

# ACTIVAL™

## Motorized Two-Way Valve with Flanged-End Connection (JIS 10K / FC200, SCS13A)

### Model VY51XXJ

#### General

ACTIVAL Model VY51XXJ is a series of motorized two-way valves with flanged-end connection. The valve and actuator are integrated in a single unit.

The valve body rating corresponds to JIS 10K.

The actuator has a reversible synchronous motor, which operates at a low voltage of 24 V AC.

4 kinds of control signals are available to operate the ACTIVAL.

1. Nominal 135  $\Omega$  feedback potentiometer:  
Provides proportional control in combination with a DDC controller. (e.g., Infilex™ GC Model WY5111)
2. Nominal resistance 135  $\Omega$  input:  
Provides proportional control in combination with a proportionally controlled electric controller. (e.g., Neostat™ Model TY900XZ)
3. 4-20 mA DC input:  
Provides proportional control in combination with a DDC controller. (e.g., Infilex™ GC Model WY5111, Model R35/R36)
4. 2-10 V DC input:  
Provides proportional control in combination with a DDC controller. (e.g., Infilex™ AC Model WY5117)

#### Features

- Compact and lightweight:  
Rotary motor actualizes small body and light weight.
- Valve and actuator integrated in a single unit.  
Pre-assembled body requires no adjustment.
- A variety of control signals available:
  - Nominal 135  $\Omega$  feedback potentiometer
  - Nominal 135  $\Omega$  resistance input
  - 4-20 mA DC input
  - 2-10 V DC input
- Valve for water/steam control applicable to high differential pressure, large Cv value, high rangeability, and low leakage.
- Durable actuator with low power consumption.
- Equal percentage flow characteristics.
- 2-10 V DC output (for position feedback) available with 4-20 mA DC input type and 2-10 V DC input type.



#### \* Notes

DDC: Direct Digital Control  
JIS: Japanese Industrial Standards

#### IMPORTANT:

To control ACTIVAL with a third-party controller, please consult with Yamatake's sales personnel.

## Safety Instructions

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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 Yamatake's sales representative. Yamatake Corporation will not bear any responsibility for the results produced by the operators.

### WARNING



- This product weighs 18 kg or over (depending on the models). To prevent hazardous accident and severe injury, move or carry the product with enough manpower or using a vehicle.



- Do not disassemble the product. Otherwise, electrical shock or equipment damage may occur.

### CAUTION



- Installation and wiring must be performed by qualified personnel in accordance with all applicable safety standards.



- Disconnect power from ACTIVAL before performing any wiring or maintenance to prevent equipment damage.



- All wiring must comply with local codes of indoor wiring and electric installation rules.



- Use crimp terminal lugs with insulation for electric wires to be connected to the screw terminals.



- Make sure all the wires are tightly connected to the screw terminals. Loose connection may cause fire or heat generation.



- Install the ACTIVAL in the position as specified in this manual. Excessively tight connection of the valve to a pipe and improper installation position may damage the valve.



- Do not install the ACTIVAL in a location close to a steam coil or a hot-water coil. High temperature radiation may result in an actuator malfunction.



- After installation, make sure no fluid leaks from the connecting parts of valve and pipes. Incorrect piping may cause fluid leakage.



- Do not allow any foreign substance inside the piping. After piping installation, flush the piping so that no foreign substance remains. Attach a strainer in a pipe on the inflow side of the ACTIVAL to prevent equipment damages.



- This product must be operated within its rated operating ranges specified in this manual. Failure to comply will cause equipment damages.



- This product must be operated under the operating conditions (power, temperature, humidity, vibration, shock, installation position, atmospheric condition, etc) specified in this manual to prevent equipment damages.



- Avoid using the product (actuator, valve, and other components) in a corrosive gas including oxide gas and explosive gas.



- Operate the ACTIVAL within the service life, and avoid application that keeps product operating cycle excessively frequent so as not to shorten its service life.



- Do not leave the controlled fluid frozen to prevent equipment damage or fluid leakage.



- Do not put heavy load on the actuator.



- Avoid touching the installed ACTIVAL (valve body, yoke, joint). When being used to control hot water, it reaches high temperature and may cause burn injury.



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

Trademark information:

ACTIVAL, Infiflex, Neostat are trademarks of Yamatake Corporation in Japan or in other countries.

## Model Numbers

Model VY51XXJ00XX is the model for the valve and actuator integrated into a single unit.

The model number label is attached to the yoke. The control signal is indicated on the actuator label and on the wiring diagram as follows:

- Nominal 135  $\Omega$  feedback potentiometer: 

F.B. Pot
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- Nominal 135  $\Omega$  resistance input: 

135 $\Omega$
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- 4 mA DC to 20 mA DC input : 

4-20 mA
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- 2 V DC to 10 V DC input: 

2-10 V
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Base model number	Actuator/valve		Actuator		Valve	Description
	Control signal	Rating/material	Type	—	Nominal size/Cv	
VY51						Motorized two-way valve with flanged-end connection
	1					Nominal 135 $\Omega$ feedback potentiometer
	2					Nominal 135 $\Omega$ resistance input
	3					4 mA DC to 20 mA DC input with 2 V DC to 10 V DC feedback output
	4					2 V DC to 10 V DC input with 2 V DC to 10 V DC feedback output
		0				JIS 10K / JIS FC200 [for chilled/hot water, high temperature water]
		1				JIS 10K / JIS SCS13A [for chilled/hot water, high temperature water]
		5				JIS 10K / JIS FC200 [for 0 °C to 175 °C steam]
		6				JIS 10K / JIS SCS13A [for 0 °C to 175 °C steam]
		A				JIS 10K / JIS FC200 [for 0 °C to 200 °C steam]
		B				JIS 10K / SCS13A [for 0 °C to 200 °C steam]
			J			IEC IP54 protected and standard torque type actuator with terminal block (Mountable valve sizes: DN15 to DN80)
				00		—
					11	DN15 (1/2") / 1.0 in Cv value
					12	DN15 (1/2") / 2.5 in Cv value
					13	DN15 (1/2") / 6.0 in Cv value
					14	DN15 (1/2") / 1.6 in Cv value
					15	DN15 (1/2") / 4.0 in Cv value
					21	DN25 (1") / 10 in Cv value
					22	DN25 (1") / 16 in Cv value
					41	DN40 (1 1/2") / 25 in Cv value
					42	DN40 (1 1/2") / 40 in Cv value
					51	DN50 (2") / 65 in Cv value
					61	DN65 (2 1/2") / 95 in Cv value
					81	DN80 (3") / 125 in Cv value

## Specifications

For weight, refer to the table shown in the section **Dimensions**.

