immediately. Always check the temperature of the mixed water when the lever handle is turned to full **HOT**. Excessively hot water is **DANGEROUS AND MAY CAUSE SCALDING!**

The high temperature limit stop is factory set at approximately 90°F (32°C) with an incoming hot water supply temperature of 135°F (57°C). If the incoming hot water on the job is higher than 135°F, the valve when turned to full hot will deliver water in excess of 90°F (32°C) and the high temperature limit stop **MUST BE RESET BY THE INSTALLER.**

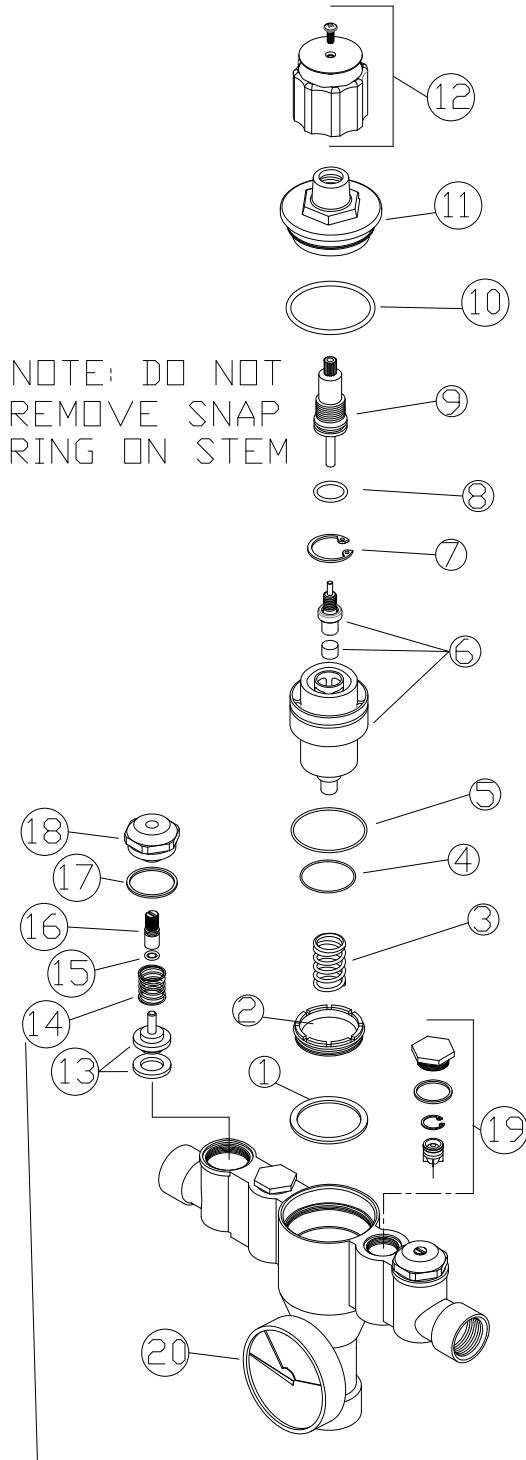
## INFORMATION / INSTRUCTIONS

- EXL-600, 3/4" female NPT inlets and 1" female NPT outlet
- EXL-800, EXL-850, 1" female NPT inlets and 1-1/4" female NPT outlet
- Maximum Operating Pressure 125PSI (860 KPA)
- Outlet temperature range from 60 to 90°F (15 to 32°C) for drench / eye / eye/face wash applications only
- Hot water inlet temperature range is 120 to 180°F (49 to 82°C)
- Cold water inlet temperature range is 33 to 75°F (.5 to 24°C)
- Installer needs to verify that no single emergency fixture supplied by this device has a minimum flow rate less than 3.0 GPM (11.4 L/M)
- Valve must be accessible for testing, adjustment and/or maintenance in its installed position
- If shut-off valves are installed for maintenance purposes, provisions must be made to prevent unauthorized shut-off

