# ACTIVAL™

# Two-way Ball Valve with Threaded-end Connection

## ■ General

ACTIVAL™ Model VY5302A is a two-way ball valve with threaded-end connection (ISO 7-1: 1994). It proportionally controls chilled/hot water for HVAC applications.

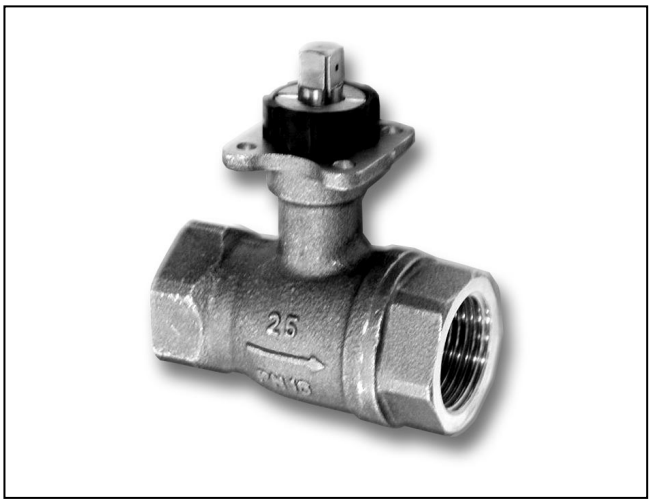
Model VY5302A has bronze valve body, stainless-steel ball and stem, and the components exposed to process fluid are made of other corrosion resistant materials.

Cv value and size variation of Model VY5302A are best suited to HVAC control.

Model VY5302A is used in combination with the actuator Model MY53X0A. Regarding the detailed information on the actuator, refer to:

**Specifications/Instructions of ACTIVAL Model MY53X0A**

HVAC: Heating, ventilation, and air conditioning
ISO: International Organization for Standardization



## ■ Features

- Compact and lightweight:
  Valve can be installed in a restricted space such as inside of a compact AHU.
- Bronze valve body applicable to PN16.
- Easy assembly with Model MY53X0A actuator using no tool, and no adjustment required.
- Equal percentage flow characteristic.

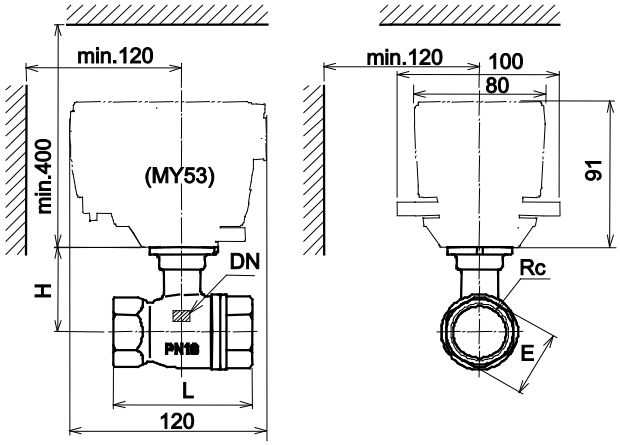
AHU: Air handling unit

IMPORTANT:
To control ACTIVAL with a third-party controller, please consult with our sales person.

## ■ Model Numbers

| Base model number | Material | — | Size/ Cv | Description |
|---|---|---|---|---|
| VY53 | | | | Two-way valve with threaded-end connection |
| | 0 | | | Bronze |
| | | 2A00 | | Fixed |
| | | | 11 | DN15 (1/2") / 2.5 in Cv |
| | | | 12 | DN15 (1/2") / 4 in Cv |
| | | | 22 | DN20 (3/4") / 6.3 in Cv |
| | | | 23 | DN25 (1") / 10 in Cv |
| | | | 31 | DN32 (1 1/4") / 16 in Cv |
| | | | 41 | DN40 (1 1/2") / 25 in Cv |
| | | | 42 | DN40 (1 1/2") / 40 in Cv |
| | | | 51 | DN50 (2") / 40 in Cv |

