

# ACTIVAL™

## Motorized Two-Way Valve with Flanged-End Connection (Spring Return Type Actuator)

### (JIS 10K-FC200, -SCS13A)

#### General

ACTIVAL™ Models VY51XXK and VY51XXH are series of motorized two-way valves with flanged-end connection. Valve and actuator are integrated in a single unit.

Valve size ranges from DN15 (1/2") to DN80 (3") and valve body rating corresponds to JIS 10K.

Actuator has a reversible synchronous motor, which operates at a low voltage of 24 V AC. Since the actuator fully closes the valve in case of power failure, it is suitable for failsafe application.

4 kinds of control signals are available to operate ACTIVAL.

1. Nominal 135  $\Omega$  feedback potentiometer (built-in):  
Provides proportional control in combination with a DDC controller (e.g., Infilex™ GC Model WY5111).
2. Nominal 135  $\Omega$  resistance input:  
Provides proportional control in combination with a proportional controlled electric controller (e.g, Neostat™ Model TY900XZ, Model TY991).
- 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 applicable to high differential pressure, with 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 and 2-10 V DC input types.
- Spring return actuator:  
Actuator automatically closes the valve in 0 % position in case that the power is down.



#### \* Notes

DDC: Direct Digital Control  
JIS: Japanese Industrial Standards

#### IMPORTANT:

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




## 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 Azbil Corporation's sales representative. Azbil 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 a vehicle.
-  • Do not disassemble the spring unit of the actuator. The spring may rotate too fast or jump out of the actuator due to disassembly, resulting in severe injury.
-  • Avoid touching the moving parts of ACTIVAL in operation. Careless touch may cause severe injury.

### 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 cause valve damage.
-  • 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.
-  • Use full gasket for the valve with flat face flange. Otherwise, the valve may get damaged or fluid leakage may occur.
-  • This product is not overcurrent-protected inside. Provide an overcurrent protective device such as fuse, breaker, etc. in a building (or in a control panel cabinet) where the product is installed.
-  • Do not allow any foreign substance inside the piping. Flush the piping so that no foreign substance remains.
-  • This product must be operated within its rated operating ranges specified in this manual. Failure to comply will cause equipment damage.
-  • 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 damage.
-  • Operate the ACTIVAL within the service life (spring unit: 30,000 returns), and avoid application that keeps the 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.
-  • Do not disassemble the product. Disassembly may result in equipment damage.
-  • Do not detach the actuator from the valve in open position.
-  • Avoid touching the installed ACTIVAL (valve body, yoke, joint). When being used to control hot water or steam, it may reach 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.

## Model Numbers

Model VY51XXK00XX/VY51XXH00XX 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 label, as shown below.

Nominal 135 $\Omega$ feedback potentiometer:	F.B. Pot
Nominal 135 $\Omega$ resistance input:	135 $\Omega$
4-20 mA DC input:	4-20 mA
2-10 V DC input:	2-10 V

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 position feedback output
	4					2 V DC to 10 V DC input with 2 V DC to 10 V DC position feedback output
		5				JIS 10K / JIS FC200
		6				JIS 10K / JIS SCS13A
				K		IEC IP54 protected and standard torque type spring return actuator with terminal block (Valve sizes: DN15 to DN80)
				H		IEC IP54 protected and standard torque type spring return actuator with terminal block for high differential pressure application (Valve sizes: DN65 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	

### Note:

For DN65 and DN80 valves to control chilled/hot water or high-temperature water, Models VY51XXH0061 and VY51XXH0081 (for high differential pressure application) are applicable. (Models VY51XXK0061 and VY51XXK0081 are not applicable.)

## 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, Close-off ratings  Note: Close-off ratings of the actuator in combination are shown on the right. Practical close-off rating required for the valve controlling 175 °C steam is 0.8 MPa.	Model number	Nominal size	Cv	Close-off ratings	
				Steam	Chilled/hot water, Hot water
	VY51XXK0011	DN15 (1/2")	1.0	1.0 MPa	1.0 MPa
	VY51XXK0012	DN15 (1/2")	2.5	1.0 MPa	1.0 MPa
	VY51XXK0013	DN15 (1/2")	6.0	1.0 MPa	1.0 MPa
	VY51XXK0014	DN15 (1/2")	1.6	1.0 MPa	1.0 MPa
	VY51XXK0015	DN15 (1/2")	4.0	1.0 MPa	1.0 MPa
	VY51XXK0021	DN25 (1")	10	1.0 MPa	1.0 MPa
	VY51XXK0022	DN25 (1")	16	1.0 MPa	1.0 MPa
	VY51XXK0041	DN40 (1 1/2")	25	1.0 MPa	1.0 MPa
	VY51XXK0042	DN40 (1 1/2")	40	1.0 MPa	1.0 MPa
	VY51XXK0051	DN50 (2")	65	1.0 MPa	1.0 MPa
	VY51XXK0061	DN65 (2 1/2")	95	0.3 MPa	—
	VY51XXK0081	DN80 (3")	125	0.1 MPa	—
	VY51XXH0061	DN65 (2 1/2")	95	1.0 MPa	0.7 MPa
VY51XXH0081	DN80 (3")	125	0.7 MPa	0.4 MPa	
Materials	Body	Gray cast iron (JIS FC200) for flat face (FF) type Stainless steel (JIS SCS13A) for raised face (RF) type			
	Plug and stem	Stainless steel (equivalent to JIS SCS)			
	Seat ring	Heat-resistant PTFE			
	Gland packing	Inorganic fiber			
	Gasket	Non-asbestos joint sheet			
End connection	Flanged-end connection Models VY51X5K, VY51X5H (JIS FC200): Flat face (FF) Models VY51X6K, VY51X6H (JIS SCS13A): Raised face (RF)				
Allowable fluid temperature	0 °C to 175 °C				
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	Model VY51X5 (gray cast iron (JIS FC200)): Gray (Munsell 5B 4/1) Model VY51X6 (stainless steel (JIS SCS13A)): Unpainted				
Applicable fluid	Chilled/hot water, hot water, steam				
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				

