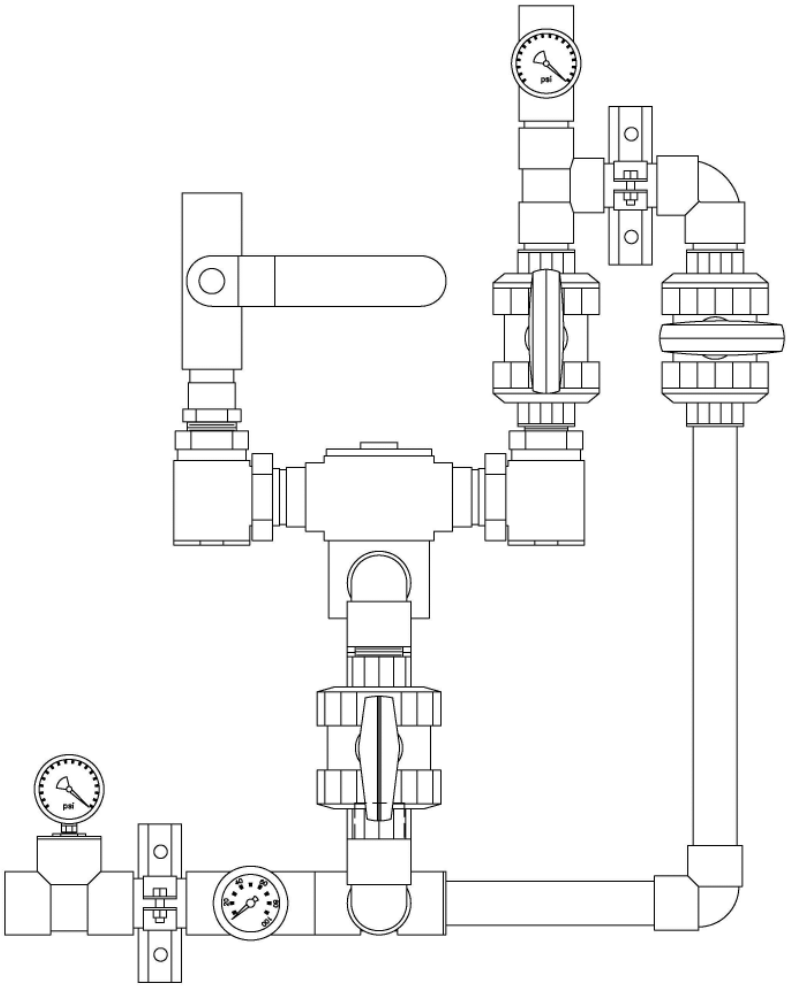
AmeriWater
The Water Purification Specialists

Blend Valve
Installation/Operation Manual



Manufactured With Pride
In The USA

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AmeriWater • 3345 Stop 8 Rd. • Dayton, OH 45414

98-0029 Rev. F

TABLE OF CONTENTS

1.0 INTRODUCTION

The Blend Valve assembly blends incoming cold tap water and heated water thermostatically to the desired temperature. It compensates quickly for flow and incoming temperature fluctuations.

Please read the Operations Manual before using the system. Contact AmeriWater Customer Service with any questions at 1-800-535-5585 Monday through Friday 8:00 a.m. to 5:00 p.m. eastern standard time. For after hours emergencies call 1-800-535-5585 and follow the instructions on the recorded message. Our on-call technician will return your call as soon as possible.

2.0 THEORY OF OPERATION

The temperature-blending valve is designed to blend together hot and cold water to produce adjustable water temperature. The reverse osmosis membrane has been designed to operate the best at 77 degrees Fahrenheit. Colder water will tighten the membrane, and cause a lower product flow. Warmer water will cause the membrane to expand, and will allow poor quality water through to the product side of the membrane.

Please note; temperatures above 110F will damage the membrane.

3.0 INSTALLATION

CAUTION: Local plumbing codes must be observed.

Prior to installing the blend valve, flush the incoming hot and cold lines of any debris. Locate the blend valve at the beginning of the water system and as close to the water source as possible (Ref. P&ID). Plumb the cold water piping into the cold water inlet tee and plumb the hot water piping into the hot water inlet valve. Open both the hot water and cold water valves and flush all piping thoroughly and check for leaks.

Adjust the temperature adjustment screw until a value between 75 - 80 degrees Fahrenheit is achieved during water flow. This will need to be done utilizing a hex key (not provided).

Additional fittings are provided with the blend valve. Two copper mips and a transition fitting are provided, the two mips are supplied for field connection to the incoming hot and incoming cold water supply lines, while the transition fitting is supplied for connection from an incoming copper line to the pvc tee on the cold water side of blend valve.

