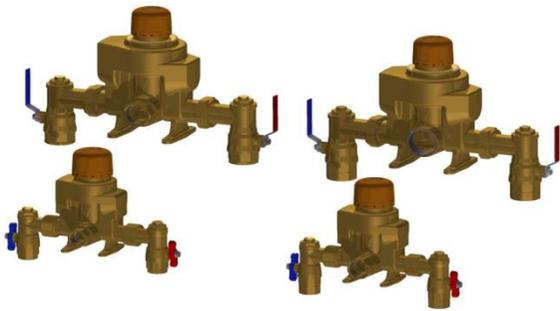




Masterguard 24539/24540/24541/24542 Lead Free Series

Installation Instructions



Thermostatic Mixing Valve

IMPORTANT

Failure to comply with all aspects of these instructions may result in unsafe performance. All installations must comply with relevant State and Local Authority requirements.

Flush the system thoroughly before fitting Masterguard:

It is CRITICAL that all debris is flushed from the pipe work prior to installing the valve. Not flushing the system properly is the most common cause of system difficulties.

Commission the valve:

Every valve is factory-set to a nominal temperature of 120°F. Every valve must be adjusted on-site to ensure correct delivery of the desired mixed water temperature, as installations conditions can vary from site to site.

Check:

- Measure and note all site parameters (pressure, temperature, etc.) and check against the specifications of the chosen valve. If the site conditions are outside those specified for the valve then they must be rectified prior to installing the valve.
- Valve MUST NOT be subjected to heat during installation as this may damage the valve's internals.
- Valve MUST NOT be fitted on steam-supplied systems, but to water systems only.
- Valve MUST NOT be frozen. If the valve is installed in a situation where freezing is a possibility, then suitable measures must be taken to prevent the valve from freezing.
- DO NOT use excess thread sealant (in liquid, tape or other form) as this may cause the valve to fail.

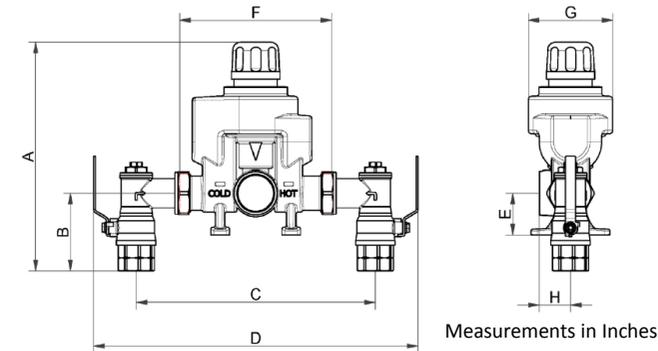
This is a Temperature Control device that must be checked and serviced regularly to ensure correct and safe performance.

Leave a copy of these instructions with the valve or client for future reference.

California Proposition 65 Warning:

This product contains chemicals known to the state of California to cause cancer and birth defects or other reproductive harm. (Installer: California law requires that this warning be given to the consumer.)

VALVE SPECIFICATIONS



Product	Inlet (NPT)	Outlet (NPT)	Flow @ 45 PSI	Min Flow rate	A	B	C	D	E	F	G	H
24539	3/4"	1"	51 GPM	4 GPM	10.6	3.2	10.3	13.8	1.7	6.5	3.5	2.7
24540	1"	1 1/4"	75 GPM	8 GPM	11.0	3.6	10.3	13.8	1.7	6.5	3.5	2.8
24541	1 1/4"	1 1/2"	105 GPM	13 GPM	13.2	4.2	14.6	19.8	2.5	9.3	5.1	2.7
24542	1 1/2"	2"	149 GPM	18.5 GPM	13.7	4.7	14.6	19.8	2.5	9.3	5.1	1.9

Installation Conditions:

Hot Temperature Supply Range: 120°F (48.9°C) – 180°F (82.2°C)
 Maximum Peak Hot Supply Temperature: 200°F (93°C)
 Cold Temperature Supply Range: 39°F (3.9°C) – 80°F (26.7°C)
 Maximum Supply Pressure: 145 PSI (1000kPa)
 Permitted Supply Pressure Variation: 10% (max)

