ACTIVAL™
Motorized Three-Way Valve with Flanged-End Connection (ANSI Class 125 / A126 Class B)

■ Overview

ACTIVAL Model VY54_FF is a series of motorized three-way valves with flanged connection. The valve and the actuator are integrated in a single unit.

The valve size ranges from 2" to 3", and the valve body rating corresponds to ANSI Class125.

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

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

1. 4–20 mA DC input
2. 2–10 V DC input

   Both provide proportional control in combination with a single loop controller (e.g., SDC35/SDC36).

■ Features

- Compact and lightweight:
  Rotary motor actualizes small body and light weight.
- NEMA 4X Enclosure
- Valve and actuator integrated in a single unit:
  Pre-assembled body requires no adjustment.
- A variety of control signals available:
  - 4–20 mA DC input
  - 2–10 V DC input
- Valve for chilled/hot water control applicable to high differential pressure, large Cv value, high rangeability, and low leakage.
- Durable actuator with low power consumption.
- Linear flow characteristics.

For 4 to 20 mA DC input model

- Open/close changeover for input signal failure:
  Actuator fully opens/closes valve in case that the control signal is not input to the actuator. (Default: Fully open)
- Direction changeover of control action:
  Open/close action by 4 to 20 mA DC input signal is reversely controllable.
  Normal action 4 mA: 0 % to 20 mA: 100 %
  Reverse action 20 mA: 0 % to 4 mA: 100 %.
  (Default: Normal action)
- Adjustable dead band*:
  Dead band width can be narrowed to more precisely operate valve actuator.

* Actuator is not operated by input signal changed less than a certain amount. This amount of change is called dead band.

Safety Precautions

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

Restrictions on Use

This product was developed, designed, and manufactured for general air conditioning use.

Do not use the product in a situation where human life may be at risk or for nuclear applications in radiation controlled areas. If you wish to use the product in a radiation controlled area, please contact Azbil Corporation.

Particularly when the product is used in the following applications where safety is required, implementation of fail-safe design, redundant design, regular maintenance, etc., should be considered in order to use the product safely and reliably.

- Safety devices for protecting the human body
- Start/stop control devices for transportation machines
- Aeronautical/aerospace machines

For system design, application design, instructions for use, or product applications, please contact Azbil Corporation.

Azbil Corporation bears no responsibility for any result, or lack of result, deriving from the customer's use of the product.

Recommended Design Life

It is recommended that this product be used within the recommended design life.

The recommended design life is the period during which you can use the product safely and reliably based on the design specifications.

If the product is used beyond this period, its failure ratio may increase due to time-related deterioration of parts, etc.

The recommended design life during which the product can operate reliably with the lowest failure ratio and least deterioration over time is estimated scientifically based on acceleration tests, endurance tests, etc., taking into consideration the operating environment, conditions, and frequency of use as basic parameters.

The recommended design life of this product is 10 years.

The recommended design life assumes that maintenance, such as replacement of the limited life parts, is carried out properly.

Refer to the section on maintenance in this manual.

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

	Notifies users that specific actions are prohibited to prevent possible danger. The symbol inside ⃠ graphically indicates the prohibited action. (For example, the sign on the left means 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. (For example, the sign on the left indicates general instructions.)

⚠ WARNING	
	When handling or transporting any heavy product (more than 39.7 lb (18 kg)), carefully move the product with a handtruck or the like, or with 2 or more people. Careless lifting or accidental dropping of the product may result in injury or product damage.

⚠ CAUTION	
	Provide a circuit protector (e.g., a fuse or circuit breaker) for the power source. Failure to do so may cause a short circuit leading to fire or device failure.
	Do not freeze this product. Doing so may damage the valve body and cause leakage.
	When piping this product, be sure there is no foreign matter in the pipes. If foreign matter remains in the pipes, the product may break down.
	Install, wire, and use this product under the conditions specified by this manual. Failure to do so may cause fire or device failure.
	Use full face gaskets for flat face flanges. Failure to do so may damage the flanges or cause leakage outside of the valve.