## ■ Dimensions and Maintenance Clearance




| Model number | Dimensions | | | | |
|---|---|---|---|---|---|
| | Valve size | Rc* | L (mm) | H (mm) | E (mm) |
| VY5302A0011 | DN15 | Rc 1/2 | 63 | 47.5 | 27 |
| VY5302A0012 | DN15 | Rc 1/2 | 63 | 47.5 | 27 |
| VY5302A0022 | DN20 | Rc 3/4 | 72 | 50 | 33 |
| VY5302A0023 | DN25 | Rc 1 | 85 | 53.5 | 41 |
| VY5302A0031 | DN32 | Rc 1 1/4 | 98.5 | 68.5 | 50 |
| VY5302A0041 | DN40 | Rc 1 1/2 | 108.5 | 72 | 56 |
| VY5302A0042 | DN40 | Rc 1 1/2 | 108.5 | 72 | 56 |
| VY5302A0051 | DN50 | Rc 2 | 109 | 73 | 69 |

Note:
* Rc: Internal tapered pipe thread complying with ISO 7-1: 1994.

Figure 1. Dimensions and maintenance clearance (mm)

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## Safety Instructions

Please read instructions carefully and use the product as specified in this manual. Be sure to keep this manual near by for ready reference.

### Usage Restrictions

This product is targeted for general air conditioning. Do not use this product in a situation where human life may be affected. If this product is used in a clean room or a place where reliability or control accuracy is particularly required, please contact our sales representative. Azbil Corporation will not bear any responsibility for the results produced by the operators.

### ■ Warnings and Cautions

| | |
|---|---|
| ⚠ WARNING | Alerts users that improper handling may cause death or serious injury. |
| ⚠ CAUTION | Alerts users that improper handling may cause minor injury or material loss. |

### ■ Signs

| | |
|---|---|
| | Alerts users possible hazardous conditions caused by erroneous operation or erroneous use. The symbol inside △ indicates the specific type of danger.<br>(For example, the sign on the left warns of the risk of electric shock.) |
| | Notifies users that specific actions are prohibited to prevent possible danger. The symbol inside ⃠ graphically indicates the prohibited action.<br>(For example, the sign on the left notifies that disassembly is prohibited.) |
| | Instructs users to carry out a specific obligatory action to prevent possible danger. The symbol inside ● graphically indicates the actual action to be carried out.<br>(For example, the sign on the left indicates general instructions.) |

| ⚠ CAUTION | |
|---|---|
| | Do not freeze this product.<br>Doing so may damage the valve body and cause leakage. |
| | When piping this product, be sure there is no foreign matter in the pipes.<br>If foreign matter remains in the pipes, the product may break down. |
| | Install and use this product according to the specifications stated in this manual.<br>Failure to do so may cause device failure. |
| | Do not screw a pipe excessively far into this product.<br>Doing so may damage the inside of the valve and cause leakage outside of the valve, or may cause malfunction. |
| | After installation, make sure no fluid leaks from the valve-pipe connections.<br>Improper piping may cause fluid leakage outside of the valve. |
| | Do not put a load or weight on this product.<br>Doing so may damage the product. |
| | Do not carelessly touch this product when it is used to control hot water.<br>Doing so may result in burns, because the product reaches a high temperature. |