Operating Conditions:

Adjustable Temperature Range: 95°F (35°C) – 150°F (65°C)
 Factory Set Temperature Range: 117.5 ±35.6°F (47.5±2°C)
 Minimum Temperature Differential: 59°F (15°C)

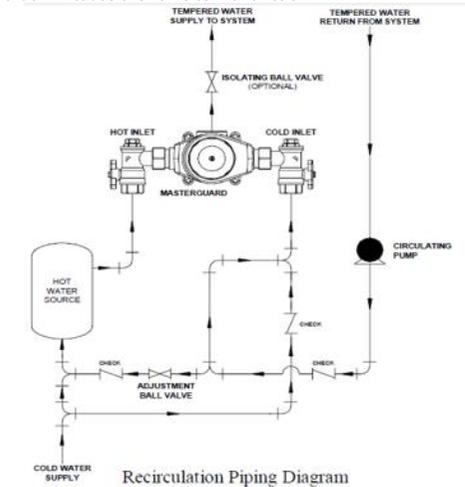
INSTALLATION

1. Flush lines prior to connection of valve.
2. Secure the Masterguard to the wall if desired using mounting feet. Valve can be mounted in any orientation.
3. The combination fittings supplied (including strainers and non-returns) must be installed with the valve to ensure correct operation.
4. Connect the inlet lines as shown on facing page.
5. It is recommended that an isolation valve be installed on the outlet of the Masterguard.
6. Connect the outlet line as shown in facing page.
7. Check Outlet water temperature and adjust as required. (See Temperature Adjustment)

In areas where temperatures can drop below freezing, care should be taken to ensure the valve does not freeze. Freezing the valve will result in serious damage to the internal components that will cause the valve to malfunction

RECIRCULATION PIPING REQUIREMENTS

In order to maintain mixed water throughout the installation it is recommended that a recirculating system be used. To achieve a stable recirculation temperature, follow the piping diagram exactly.



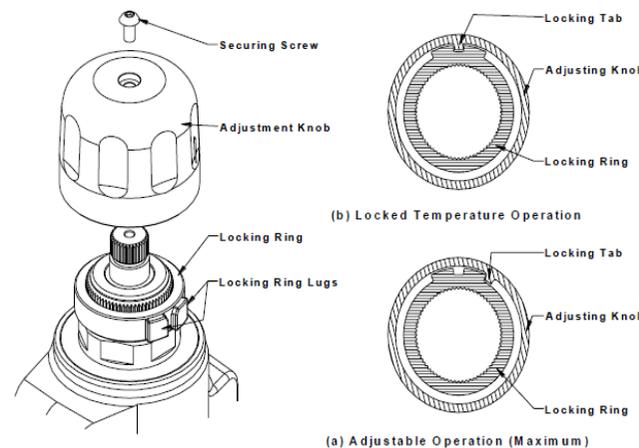
Setting Recirculation Temperature

1. Purge the system of air and ensure the hot water source is switched on and delivering hot water at normal operating temperature.
2. With the Adjustment Ball Valve fully closed and the recirculating pump turned off, set the desired mix temperature of the valve as detailed in the Temperature Adjustment section.
3. With the mixed temperature set, close all outlets. (Make sure there is no water being drawn off through the Masterguard).
4. Start the Circulating Pump and open the Adjusting Ball Valve approximately half way.
5. Allow the recirculating temperature to stabilise.
6. If the temperature increases above the desired temperature, slightly close the Adjustment Ball Valve. If the temperature decreases below the desired temperature open the Adjustment Ball Valve slightly.
7. Repeat Steps 4 and 5 until the valve is recirculating at the desired temperature.

When installing the Masterguard in an environment that experience large seasonal temperature changes through the year, it may be necessary to make minor adjustments to the Adjustment Ball Valve to maintain.