4.0 MONITORING

Monitoring of the blend valve must be carried out daily to ensure that the blend valve is meeting the facility requirements. Monitoring daily includes the items listed below:

1. Inlet pressure on the inlet pressure gauge
2. Outlet pressure on the outlet pressure gauge
3. Outlet temperature on the temperature gauge
4. Note the pressure and temperature when water is flowing.

All of these should be recorded in the daily log.

5.0 BYPASS OPERATION

If you need to bypass the blend valve, simply close the cold water inlet ball valve and the blended ball valve. Then open the bypass ball valve. When ready to return to normal operation, simply reverse these steps. See the ball valves listed in figure 5.1

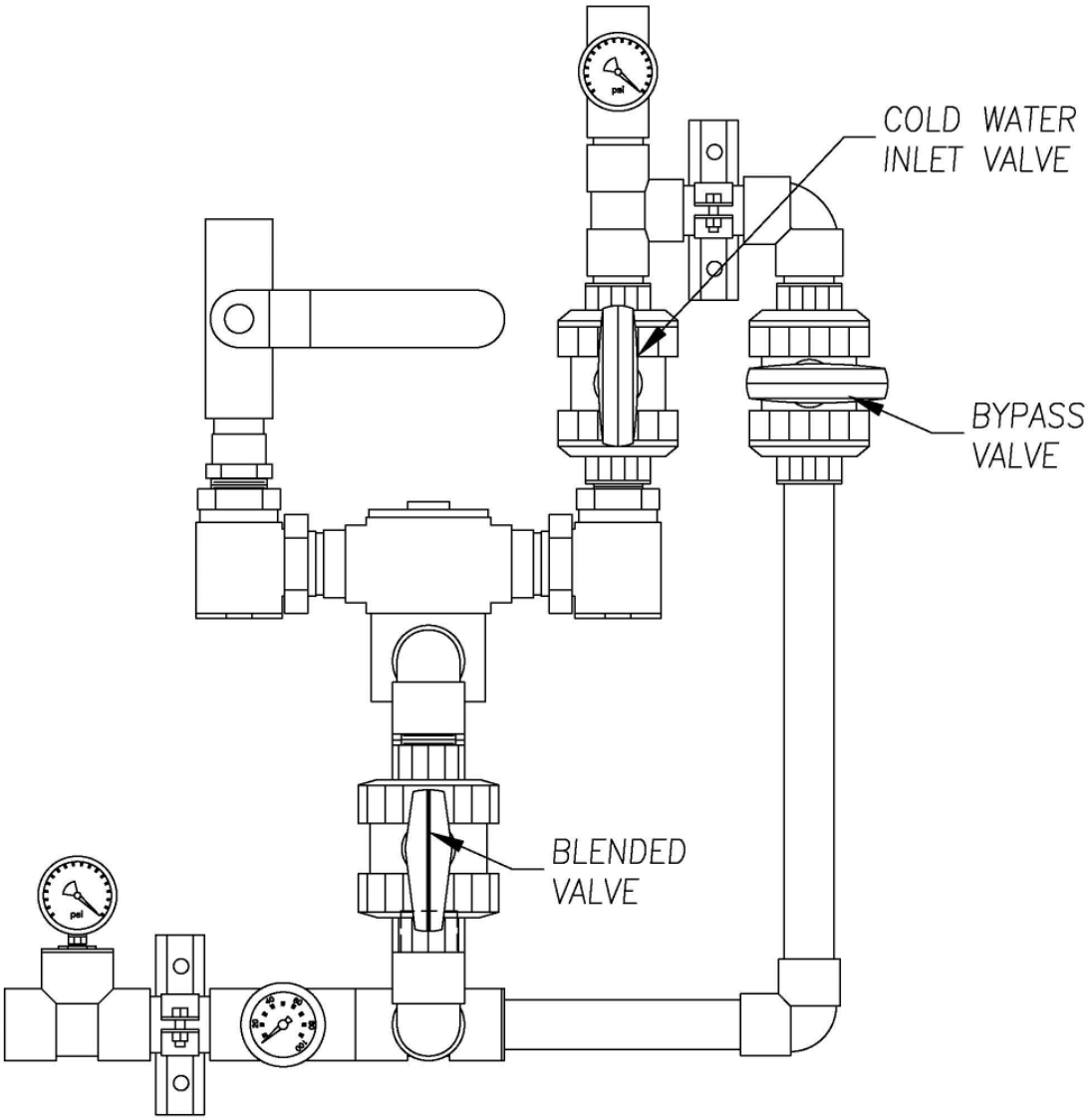
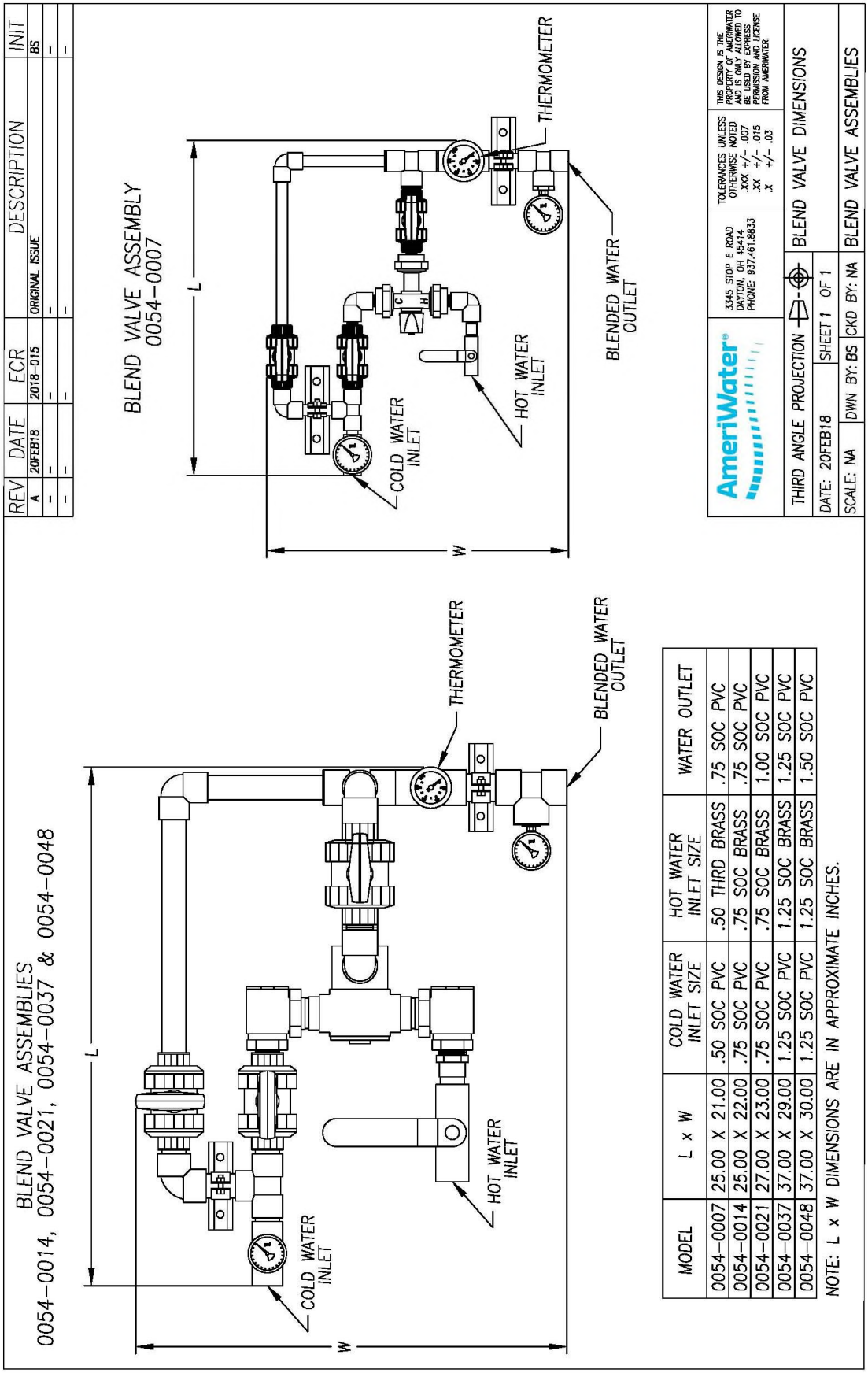