### Valve specifications

Item	Specification			
Model	Two-way valve with flanged-end connection			
Body pressure rating	JIS 10K (Max. pressure: 1.0 MPa)			
Size, Cv	Model number	Nominal size	Cv	Close-off ratings
Max. pressure drop	VY51XXJ0011	DN15 (1/2")	1.0	1.0 MPa
	VY51XXJ0012	DN15 (1/2")	2.5	1.0 MPa
	VY51XXJ0013	DN15 (1/2")	6.0	1.0 MPa
	VY51XXJ0014	DN15 (1/2")	1.6	1.0 MPa
	VY51XXJ0015	DN15 (1/2")	4.0	1.0 MPa
	VY51XXJ0021	DN25 (1")	10	1.0 MPa
	VY51XXJ0022	DN25 (1")	16	1.0 MPa
	VY51XXJ0041	DN40 (1 1/2")	25	1.0 MPa
	VY51XXJ0042	DN40 (1 1/2")	40	1.0 MPa
	VY51XXJ0051	DN50 (2")	65	1.0 MPa
	VY51XXJ0061	DN65 (2 1/2")	95	1.0 MPa
	VY51XXJ0081	DN80 (3")	125	Models VY51X0J, VY51X1J, VY51X5J, VY51X6J: 0.7 MPa Models VY51XAJ, VY51XBJ: 1.0 MPa
Materials	Body	Gray cast iron (JIS FC200) for flat face (FF) type Stainless steel (JIS SCS13A) for raised face (RF) type		
	Plug, stem	Stainless steel (JIS SCS13A)		
	Seat ring	Heat-resistant PTFE		
	Gland packing	Inorganic fiber (Models VY51X0J, VY51X1J, VY51X5J, VY51X6J) PTFE (Models VY51XAJ, VY51XBJ)		
	Gasket	Non-asbestos joint sheet		
End connection	Flanged-end connection (JIS 10K) Models VY51X0J, VY51X5J, VY51XAJ (JIS FC200): Flat face (FF) Models VY51X1J, VY51X6J, VY51XBJ (JIS SCS13A): Raised face (RF)			
Allowable fluid temperature*	Models VY51X0J, VY51X1J: 0 °C to 175 °C chilled/hot water, high temperature water Models VY51X5J, VY51X6J: 0 °C to 175 °C steam Models VY51XAJ, VY51XBJ: 0 °C to 200 °C steam			
Flow characteristics	Equal percentage			
Rangeability	100 : 1			
Seat leakage	0.01 % or less of rated Cv value (0.0006 Cv or less for DN15 model)			
Paint	Body of FF type (JIS FC200): Gray Body of RF type (JIS SCS13A): Unpainted			
Applicable fluid	Chilled/hot water, high temperature water, steam, brine (ethylene glycol solutions, 50 % max.)			
Installation orientation	Installable in any position ranging from upright to sideways (90° tilted) *Always install in upright position outdoors.			
Actuator to be combined	Integrated with the valve			
Valve position indication	with the groove on the top of the valve stem			

\* Note: To use the stainless steel valve for fluid of temperature below 0 °C, consult with our sales personnel.

### Actuator specifications

(1/2)

Item	Specification
Power supply	24 V AC $\pm$ 15 %, 50 Hz/60 Hz
Applicable valve size	DN15 to DN80 of standard torque type
Power consumption	Nominal 135 $\Omega$ feedback potentiometer type: 7 VA Other types (nominal 135 $\Omega$ resistance input, 4-20 mA DC input and 2-10 V DC input): 8 VA
Timing	63 $\pm$ 5 sec. (50 Hz) / 53 $\pm$ 5 sec. (60 Hz)
Control signal input	Nominal 135 $\Omega$ feedback potentiometer (Total resistance: Nominal 135 $\Omega$ / Max. applied voltage: 5 V DC) Nominal 135 $\Omega$ resistance input 4 mA DC to 20 mA DC input (Input impedance: 100 $\Omega$ ) 2 V DC to 10 V DC input (Input impedance: 150 k $\Omega$ or higher)
Feedback signal output (only with 4 -20 mA DC and 2-10 V DC inputs)	Range: 2 V DC (0 % position) to 10 V DC (100 % position) Max. load resistance: 10 k $\Omega$ or higher (Max. 1 mA)

Item	Specification	
Environmental conditions	Rated operating conditions	
	Ambient Temperature*1	-20 °C to 50 °C (Fluid temperature 0 °C to 150 °C)
		-20 °C to 45 °C (Fluid temperature 150 °C to 200 °C)
	Humidity	5 %RH to 95 %RH
	Vibration	4.9 m/s <sup>2</sup> (10 Hz to 150 Hz)
	Transport storage conditions*2	-20 °C to 70 °C
	Notes: *1 Do not allow the fluid to freeze. *2 The actuator shall be packed during transport.	
	<p>Ambient temperature (°C)</p> <p>Fluid temperature (°C)</p>	
Materials	Case:	Aluminum alloy casting
	Top cover, terminal cover	Plastic (polycarbonate resin) (Color: gray)
	Yoke	Steel plate
Surface finishing	Case	None
	Yoke	Electro-galvanizing (Bright chromate finish)
Installation location	Indoor / outdoor (Keep away from direct sunlight.)	
Installation orientation	Installable in any position ranging from upright to sideways (90° tilted). (If being installed outdoors, the actuator must be installed in upright position.)	
Valve position indication	Pointer located at the bottom of the actuator shows the position by pointing at the value (0: close to 100: open) of the scale on front, rear, and bottom sides.	
Manual operation	Available. Refer to the section <b>Manually opening/closing the ACTIVAL</b> .	
Wires connection	M3.5 screw terminal connection	
Enclosure rating	IEC IP54 (dust-proof and splash-proof)	
Insulation	Between terminal and case: 5 MΩ or higher at 500 V DC	
Dielectric strength	Between terminal and case: 500 V AC/min with 5 mA or less leakage current	
Position for shipment	100 % (fully open)	

## Options

For options, separate order is required.