### Actuator specifications

(1/2)

Item	Specification
Actuator type	Spring return actuator for standard and high differential pressure application
Power supply	24 V AC ± 15 %, 50 Hz/60 Hz
Applicable valve size	DN15 to DN80 of standard torque type DN65, DN80 of high torque type
Power consumption	Nominal 135 Ω feedback potentiometer type (Model VY511XX): 13 VA Nominal 135 Ω resistance input type (Model VY512XX), 4-20 mA DC input type (Model VY513XX), 2-10 V DC input type (Model VY514XX): 15 VA
Timing	63 ± 5 sec (50 Hz) / 53 ± 5 sec (60 Hz) Return time: 3 to 40 seconds (Fully open → fully close operation)
Control signals	- Nominal 135 Ω feedback potentiometer (Total resistance: Nominal 135 Ω, Max. applied voltage: 5 V DC) - Nominal 135 Ω resistance input - 4 mA DC to 20 mA DC input (Input impedance: 100 Ω) - 2 V DC to 10 V DC (Input impedance: 150 kΩ or higher)
Feedback signal (only with 4-20 mA DC input type and 2-10 V DC input type)	Range: 2 V DC (0 % position) to 10 V DC (100 % position) Max. load resistance: 10 kΩ or higher (Max. output current: 1mA)

Item	Specification	
Environmental conditions	Rated operating conditions	
	Transport storage conditions* <sup>2</sup>	
	Ambient temperature* <sup>1</sup>	-20 °C to 50 °C (Fluid temperature 0 °C to 175 °C)
	Ambient humidity	5 %RH to 95 %RH
	Vibration	4.9 m/s <sup>2</sup> (10 Hz to 150 Hz)
	19.6 m/s <sup>2</sup> (10 Hz to 150 Hz)	
	Notes: *1 Do not allow the fluid to freeze. *2 The actuator shall be packed during transport.	
Materials	Case	Aluminum alloy casting
	Top cover, terminal cover	Polycarbonate resin (Color: gray)
	Yoke	Steel plate
	Case of the spring unit	Aluminum alloy casting
	Cover of the spring unit	Aluminum alloy casting
	Spring	Stainless steel
Surface finishing	Case	None
	Yoke	Electro-galvanized (Bright chromate finish)
Installation locations	Indoor / outdoor (keep away from direct sunlight.)	
Valve position indication	Pointer located at the bottom of the actuator shows the position by pointing at the value of the scale (0: close to 100: open) on front, rear, and bottom sides.	
Manual operation	Not available.	
Wires connection	M3.5 screw terminal connection	
Enclosure rating	IEC IP54 (dust-proof and splash-proof)	
Insulation resistance	Between terminal and case: 5 MΩ or higher at 500 V DC	
Dielectric strength	Between terminal and case: 500 V AC/min with 1 mA or less leakage current	
Installation orientation	Installable in any position ranging from upright to sideways (90° tilted) *Always install in upright position outdoors.	
Position for shipment	0 % (fully closed)	
Service life of spring unit	30,000 returns	

## Options

For options, separate order is required.

Item	Specification
Seal connector (Part No. 83104346-003)	Applicable wire size: φ7 mm to φ9 mm (Seal connector is necessary for IEC IP54 protection.)
Auxiliary switches (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 (Part No. 83165275-001)	Number of auxiliary potentiometer: 1 Overall resistance: Nominal 1 kΩ Actuating position: 0 % (fully closed) to 100 % (fully open) Max. applied voltage: 5 V DC

\* Note:

