

MXV-1

MIXING VALVE

INSTRUCTION MANUAL

Thank you very much for choosing the Yoshitake's product. To ensure the correct and safe use of the product, please read this manual before use. This manual shall be kept with care for future references.

The symbols used in this manual have the following meanings.

	Warning	This symbol indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury.
	Caution	This symbol indicates a hazardous situation that, if not avoided, may result in minor or moderate injury or may result in only property damage.

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YOSHITAKE

1. Usage of the Product

The MXV-1 mixing valve is a temperature regulating valve that mixes hot water and cold water to make water of desired temperature. The valve is controlled by expansion/compression of the wax thermoelement to provide mixed water of stable temperature. This product has built-in check valves.

2. Specifications

Model	MXV-1
Nominal size	25-50A
Application	Cold and hot water
Working pressure	1.0 MPa or less
Minimum closing pressure of check valve	3 kPa
Supply pressure difference between cold water and hot water	Within 0.05 MPa
Set temperature range	38-65°C
Initial set pressure	48°C
Working temperature	90°C or below (No freeze condition)
Difference between cold water temperature and set temperature	10°C or more
Difference between hot water temperature and set temperature	10°C or more
Installation posture	Vertical or horizontal installation
Connection	JIS Rc screwed
Connection for circulating water inlet	JIS G 1/2 screwed



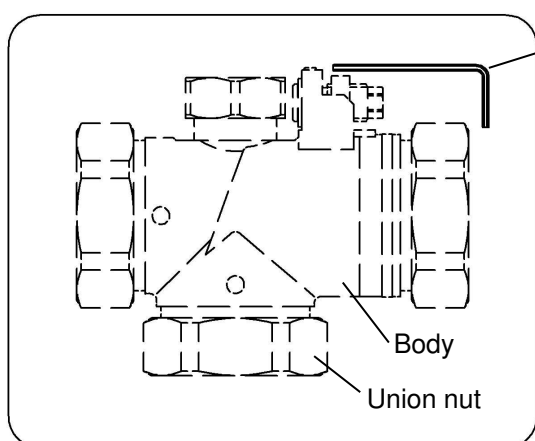
Caution

Please confirm that the indications on the product correspond with the specifications of the ordered product model before use.

* If they are different, please contact us without using the product.

3. Package Content

Please confirm that the package includes the following parts:

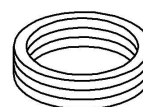


- Body (with 3 pieces of union nut installed)
- Insulating case
- Hexagon wrench (1 piece) (attached on the surface of the insulating case)
- Band (Fasten this band around the insulating case.)

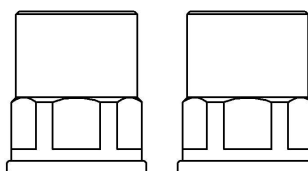
Hexagon wrench
Insulating case



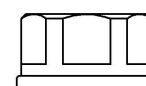
- Circulating water inlet joint (1 piece)



- Union packing (3 pieces)



- Union joint with check valve (2 pieces)



- Union joint (1 pieces)