Figure 5.1

6.0 REBUILDING BLEND VALVES

Refer to manufacturers supplement, section 9.0 and section 10.0

7.0 SYSTEM DRAWINGS



8.0 PARTS LIST

Description	Ameriwater Part Number	Powers Part Number
Plunger / Motor Kit for 54-0007	54-0008	490-190
Blend Valve 0.5 Min Flow	54-0007	LM490-101
Blend Valve 3-14 GPM	54-0014	MM431
Blend Valve 4-21 GPM	54-0021	MM432-3
Plunger Kit for 54-0014 & 54-0021	54-0015	390-802
Actuator Kit for 54-0014 & 54-0021	54-0016	390-807
Blend Valve 5-37 GPM	54-0037	MM433-3
Blend Valve 7-48 GPM	54-0048	MM-434-3
Plunger Kit for 54-0037 & 54-0048	54-0038	390-803
Actuator Kit for 54-0037 & 54-0048	54-0039	390-809
Thermometer, 0-140 F	39530708	
Ball Valve, 0.5” TU, PVC80	041531812	
Ball Valve, 0.5” FPT, Brass	045-0028	
Pressure Gauge, 0-160	43730133	
Ball Valve, 0.75” TU, PVC80	041530841	
Ball Valve, 0.75” SOC, Brass	045730108	
Ball Valve, 1.0” TU, PVC80	041720169	
Ball Valve, 1.25” TU, PVC80	041732001	
Ball Valve, 1.25” SOC, Brass	043-0031	
Ball Valve, 1.5” TU, PVC80	041531840	

9.0 SERIES LM490 VALVE SUPPLEMENT

POWERS™ IS-P-LM490-LM490-10

HYDROGUARD® Thermostatic Tempering Valves
ASSE 1017 Series LM490 & LM490-10

Installation Instructions

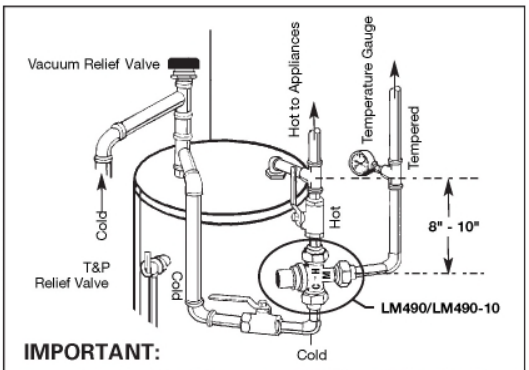
NOTE: Installation should be in accordance with accepted plumbing practices. Flush all pipes thoroughly before installation. Installation and field adjustment are the responsibility of the installer.

Installation Instructions ■

1. Close both hot and cold water shutoff valves upstream of the tempering valve.
2. Bleed pressure from the system.
3. Route copper tubing or piping to fit valve dimensions.
4. For valves with Quick-Connect tailpieces refer to "Quick-Connect Installation" instructions.
5. Remove tailpieces from the valve and make sure union nuts are over the tubing/piping before connecting to the tailpiece.

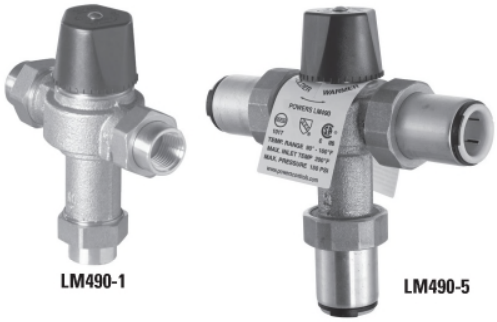
NOTE: If soldering, remove unions and gaskets from valve body prior to soldering to prevent damage to valve from excessive heat.

6. Flush piping again, install valve using filter gasket on hot and cold water inlets and fiber gasket on mixed water outlet.
7. Turn on the cold and hot water. If any leak are observed, tighten connections as necessary to stop leak before proceeding.



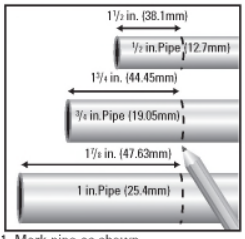
IMPORTANT:
To prolong the life of the series LM490 or LM490-10 valves, it is recommended that the hot water inlet to the valve should be 8-10"(200-305 mm) below the hot water inlets.

Figure 1. Domestic Hot Water Application

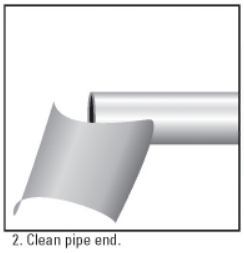


Quick-Connect Installation ■

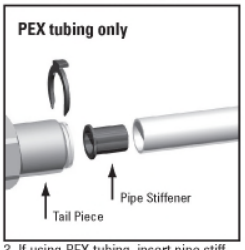
TO CONNECT



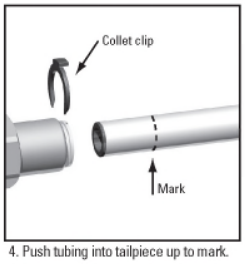
1. Mark pipe as shown. This is pipe insertion depth.