⚠CAUTION	
❗	When installing this product, hold it in the proper position and securely fasten it to the pipes. Excessive tightening or improper installation position may damage the valve.
❗	After installation, make sure no fluid leaks from the valve-pipe connections. Improper piping may cause fluid leakage outside of the valve.
🚫	Do not put a load or weight on this product. Doing so may damage the product.
❗	Installation and wiring of the actuator must be performed by personnel qualified to do instrumentation and electrical work. Mistakes in installation or wiring may cause fire or electric shock.
❗	Before wiring, setting, or maintenance, be sure to turn off the power to this product. Failure to do so may result in electric shock or device failure.
❗	All wiring must comply with applicable codes and ordinances. Otherwise there is a danger of fire.

⚠ CAUTION	
❗	Use crimp terminals with insulation for connections to the product terminals. Failure to do so may cause short circuit leading to fire or device failure.
❗	Tighten the terminal screws with the specified torque. Insufficient tightening of the terminal screws may cause fire or overheating.
❗	After wiring, setting, or maintenance, be sure to reattach the terminal cover. Failure to do so may result in electric shock.
🚫	Do not touch any parts unless instructed to do so in this manual. Failure to observe these precautions may result in burns, because actuator parts reach a high temperature.
🚫	Do not carelessly touch this product when it is used to control hot water. Doing so may result in burns, because the product reaches a high temperature.

■ Model Numbers

Model VY54_FF00_ _ 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.

- 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	Fixed	Nominal size / Cv	
VY54						Motorized three-way valve with flanged connection
	4					2 V DC to 10V DC input with 2 V DC to 10 V DC feedback output
	9					4 mA DC to 20 mA DC input with 4 mA DC to 20 mA DC feedback output
		F				ANSI Class 125 / A126 Class B
			F			NEMA 4X and IEC IP54 protected and standard torque type actuator with terminal block
				00		Fixed
					51	2" / 45 Cv value
					61	2½" / 70 Cv value
					81	3" / 100 Cv value

Notes:
1. This product has acquired the following UL/cUL certification.
   UL60730-1/-2-14, CAN/CSA E60730-1:15 / -2-14:13
   Rated impulse voltage : 330 V (Over Voltage Category I), Control pollution degree: 4 (3 for the inside of actuator), Type of action: 1
   Use the class 2 power supply.
   Provide a circuit protector (8 A max.) such as a fuse or circuit breaker for the power source.
   UL50E
   Type 4 Enclosure
2. Only the actuator is certified with the UL/cUL above.

■ Specifications

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

● **Valve**

Item	Specification				
Model	Three-way valve with flanged-end connection, proportional control				
Body pressure rating	ANSI Class 125				
End connection	ANSI Class 125 Bolt pattern flanges, flat face flange (FF)				
Size, Cv, Close-off ratings	Model number	Nominal size		Cv	Close-off ratings
		Inch	DN		
	VY54_FFJ0051	2"	50	45	43.5 psi
	VY54_FFJ0061	2½"	65	70	29.0 psi
	VY54_FFJ0081	3"	80	100	21.8 psi for mixing use 14.5 psi for diverting use
Materials	Body	Gray cast iron (A126 Class B)			
	Plug and stem	Stainless steel			
	Seat ring	Heat-resistant PTFE			
	Gland packing	Inorganic fiber			
	Gasket	Non-asbestos joint sheet			
Applicable fluids	Chilled/hot water, high temperature water, ethylene glycol solutions, 50% max., Steam				
Allowable fluid temperature*	32 °F to 212 °F (0 °C to 100 °C) Non-freezing				
Flow characteristics	Linear characteristic (See Fig.1.)				
Rangeability	30:1				
Seat leakage	Class IV (0.01 % of rated Cv value)				
Paint	Gray				
Actuator to be combined	Integrated with the valve				