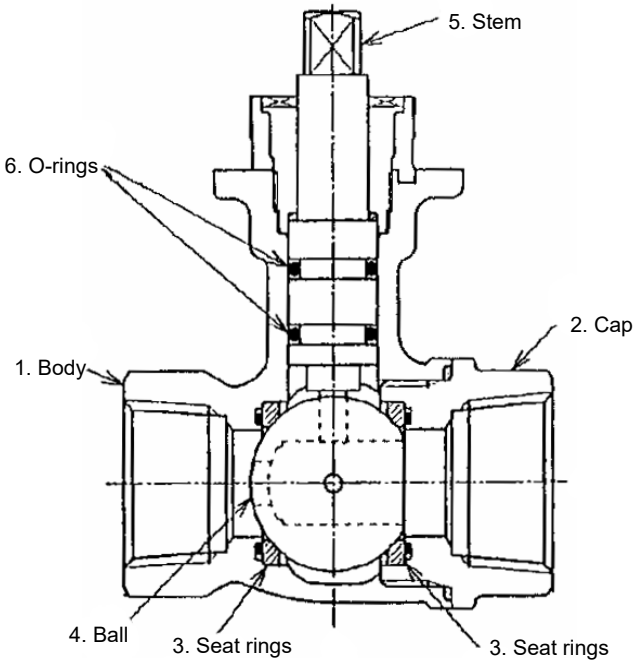
## ■ Specifications

| Item | Specification | | | | |
|---|---|---|---|---|---|
| Type | Two-way ball valve with threaded-end connection (internal), proportional control | | | | |
| Applicable actuator to be combined | Model MY53X0A | | | | |
| Pressure rating | PN16 (Max. working pressure: 1.6 MPa) | | | | |
| Valve size, Cv, close-off rating | Model number | | Nominal size | Cv | Close-off rating |
| | VY5302A0011 | | DN15 (1/2”) | 2.5 | 1.0 MPa |
| | VY5302A0012 | | DN15 (1/2”) | 4 | 1.0 MPa |
| | VY5302A0022 | | DN20 (3/4”) | 6.3 | 1.0 MPa |
| | VY5302A0023 | | DN25 (1”) | 10 | 1.0 MPa |
| | VY5302A0031 | | DN32 ($1^1/_4$”) | 16 | 0.5 MPa |
| | VY5302A0041 | | DN40 ($1^1/_2$”) | 25 | 0.5 MPa |
| | VY5302A0042 | | DN40 ($1^1/_2$”) | 40 | 0.5 MPa |
| | VY5302A0051 | | DN50 (2”) | 40 | 0.5 MPa |
| Materials | Body | Cast bronze (equivalent to: - CuAn5An5Pb5-C (DIN EN1982) for global standard - CAC406 (JIS) for Japanese standard) | | | |
| | Ball | Cast stainless steel | | | |
| | Stem | Stainless steel | | | |
| | Seat ring | PTFE | | | |
| | O-ring | EPDM | | | |
| End connection | Internal threaded-end (equivalent to ISO 7-1: 1994) | | | | |
| Applicable fluid | Chilled/hot water, brine (ethylene glycol solutions, 50 wt.% max.) | | | | |
| Allowable fluid temperature | 0 °C to 100 °C (non-freezing)<br>Note: When using this product in China, use it at 99°C or below. | | | | |
| Flow characteristic | Equal percentage | | | | |
| Rangeability | 100 : 1 | | | | |
| Seat leakage in fully closed position | 0.01 % of rated Cv value (0.0006 Cv or less for DN15 models) | | | | |
| Factory preset position | Fully open | | | | |
| Installation locations | Indoor / outdoor<br>Note: Salt air, corrosive gas, flammable gas, and organic solvent must be avoided. | | | | |
| Mounting position | Refer to ■ “Installation,” ● “Mounting position.” | | | | |
| Weight (Actuator in combination is NOT included.) | VY5302A0011 | 0.4 kg | | | |
| | VY5302A0012 | 0.4 kg | | | |
| | VY5302A0022 | 0.6 kg | | | |
| | VY5302A0023 | 0.8 kg | | | |
| | VY5302A0031 | 1.2 kg | | | |
| | VY5302A0041 | 1.5 kg | | | |
| | VY5302A0042 | 1.5 kg | | | |
| | VY5302A0051 | 1.8 kg | | | |

DIN: Deutsche Industrie Normen
EPDM: Ethylene-propylene-diene copolymer
JIS: Japanese Industrial Standards
PTFE: Polythetrafluoroethylene