Item	Specification		
Seal connector (Part No. 83104346-003)	Applicable wire size: $\phi 7$ mm to $\phi 9$ mm (Seal connector is necessary for IEC IP54 protection.)		
Auxiliary switches*1 (Part No. 83165274-001)	Number of auxiliary switches: 2 (SW A and SW B) Maximum applied voltage/current: 30 V DC / 3 A DC Actuating position (SW A): Adjustable between 0 % (fully closed) to 100 % (fully open) (SW B): Adjustable between 0 % (fully closed) to 100 % (fully open)		
Auxiliary potentiometer*1 (Part No. 83165275-001)	Number of auxiliary potentiometer: 1 Total resistance: Nominal 1 kΩ Actuating position: 0 % (fully closed) and 100 % (fully open) Max. applied voltage: 5 V DC		
Valve flange adapter kit (for replacing Model V5063/V5064 with Model VY51XX)	Hot-rolled steel (JIS*2 SS400), electro-galvanized/not electro-galvanized		
	Electro-galvanized	Not electro-galvanized	Applicable valve size
	Part No. 83168456-001	Part No. 83168456-101	DN15
	Part No. 83168456-002	Part No. 83168456-102	DN25
	Part No. 83168456-003	Part No. 83168456-103	DN40
	Part No. 83168456-004	Part No. 83168456-104	DN50
	Part No. 83168456-005	Part No. 83168456-105	DN65
Part No. 83168456-006	Part No. 83168456-106	DN80	

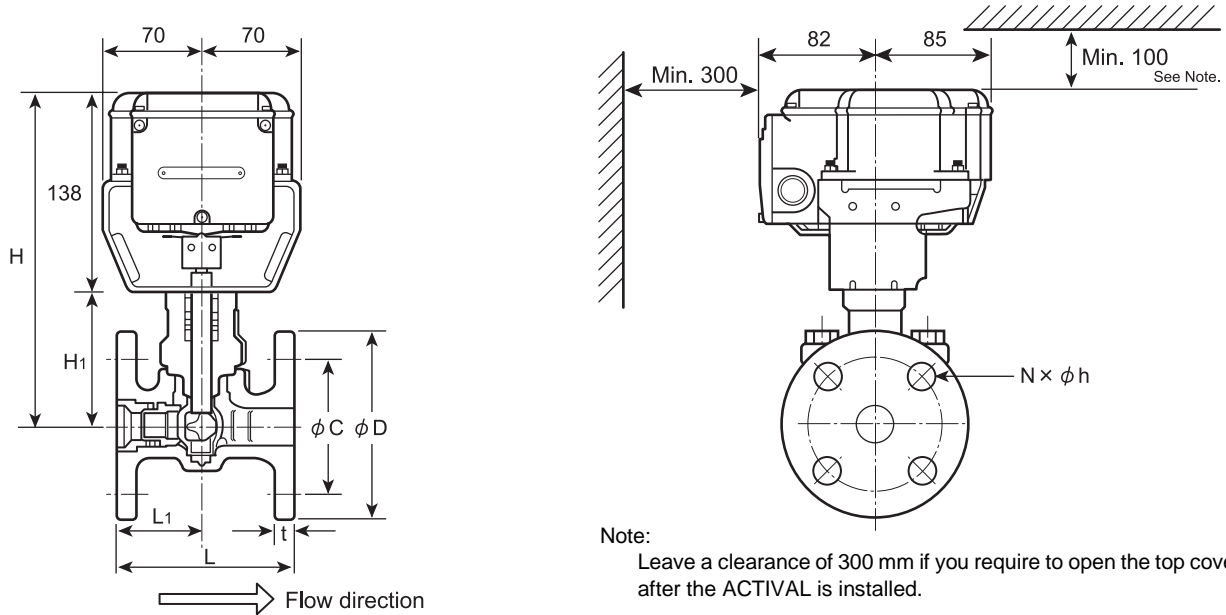
Notes:

\*1 Either of an auxiliary switch or an auxiliary potentiometer can be added, but not both.

\*2 JIS: Japanese Industrial Standards

**Dimensions and Maintenance Clearance**

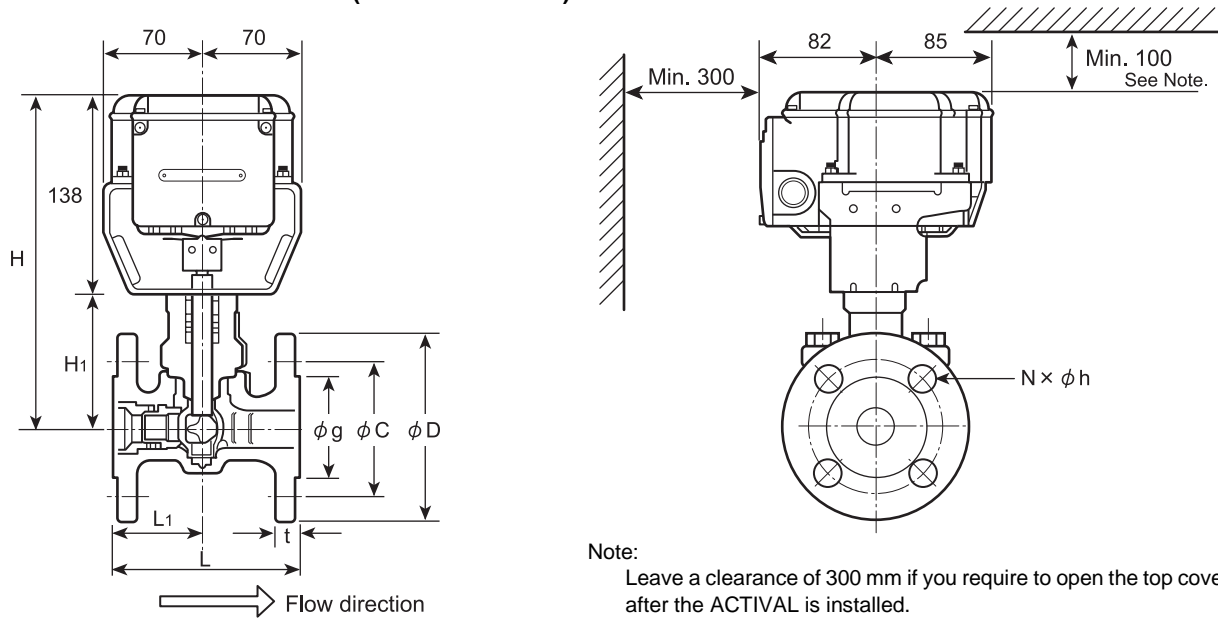
**Model VY51X0J / VY51X5J / VY51XAJ (JIS FC200 valve)**



Valve size (DN)	H	H <sub>1</sub>	L	L <sub>1</sub>	t	φC	φD	φh	N	Weight (kg)
15	213	75	108	50	16	70	95	15	4	4.6
25	228	90	127	60	18	90	125	19	4	6.6
40	241	103	165	82.5	20	105	140	19	4	10
50	245	107	178	89	20	120	155	19	4	11.5
65	262	124	190	90	22	140	175	19	4	16
80	263	125	203	100	22	150	185	19	8	18.5