Fig. 1 Package content

4. Dimensions and Weights

4.1 Dimensions and weights of product

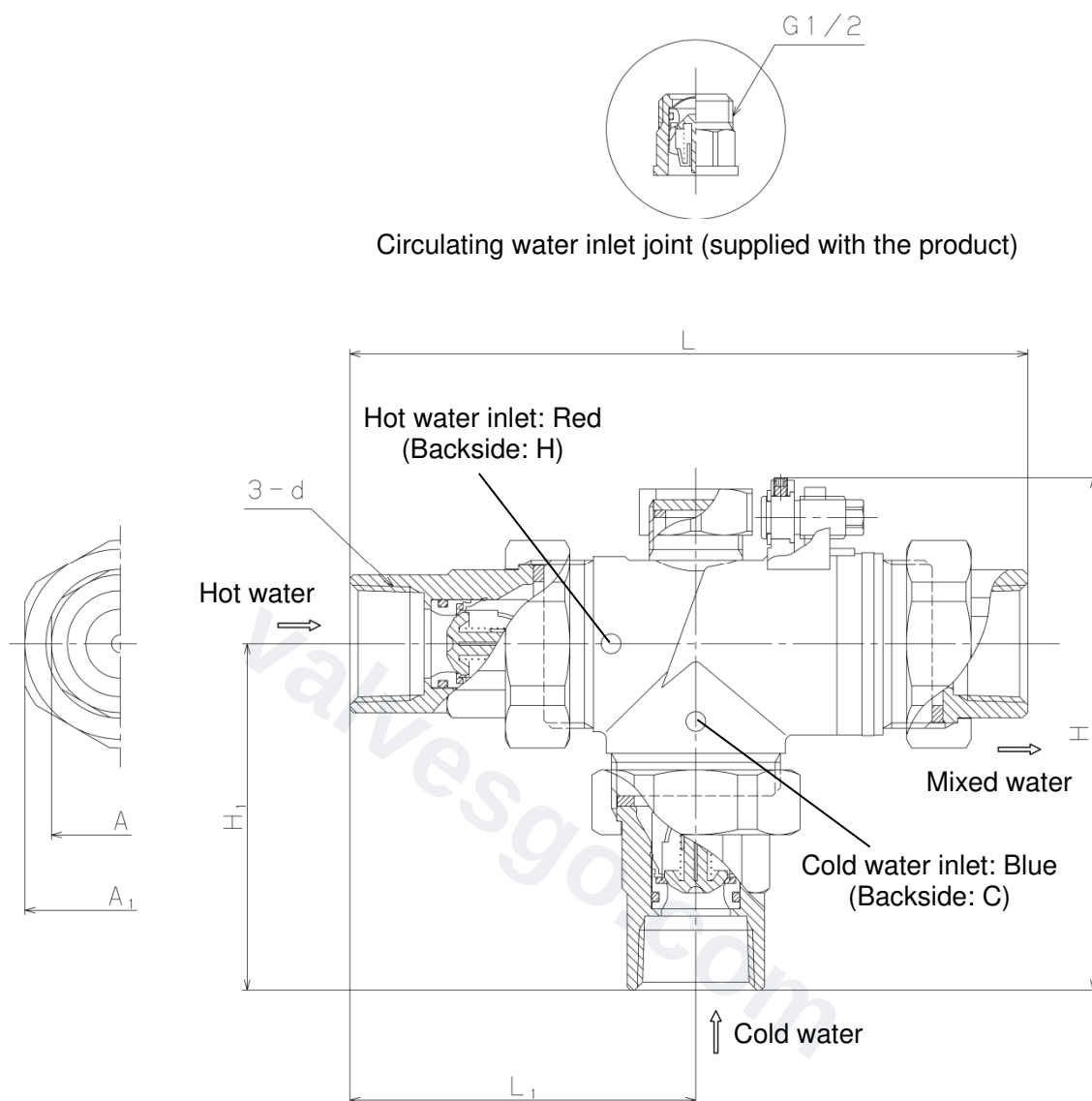


Fig. 2 Dimensions of the product

(mm)								
Nominal size	d	L	L ₁	H	H ₁	A	A ₁	Weight (kg)
25A	Rc 1	192	110	145	98	39	54	2.3
32A	Rc 1 1/4	225	130	172	114	49	66	4.0
40A	Rc 1 1/2	256	150	189	128	56	73	5.4
50A	Rc 2	292	180	221	144	69	90	9.4

4.2 Dimensions and weights of insulating case

After installing the product, use the case made of polystyrene foam (fire-retarding material) as an insulating case for the product.

