

# Thermostatic Mixing Valve with Cold Bypass



## Model: 120-TM3F

Mixing valve with mounting block

## Model: 696-T2001CR, 696-T2001PR, 696-T2001WR, 696-T2001XR

Mixing valve with in-line isolation valves and access box<sup>1</sup>

## Application:

For faucet or sink water supply to prevent scalding when faucet is activated. Final water temperature must be set by installation professional. Each unit includes integral stainless steel screens with micro-mesh to catch all fouling debris and protect the valve. Each unit includes integral stainless steel spring, EPDM o-rings, no-lead brass plugs/body/caps and assemblies. Each unit includes integral check valves to inhibit cross-flow. Each unit includes a mounting/positioning block, nylon test cap, and brass bypass cap.

## Specs:

Operating Pressure: 30 PSI – 125 PSI

Max Test Pressure: 150 PSI

Cold Inlet Temperature: 39° – 85° F

Hot Inlet Temperature: 120° – 180° F

Flow Rate: 0.25 GPM – 4 GPM

Differential (hot to cold) Pressure: 25% max

## Features:

Ensures proper thermostatic mixing for tempered water to satisfy plumbing codes and eliminate scalding.

ASSE 1070 approved

Hot water temperature can safely be set high enough to control Legionella (usually around 140° F)

Reduce hot water use. Using tempered water means less hot water demand and less energy consumption.

Top-quality materials – No Lead brass valve body<sup>1</sup> is dezincification and SCC resistant. EPDM o-rings. Stainless steel and engineered polymer internal components

<sup>1</sup> Finish frame (696-1F) and accessories available separately

<sup>2</sup> Material is C69300 and C46500. Brass is dezincification and SCC resistant, and is compliant with NSF-61 Annex G and California No Lead Plumbing Law

## WARNING

**Water Temperatures of 110° and Above Will Scald!**  
Ensure water is maintained in a safe temperature range.

Failure to follow warnings and instructions can cause harm to the device, the installer, and/or the operator. To ensure the product is being operated properly for the lifetime of the device, follow instructions.

## WARNING

**Maintenance:** Periodic maintenance of the device should be performed - minimally once a year. Valve inlet screens should be cleaned and checked for debris or water scale, and cleaned or replaced as necessary. Overall valve performance should be monitored. Use inspection log and keep in facilities maintenance. Routine inspections and maintenance can help avoid problems before they start and should be used to ensure valve is working properly (supplying safe temperature) and has not been set by an unauthorized individual.

**Water Quality:** Water quality can affect the time between inspections and needed cleaning. Seasonal checks are recommended.

**!! AT START UP, FLUSH THE WATER SUPPLY LINES THOROUGHLY DOWNSTREAM OF THE DEVICE !!**

For access box models, the isolation valves are shipped in the OFF position. They should remain off until after lines are flushed. Once the lines have been flushed and cleaned of any fouling debris, the included valve handle or a flat-head screwdriver can operate the valve.

**!! CHECK FOR LEAKS !!**

**!! CHECK OUTLET TEMPERATURE !!**

## WARNING

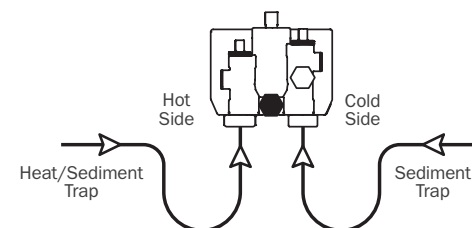
**System Design:** Water supply to the device should be designed to limit fluctuations in water pressure and water temperature.

**Preset:** Each valve is preset to limit 'MIX' water temperature to 105° F.

The 'MIX' water temperature should be checked before putting the valve into service and monitored afterwards. Follow adjustment diagram to ensure 105° F is maintained

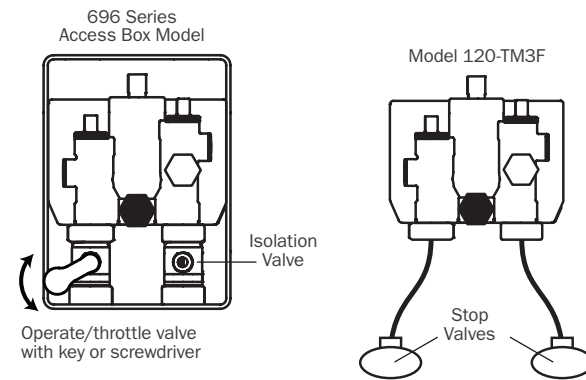
## INSTALLATION TIPS

**Sediment/Heat Trap:** Install a heat trap loop or sediment trap upstream of the device. This will keep the internal screens and working chamber as clean as possible for continued service.