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

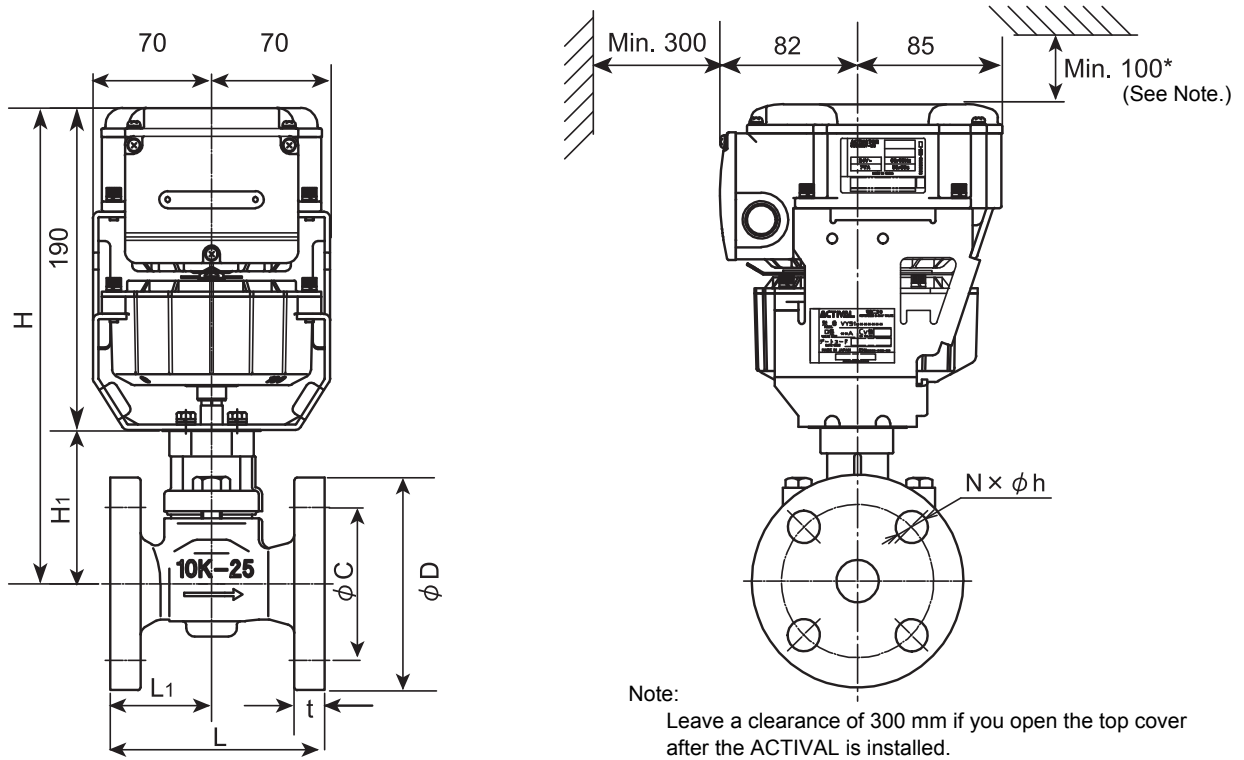
**CE Marking Conformity**

This product complies with the following Electromagnetic Compatibility (EMC).

EMC : EN61000-6-2, EN55011 Class A

**Dimensions**

**Model VY51X5K/VY51X5H (JIS FC200 valve, FF flanged)**



**Model VY51X5K00XX**

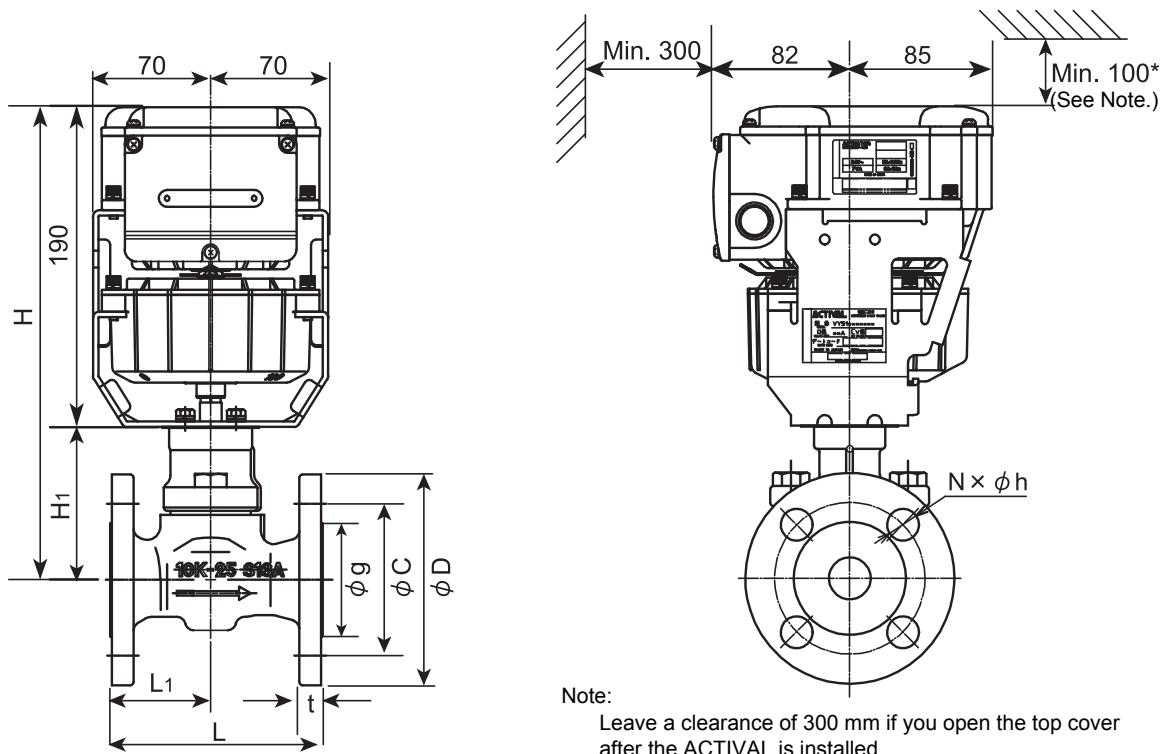
Model number	Valve size	H (mm)	H <sub>1</sub> (mm)	L (mm)	L <sub>1</sub> (mm)	t (mm)	φC (mm)	φD (mm)	φh (mm)	N	Weight (kg)
VY51X5K001X	DN15	265	75	108	50	16	70	95	15	4	6.6
VY51X5K002X	DN25	280	90	127	60	18	90	125	19	4	8.6
VY51X5K004X	DN40	293	103	165	82.5	20	105	140	19	4	12.0
VY51X5K0051	DN50	297	107	178	89	20	120	155	19	4	13.5
VY51X5K0061	DN65	314	124	190	90	22	140	175	19	4	18.0
VY51X5K0081	DN80	315	125	203	100	22	150	185	19	8	20.5