Figure 1. Dimensions and maintenance clearance (mm): Model VY51X0/VY51X5/VY51XA

**Model VY51X1J / VY51X6J / VY51XBJ (JIS SCS13A valve)**



Valve size (DN)	H	H <sub>1</sub>	L	L <sub>1</sub>	t	φg	φC	φD	φh	N	Weight (kg)
15	213	75	108	50	12	51	70	95	15	4	4.6
25	228	90	127	60	14	67	90	125	19	4	6.6
40	241	103	165	82.5	20	81	105	140	19	4	10
50	245	107	178	89	20	96	120	155	19	4	11.5
65	262	124	190	90	22	116	140	175	19	4	16
80	263	125	203	100	22	126	150	185	19	8	18.5

Figure 2. Dimensions and maintenance clearance (mm): Model VY51X1/VY51X6/VY51XB

Parts Identification

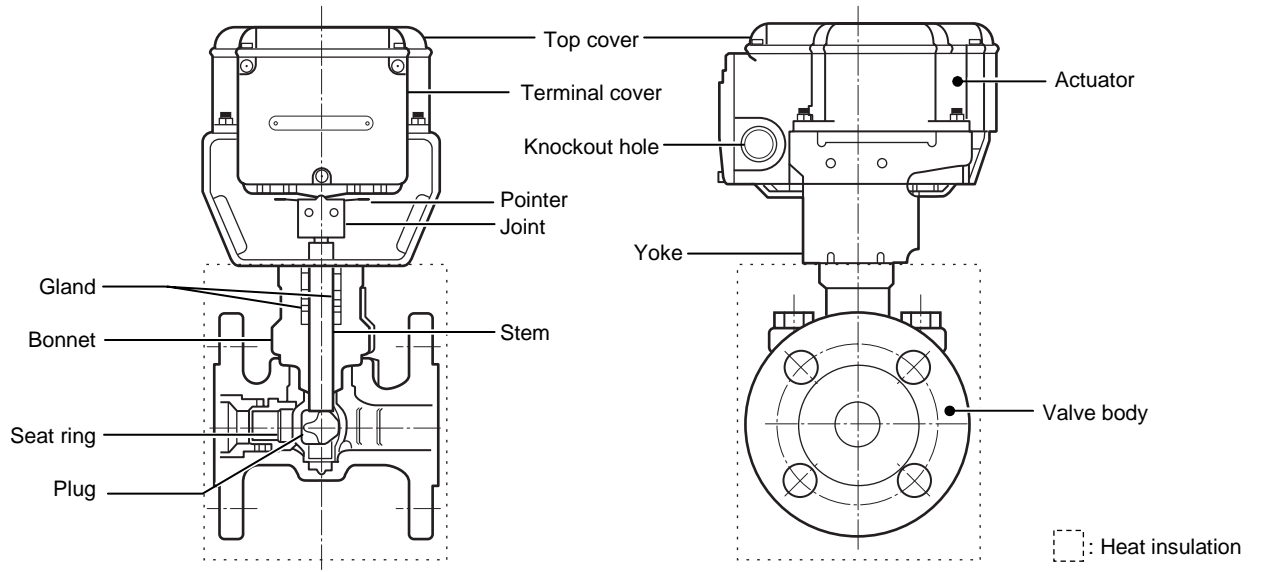


Figure 3. Parts identification

## Installation

### Precautions for installation

#### ⚠ CAUTION

- ❗ • Disconnect power from ACTIVAL before performing any wiring or maintenance (installation) to prevent equipment damage.
- ❗ • Install the ACTIVAL in the position as specified in this manual. Excessively tight connection of the valve to a pipe and improper installation position may damage the valve.
- ❗ • After installation, make sure no fluid leaks from the connecting parts of valve and pipes. Incorrect piping may cause fluid leakage.
- ❗ • Do not allow any foreign substance inside the piping. After piping installation, flush the piping so that no foreign substance remains. Attach a strainer (with 40 or more meshes) in a pipe on the inflow side of the ACTIVAL to prevent equipment damages.

- ACTIVAL Model VY51XXJ00 is the valve and actuator integrated into a single unit. Do not combine the valve with any other actuator, or do not combine the actuator with any other valve.
- To remove foreign substances inside the pipes, install a strainer (with 80 or more meshes recommended for steam application) 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

#### ⚠ CAUTION

- ❗ • Avoid using the ACTIVAL in an atmosphere containing oxidizing or explosive gas since it may corrode the actuator, valve, or their components.
- ❗ • The actuator may malfunction if being exposed to high heat radiation. Do not install it near by steam coil or high temperature water coil.

#### IMPORTANT:

- The covers might be corroded by some chemical and organic solvent/vapor. Do not clean the ACTIVAL using such substances, or do not expose the ACTIVAL to such substances.
- When the ACTIVAL is used for steam humidifying, install a valve interlocking with air-conditioning unit on the inflow side in case the ACTIVAL gets damaged.
- Although the ACTIVAL can be used in high humidity environments (max. 95 %RH), do not immerse the actuator in water.
- Although the ACTIVAL can also be used outdoors, be sure not to expose the ACTIVAL to direct sunlight.

- Install the ACTIVAL in a position allowing easy access for maintenance and inspection. Figs 1 and 2 show the minimum clearance for maintenance and inspection. When installing the ACTIVAL in a ceiling space, provide an access hole within the 50 cm radius of the ACTIVAL. And, place a drain pan under the valve.
- Do not mount the ACTIVAL on a pipe where water hammer occurs, or where solid objects including slug may accumulate.

### Mounting position

The ACTIVAL can be mounted in any position ranging from upright to sideways (90° tilted). The ACTIVAL should be installed with its actuator vertically positioned above the valve body. (See Fig. 4.) However, the ACTIVAL must be installed always in upright position outdoors.

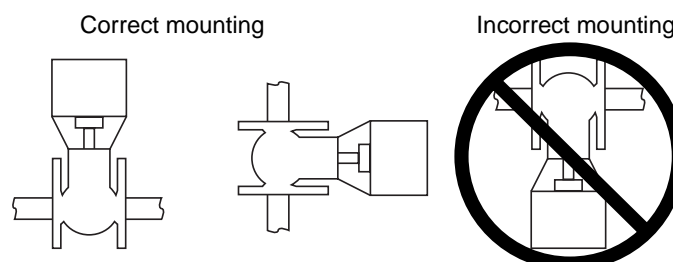


Figure 4. Actuator mounting position

## Piping

- Check that the model number of the product is what you ordered. The model number is shown on the label attached to the yoke.
- Install a bypass pipe and gate valves on the inflow, outflow, and bypass sides. Also, install a strainer on the inflow side.
- When installing the ACTIVAL to the pipes, do not allow any object, such as chips, to get inside a pipe or valve. Valve cannot fully close, or the valve seat may get damaged causing fluid leakage, due to an 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.
- Before activating the ACTIVAL, fully open (in 100 % position) the valve and flush the pipes at the maximum flow rate to remove all the foreign substances. (Factory preset position: 100 %)
- For steam control, drain retained water (condensate) in piping. Install a trap on a pipe run which may retain condensate. Condensate may cause water hummer or damage the valve and piping.