Linear flow characteristic diagram

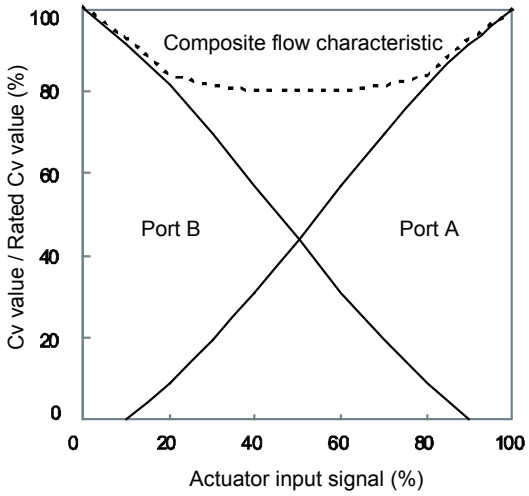


Figure 1. Linear flow characteristic diagram

● Actuator

Item	Specification	
Power supply	24 V AC ± 15 %, 50 Hz / 60 Hz	
Applicable valve size	2" to 3" of standard torque type	
Power consumption	12 VA	
Timing	63 ± 5 sec (50 Hz) / 53 ± 5 sec (60 Hz)	
Control signal input	4 mA DC to 20 mA DC input (Input impedance: 100 Ω) 2 V DC to 10 V DC input (Input impedance: 150 kΩ or higher)	
Feedback signal output	Range: 4 mA DC (0 % position) to 20 mA DC (100 % position) Max. load resistance: 500 Ω Range: 2 V DC (0 % position) to 10 V DC (100 % position) Max. load resistance: 10 kΩ or higher (Max. 1 mA)	
Materials	Case	Cast aluminum alloy
	Top cover, terminal cover	Polycarbonate resin (Color: gray)
	Yoke	Steel plate
Surface finishing	Case	None
	Yoke	Electro-galvanized (Bright chromate finish)
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. (0: B-AB (Port B fully open), 100: (Port A fully open)	
Manual operation	Available	
Wires connection	M3.5 screw terminal connection	
Enclosure rating	NEMA 4X, IEC IP54	
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 5 mA or less leakage current	
Manual operation	Available. Refer to the section Manually opening/closing the ACTIVAL.	

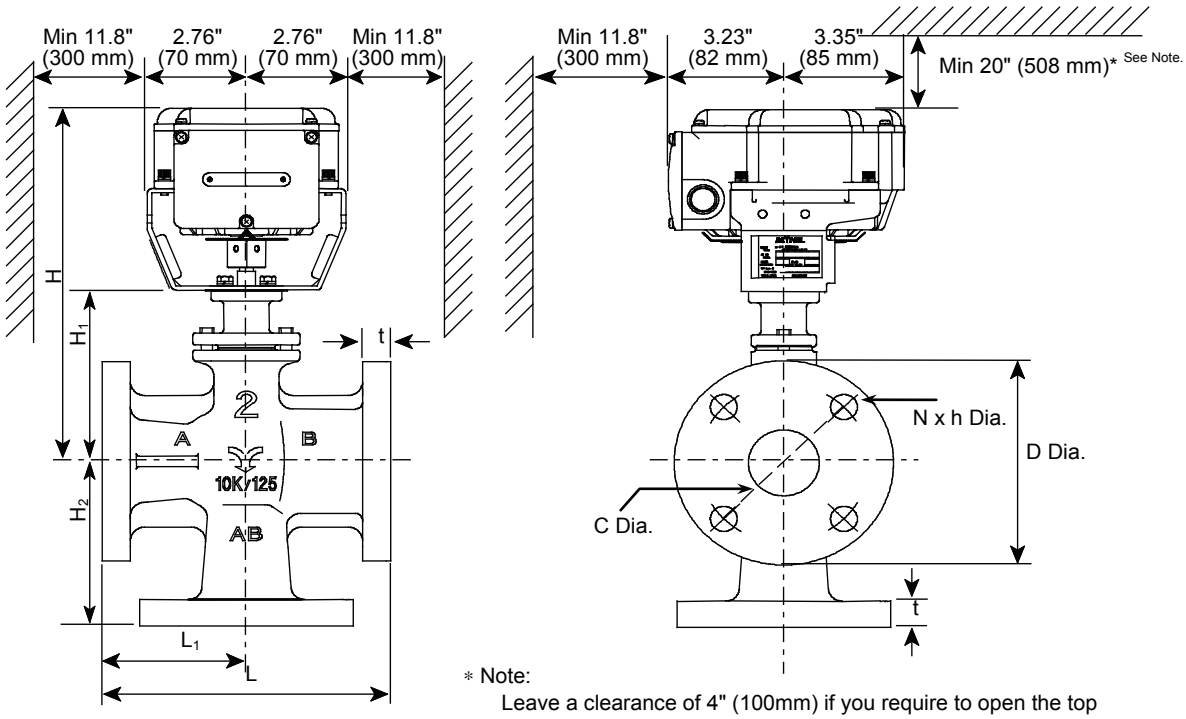
● Valve and actuator (as a single unit) specifications