2. Clean pipe end.

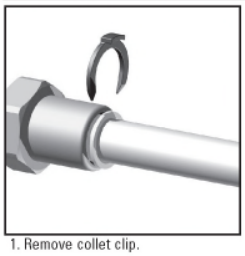


3. If using PEX tubing, insert pipe stiffener (provided) into end of pipe.

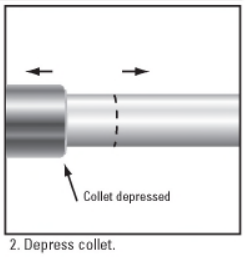


4. Push tubing into tailpiece up to mark.
5. Insert collet clip.

TO DISCONNECT



1. Remove collet clip.



2. Depress collet.
3. Pull tubing from tailpiece.

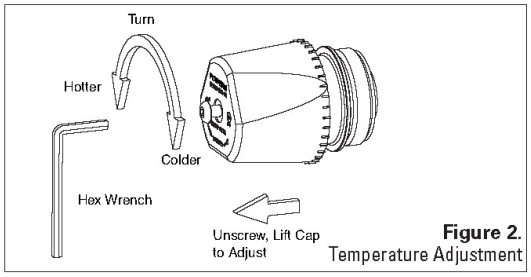


Figure 2.
Temperature Adjustment

To Adjust Temperature (Figure 2) ■

LM490 is factory pre-set to 120°F (49°C) and LM490-10 is factory set to 90°F (31°C) outlet temperatures under the following conditions:

Cold inlet: 60° - 70°F (16 - 21°C)
Hot inlet: 140° - 145°F (60 - 63°C)
Supply Pressures: 45psi (310 kPa)

1. Let the water flow for at least two minutes to allow supply temperature to stabilize.
2. Place a thermometer in the outlet water stream.
3. Loosen handle screw with hex wrench.
4. Handle must be lifted 1/4" to adjust temperature. Rotate handle clockwise to decrease temperature and counter-clockwise to increase the temperature.
5. Lower handle and tighten screw.
6. Check for outlet temperature.

Caution: Need Periodic Inspection ■

This valve requires periodic inspection and verification of outlet temperature by a licensed contractor. Corrosive water conditions, inlet temperatures over 200°F (93°C), unauthorized adjustments or repair could render the valve ineffective for service intended. Regular cleaning and checking of thermostat assembly helps to assure maximum life and proper product function. Frequency of cleaning depends upon local water conditions.

Troubleshooting ■

Fluctuating or erratic hot water temperature at fixture:
Unbalanced Pressure. Install balancing or throttling valve at the hot and cold water supplies and adjust accordingly for demand.

Hot water backing up into cold water line:
Hot water pressure is higher than cold water pressure. Examine check valves for dirt & debris, clean as necessary.

Cannot adjust water temperature to desire temperature:
Install balancing or throttling valve at the hot and cold water supplies and adjust accordingly for demand.

High pressure drop through the tempering valve:
Valve Undersized. Install larger thermostatic tempering valve.

Insufficient hot water during peak demand:
Check flow requirement during peak demand period. Use larger thermostatic tempering valve.

Repair Kit ■

Model	Part #	Description
LM490	490-090	Plunger/Motor Assembly
LM490-10	490-190	Plunger/Motor Assembly

WARNING: For valves with CPVC or PEX-end connections, do not exceed the tubing manufacturers pressure and temperature ratings. Refer to the tubing manufacturers product specifications for that information.

WARNING:
Powers Hot Water Temperature Control Valve Series LM490 & LM490-10 are designed to be installed at or near the boiler or water heater. They cannot be used by themselves for tempering water temperatures at fixtures where ASSE Standard 1016 or ASSE Standard 1070 listed devices are required. To comply with ASSE Standard 1016 or ASSE Standard 1070, listed devices such as Powers Series e480 or LM495 should be used at fixtures to prevent possible injury.

Powers Hot Water Temperature Control Valve Series LM490 or LM490-10 are not designed to compensate for system pressure fluctuations. Such use may result in severe bodily injury (i.e., scalding or chilling) and/or death.

When installing the Series LM490 or LM490-10 valves in radiant heat applications, the components of the radiant heat system must be of materials with a construction capable of withstanding the high limit output temperatures of the heating boiler. If you are uncertain as to the product's adaptability for your application, please consult an authorized representative before installing or using the product.

CALIFORNIA PROPOSITION 65 WARNING

WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.
(California law requires this warning to be given to customers in the State of California.)
For more information: www.watts.com/prop65

ATTENTION INSTALLER:
After installation, please leave this Instruction Sheet for occupant's information.
IMPORTANT: Inquire with governing authorities for local installation requirements.