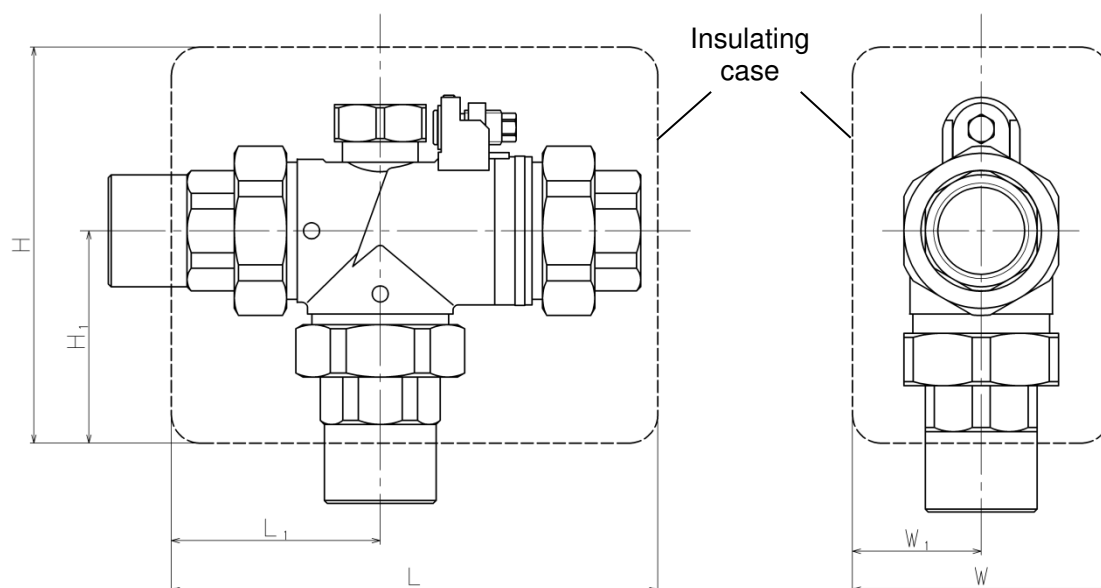


Fig. 3 Dimensions of insulating case

Nominal size	L	L ₁	H	H ₁	W	W ₁
25A	170	73	138	74	90	45
32A	192	83	157	83.5	104	52
40A	217	91	172	91	124	62
50A	267	113	213	99	156	78

(mm)

5. Flow Characteristics Chart

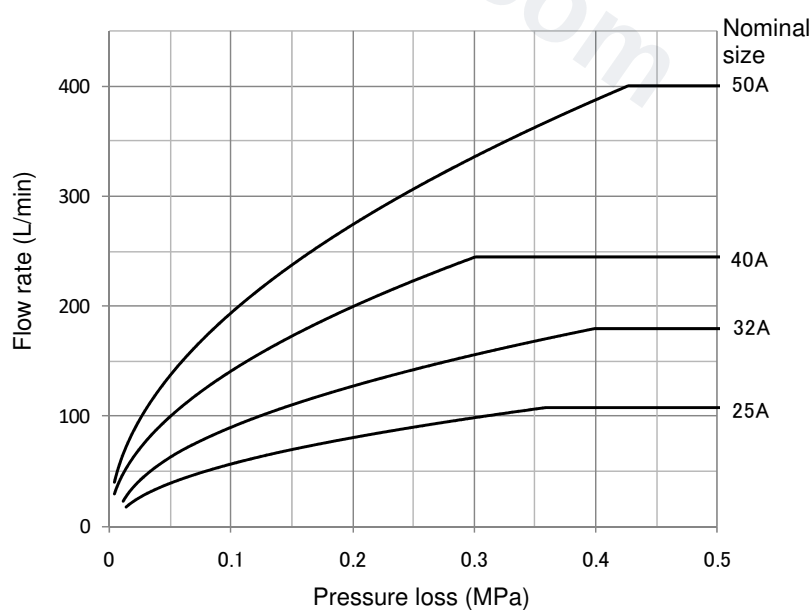


Fig. 4 Flow characteristics chart

This chart shows the flow characteristics obtained when the supply pressures of hot water and cold water are the same (If these pressures are different, regard pressure difference between the lower one and the mixed water as the pressure loss).

The values which this chart shows include pressure loss due to check valves.

6. Installation

6.1 How to install

1. Install the union joints with check valves [1] at the both inlets for cold water and hot water.
2. Install the union joint [2] at the mixed water outlet.
3. The union nuts [3] and union packings [4] can be used at any of the three connections.