## ■ Parts Indication and Materials

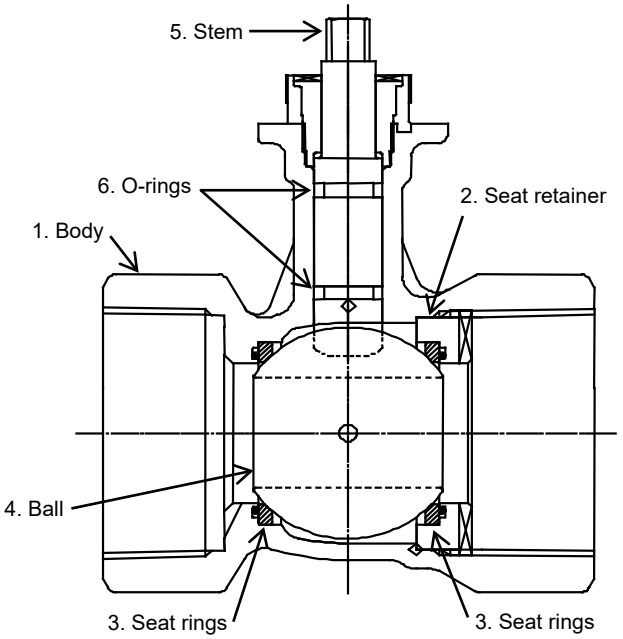
● **Valve size: DN15 to DN40**




| No. | Part name | Material |
|---|---|---|
| 1 | Body | Cast bronze<br>(equivalent to: - CuAn5An5Pb5-C (DIN EN1982)<br>- CAC406 (JIS)) |
| 2 | Cap | Cast bronze<br>(equivalent to CuAn5An5Pb5-C (DIN EN1982)) |
| 3 | Seat ring | PTFE |
| 4 | Ball | Stainless steel |
| 5 | Stem | Stainless steel |
| 6 | O-ring | EPDM |

Figure 2. Parts identification and materials: DN15 to DN40 valve

● **Valve size: DN50**




| No. | Part name | Material |
|---|---|---|
| 1 | Body | Cast bronze<br>(equivalent to: - CuAn5An5Pb5-C (DIN EN1982)<br>- CAC406 (JIS)) |
| 2 | Seat retainer | Copper alloy |
| 3 | Seat ring | PTFE |
| 4 | Ball | Stainless steel |
| 5 | Stem | Stainless steel |
| 6 | O-ring | EPDM |

Figure 3. Parts identification and materials: DN50 valve

## ■ Flow Characteristic

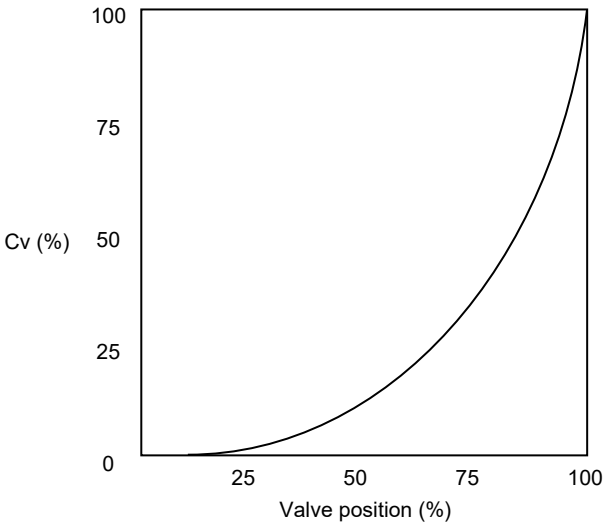



Figure 4. Flow characteristic diagram

## ■ Installation

| ⚠ CAUTION |
|---|
| Do not freeze this product.<br>Doing so may damage the valve body and cause leakage. |
| When piping this product, be sure there is no foreign matter in the pipes.<br>If foreign matter remains in the pipes, the product may break down. |
| Install and use this product according to the specifications stated in this manual.<br>Failure to do so may cause device failure. |

- To remove foreign substances inside the pipes, install a strainer on the inflow side of each valve. In case that the strainers cannot be installed on the inflow side of each valve, install it on the pipe diverting sections (sections diverting from main piping system to sub piping system).
- Install the valve so that the flow direction of process fluid agrees with the arrow indicated on the valve body.

## ■ Installation location

- Install the valve assembled with the actuator in a position allowing easy access for maintenance and inspection. Fig. 1 shows the minimum clearance for maintenance and inspection. When installing the valve and actuator in a ceiling space, provide an access panel within the 50 cm radius of the valve and actuator. And, place a drain pan under the valve.
- Do not install the product nearby a steam coil or a hot-water (in high temperature) coil. High heat radiation may result in an actuator malfunction.
- Do not mount the valve on a pipe where water hammer occurs, or where solid objects including slug may accumulate.

### ● Mounting position

The valve (assembled with the actuator) can be mounted in any position ranging from upright to sideways (90° tilted). The valve should be installed with its actuator vertically positioned above the valve body. However, the valve must be installed always in upright position outdoors.