**Model VY51X5H00X1**

Model number	Valve size	H (mm)	H <sub>1</sub> (mm)	L (mm)	L <sub>1</sub> (mm)	t (mm)	φC (mm)	φD (mm)	φh (mm)	N	Weight (kg)
VY51X5H0061	DN65	314	124	190	90	22	140	175	19	4	18.5
VY51X5H0081	DN80	315	125	203	100	22	150	185	19	8	21.0

Figure 1. Dimensions and maintenance clearance (mm): Models VY51X5K00XX, VY51X5H00X1

Model VY51X6K/VY51X6H (JIS SCS13A valve, RF flanged)



Model VY51X6K00XX

Model number	Valve size	H (mm)	H <sub>1</sub> (mm)	L (mm)	L <sub>1</sub> (mm)	t (mm)	φC (mm)	φD (mm)	φg (mm)	φh (mm)	N	Weight (kg)
VY51X6K001X	DN15	265	75	108	50	12	70	95	51	15	4	6.6
VY51X6K002X	DN25	280	90	127	60	14	90	125	67	19	4	8.6
VY51X6K004X	DN40	293	103	165	82.5	16	105	140	81	19	4	12.0
VY51X6K0051	DN50	297	107	178	89	16	120	155	96	19	4	13.5
VY51X6K0061	DN65	314	124	190	90	18	140	175	116	19	4	18.0
VY51X6K0081	DN80	315	125	203	100	18	150	185	126	19	8	20.5

Model VY51X6H00X1

Model number	Valve size	H (mm)	H <sub>1</sub> (mm)	L (mm)	L <sub>1</sub> (mm)	t (mm)	φC (mm)	φD (mm)	φg (mm)	φh (mm)	N	Weight (kg)
VY51X6K0061	DN65	314	124	190	90	18	140	175	116	19	4	18.0
VY51X6K0081	DN80	315	125	203	100	18	150	185	126	19	8	21.0

Figure 2. Dimensions and maintenance clearance (mm): Models VY51X6K00XX, VY51X6H00X1