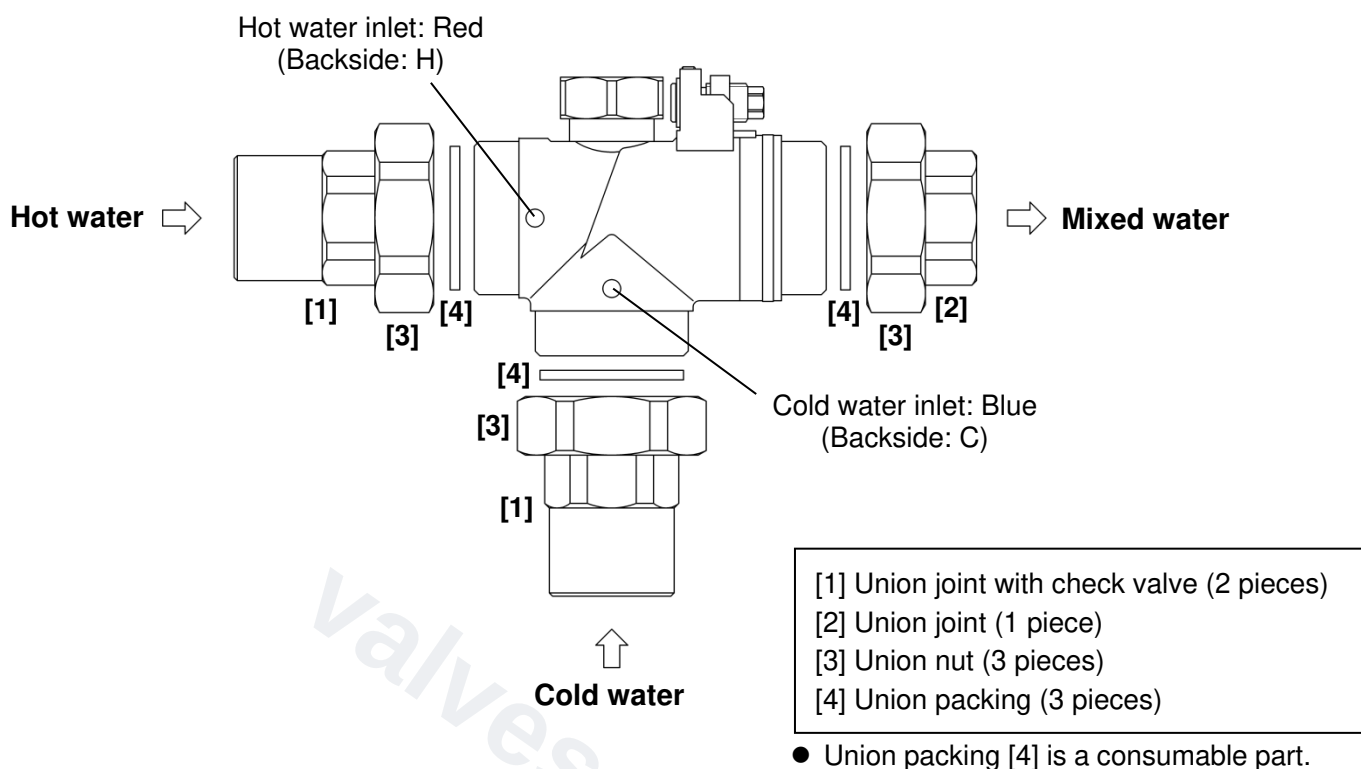


Fig. 5 Installation of joints

4. To circulate mixed water, a return pipe for circulating water needs to connect to the product by using the circulating water inlet joint [7].
 Loosen and remove the union nut [5] at the circulating water inlet, and then replace the cap [6] with the circulating water inlet joint [7]. The union nut [5] and the union packing [8] can be used without replacing.

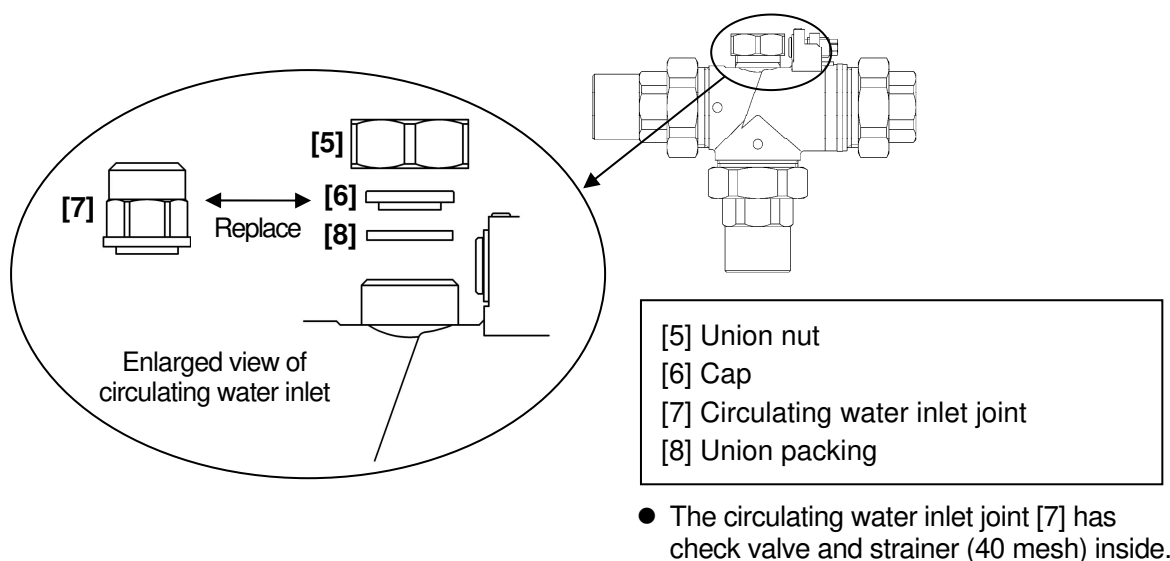
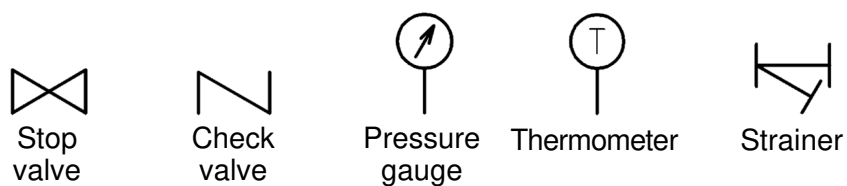