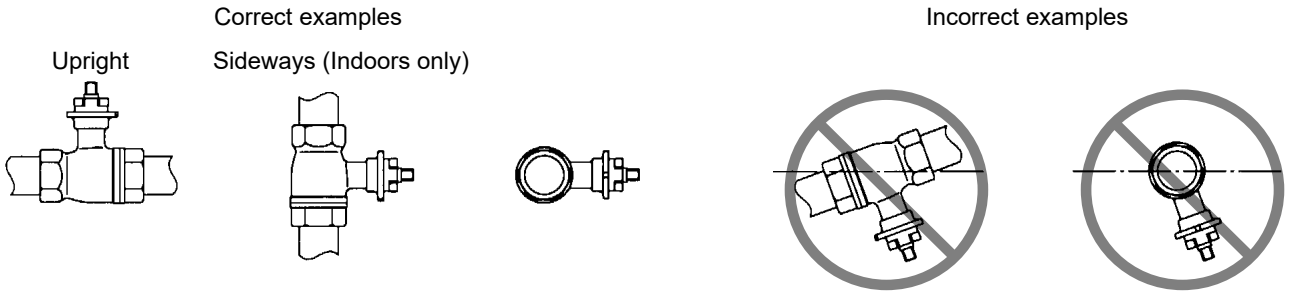
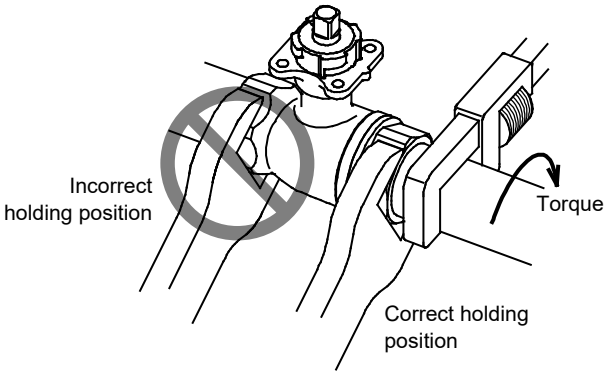



Figure 5. Mounting position

● **Piping**

| ⚠ CAUTION |
|---|
| Do not screw a pipe excessively far into this product.<br>Doing so may damage the inside of the valve and cause leakage outside of the valve, or may cause malfunction. |

- Install a bypass pipe and gate valves on the inflow, outflow, and bypass sides. Also, install a strainer (with 40 or more meshes) on the inflow side.
- When installing the valve to pipes, do not allow any object, such as chips, to get inside a pipe or valve. Valve cannot fully closes, or the valve seat may get damaged causing fluid leakage, due to an foreign object jammed inside the valve.
- When piping, do not apply too much sealing material, such as solidifying liquid and tape, to the pipe connection sections so that these materials flow into the valve. Valve cannot fully closes, or the valve seat may get damaged causing fluid leakage, due to the sealing material jammed inside the valve.
- When connecting the valve to pipes, hold the valve body (where a pipe is screwed) with a tool such as a wrench, and screw the pipe into the valve. (See Fig. 6.) Do not apply excessive torque to the pipe. Refer to the table in Fig. 6 for the recommended torque.




Recommended torque to screw into the pipe

| Valve size (DN) | 15 | 20 | 25 | 32 | 40 | 50 |
|---|---|---|---|---|---|---|
| Max. torque (N·m) | 40 | 60 | 100 | 120 | 150 | 200 |

Figure 6. Valve connection to a pipe

- Before activating the valve and actuator, flush the pipes (with the valve and actuator installed) at the maximum flow rate to remove all the foreign substances. Fully open (in 100 % position) the valve to flush. (Factory preset position: 100 %)

| ⚠ CAUTION |
|---|
| After installation, make sure no fluid leaks from the valve-pipe connections.<br>Improper piping may cause fluid leakage outside of the valve. |
| Do not put a load or weight on this product.<br>Doing so may damage the product. |

● **Heat insulation**

Do not apply heat insulation to the joint surface. Correctly apply heat insulation to the valve as shown in Fig. 7.

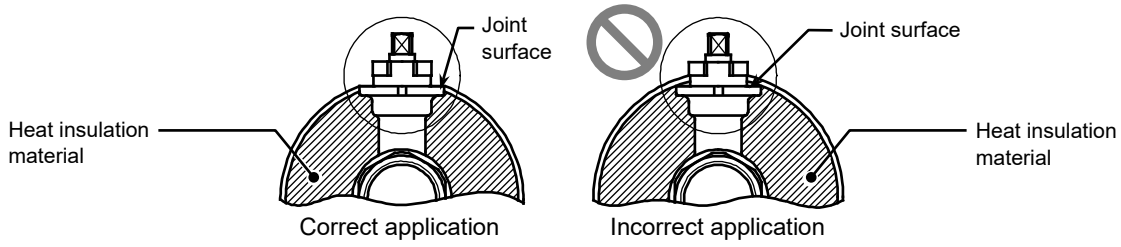



Figure 7. Heat insulation

● **Factory preset position**

ACTIVAL is set in fully open (100 %) position before shipment.