Parts Identification

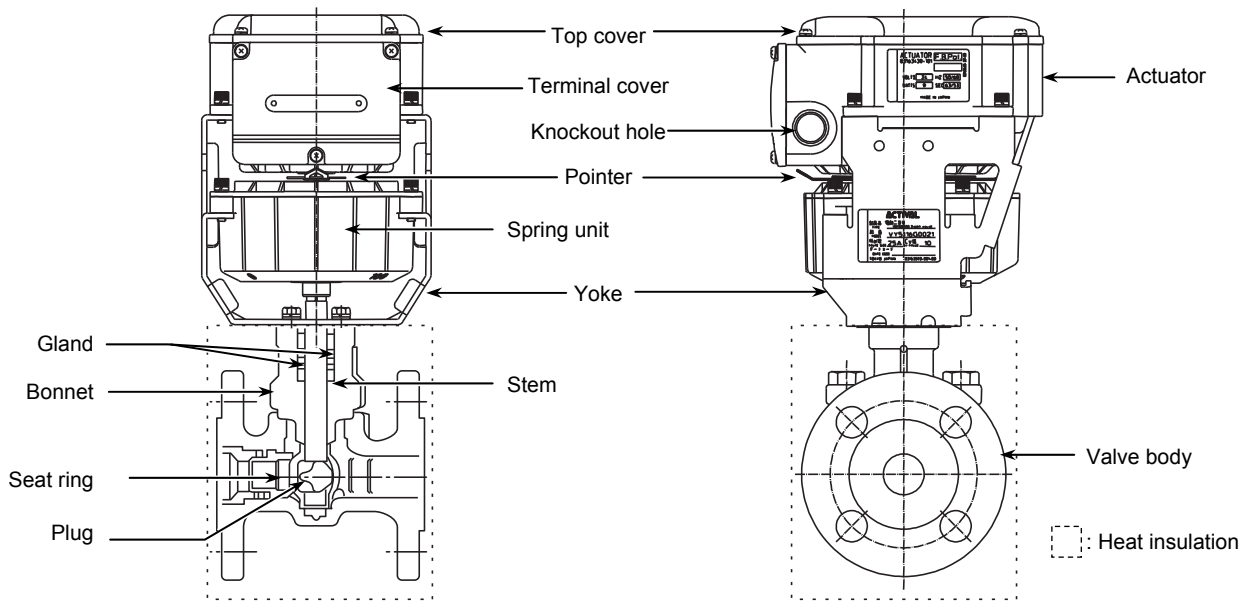


Figure 3. Parts identification



## 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 piping and improper installation position may damage the valve.
- ❗ • After piping installation, make sure no fluid leaks from the connecting parts. Incorrect piping may cause fluid leakage.
- ❗ • Do not allow any foreign substance inside the piping. Flush the piping so that no foreign substance remains. Foreign substance may damage the valve.

- ACTIVAL Model VY51XXK/VY51XXH 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 control) 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 hot water (in high temperature) 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.
  - When the ACTIVAL is used for steam humidifying, set the high limit alarm of supply air temperature in case that the valve fails to properly operate. For critical piping system, in addition to the high limit alarm of supply air temperature, set the high and low limit alarms of humidity for AHU (air handling unit) operation, and on the inflow side, install a valve interlocking with the AHU fan.
- 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 may occur or 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.

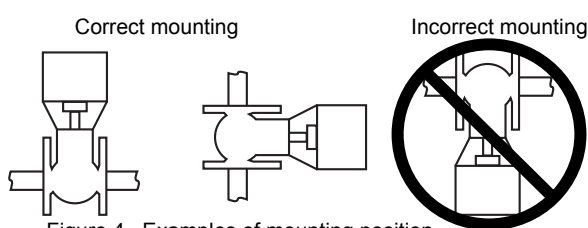


Figure 4. Examples of mounting position

### 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 (with 80 or more meshes recommended for steam control) on the inflow side.
- When piping, 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 close, or the valve seat may get damaged causing fluid leakage, due to the sealing material jammed inside the valve.
- Before activating the ACTIVAL, flush the pipes (with the ACTIVAL installed) at the maximum flow rate to remove all the foreign substances. Fully open (100 % position) the ACTIVAL to flush. (Factory preset position: 0 %)

### 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 0% (in fully open position) for shipment. The shaft is thus completely turned counterclockwise, and the pointer points at '0'. (See Fig. 5.)

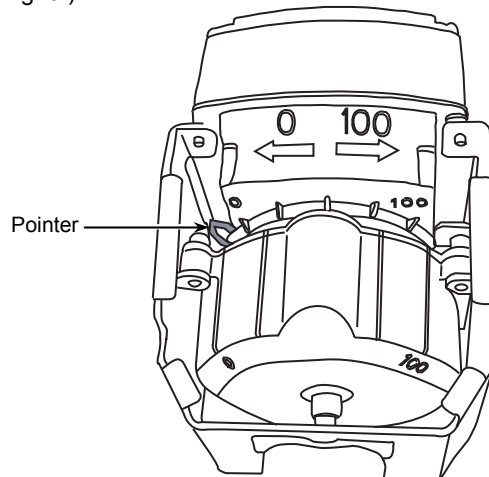


Figure 5. Pointer position for shipment

### Auxiliary switch / Auxiliary potentiometer (optional)

<p><b>IMPORTANT:</b></p> <ul style="list-style-type: none"><li>• The auxiliary switch/potentiometer is installed on site. Refer to the instructions supplied with the auxiliary switch/potentiometer for installation.</li><li>• Do not open the top cover except when adjusting the auxiliary switch/potentiometer. Close the top cover instantly after adjusting the auxiliary switch/potentiometer.</li><li>• Do not put any load on the top cover.</li></ul>
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## 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.
- Make sure the polarity of the power supply and 2-10 V DC feedback output for 2-10 V DC input and 4-20 mA DC input types, referring to the wiring diagrams. 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.

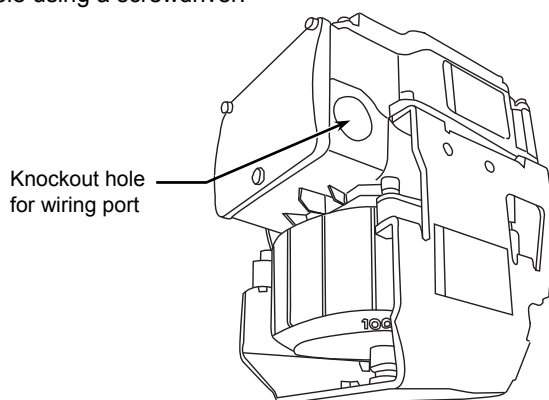


Figure 6. Knockout hole for wiring port

- 2) Unscrew the 3 setscrews (M4 × 10) of the terminal cover and remove the terminal cover, as shown in Fig. 7.