Item		Specification		
Environmental conditions		Rated operating conditions	Limit operating condition	Transport/storage conditions (packaged*2)
	Ambient temperature*1	-4 to 122 °F (-20 to 50 °C) (Fluid temperature 32 to 212 °F (0 to 100°C))	-4 to 140 °F (-20 to 60 °C)	-4 to 158 °F (-20 to 70 °C)
	Ambient humidity	5 %RH to 95 %RH		
	Vibration	16.1 fps^2 (4.9 m/s^2) (10 Hz to 150 Hz)	32.2 fps^2 (9.8 m/s^2) (10 Hz to 150 Hz)	64.3 fps^2 (19.6 m/s^2) (10 Hz to 150 Hz)
		Notes: *1 Do not allow the fluid to freeze. *2 Actuator shall be packed during transport and storage.		
Installation locations		Indoor (salt air, corrosive gas, flammable gas, and organic solvent must be avoided.) Outdoor (Use the outdoor cover etc. to be ordered separately. Direct sunlight, salt air, corrosive gas, flammable gas, and organic solvent must be avoided.)		
Installation orientation		Installable in any position ranging from upright to sideways (90° tilted.) * Always install in upright position outdoors.		
Position for shipment		Port A in 100 % (fully open) preset at factory.		

● Option and auxiliary device

Item	Specification
Seal connector (Part No. 83104346-003)	Applicable wire size: 0.28" Dia. to 0.35" Dia.(7mm Dia. to 9mm Dia.) (Seal connector is necessary for NEMA 4X and IEC IP54 protection.)
Auxiliary switches (Part No. 83174063-101)	Number of auxiliary switches: 2 (SW A and SW B) Maximum applied voltage/current: 30 V DC / 100 mA 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)

■ Dimensions



* Note:
Leave a clearance of 4" (100mm) if you require to open the top cover (to set the selector switches after the ACTIVAL is installed).

Model number	Valve size	H	H1	H2	L	L1	t	C	D	φh	N	Weight (lb)
VY54_FF005_	2”	10.61	5.16	4.92	8.03	4.02	0.79	4.72	5.91	0.75	4	30.9
VY54_FF006_	2½"	10.79	5.33	5.12	9.06	4.53	0.87	5.51	7.09	0.75	4	40.8
VY54_FF008_	3”	10.96	5.51	5.91	9.45	4.72	0.87	6.00	7.48	0.75	4	44.1