**REMEMBER! THIS IS A CONTROL DEVICE WHICH MUST BE CLEANED AND MAINTAINED ON A REGULAR BASIS. (SEE MAINTENANCE GUIDE AND RECORD, MGR-1001).**

# TROUBLESHOOTING INSTRUCTIONS

**NOTE: All parts / kits are the same for EXL-600, EXL-800 and EXL-850**



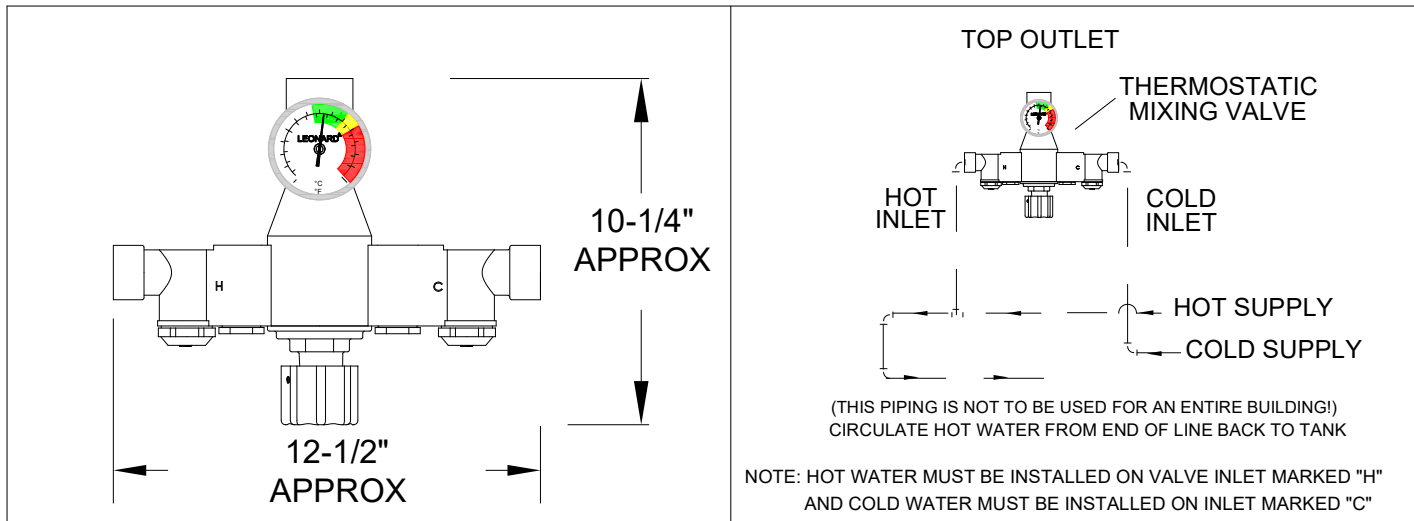
NOTE: HOT SIDE SPRING HAS RED MARKINGS, COLD SIDE HAS NO MARKINGS

- Leak from stem, cover or between body and cover
  - replace o-rings with  
**KIT 1/EXL800**
- Water crossing over from hot to cold or cold to hot
  - Clean checkstops, if that does not fix issue repair checkstops with  
**KIT 4/EXL800** (kit includes parts for both left and right checkstops)
- Valve outlet temperature is too hot or cold and cannot be adjusted
  - Clean valve interior, if that does not fix issue repair valve with  
**KIT R/EXL800**

KIT #	TYPE KIT	INCLUDES
KIT 1/EXL800	O-RING KIT	1, 4, 5, 8, 10
KIT R/EXL800	REPAIR KIT	1 THRU 8, 10
KIT 4/EXL800	CHECK	13 THRU 19