Temperature Adjustment

1. Prior to setting the valve it is necessary for the hot water source to be switched on and delivering hot water at normal operating temperature.
2. Open the nearest hot water outlet supplied by the Masterguard to a flow of 4 to 5 gpm. Allow the water to reach a stable temperature before recording. The temperature must be tested at the nearest outlet to ensure that the water delivered to any outlet is not greater than the desired maximum.
3. If the temperature is outside the desired operating limits it will be necessary to adjust the valve. The valve has two modes of temperature adjustment, (a) Adjustable to a preset maximum and (b) Locked temperature operation.



Temperature Adjustment (continued)

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| <p>a) Adjustable (With preset Maximum)</p> <ol style="list-style-type: none"> 1. Remove the securing screw. 2. If adjusting knob is currently in the locked position, remove the adjusting knob and replace it in a new position that allows it to rotate freely. There should be no need to remove the white locking ring. 3. Set the outlet temperature to the maximum required temperature. 4. Replace the adjusting knob with the Locking Tab to the RIGHT of the Locking Ring Lugs but not in the engaged position. | <p>b) Locked Temperature.</p> <ol style="list-style-type: none"> 1. Removing the securing screw. 2. If adjusting knob is currently locked in the locked position, remove the adjusting knob and replace it in a new position that allows it to rotate freely. There should be no need to remove the white locking ring. 3. Set the outlet temperature as desired. 4. Reposition the adjusting knob so the locking Tab and the Locking Ring Grooves are engaged. 5. Replace the securing screw. |
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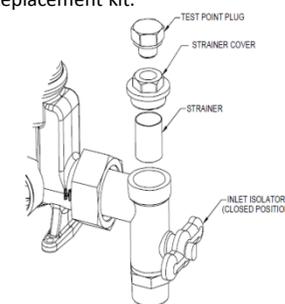
*This represents the maximum position of the knob. From this point the temperature can be adjusted lower, but not higher. To adjust lower turn the adjusting knob clockwise. If it is possible to turn the knob anticlockwise (ie to a higher temperature), then step three (3) needs to be repeated to set the knob in the correct position.

5. Replace the securing screw.
6. If desired, use adjusting knob to set the temperature lower than the maximum

MasterGuard Servicing

This is a Temperature Control device that must be checked and serviced regularly to ensure correct and safe performance. It should not be necessary to disassemble a new valve on initial installation. However if after following all instructions and trouble shooting guides presented here and you are still having difficulties, please contact Cash Acme for additional guidance and information.

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| <ol style="list-style-type: none"> 1. It is recommended that the Masterguard be serviced at regular intervals not exceeding 12 months to maintain safe and reliable operation. 2. If the valve is not functioning correctly proceed to the trouble shooting section for assistance. 3. Shut off the Hot and Cold Inlet Isolators and the Outlet Isolator (If fitted). It is recommended that the valve be allowed to cool before continuing to prevent scalding from the hot water and any hot parts. 4. Using a suitable sized shifter undo the test point plug followed by the strainer cover. 5. Carefully remove the strainer taking care not to deform it in any way. 6. Using either compressed air or water, remove all foreign material from the strainer. If the strainer is heavily blocked it may be necessary to increase service frequency or install a separate line strainer downstream from the valve. If Calcium build up is visible, soak the strainers | <ol style="list-style-type: none"> 7. in an acceptable de-liming agent. Rinse strainer thoroughly in water after soaking. Leaving the Inlet Isolators Closed, open a hot outlet that is supplied by the Masterguard and is elevated above the Masterguard. Slowly open the Outlet Isolator. No water should flow out of either of the fittings. If water does flow from one or both of the fittings the non-returns have become fouled and the four in one fittings will have to be replaced using a 4 in 1 Replacement kit. |
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MasterGuard Servicing (Continued)