## ■ Assembling the valve Model VY5302A with the actuator Model MY53X0A

IMPORTANT:

- The actuator can be horizontally rotated every 90 degrees to fit into the valve mounting position (4 mounting positions). Make sure the positions of the actuator and the valve as follows, referring to Fig. 8:
  - Actuator: Indicator/manual lever points at 100 (fully open position).
  - Valve: An arrow on the top of the stem points at 100 (fully open position).
    (Align the hole on the side of the stem with the tip at the joint surface as 'a' in Fig. 8 shows.)
- Set the ACTIVAL (actuator and valve) in 100 % position when changing the mounting position.
  If the valve in 0 % position is assembled with the actuator in 100 % position, the actuator put torque on the closed valve, and the gear of the actuator gets damaged.
  If the valve and the actuator are assembled despite their positions unmatched, they might operate reversely and become unable to control the process fluid.

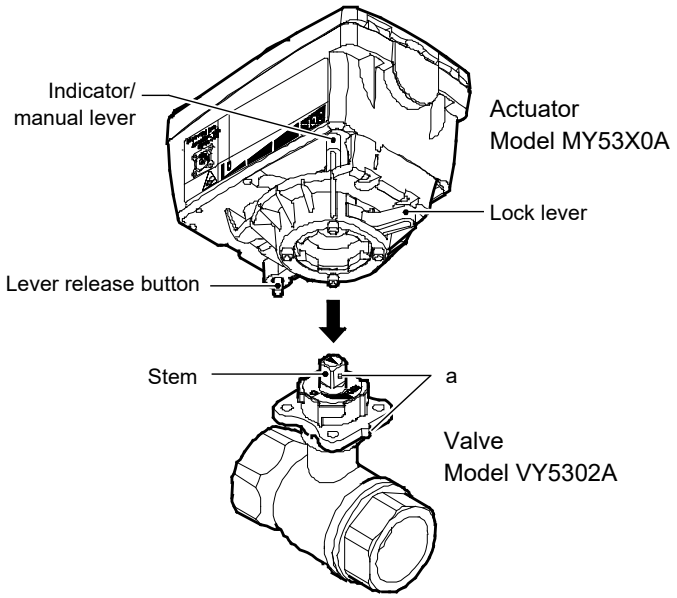



Figure 8. Mounting the actuator onto the valve

### ● Mounting procedure

1) Manually turn the indicator/manual lever of the actuator to "100" with the lever release button pressed.

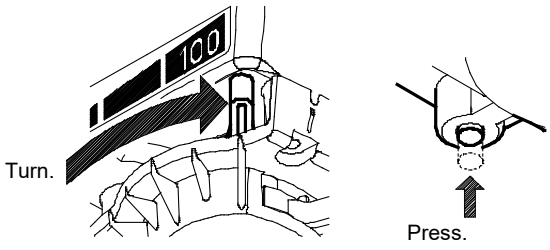



Figure 9. Indicator/manual lever at 100 % (fully open) position

2) Move the lock lever to right-end to unlock.

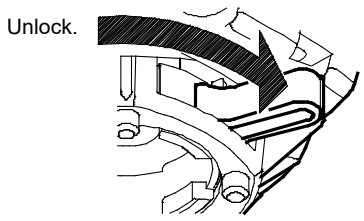



Figure 10. Unlocking the lock lever

3) Confirm that the arrow on the top of the valve stem points at "100". A hole on the side of the stem faces the same direction at which the tip of the valve joint surface (with the actuator) points when the valve position is fully open. (See 'a' in Fig. 8.)

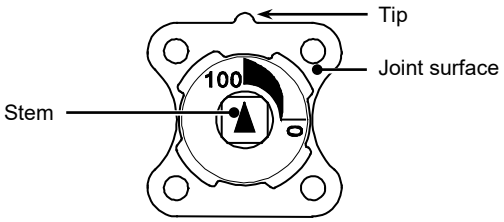



Figure 11. Valve stem pointing at 100 % (fully open) position

4) Assemble Model MY53X0A actuator with the valve. Engage 4 pins of the actuator with the mating holes on the valve joint surface.