**Supply Valves:** Access box models (696 Series) include in-line isolation valves. It is possible to throttle the hot and cold water using this isolation valve to achieve the exact desired outlet temperature of the mixing outlet. The outlet mix temperature should always be checked to be set at the desired temperature with all working conditions set.

For 120-TM3F models, stop valves should be used for service and repair applications.



## AVAILABLE ACCESSORIES

(for Access Box Models – Sold Separately)



696-1F  
Finish Frame



696-EX  
Finish Frame Extension



696-BC  
Box Clip for Stud Mount



525-6917  
Mounting Bracket

## INSTALLATION

Install in accordance with applicable plumbing codes and local jurisdictional requirements, using accepted plumbing practices.

**!! DO NOT over tighten compression fittings !!**

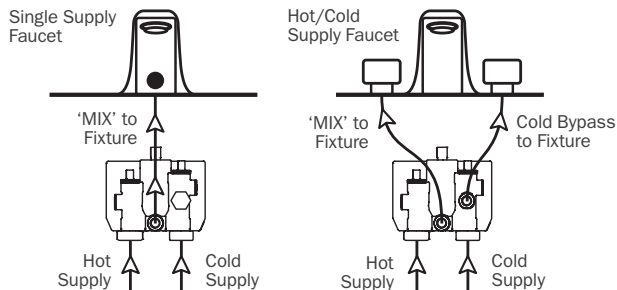
**!! DO NOT use pipe dope/sealant – use pipe thread tape only !!**

### 696 Series Access Box Models:

- 1 Secure access box in place under fixture to be served. Box clips (696-BC) and brackets (525-6917) sold separately. Models include a mounting block to hold valve in position within Access box.
- 2 Ensure in-line isolation valves are OFF. Keep valve handle/key with valve on provided loop or in facilities maintenance office. Isolation valves can be operated with a flat-head screwdriver if necessary.
- 3 Connect Hot/Cold water supply to mixing valve using appropriate procedures for the system/connection type. Test for leaks.
- 3 Protect box with debris cover, taping cover in place.
- 4 **IMPORTANT:** Flush water lines thoroughly before proceeding.
- 5 After drywall installation, remove debris cover. Install finish frame if desired. Remove nylon test cap from 'MIX' outlet and connect supply line. If cold bypass supply will be run to the fixture, remove brass cap and connect supply line to fixture. (See figure below)
- 6 Open isolation valves. Inspect valve and all connections for leaks. Tighten any loose connections. Check water temperature (see below).

### 120-TM3F Model:

- 1 Secure valve with mounting block to the wall, under and as close as possible to fixture to be served. Install #9 screws through mounting holes on either side of the 'MIX' outlet. Screws should drive into a stud, framing member, or drywall anchor. Protect the valve from any paint or spray that may be part of cabinet or bathroom finishing.
- 2 Ensure stop valves supplying the mixing valve are OFF.
- 3 **IMPORTANT:** Flush water lines thoroughly before proceeding.
- 4 Remove nylon test cap from 'MIX' outlet and connect supply line. If cold bypass supply will be run to the fixture, remove brass cap and connect supply line to fixture. (See figure below)
- 5 Open stop valves. Inspect valve and all connections for leaks. Tighten any loose connections. Check water temperature (see below).



**Check Temperature at Fixture!** Valve is preset to 105° F. Ensure all system variables are set for desired flow pressure and temperature and confirm 'MIX' outlet is providing safe/desired temperature. For adjustments, see Adjustment and Maintenance Operation.

## TROUBLESHOOTING

**Problem:** Desired 'MIX' temperature can not be achieved.

Possible Causes: 1) Valve may be fouled; 2) Hot water supply may not be sufficiently hot; 3) Valve was not hooked up properly.

Solutions: 1) Check for fouling and clean screens; 2) Check water supply temperature; 3) Ensure the 'MIX' outlet is supplying the faucet.

**Problem:** Flow stops or no Flow

Possible Causes: 1) Water supply too hot - valve does not allow water flow above 120° F.; 2) Supply pressures are not high enough (loss of pressure from fixture activation); 3) Supply line failure; 4) Improper installation; 5) Sediment/debris has clogged or fouled the valve

Solutions: 1) Ensure nothing is impeding hot and cold water supply of hot or cold - look for kinks in the supply lines; 2) Check incoming water pressures of hot and cold lines and ensure they meet specifications; 3) Ensure the difference in temperature between incoming hot and cold water is within the range specified for the valve; 4) Ensure isolation valves or stop valves are open; 5) Check for clogs and clean debris screens.

**Problem:** Hot water too cold

Possible Cause: Internal check valves are fouled

Solution: Replace internal check valves. See repair kits below.