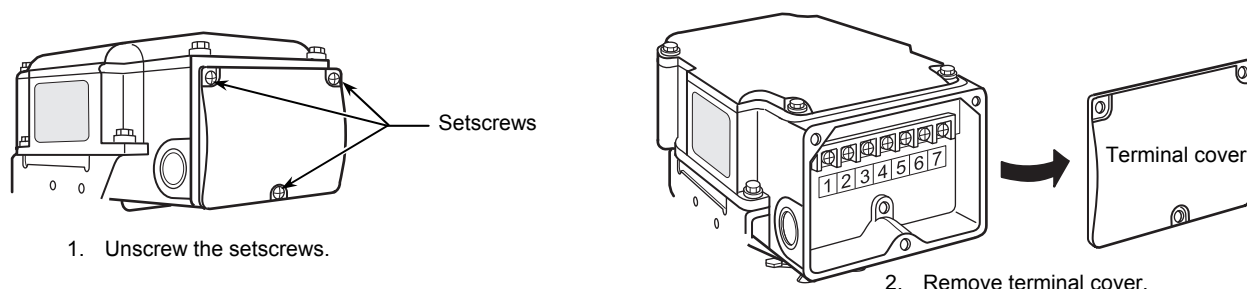


Figure 7. Terminal cover removal

- 3) Correctly connect the wires to the terminals with M3.5 screw terminal lugs, referring to Figs 8 to 16.
- 4) When the ACTIVAL is used in a high-humidity environment or outdoors, use a water-proof connector for the wiring port.

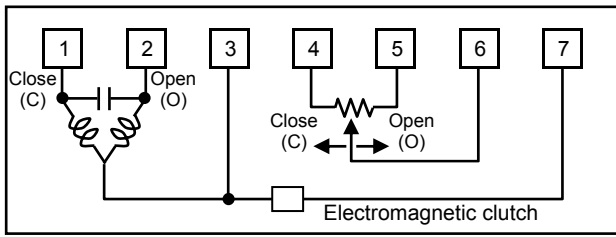
### To keep IP54 protection (dust-proof and splash-proof),

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 VY511XK/VY511XH



When power supply is disconnected between terminals 3 and 7, the actuator fully closes the valve (in 0 % position).

Figure 8. Terminals connection of Model VY512XK/VY512XH (Nominal 135 Ω feedback potentiometer type)

\* Note:

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

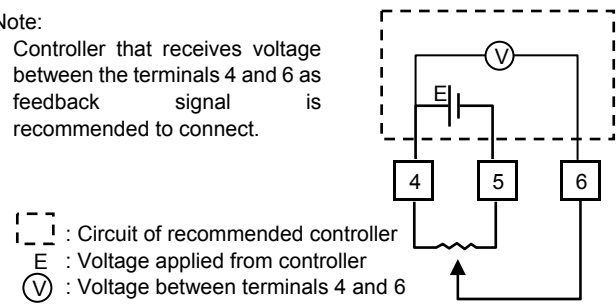
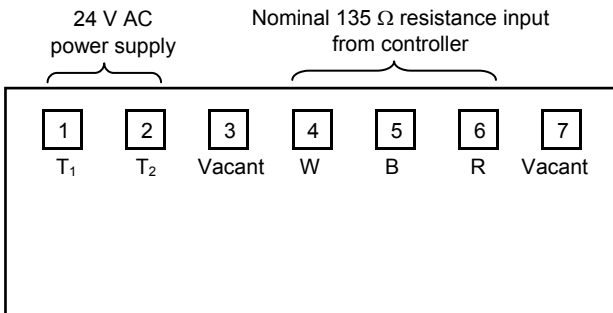


Figure 9. Circuit of recommended controller

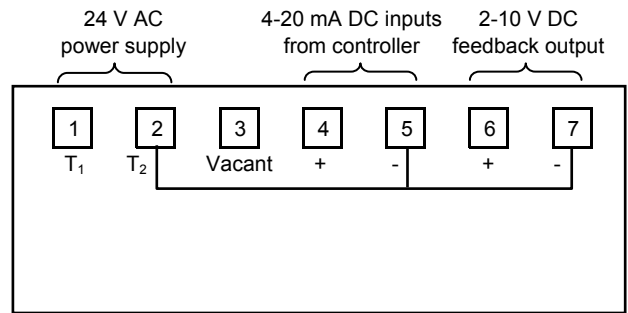
Model VY512XK/VY512XH



When power supply is disconnected, the actuator fully closes the valve (in 0 % position).

Figure 10. Terminals connection of Model VY512XK/VY512XH (Nominal 135 Ω resistance input type)

Model VY513XK/VY513XH



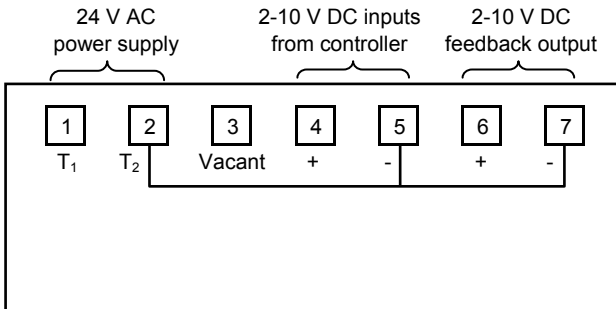
When power supply is disconnected, the actuator fully closes the valve (in 0 % position).