## Heat insulation

Do not apply heat insulation to the actuator or to the yoke, as [ ] shows in Fig. 3. If the yoke and the actuator are covered with insulation material, the pointer cannot be checked and may be distorted.

## Factory preset position

The actuator shaft is positioned at 100% (in fully open position) for shipment. The shaft is thus completely turned clockwise, and the pointer points at '100'. (See Fig. 5)

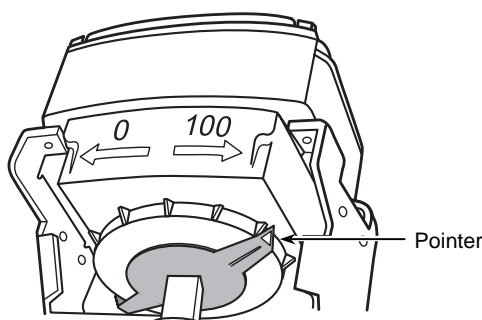


Figure 5. Pointer position for shipment

## Manually opening/closing the ACTIVAL

### IMPORTANT:

- Manually opening/closing the ACTIVAL with the power (24 V AC) applied may damage the actuator.
- To manually open/close the ACTIVAL, do not turn the joint beyond the fully open (100)/closed (0) mark.
- To manually open/close the ACTIVAL, slowly turn the joint. If shock is sent to the actuator, the actuator may get damaged.

Disconnect the power from the ACTIVAL before manually operating the ACTIVAL. As shown in Fig. 6, from the front of the ACTIVAL, hold the joint using a tool such as a wrench, and turn the joint slowly toward the set position.

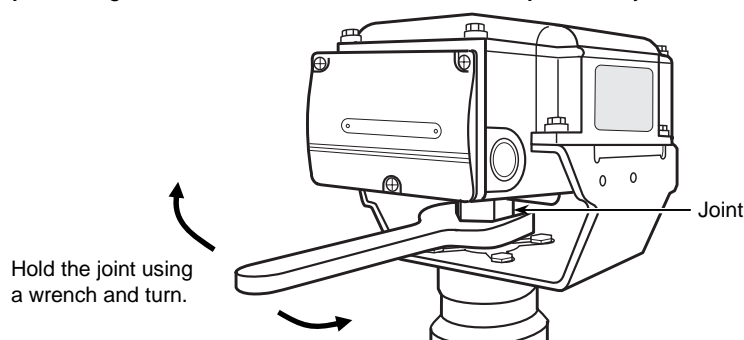


Figure 6. Manual operation

**Auxiliary switch / Auxiliary potentiometer (optional)**

**IMPORTANT:**

- The auxiliary switch/potentiometer is installed on site. Refer to the instructions supplied with the auxiliary switch/potentiometer for installation.
- Do not open the top cover except when adjusting the auxiliary switch/potentiometer. Close the top cover instantly after adjusting the auxiliary switch/potentiometer.
- Do not put any load on the top cover.

**Procedure to change the actuator mounting position**

**IMPORTANT:**

- Do not change the combination of the valve, yoke, and actuator.
- 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.

- 1) Remove the screws connecting the actuator and the yoke. Lift the actuator and detach it from the yoke. Make sure that the groove on the top of the valve stem is parallel to the pipes (indicating the valve in 100 % position). <Step 1 in Fig. 7>
- 2) Remove the screws connecting the yoke and the valve. <Step 2 in Fig. 7>
- 3) Change the facing direction of the yoke. The yoke and actuator can be horizontally rotated every 90° (0°/90°/180°/270° from the factory preset position) to mount onto the valve.
- 4) A thermal insulation sheet is inserted between the yoke and the valve. When changing the mounting positions, reinsert the sheet and then fit the yoke into the new mounting position.
- 5) Before fixing the yoke to the valve with the screws, check that the actuator engages correctly with the valve stem (at the new mounting position). Check that the pointer of the actuator indicates 100 % position as well. Then, fix the yoke to the valve. <Step 3 in Fig. 7>
- 6) Mount the actuator. Place the actuator, with its facing direction changed, on the yoke, and fix them with the screws. <Step 4 in Fig. 7>
- 7) Check that the ACTIVAL with the mounting position changed operates smoothly (from 0 % to 100 %).