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IS-P-LM490-LM490-10 0745 EDP# 6511207

10.0 SERIES MM430 VALVE SUPPLEMENT

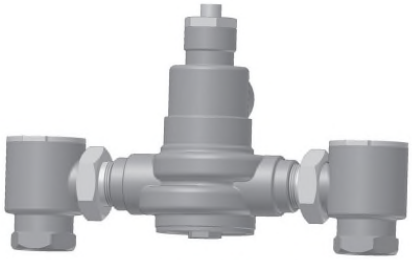
POWERS™ IS-P-MM430

HYDROGUARD® XP Master Tempering Valves
Series MM430

Technical Instructions

Description ■

The Hydroguard® XP MM430 series is a temperature actuated mixing valve designed for use in hot water distribution systems, in compliance with ASSE 1017.



Advanced Thermal Activation

Specifications ■

Maximum Operating Pressure ..... 125 psi (861 kPa)

Maximum Hot Water Temperature ..... 200°F (93°C)

Minimum Hot Water Supply Temp . ..... 5°F (3°C) Above Set-Point*

Temp. Adjustment Ranges **Standard: ..... 90 - 160°F (32 - 71°C)
Low: ..... 60 - 90°F (16 - 32 C)

Hot Water Inlet Temperature Range ..... 120 -180°F (49 - 82°C)

Cold Water Inlet Temperature Range ..... 40 - 80°F (4 - 27°C)

Listing ..... ASSE 1017

Certified ..... CSA B125

* With Equal Pressure

** **NOTE:** Low limit cannot be less than the cold water temperature. For best operation, hot water should be at least 5°F (3°C) above desired set point.

WARNING: TO ENSURE THE ACCURATE AND RELIABLE OPERATION OF THIS PRODUCT, IT IS ESSENTIAL TO:

- Properly size each valve based on the individual application.
- Properly design the recirculation system to minimize pressure and temperature variations.
- Conduct an annual maintenance program to ensure proper operation of all critical components.

THIS VALVE MUST BE USED IN CONJUNCTION WITH TEMPERATURE ACTUATED POINT-OF-USE DEVICES THAT COMPLY WITH ASSE 1016, 1069, OR 1070. FAILURE TO COMPLY WITH PROPER INSTALLATION INSTRUCTIONS COULD CONTRIBUTE TO VALVE FAILURE, RESULTING IN INJURY OR DEATH.

Capacity ■

Table 1, Capacity Tables, present the Hydroguard discharge capacity in gpm and l/m for various pressure differentials (the difference between the lowest inlet pressure and the discharge pressure at the Hydroguard).

Flow Capacity at 50-50 mixed ratio

				Pressure Drop Across Valve						
Model	Min. Flow Rate*	Min. Flow to ASSE 1017	Cv	5psi (34 kPa)	10psi (69 kPa)	20psi (138 kPa)	30psi (207 kPa)	45psi (310 kPa)	60psi (414 kPa)	70psi (517 kPa)
MM431	0.5 gpm 1.89 lpm	3 gpm 11 lpm	6.32	14 gpm 53 lpm	20 gpm 76 lpm	28 gpm 106 lpm	35 gpm 132 lpm	42 gpm 159 lpm	49 gpm 185 lpm	53 gpm 201 lpm
MM432	0.5 gpm 1.89 lpm	4 gpm 15 lpm	9.49	21 gpm 80 lpm	30 gpm 114 lpm	42 gpm 159 lpm	52 gpm 197 lpm	64 gpm 242 lpm	74 gpm 280 lpm	79 gpm 299 lpm
MM433	0.5 gpm 1.89 lpm	5 gpm 19 lpm	16.44	37 gpm 140 lpm	52 gpm 197 lpm	74 gpm 280 lpm	90 gpm 341 lpm	110 gpm 416 lpm	127 gpm 481 lpm	138 gpm 522 lpm
MM434	0.5 gpm 1.89 lpm	7 gpm 26 lpm	21.50	48 gpm 182 lpm	68 gpm 257 lpm	96 gpm 363 lpm	118 gpm 447 lpm	144 gpm 545 lpm	167 gpm 632 lpm	180 gpm 681 lpm
MM435	0.5 gpm 1.89 lpm	10 gpm 38 lpm	31.00	69 gpm 261 lpm	98 gpm 371 lpm	139 gpm 526 lpm	170 gpm 644 lpm	208 gpm 787 lpm	240 gpm 908 lpm	259 gpm 980 lpm

** Minimum flow when Hydroguard is installed at or near hot water source with recirculated tempered water with continuously operating recirculating pump.*

Operation ■

Typical Flow

Hot and cold water supplies enter Hydroguard at indicated ports, (see Figure 1) then flow past their respective balanced poppet plug and seats. Next, hot and cold water flow is directed to the mixing chamber where the thermostatic actuator is located.