Fig. 6 How to replace the part for circulation piping

6.2 Piping examples

The following symbols are used in the example:



6.2.1 Piping example

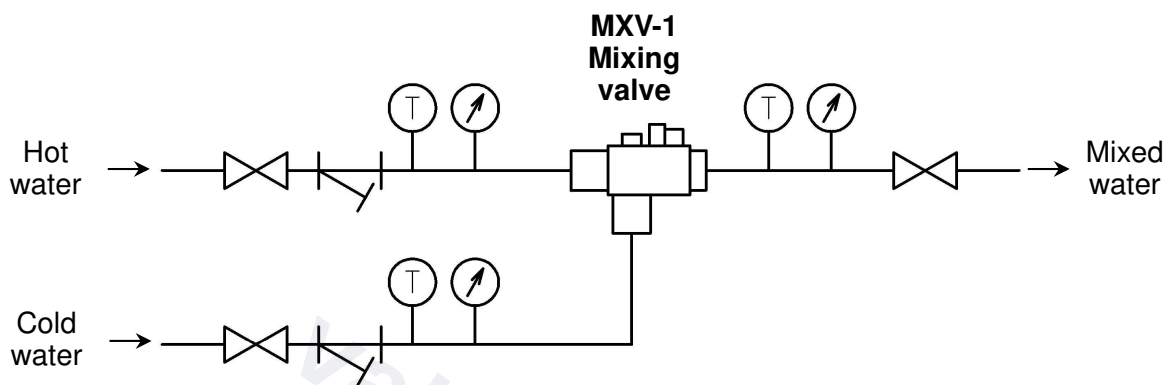


Fig. 7 Piping example

6.2.2 Piping example for hot water system

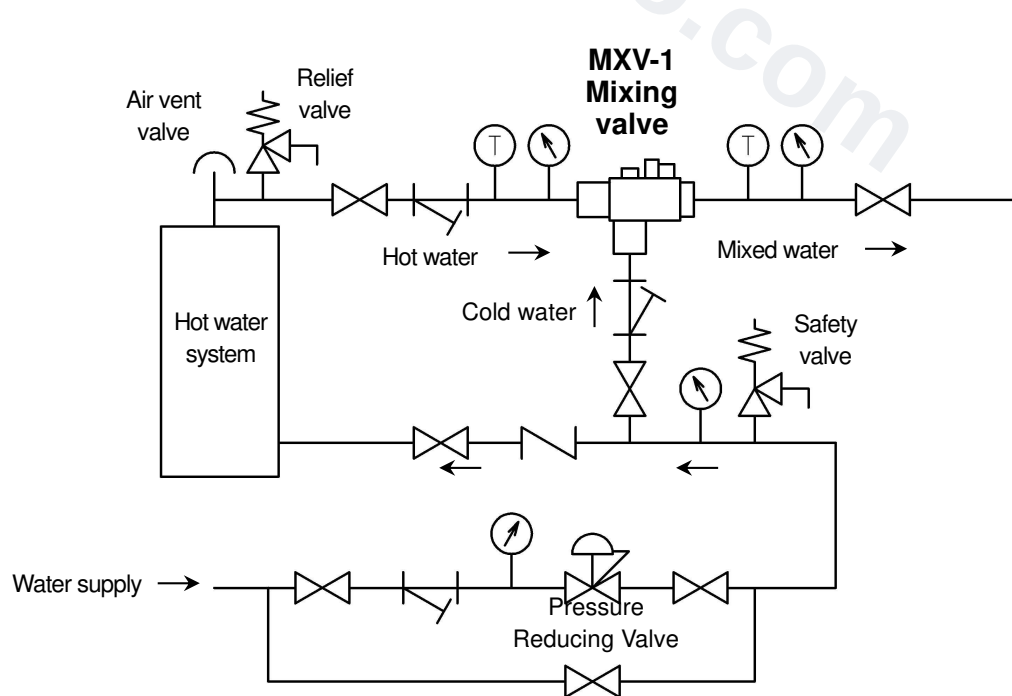


Fig. 8 Piping example for hot water system

6.2.3 Piping example for circulation piping

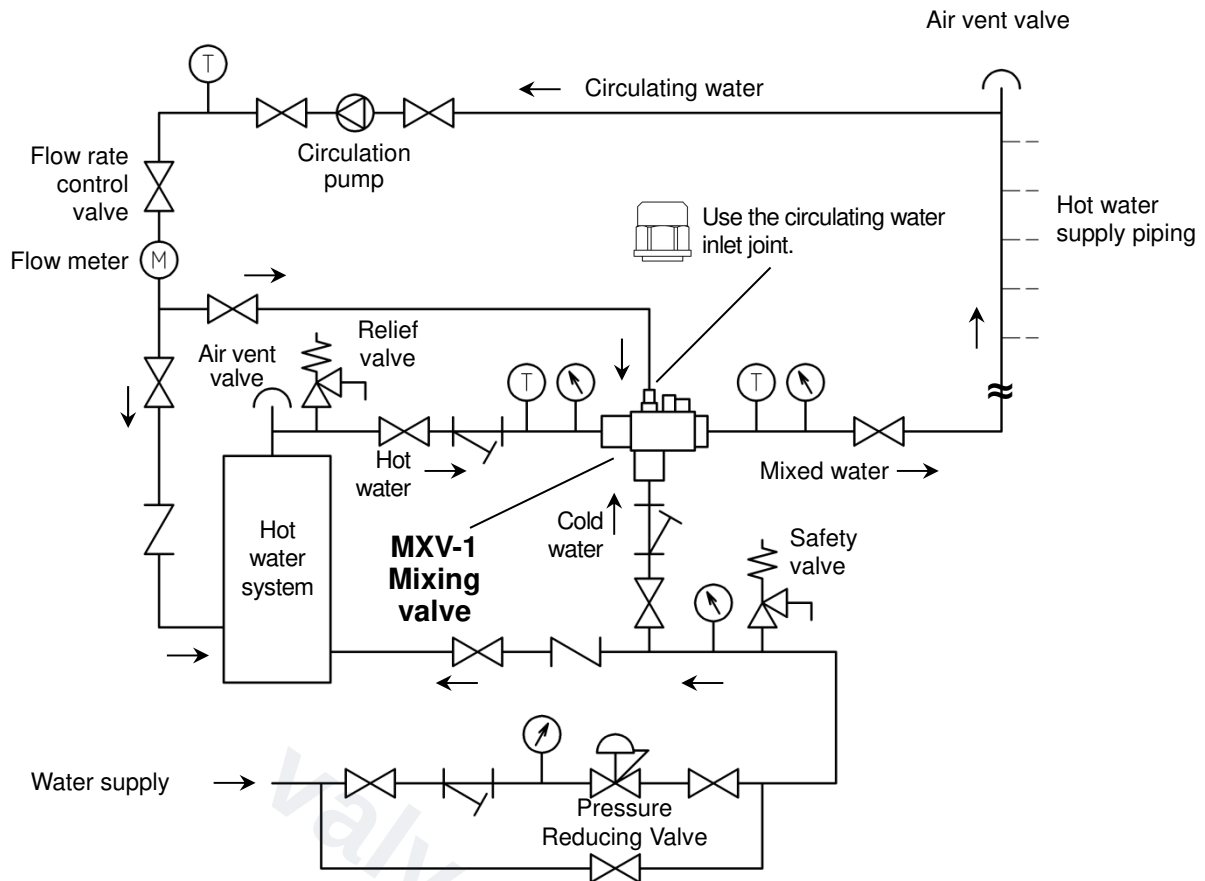


Fig.9 Piping example for circulation piping

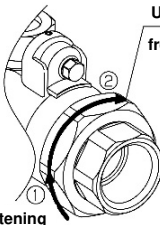
6.3 Precaution for installation

Warning

1. When installing the product, make sure that each connection (for hot water, cold water, and mixed water) is connected to the piping properly, and that two union joints with check valves and one union joint are properly connected to the body. (See "6.1 How to install" on page 4.)
* Failure to follow this notice may prevent the product from functioning properly resulting in scalds due to hot water.
2. Since the product cannot stop water completely, when cold water is not supplied to the product due to water cutoff or any other reasons, only hot water comes out of the mixed water outlet without being cooled. Please take measures against such temperature rise.
* Failure to follow this notice may scald your skin if only hot water comes out of the mixed water outlet.