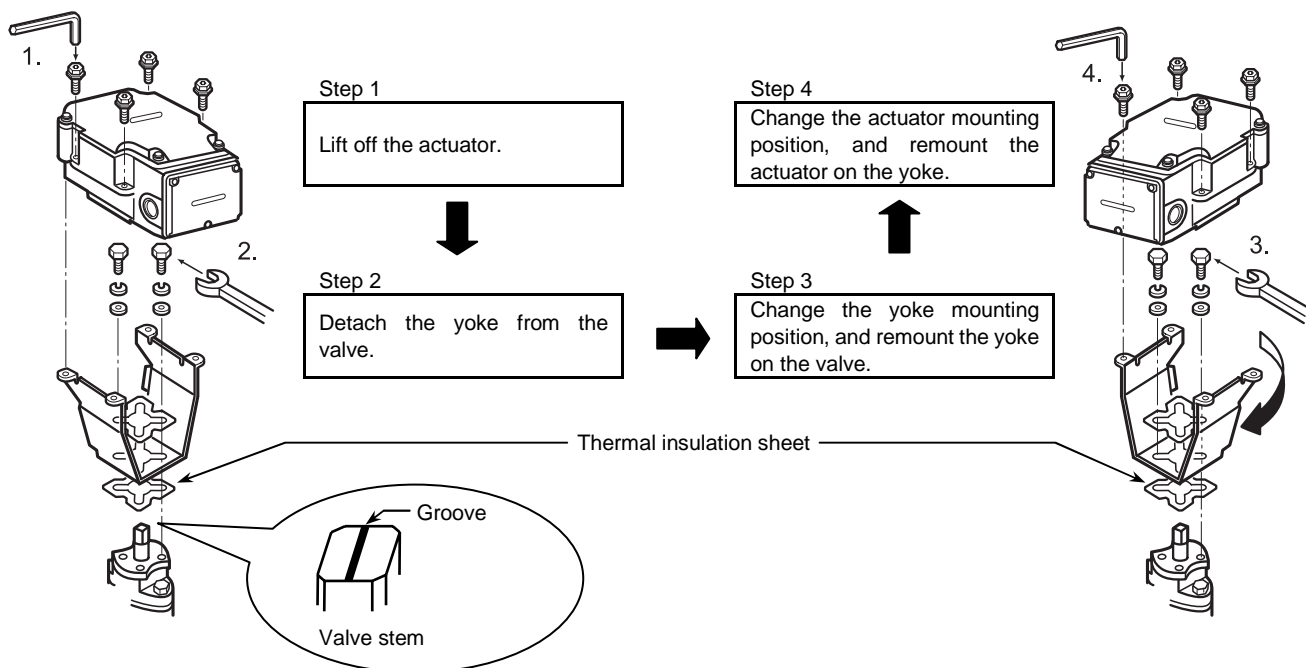


Figure 7. Changing the actuator mounting position

## Wiring

### ⚠ CAUTION



- Disconnect power from ACTIVAL before performing any wiring or maintenance (installation) to prevent equipment damage.

### IMPORTANT:

- The ACTIVAL is designed for 24 V AC power supply voltage. Do not apply any other power voltage (e.g., 100 V AC, 200 V AC) to the ACTIVAL.
- For 2-10 V DC input type and 4-20 mA input type, make sure the polarity of the power supply and 2-10 V DC feedback output referring to Figs 13 and 14. Incorrect wiring may result in PCB (print circuit board) burnout.
- To prevent damage, cover the terminals except when connecting/disconnecting wires.
- Do not connect 24 V AC power to the terminals 4 to 7.

### Wiring precautions

- 1) To lead the wires into the terminals, cut out a knockout hole for a wiring port. Two knockout holes are provided on the bilateral sides of the actuator terminals. Select a knockout hole according to the conduit mounting direction, and cut it out by lightly knocking the hole using a screwdriver.

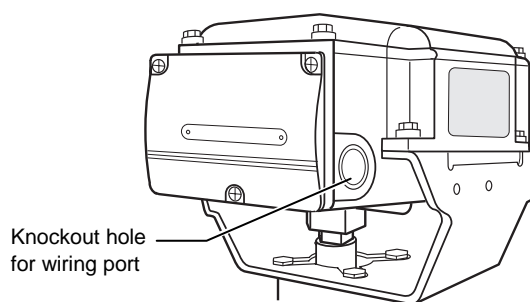
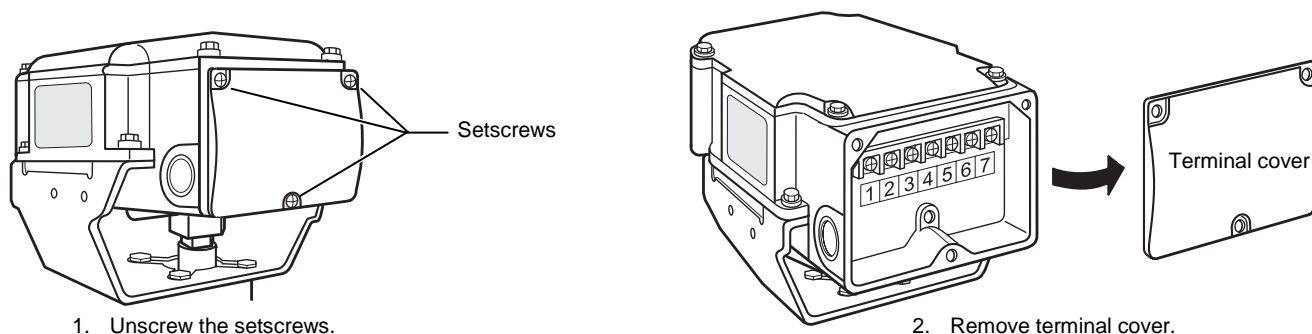


Figure 8. Knockout hole for wiring port

- 2) Unscrew the 3 setscrews (M4 × 10) of the terminal cover and remove the terminal cover, as shown in Fig. 9.



1. Unscrew the setscrews.

2. Remove terminal cover.

Figure 9. Terminal cover removal

- 3) Correctly connect the wires to the terminals with M3.5 screw terminal lugs, referring to Figs 10 to 18.
- 4) When the ACTIVAL is used in a high-humidity environment or outdoors, use a water-proof connector for the wiring port.

### To keep IP54 protection (dust-proof and splash-proof),

Use a water-proof connector for the ACTIVAL in a high-humidity environment or outdoor location.

- Be sure to completely close the terminal cover and the top cover.
- Waterproof the wiring port.
  - For cable connection, use a water-proof connector. (Seal connector Part No. 83104346-003 is recommended.)
  - For conduit connection, use a water-proof plica tube or the like.

**Terminals connection**

Model VY511XJ00XX

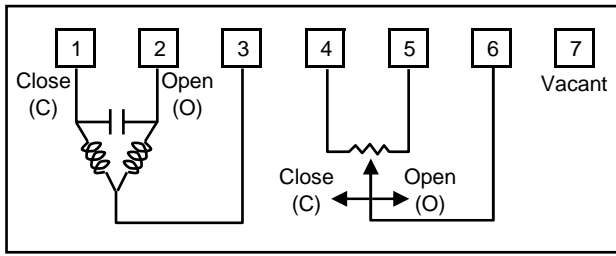


Figure 10. Terminals connection of Model VY511XJ00XX (Nominal 135 Ω feedback potentiometer type)

\* Note:

Controller that receives voltage between the terminals 4 and 6 as feedback signal is recommended to connect.

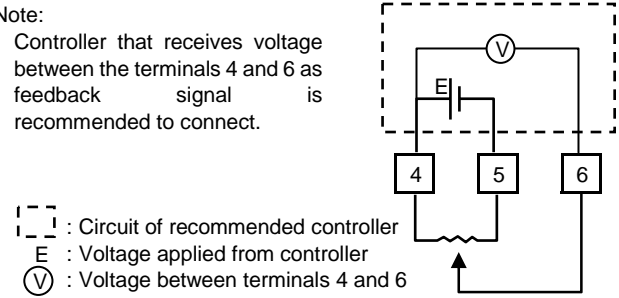


Figure 11. Circuit of recommended controller

Model VY512XJ00XX

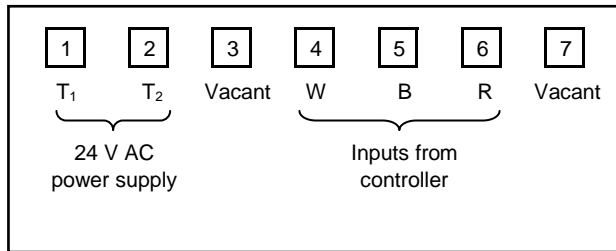
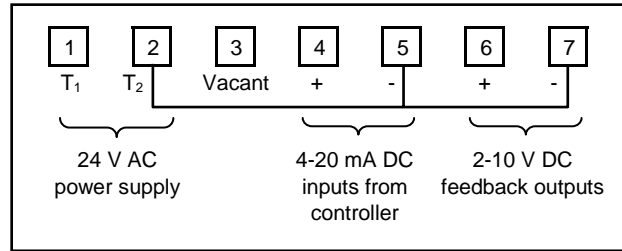