5) Move the lock lever to left-end to lock. Locked position is indicated with the groove as shown in Fig. 12.

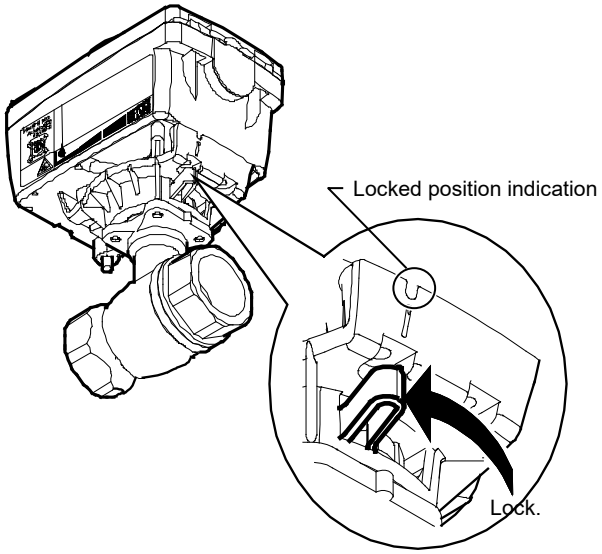



Figure 12. Locking the lock lever

## ■ Maintenance

| ⚠ CAUTION |
|---|
| Do not put a load or weight on this product.<br>Doing so may damage the product. |
| Do not carelessly touch this product when it is used to control hot water.<br>Doing so may result in burns, because the product reaches a high temperature. |

- Manually open/close the product at least once a month if it is left in inactive state for a long period after installation.
- Inspect the product according to Table 1.
- Visually inspect the product (e.g., fluid leakage) every six months. If any of the problems described in Table 2 are found, take corresponding actions shown in the table.
  If your problem is not solved by the corresponding action, please contact us.

Table 1. Inspection items and details

| Inspection item | Inspection interval | Inspection detail |
|---|---|---|
| Visual inspection | Semiannual | • Loosened lock lever<br>• Valve and actuator damages<br>• Fluid leakage from the gland/pipe connecting part |
| Operating status | Semiannual | • Unstable open/close operation<br>• Abnormal noise and vibration |
| Routine inspection | Any time | • Abnormal noise and vibration<br>• Unstable open/close operation<br>• Valve hunting |

Table 2. Troubleshooting

| Problem | Part to check | Action |
|---|---|---|
| Valve does not operate smoothly / valve stops halfway / valve does not operate at all. | Conditions of the power applied and of the input signal applied to the actuator.<br>Wiring condition/disconnected wires of the actuator.<br>Foreign substance jammed. | Check the power supply and the controller connected to.<br>Check the wiring.<br>Remove foreign substance by manually opening the valve. |
| Fluid leaks to the outside of the valve when the assembled actuator fully closes the valve. | Confirm the mounting procedure referring to the section **Assembling the valve Model VY5302A with the actuator Model MY53X0A**. | Dismount and remount the actuator according to the correct mounting procedure. |
| Valve hunting occurs. | Secondary pressure condition.<br>Differential pressure condition.<br>Control stability. | Reset and adjust the valve inlet/outlet pressure.<br>Modify control parameter/PID setting of the controller in connection to the assembled actuator. |
| The auxiliary switch of the assembled actuator does not operate. | Auxiliary switch (cam switch) condition.<br>Wiring condition/disconnected wires of the actuator. | Redo the cam switch setting.<br>Check the wiring. |
| Connecting part between the valve and the actuator vibrates or produces an abnormal noise. | Lock lever condition of the actuator.<br>Yoke damages. | Lock the lock lever.<br>Consult with our sales/service personnel. |
| Water flowing sound level is too high. | — | Consult with our sales/service personnel. |
| The assembled actuator in operation produces an abnormal noise. | — | Consult with our sales/service personnel. |
| Voltage/current input signal of the assembled actuator disagrees with the feedback output signal. | To completely shut off the valve, valve open and close (0-100% position) operation is controlled by 10-90 % range of the actuator voltage/current input signal. Voltage/current input signal therefore disagrees with the feedback signal, and this is not an error. | |

## ■ Disposal

Dispose of this product as industrial waste in accordance with your local regulations.
Do not reuse all or any part of the product.

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*Specifications are subject to change without notice.*