Caution

1. Foreign substances or rust stuck inside the product may prevent the product from functioning properly. At installation, be sure to remove foreign substances such as debris and sand from the pipe, and do not let sealing tape or liquid sealant enter the pipe.
* Since the product cannot be disassembled, the foreign substances inside cannot be removed.
* Foreign substances, scale or sealant entering the product may cause malfunction.
* Copper pipes or stainless steel pipes are recommended to use.
2. Install a strainer (60 mesh) at the inlet side of the product.
* Foreign substances or scale entering the product may cause malfunction.
3. Do not apply excessive load, torque or vibration to the product.
* Failure to follow this notice may result in malfunction or a drastically shortened service life of the product.

4. The temperature of mixed water can change due to pressure fluctuation of hot water and/or cold water or hot water temperature change. When the product is used in a place where the strict temperature control is required for mixed water or where mixed water can contact human body directly, make sure to install a mixing faucet after the product for easy temperature control.
 5. When used for hot water, take measures for pipe expansion and compression.
 * Pipe expansion and compression may damage the product and cause external leakage.
 (Expansion coefficient of stainless steel pipe: $17.3 \times 10^{-3} \text{mm/m}^{\circ}\text{C}$)
 6. When attaching the Union Joint with Check Valve and the Union Joint to the mixing valve body, [1] tighten the union nuts by hand until they contact the union packing, and [2] tighten by screwing in about 1/3 turn.
 * Overtightening may cause external leakage.
- 

Use a tool to screw in about 1/3 turn from the position ① and stop tightening

Ending position of manual tightening
7. Be sure to install thermometers and pressure gauges in piping.
 8. Additional check valves are not required because the product has check valves built in each of the hot water inlet, cold water inlet, and circulating water inlet.
 9. A large pressure difference between hot water and cold water makes temperature control of mixed water unstable because water of lower pressure does not flow into the product. Keep the pressure difference within 0.05 MPa, for example, by installing a pressure reducing valve for each inlet.
 10. After installing the product, use the case made of polystyrene foam (fire-retarding material) as the insulating case for the product.
 11. When there is a possibility of freezing or temperature drop in the piping while the product is not used, connect circulation piping to the product by using the circulating water inlet joint.
 (See "6.1 How to install" and Fig. 9 on pages 4 and 6.)

7. Operating Procedure

7.1 Precaution for operation



Warning

1. Do not touch the product having hot water of high temperature with bare hands.
 * The product having hot fluid may scald your skin.
2. Before allowing the fluid to flow, make sure that there is no danger when the fluid flows to the end the pipe.
 * The fluid discharge may cause burns or injuries.



Caution

The product must be handled by an experienced professional or a valve manufacturer.

7.2 Set temperature adjustment

7.2.1 Initial set temperature

Set temperature is adjusted to 48°C when shipped out from the factory. To change set temperature, turn the adjusting screw. Set temperature range is from 38°C to 65°C. Also, the adjusting screw is fixed by the lock screw when shipped out from the factory.

7.2.2 How to adjust set temperature

To change set pressure, use the hexagon wrench (supplied with the product) and another wrench (commercially available) to turn the adjusting screw.

The hexagon wrench is placed on the surface of the insulating case.

Nominal size		25A	32A	40A	50A
Hexagon wrench	(supplied with the product)	2 mm	2.5 mm		
Other wrenches	(commercially available)	9 mm	10 mm	12 mm	

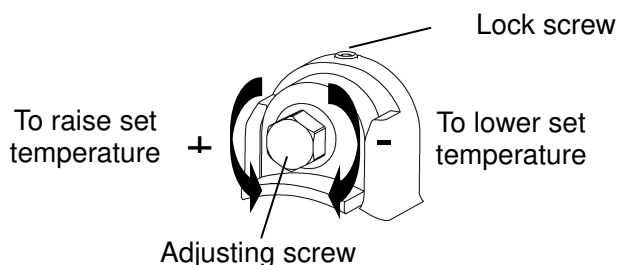


Fig. 10 How to adjust set temperature

- (1) Loosen the lock screw by using the hexagon wrench (supplied with the product).
- (2) Slowly turn the adjusting screw by using a wrench (commercially available) to achieve the desired temperature while checking the thermometer set at the mixed water outlet. Turn the adjusting screw counterclockwise to raise set temperature, or clockwise to lower set temperature.
- (3) After adjustment, tighten the lock screw. The hexagon wrench should be put back on the surface of the insulating case.