ITEM #	DESCRIPTION	QTY.	PART # / KIT #
1	SHUT OFF DISK	1	KIT 1/EXL800, KIT R/EXL800
2	LOCKING RING	1	KIT R/EXL800
3	RETURN SPRING	1	KIT R/EXL800
4	O-RING, SHUTTLE, LOWER	1	KIT 1/EXL800, KIT R/EXL800
5	O-RING, SHUTTLE, UPPER	1	KIT 1/EXL800, KIT R/EXL800
6	SHUTTLE ASSEMBLY	1	KIT R/EXL800
7	SNAP RING, COVER	1	KIT R/EXL800
8	O-RING, STEM	1	KIT 1/EXL800, KIT R/EXL800
9	STEM	1	851300
10	O-RING, COVER	1	KIT 1/EXL800, KIT R/EXL800
11	COVER	1	8504
12	KNOB ASSEMBLY	1	852700
13	LOWER STEM & PACKING	2	KIT 4/EXL800
14	SPRING,CHECK	2	KIT 4/EXL800
15	O'RING, UPPER STEM	2	KIT 4/EXL800
16	STEM, UPPER CHECK	2	KIT 4/EXL800
17	PACKING, BONNET	2	KIT 4/EXL800
18	BONNET	2	KIT 4/EXL800
19	BYPASS ASSEMBLY	2	KIT 4/EXL800
20	THERMOMETER	1	2129

# EXL-600-LF / EXL-800-LF / EXL-850-LF



**CAUTION!** It may be necessary to recirculate the tempered water to the eye/face wash should the piping be exposed to excessive hot or cold conditions. See page 5 for piping for a tepid recirculation loop.

## FLOW CAPACITIES

MODEL	IN	OUT	MINIMUM FLOW (GPM)	INTERNAL COLD WATER BY-PASS	PRESSURE DROP									PSI
			L\MIN	AT 30 PSI DROP	5	10	15	20	25	30	35	40	45	
					0.3	0.7	1.0	1.4	1.7	2.1	2.4	2.8	3.1	BAR
EXL-600-LF	3/4"	1"	3	20	15	22	28	33	37	41	45	48	51	GPM
			11.4	75.7	57	83	106	125	140	155	170	182	193	L\MIN
EXL-800-LF	1"	1-1/4"	3	20	21	29	35	41	46	51	56	59	61	GPM
EXL-850-LF			11.4	75.7	79	110	132	155	174	193	212	223	231	L\MIN
MAXIMUM FLOW CAPACITY														

Flow rate with cold water shut-off, less than .2 GPM (.75 L/M)

The Emergency drench / eye/face wash Mixing Valve shall control and maintain the temperature of the water to the station. Unit shall be self contained and include a thermostatic water mixing valve, a dial thermometer on the outlet, checkstops, unit set for 85°F (29°C) and a maximum temperature of 90°F (32°C). Unit must be able to be set to the correct temperature for the specific contaminant but must be locked in place to prevent changing of the temperature by accident. Unit must be checked weekly for performance in conjunction with the requirements of ANSI Z358.1.

**WARNING! IT IS THE RESPONSIBILITY OF THE SPECIFIER TO DETERMINE THE DELIVERED WATER TEMPERATURE TO EACH SAFETY FIXTURE. A COMFORTABLE RANGE IS 60°F TO 90°F (15° TO 32°C). IN CIRCUMSTANCES WHERE A CHEMICAL REACTION IS ACCELERATED BY WATER TEMPERATURE, A MEDICAL ADVISOR SHOULD BE CONSULTED FOR THE OPTIMUM TEMPERATURE FOR EACH APPLICATION.**

Specifications are subject to change without notice!

**CAUTION!** All thermostatic water mixing valves have limitations. They will NOT provide the desired accuracy outside of their flow capacity range. Consult the Flow Capacity Chart and DO NOT OVERSIZE. Minimum flow must be no less than indicated.