Figure 12. Terminals connection of Model VY512XJ00XX (Nominal 135 Ω resistance input type)

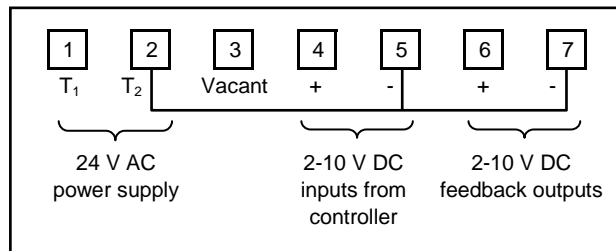
Model VY513XJ00XX



Note: Terminals 2, 5, and 7 are connected inside the actuator.

Figure 13. Terminals connection of Model VY513XJ00XX (4-20 mA DC input type)

Model VY514XJ00XX



Note: Terminals 2, 5, and 7 are connected inside the actuator.

Figure 14. Terminals connection of Model VY514XJ00XX (2-10 V DC input type)

**Connection examples (Connection to Yamatake's controllers)**

Connection to Infilex™ GC

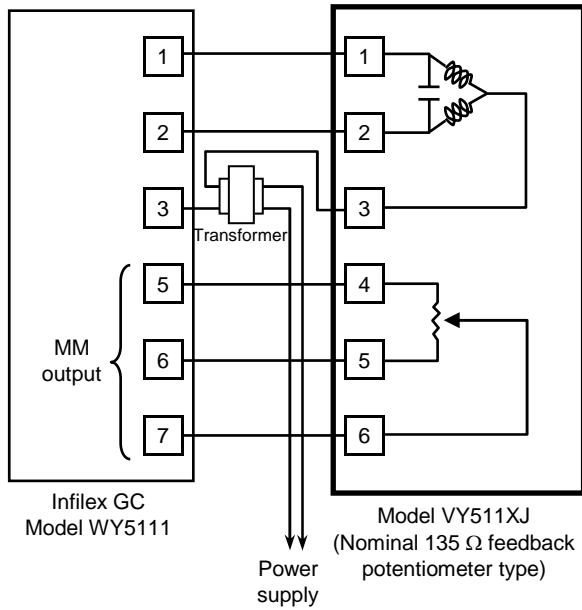


Figure 15. Connection example: Model VY511XJ to Model WY5111

Connection to Neostat™ (Model TY900XZ)