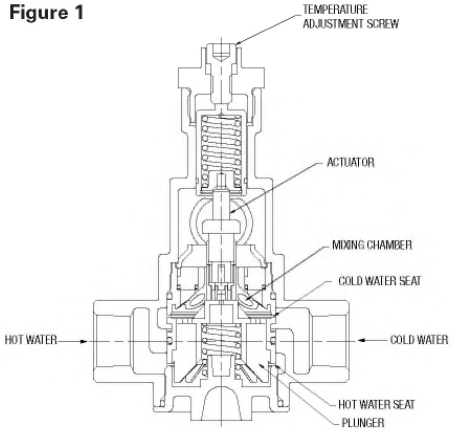
Temperature adjustment screw moves the actuator to determine the discharge temperature.

With a rise in discharge temperature due to pressure or temperature fluctuation on the inlet, the actuator expands, decreasing flow of hot water. The reverse occurs with a drop in discharge temperature.

- Cold water supply failure – causes actuator to expand allowing the motor to drastically reduce hot water flow.*
- Hot water supply pressure failure – causes actuator to contract allowing return spring to close cold water port*.

*When tested in accordance to conditions described in ASSE 1017.

Figure 1



Installation Instructions ■

1. **IMPORTANT:** Installation should be in accordance with acceptable plumbing practices. Flush all piping thoroughly before installation. Installation and field adjustment are the responsibility of the installer.

2. Valves are to be installed as close to building inlet supply as possible to prevent/minimize pressure fluctuations.

3. Valve body can be rotated to any position due to union inlets (see Figure 2). Make sure that union nuts are tightened securely.

4. Connect inlets and outlet and check for leaks.

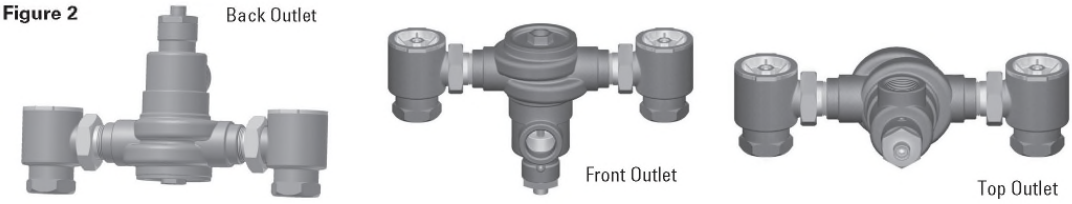
5. **CAUTION:** When the Hydroguard supplies tempered water to self-closing and/or solenoid valves, provide a shock absorber (Powers Part No. 460-353) on the discharge line.

6. **Before use, check discharge temperature. Reset if necessary.**

Operation Check:

After Hydroguard is installed, make certain the supply stop valves and strainers are free and clean and ready for operation by disassembling checkstops as shown in servicing.

Figure 2



Maintenance and Troubleshooting ■

What to look for if:

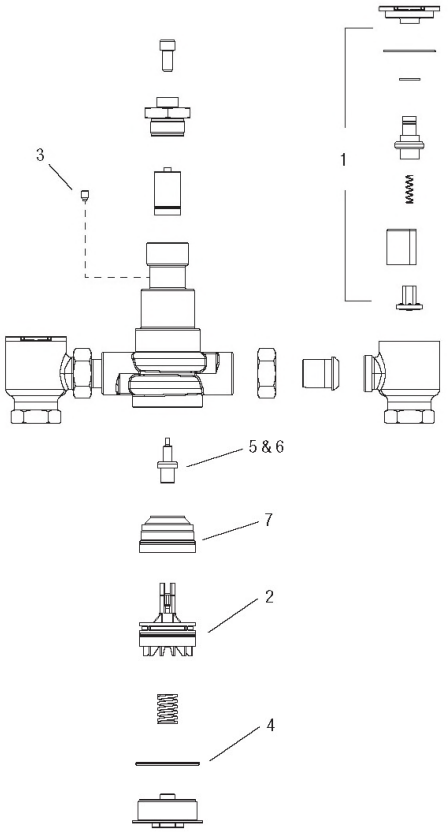
- **The flow of water is less than desired...**
  a. Stop valves or supply to Hydroguard not fully open.
  b. Clogged checkstop strainer screens.
  c. Accumulation of lime deposits around valve seats.
  d. Low supply pressures.

- **The flow of water is completely shut off...**
  a. Stop valves or supply valves are completely closed.
  b. Valves downstream from Hydroguard fully closed.
  c. Loss of either hot or cold water supply pressure.

- **Discharge temperature varies...**
  a. Very large restriction in outlet flow.
  b. Very large drop in inlet pressure.
  c. Very large fluctuation of hot water supply temperature.
  d. Worn valve seats.
  e. Minimum flow requirement not achieved.
  f. Lime deposits around motor, poppets and/or seat.