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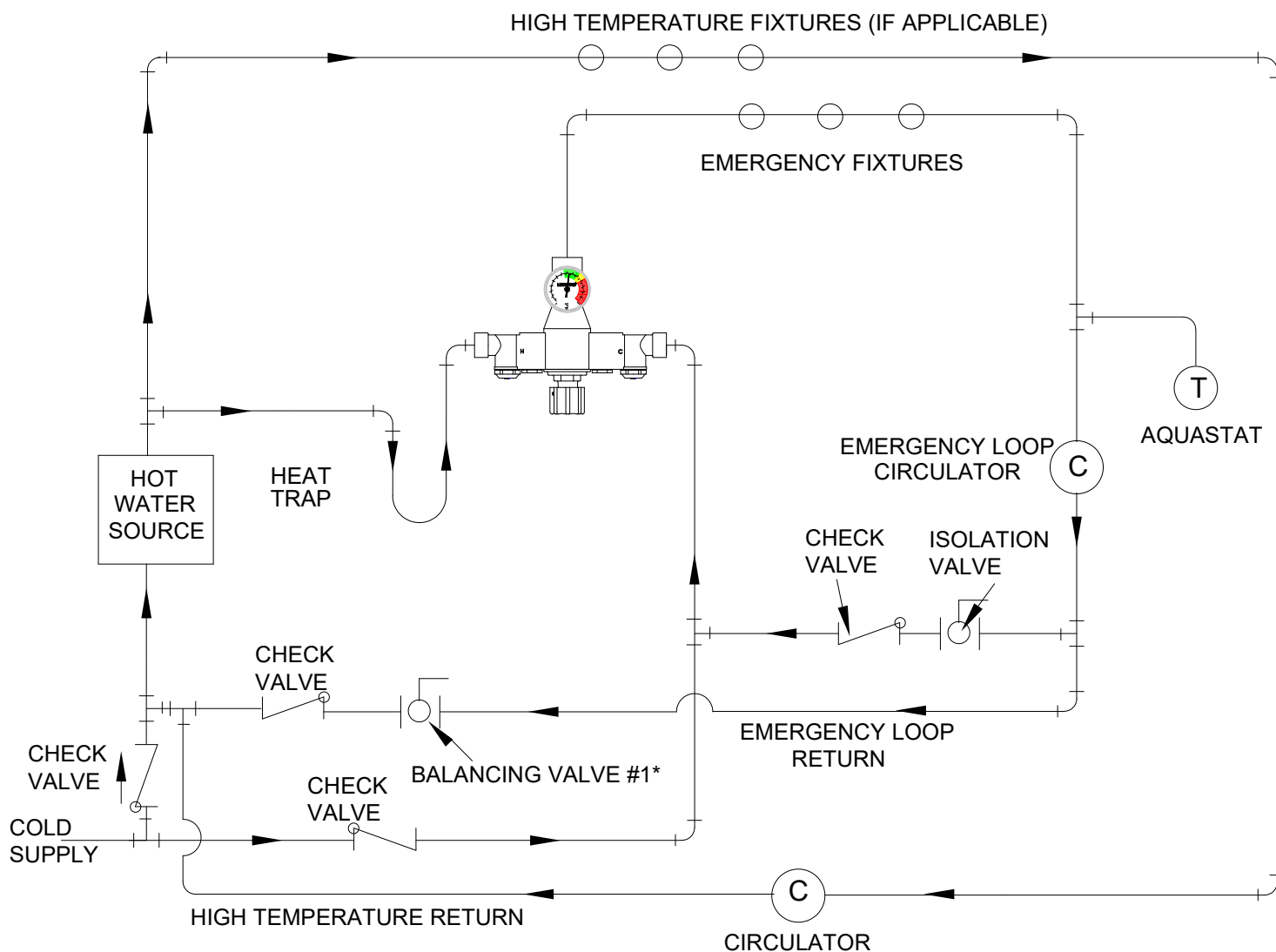
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# REQUIRED METHOD OF PIPING FOR A TEPID EMERGENCY RECIRCULATION LOOP

**CAUTION:** THIS PIPING METHOD IS SPECIFIC TO A THERMOSTATIC MIXING VALVE BEING USED FOR EMERGENCY DRENCH APPLICATIONS. SAFETY IS OF THE UTMOST CONCERN, AND ADJUSTMENTS TO BALANCE THE RECIRCULATION LOOP MUST BE DONE WITH CARE AND DILIGENCE. IMPROPER ADJUSTMENTS MAY RESULT IN INJURY OR DEATH.