\*Note:

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

Figure 11. Terminals connection of Model VY513XK/VY513XH (4-20 mA DC input type)

Model VY514XK/VY514XH



When power supply is disconnected, the actuator fully closes the valve (in 0 % position).

\*Note:

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

Figure 12. Terminals connection of Model VY514XK/VY514XH (2-10 V DC input type)

**Connection examples (Connection to Azbil Corporation's controllers)**

Connection to Inflex™ GC (Model WY5111)

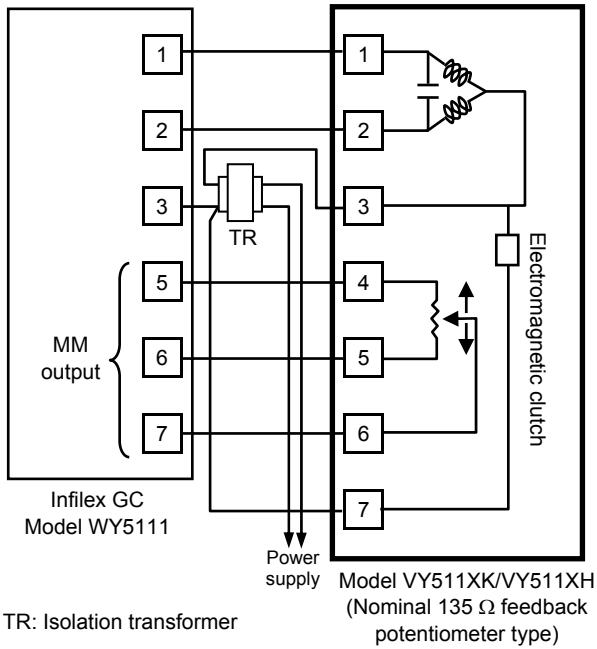


Figure 13. Connection example:  
Model VY511XK/VY511XH to Model WY5111

Connection to Neostat™ (Model TY900XZ)

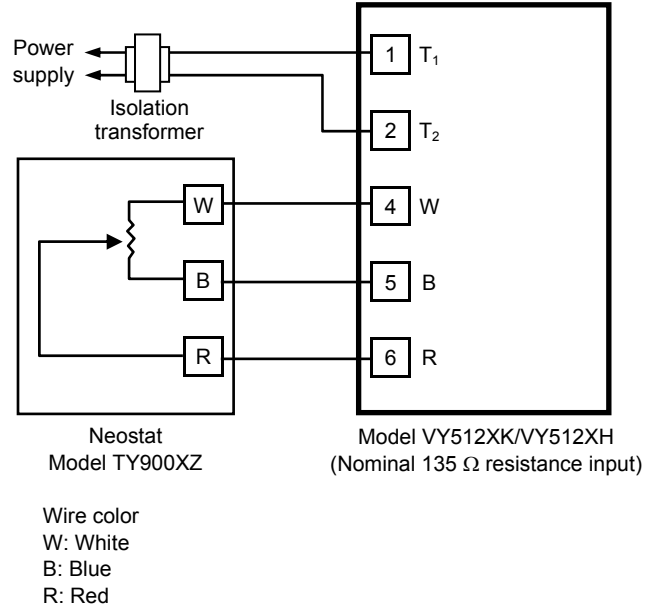


Figure 14. Connection example:  
Model VY512XK/VY512XH to Model TY900XZ

Connection to R series (Model R35/R36)controller

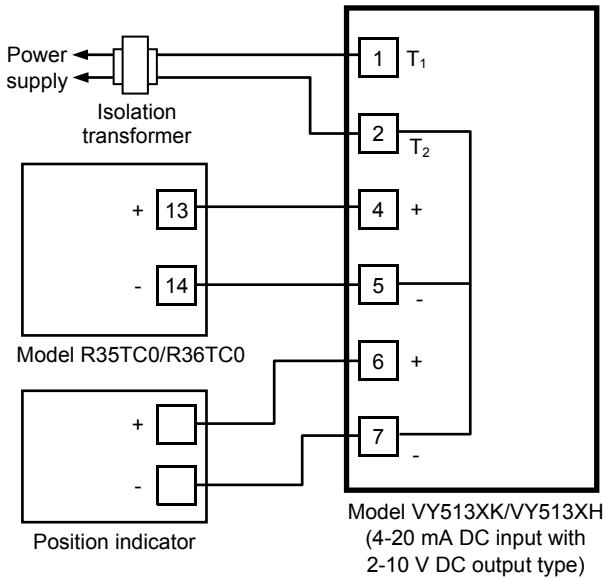


Figure 15. Connection example:  
Model VY513XK/VY513XH to Model R35TC0/R36TC0

Connection to Inflex™ AC (Model WY5117)