8. Close the Hot Outlet and the Outlet Isolator.
9. Reposition the strainer in the fitting, again being careful not to deform the strainer in any way.
10. Replace and tighten the strainer cover and test point plug.
11. Open the Hot and Cold Isolators and the Outlet Isolator (If fitted).
12. Following the steps outlined in the Temperature Adjustment Section, measure the outlet water temperature and adjust as necessary.
13. It is recommended the valve be tested to verify that valve's internals are clear from build up and free to move.
 - i. Open the nearest hot water outlet supplied by the Masterguard to a flow between 2 and 3 gallons per minute.
 - ii. Using the Cold Inlet Isolator quickly shut off the cold supply to the valve.
 - iii. The flow from the outlet should reduce to a fast trickle (0.25 Gallon per Minute) within 5 seconds.
 - iv. Restore the Cold Supply.
 - v. Allow the water to flow for 1 minute, using the Hot Inlet Isolator quickly shut of the hot supply to the valve.
 - vi. The flow from the outlet should reduce to a fast trickle (0.25 Gallon per Minute) within 5 seconds.
 - vii. Restore the Hot supply.
 - viii. Allow the water to flow for 1 minute before repeating steps ii thru vii.
 - ix. Allow the valve to flow for several minutes to allow the outlet temperature to stabilize before measuring it.
14. If the valve is unable to reduce the flow to less than 0.25 gallons per minute or the final outlet temperature is greater than $\pm 5^{\circ}\text{F}$ the valve is not operating correctly and the internals should be replaced immediately using the Internal Component Replacement Kit.

Valve Troubleshooting

FAULT / SYMPTOM	CAUSE	RECTIFICATION
1. Water leaks from head work.	<ul style="list-style-type: none"> O-ring worn or damaged. 	<ul style="list-style-type: none"> Replace O-ring with suitable part from the Internal Components Replacement Kit.
2. Valve is difficult or impossible to set.	<ul style="list-style-type: none"> Inlet temperatures are not within specific limits. Hot and cold supplies are reversed. Strainers blocked. 	<ul style="list-style-type: none"> Ensure inlet temperatures are within the specified limits for the valve. Refit the valve with Hot/Cold supplies fitted to the correct connections. Clean strainers as detailed in Servicing Section.
3. Mix temperature unstable or mix temperature changing over time.	<ul style="list-style-type: none"> Strainers blocked. Fluctuating supply pressures. 	<ul style="list-style-type: none"> Clean strainers as detailed in Servicing Section. Install pressure-regulating valves on hot and cold supplies.
4. Either full hot or full cold water flowing from outlet fixture.	<ul style="list-style-type: none"> Valve is incorrectly set. Hot and cold supplies are reversed. Hot/Cold water has migrated to other inlet. 	<ul style="list-style-type: none"> Adjust mix temperature as required. Refit the valve with Hot/Cold supplies fitted to the correct connections. Check non-return as detailed in Servicing Section.

Valve Troubleshooting (Continued)

FAULT / SYMPTOM	CAUSE	RECTIFICATION
5. No flow from the valve outlet.	<ul style="list-style-type: none"> Hot or Cold water supply failure. Strainers blocked. 	<ul style="list-style-type: none"> Restore inlet supplies and check mix temperature. Clean strainers as detailed in Servicing Section.
6. Flow rate reduced or fluctuating.	<ul style="list-style-type: none"> Strainers blocked. Fluctuating supply pressures. 	<ul style="list-style-type: none"> Clean strainers as detailed in Servicing Section. Install pressure-regulating valves on hot and cold supplies.
7. Mixed water temperature does not change when temperature adjuster is altered.	<ul style="list-style-type: none"> Hot and cold supplies are reversed. 	<ul style="list-style-type: none"> Refit the valve with Hot/Cold supplies fitted to the correct connections.
8. Hot water flows into the cold water system or vice versa.	<ul style="list-style-type: none"> Non-return valves fouled. 	<ul style="list-style-type: none"> Check non-return as detailed in Servicing Section.
9. Valve is noisy.	<ul style="list-style-type: none"> Excessive water velocity. Valve incorrectly sized 	<ul style="list-style-type: none"> Reduce water velocity (best achieved by installing a pressure regulating valve). Replace valve with correctly sized valve.