### Repair Kits:

**120-TM3F-1:** Debris screens (2)

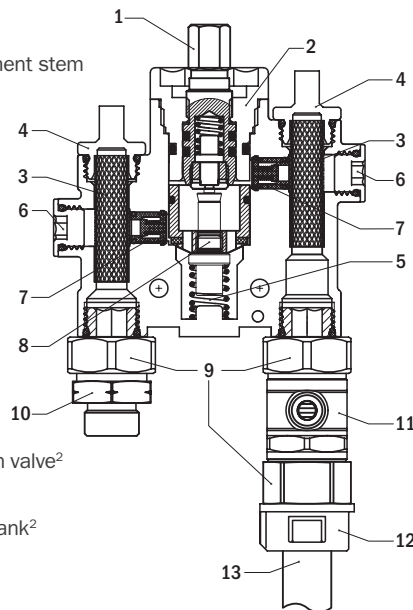
**120-TM3F-2:** Debris screens (2), Valve spring, Piston assembly, and EPDM gaskets\* (2)

**120-TM3F-3:** Check valves (2), EPDM gaskets\* (2)

\*EPDM gaskets if needed for swivel nuts (see #9 in diagram)

### Mixing Valve Diagram:

- 1 Temperature adjustment stem
- 2 Valve cap
- 3 Stainless steel debris screen
- 4 Screen plug
- 5 Valve spring
- 6 Side plug
- 7 Check valve
- 8 Piston Assembly
- 9 5/8" Female Comp. swivel nut
- 10 5/8" x 3/8" Comp. adapter<sup>1</sup>
- 11 Brass in-line isolation valve<sup>2</sup>
- 12 Box clip<sup>2</sup>
- 13 Brass connection shank<sup>2</sup>



1 Model 120-TM3F only  
2 696 Series models only

## ADJUSTMENT AND MAINTENANCE OPERATION

**Adjusting Temperature:** See center 3/8" hex stem on top of mixing valve. This stem operates the internal piston, which allows cold water to enter and reduces hot water simultaneously. Minimal adjustments can affect outlet water temperature significantly. Using a 3/8" wrench, turn the stem toward the 'C' (see markings on face of mixing valve) to make the 'MIX' colder - Do Not turn too far. Adjust toward the 'H' to make the 'MIX' hotter - Do Not turn too far. Let the hot water or mix flow for a full 2 minutes and take the temperature of the 'MIX' in the receptacle/sink. Adjust as necessary.

**Cleaning/Replacing Debris Screens:** Close the in-line isolation valves or stop valves supplying the mixing valve. See two 1/4" hex stems (right/left) on top of mixing valve. Using a 1/4" wrench, unscrew and remove the screen plugs (keep) and inspect/clean as needed. Using an o-ring pick, remove stainless steel debris screens. Clean or replace screens. Reinstall screens, being sure they are seated completely in the valve body.

NOTE: Do Not operate valve without screens in place as this will allow sediment and debris to enter the valve, which causes fouling and will void the warranty.

Replace screen plugs and tighten. Open isolation valves or stop valves and check for leaks. Check 'MIX' temperature at the fixture to confirm valve operation.

**Replacing Internal Check Valves:** Close the in-line isolation valves or stop valves supplying the mixing valve. Disconnect water supply lines to and from mixing valve. Remove the mixing valve from the access box or its location under the fixture. Holding the mixing valve carefully but securely in a vice, unscrew the valve cap. Wrap the valve cap with o-rings, so slow/constant pressure will loosen. Remove the valve cap (keep) and inspect/clean as needed. Remove the screen plugs and debris screens (follow screen access/removal instructions under 'Cleaning/Replacing Debris Screens' above). Using a 7/32" hex wrench, unscrew and remove the side plugs (keep) and inspect/clean as needed. From the open inside cavity of the mixing valve, push the check valves (see #8 in diagram) outwards toward the side plug opening and remove.

Note: Be careful not to scratch/scar the internal surfaces of the valve.

Install new check valves by pushing through the side opening, and against the stops in the valve body (see position in diagram). Reinstall side plugs, debris screens, screen plugs, and valve cap. Reinstall valve into access box or to location under fixture. Reconnect water supply lines to and from the mixing valve. Open isolation valves or stop valves and check for leaks. Check 'MIX' temperature at the fixture to confirm valve operation.

**Protection from Tampering:** The temperature adjustment stem can be concealed as necessary to protect from any unwanted or unauthorized adjustments.

⚠ **WARNING:** Cancer and Reproductive Harm  
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[www.siouxchief.com](http://www.siouxchief.com)  
14940 Thunderbird Road  
Kansas City, MO 64147  
P 1.800.821.3944  
F 1.800.758.5950