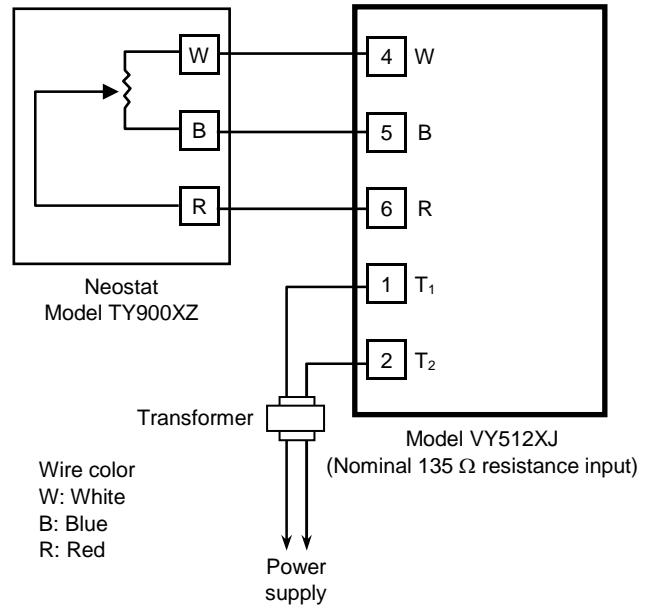


Figure 16. Connection example: Model VY512XJ to Model TY900XZ

Connection to R series controller

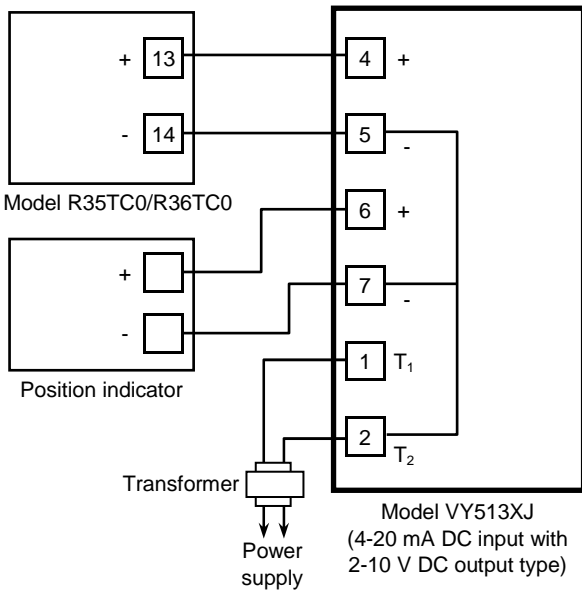


Figure 17. Connection example: Model VY513XJ to Model R35TC0/R36TC0

Connection to Infilex™ AC

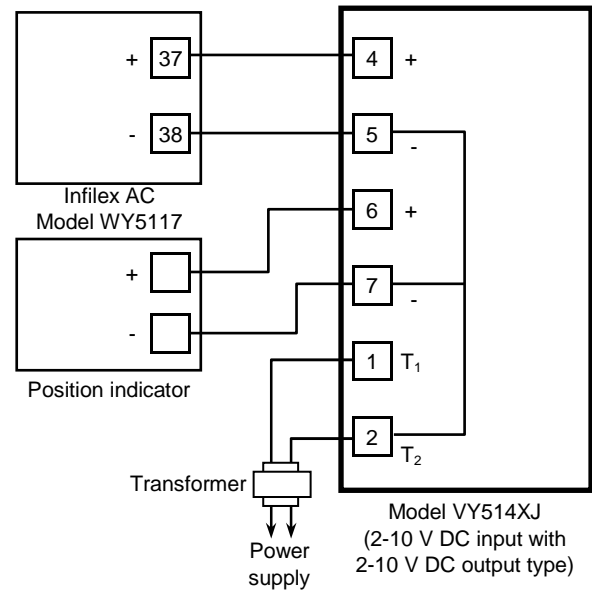
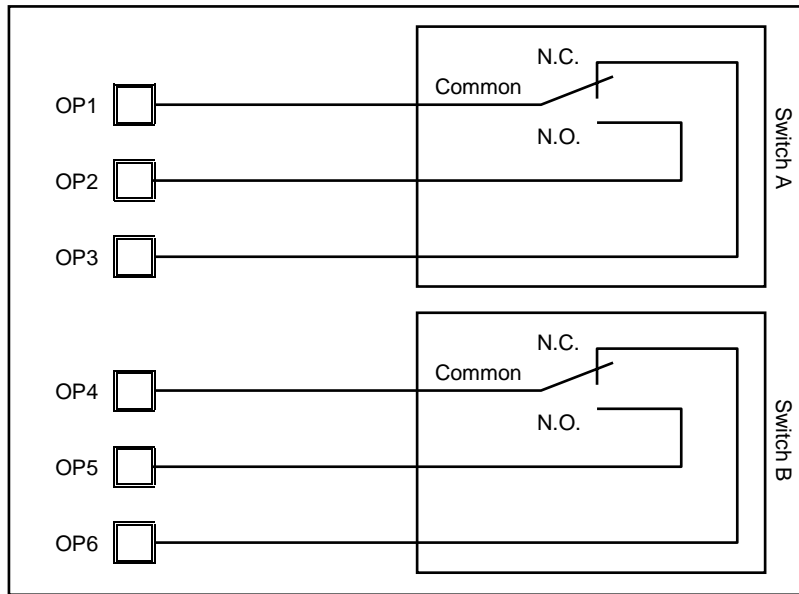


Figure 18. Connection example: Model VY514XJ to Model WY5117

### Internal Connection of Auxiliary Switch / Auxiliary Potentiometer

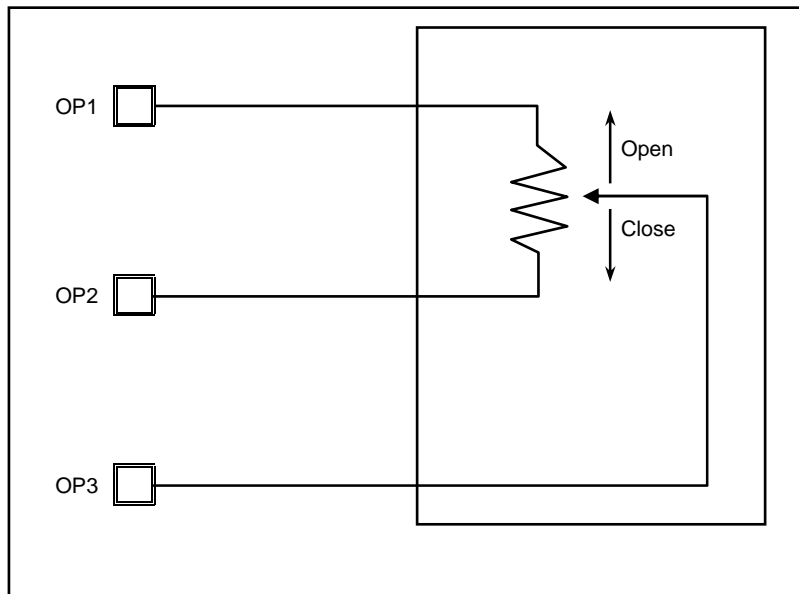
Auxiliary switch Part No. 83165274-001



Switches A and B actuating position: Adjustable between 0 % (fully closed) and 100 % (fully open)

Figure 19. Internal connection of Model 83165274-001

Auxiliary potentiometer Part No. 83165275-001



Potentiometer operating position: Adjustable between 0 % (fully closed) and 100 % (fully open)

Figure 20. Internal connection of Model 83165275-00

## Inspection and Maintenance

### CAUTION



- Avoid touching the installed ACTIVAL (valve body, yoke, joint). When being used to control hot water, it reaches high temperature and may cause burn injury.

- Inspect the ACTIVAL according to Table 1.
- Manually open/close the ACTIVAL at least once a month if it is left in inactive state for a long period.
- Visually inspect the fluid leakage of the valve and the actuator operations 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 Yamatake near you.

Table 1. Inspection items and details

Inspection item	Inspection interval	Inspection detail
Visual inspection	Semiannual	<ul style="list-style-type: none"> <li>• Fluid leakage from the gland and the flange face</li> <li>• Loosened bolts</li> <li>• Valve and actuator damages</li> </ul>
Operating status	Semiannual	<ul style="list-style-type: none"> <li>• Unstable open/close operation</li> <li>• Abnormal noise and vibration</li> </ul>
Routine inspection	Any time	<ul style="list-style-type: none"> <li>• Fluid leakage to the outside</li> <li>• Abnormal noise and vibration</li> <li>• Unstable open/close operation</li> <li>• Valve hunting</li> </ul>

Table 2. Troubleshooting

Problem	Part to check	Action
Fluid leaks from the flange face.	Loosened flange bolts Gasket on the flange face Misaligned piping	Tighten the flange bolts. Replace the gasket. Redo piping.
Fluid leaks from the gland part.	—	Consult with our sales personnel.
Fluid leaks from the bonnet.	Loosened bolts	Tighten the bolts.
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 Loosened terminals Wiring condition / disconnected wires	Check the power supply and the controller connected to. Tighten the terminals. Check the wiring.
Fluid leaks to the outside of the valve when the ACTIVAL is in fully closed position.	Actuator pointer not pointing to fully closed position	Fully close the ACTIVAL.
The valve vibrates or produces an abnormal noise.	Primary pressure condition Differential pressure condition	Adjust the mounting position and change the installation location.
The auxiliary switch does not operate.	Auxiliary switch (cam switch) condition Loosened terminals Wiring condition / disconnected wires	Redo the cam switch setting. Tighten the terminals. Check the wiring.
The auxiliary potentiometer does not operate.	Condition of resistance Loosened terminals Wiring condition / disconnected wires	Check the resistance value (1 k $\Omega$ ). Tighten the terminals. Check the wiring.
Valve hunting occurs.	Secondary pressure condition Differential pressure condition Control stability	Adjust the mounting position and change the installation location. Correct the control parameter setting of controller.
Voltage/current input signal 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 actuator voltage/current input signal. Voltage/current input signal therefore disagrees with the feedback signal, and this is not an error.	

**azbil**

*Specifications are subject to change without notice.*

**Yamatake Corporation**  
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