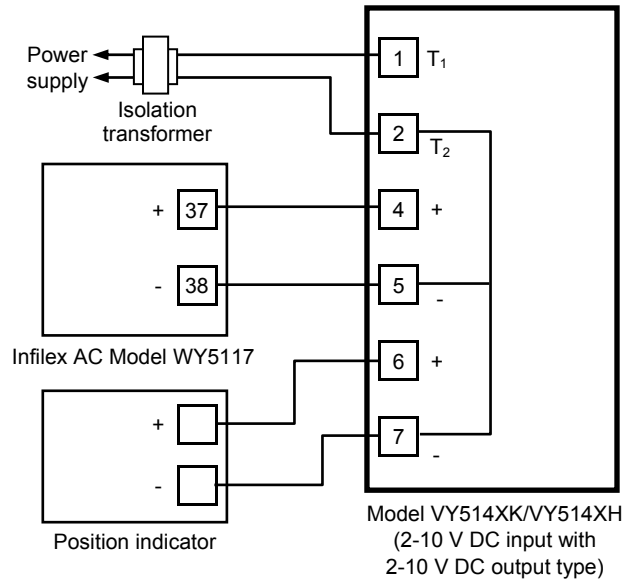
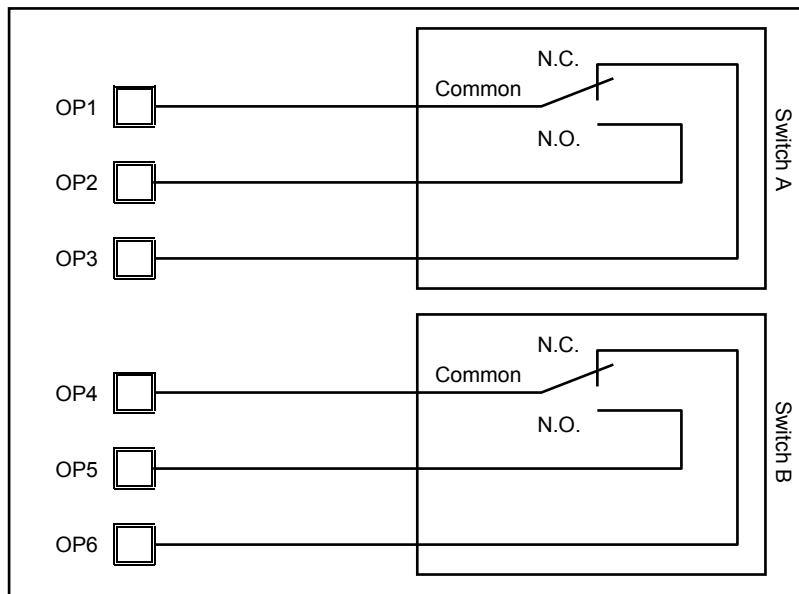


Figure 16. Connection example:  
Model VY514XK/VY514XH to Model WY5117

### Internal Connection of Auxiliary Switch / Auxiliary Potentiometer

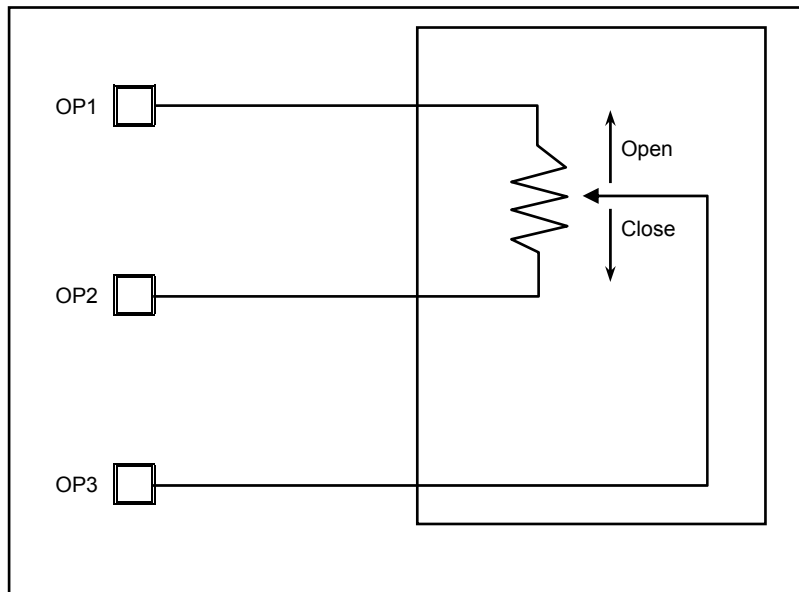
#### Auxiliary switch Part No. 83165274-001



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

Figure 17. Internal connection of Auxiliary switch Part No. 83165274-001

#### Auxiliary potentiometer Part No. 83165275-001



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

Figure 18. Internal connection of Auxiliary potentiometer Part No. 83165275-001

## 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.
- Open/close the installed 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 Azbil Corporation 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/service 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. Change the installation location.
The auxiliary switch does not actuate.	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.
Operating time of the spring return is too short.	Wiring condition of the brake motor	Consult with our sales/service personnel.
Operating time of the spring return is too long. The spring return does not operate.	Torque of valve operation	Consult with our sales/service personnel.
The actuator does not fully closes the valve (in 0 % position).	—	Consult with our sales/service personnel.
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.	

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*Specifications are subject to change without notice.*

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