Recirculation Trouble Shooting

FAULT / SYMPTOM	CAUSE	RECTIFICATION
1. Recirculating water temperature hotter than desired.	<ul style="list-style-type: none"> Ball valve incorrectly set. 	<ul style="list-style-type: none"> Close ball valve slightly.
2. Recirculating water temperature colder than desired.	<ul style="list-style-type: none"> Ball valve incorrectly set. 	<ul style="list-style-type: none"> Open ball valve slightly.
3. Recirculating water cools down with ball valve fully open.	<ul style="list-style-type: none"> Recirculating pump too small. Recirculating pump not operating. System not piped correctly. 	<ul style="list-style-type: none"> Obtain larger Pump. Rectify pump problem. Check Piping against supplied diagram and correct if necessary.

Spare Parts

Six repair kits are available for the Masterguard:

1. Internal Components Replacement Kit. This kit contains all the parts that are likely to wear or malfunction in the Masterguard during normal operation.

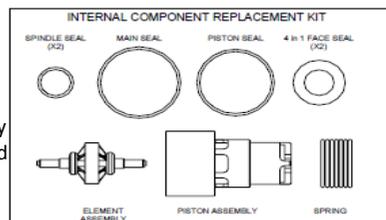
2. Head Work Replacement Kit. This kit contains a completely new head assembly for the Masterguard.

3. Temperature Adjustment Kit. This kit contains a replacement Adjuster Knob and Locking ring.

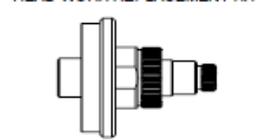
4. 4 in 1 Fitting Replacement Kit. The Four in one Replacement Kit contains both a hot and a cold Inlet fitting with strainers and non-returns installed. The kit also contains two replacement face seals.

5. Seal Kit. The Seal Kit contains all the O-rings and Seals used in the Masterguard 830, 840, 850 and 860.

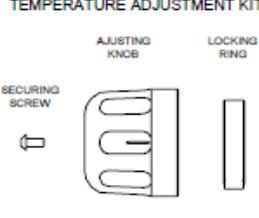
Each kit is supplied with a full set of fitting instructions, identifying each component and detailing the correct method for the disassembly and reassembly of the Masterguard. The instructions also include the full procedure for the testing and readjustment of the valve to ensure its continued safe performance.



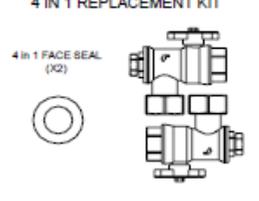
INTERNAL COMPONENT REPLACEMENT KIT



HEAD WORK REPLACEMENT KIT



TEMPERATURE ADJUSTMENT KIT



4 IN 1 REPLACEMENT KIT

(DO NOT SCALE)

Spare Parts Cont.

Six repair kits are available for the Masterguard:

1. Internal Components Replacement Kit. MS142 for 24539 & 24540 MS143 for 24541 & 24542

2. Head Work Replacement Kit. MS270 for 24539 & 24540 MS271 for 24541 & 24542

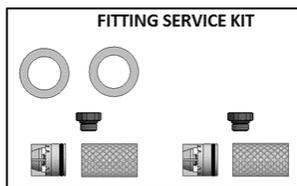
3. Temperature Adjustment Kit MS266 for 24539 MS267 for 24540 MS268 for 24541 MS269 for 24542

4. 4 in 1 Fitting Replacement Kit. MS260 for 24539 MS261 for 24540 MS262 for 24541 MS263 for 24542

5. Seal Kit MS138 for 24539 & 24540 MS139 for 24541 & 24542

6. Fitting Service Kit MS256 for 24539 MS257 for 24540 MS258 for 24541 MS259 for 24542

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FITTING SERVICE KIT



IS115 Rev. B

For warranty information, please visit

www.cashacme.com
www.cashacme.ca



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