8. Maintenance

8.1 Troubleshooting

Trouble	Cause	Remedy
Desired temperature of mixed water cannot be obtained	1. Cold water or hot water is not supplied.	1. Supply both cold water and hot water.
	2. Pressure difference between cold water and hot water is more than 0.05 MPa.	2. This is out of our specification. The supply pressure difference between cold water and hot water should be within 0.05 MPa.
	3. Temperature difference between set temperature and temperature of hot water (or of cold water) is less than 10°C.	3. This is out of our specification. Make the hot water temperature at least 10°C higher than set temperature, and make the cold water temperature at least 10°C lower than set temperature.
	4. Foreign substance is stuck inside of the product.	4. <u>The product cannot be disassembled.</u> Replace the product with a new one.
	5. It is right after set temperature has been changed.	5. It may take time for the product to supply mixed water of stable temperature. Adjust the temperature by slowly turning the adjusting screw with checking the thermometer.
	6. The body and joints are not properly connected.	6. Check if all the parts are connected properly. (See "6.1 How to install" on page 4.)
Mixed water temperature fluctuates.	1. Supply temperature and/or pressure of cold water and/or hot water fluctuate.	1. Supply cold water and hot water stable both in temperature and pressure.
	2. Pressure difference between cold water and hot water is more than 0.05 MPa.	2. This is out of our specification. The supply pressure difference between cold water and hot water should be within 0.05 MPa.
	3. Foreign substance is stuck inside of the product.	3. <u>The product cannot be disassembled.</u> Replace the product with a new one.
	4. Flow rate has changed rapidly or greatly.	4. It may take time for the product to supply mixed water of stable temperature after a rapid or great change in flow rate.
	5. It is right after set temperature has been adjusted.	5. It may take time for the product to supply mixed water of stable temperature. Adjust the temperature by slowly turning the adjusting screw with checking the thermometer.
Mixed water does not flow out.	1. The body and joints are not properly connected.	1. Check if all the parts are connected properly. (See "6.1 How to install" on page 4.)
	2. Cold water and/or hot water is not supplied.	2. Supply both cold water and hot water.
Outside leakage	1. Union nut is loosened.	1. Fasten the union nut.
	2. Union packing is deteriorated.	2. Replace the union packing with a new one, which is available as a consumable part.

Please contact us for troubles other than above or if the trouble still exists after the above remedy is taken.

8.2 Precaution for maintenance and inspection



Warning

1. Completely discharge the pressure inside of the product, piping and equipment, and cool down the product to the condition that it can be touched with bare hands, prior to dismounting the product from piping.
* Failure to follow this notice may result in scalds or injury, or wetting surroundings due to the residual pressure.
2. When hot water of high temperature is supplied to the product, do not touch the product with bare hands
* The product having high temperature fluid may scald your skin.



Caution

1. Maintenance must be done by an experienced professional or a valve manufacturer.
* Do not try to disassemble the product. If you are not a professional and outside leakage or any other abnormal condition is observed, stop water supply to the product and please contact us or a professional.
2. The product cannot be disassembled. Please contact us if you have any troubles that cannot be solved.
3. The parts made of synthetic rubber are consumable. Replace the parts when the time below comes.

■ Part replacement

Part	Time for replacement
Union packing [4]	Per 5 years

* Time for replacement may differ according to usage conditions.

* See "6.1 How to install" on page 4.

4. Before stopping operation of the product for an extended period, completely discharge fluid from the product.
5. After leaving the product not operated for a long period, perform inspection before start-up of operation.

8.3 Daily inspection

Conduct daily inspection in order to maintain optimum performance of the product.

Inspection Items	Remedy for abnormality
Mixed water temperature is as set temperature.	See "8.1 Troubleshooting" on page 8.
Outside leakage is not observed.	See "8.1 Troubleshooting" on page 8.

Please contact us for troubles other than shown in "8.1 Troubleshooting" on page 8 or when the trouble still exists after the remedy is taken.