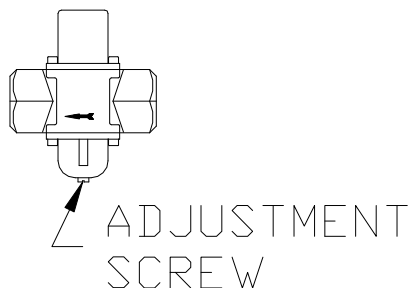


**\* WARNING:** BALANCING VALVE #1 MUST BE FIELD ADJUSTED, IF NOT SET PROPERLY LOOP TEMPERATURE CAN REACH TANK TEMPERATURE AND MAY RESULT IN INJURY OR DEATH TO THE EMERGENCY EQUIPMENT USER, SEE SET-UP BELOW.

## PROCEDURE TO BALANCE CIRCULATION SYSTEM

1. MAKE SURE NO WATER IS BEING DRAWN IN THE LOOP. OPEN BALANCING VALVE #1 ONLY APPROXIMATELY 5% ( 95% CLOSED) AND START CIRCULATOR.
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.

# REDUNDANT VALVE (EXL-850-LF ONLY)



The EXL-850 Redundant Thermostatic Mixing Valve has been factory set at 90°F (32°C). This set point can be field adjusted with a 3/8" wrench (see diagram). "Clockwise" direction will increase temperature. Maximum set point is 100°F (38°C). Consult medical advisor for correct temperature setting. As a secondary level of protection, in the event of redundant valve failure, installing contractor may wish to prevent cold water contamination by installing a swing check valve on the cold water supply to the valve (only needed on EXL-850).

This unit must be cycled each time the emergency equipment is checked. See ANSI Z358.1, Maintenance and Training section.

Cycle redundant thermostat valve by, limit stop (see page 2) and setting the primary thermostatic mixing valve to full hot. (EXL-850 only)

Open eye/face wash and check to be sure outlet temperature does not climb above 90°F (32°C).

Turn primary thermostatic valve to full cold and wait sixty seconds.

Turn primary thermostatic valve to full hot and wait sixty seconds.

Check to be sure outlet temperature does not climb above 90°F (32°C).

Turn primary thermostatic mixing valve to full cold and wait sixty seconds.

Set primary thermostatic mixing valve to the desired temperature, adjust limit stop (see page 2) and close eye/face wash.

## LIMITED WARRANTY

Leonard Valve Company (hereinafter, "Leonard") warrants the original purchaser that products manufactured by Leonard will be free from defects in material or workmanship under normal conditions of use, when properly installed and maintained in accordance with Leonard's instructions, for a period of one year from the date of shipment. During this period, Leonard 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. Leonard provides no warranty, express or implied, which extends beyond the description contained herein. LEONARD SPECIFICALLY DISCLAIMS ANY AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE. Nonetheless, some jurisdictions may not allow the disclaimer of certain implied warranties, in which case Leonard hereby limits such implied warranties to the duration of the limited warranty period contained herein. Some jurisdictions may not allow limitations on how long an implied warranty lasts, so the foregoing durational limitation may not apply to you. In no event will Leonard be liable for labor or incidental or consequential damages. Any alteration or improper installation or use of this product will void this limited warranty. If any provision of this limited warranty is prohibited by law in the applicable jurisdiction, such provision shall be null and void, but the remainder of this limited warranty shall continue in full force and effect.



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