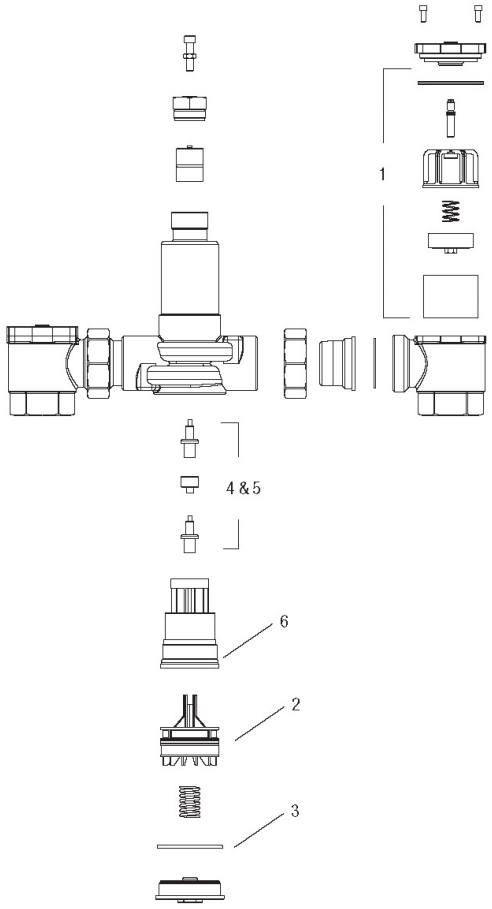
Parts List - MM431, MM432, MM433, MM434 ■

Index	Description	Part #			
		MM431	MM432	MM433	MM434
1	Checkstop Rebuild Kit	390 800	390 800	390 801	390 801
2	Plunger Kit	390 802	390 802	390 803	390 803
3	Set Screw	390 804	390 804	390 804	390 804
4	O-Ring	390 805	390 805	390 806	390 806
5	Actuator - Standard Temperature	390 807	390 807	390 809	390 809
6	Actuator - Low Temperature	390 808	390 808	390 810	390 810
7	Funnel Kit	390 826	390 826	390 827	390 827



Parts List - MM435 ■

Index	Description	Part #
		MM435
1	Checkstop Rebuild Kit	390 811
2	Plunger Kit	390 812
3	O-Ring	390 813
4	Actuator - Standard Temperature	390 814
5	Actuator - Low Temperature	390 815
6	Funnel Kit	390 828



Servicing ■

NOTE: Before disassembling, make certain both hot and cold water supplies are shut off.

Checkstop Disassembly

1. Remove bonnet with socket wrench
2. Lift out strainer screen.
3. Reassemble in reverse order.

Valve Disassembly

To Remove Thermal Actuator from Top

1. Unscrew locking setscrew.
2. Remove bonnet and over load assembly.
3. Lift out thermal actuator.
4. Reassemble in reverse order.

To Remove The Plunger Assembly Or Funnel from Bottom

1. Remove the bottom cap. Caution: spring is under tension.
2. Pull out spring.
3. Pull out plunger using a pair of pliers.
4. To remove Funnel, you will need a deep socket wrench and funnel removal tool.
5. Reassemble in reverse order.
   Note: After reassembling go back to thermal actuator section and make sure it is sitting in its holder properly.

Temperature Adjustment ■

Temperature setting for MM430 Series Valves:

1. Turn off re-circulation pump (if one is in the system).

2. Open up enough fixtures to meet minimum flow requirement of:
   MM431 = 3 gpm (11 Lpm)
   MM432 = 4 gpm (15 Lpm)
   MM433 = 5 gpm (19 Lpm)
   MM434 = 7 gpm (26 Lpm)
   MM435 = 10 gpm (38 Lpm)

3. For MM431 to MM434, loosen set screw on the back of the body, for MM435 loosen locknut.

4. Turn temperature adjustment screw counter-clockwise to increase or clockwise to decrease the outlet temperature. (see Fig. 1)

NOTE: Please allow valve temperature to settle in before making your next adjustment.

5. When desired temperature is set, tighten set screw for MM431 to MM434, tighten the locknut for MM435. Turn recirculation pump back on. Close open fixtures.

CALIFORNIA PROPOSITION 65 WARNING

WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. (California law requires this warning to be given to customers in the State of California.)

For more information: www.watts.com/prop65

⚠ **NOTE: AFTER COMPLETING REPAIRS, CHECK DISCHARGE TEMPERATURE. (115°F [46°C]). RESET IF NECESSARY.**

WARNING: FAILURE TO PERFORM THIS OPERATION COULD RESULT IN UNSAFE DISCHARGE TEMPERATURE, WHICH MAY CAUSE INJURY OR DEATH.