Figure 2. Dimensions

■ Parts Identification

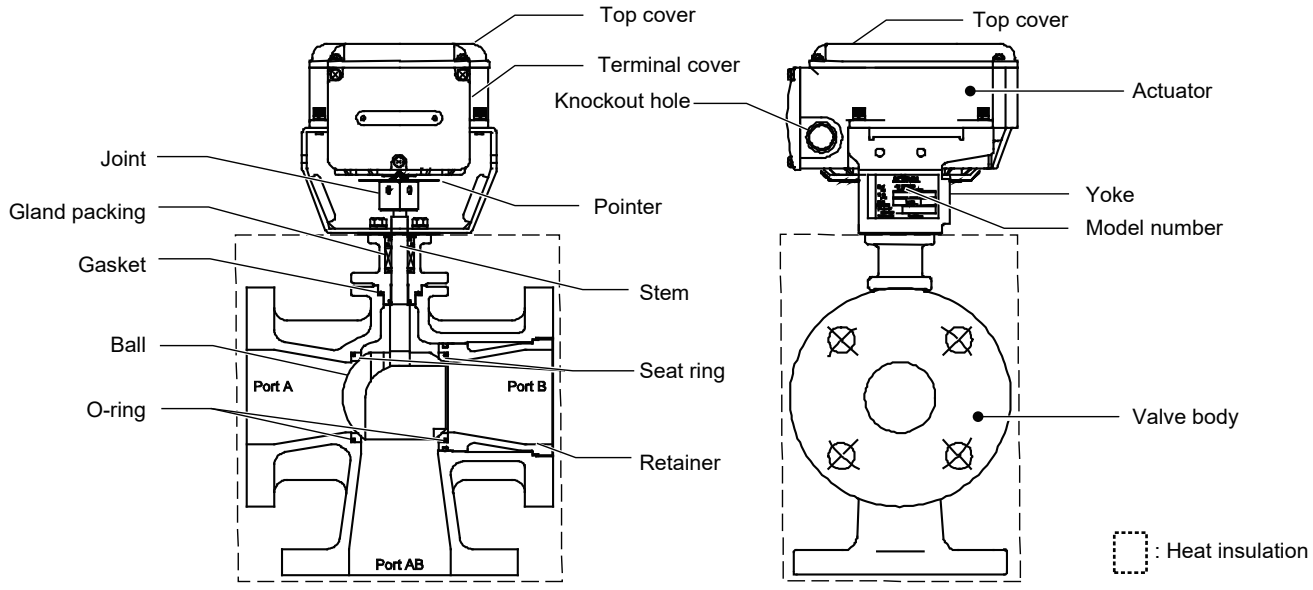


Figure 3. Parts identification

■ Flow Direction

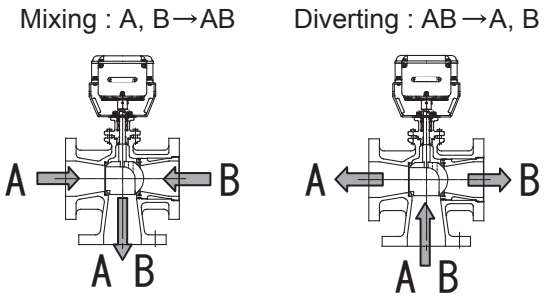


Figure 4. Flow direction

■ How to Identify port A or port B

- When the valve is not wrapped with heat insulation material
  Port A or port B is identified by the casted letters on the valve body.
- When the valve is wrapped with heat insulation material
  Port A or port B is identified by the tip on the top cover of the body.

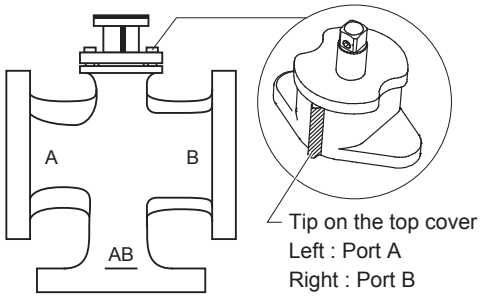


Figure 5.

■ Instrumentation Examples

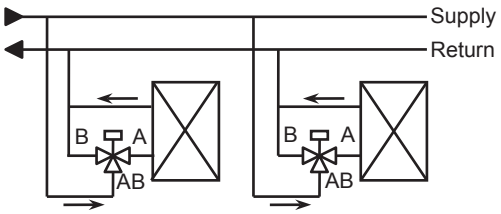


Figure 6. Application for diverting

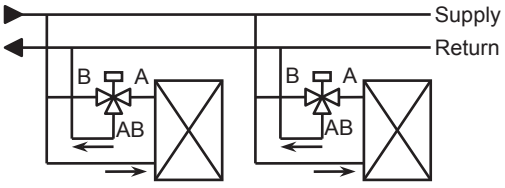


Figure 7. Application for mixing

■ Mounting Position Examples

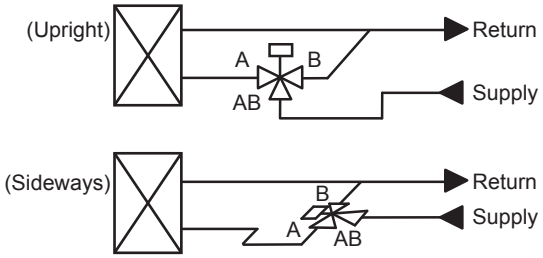


Figure 8. Application for diverting

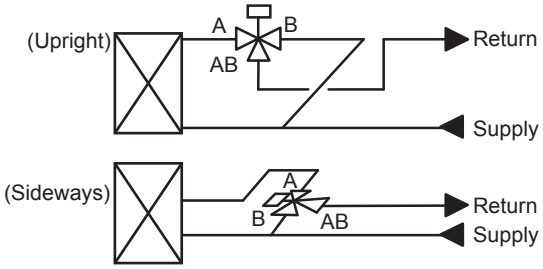


Figure 9. Application for mixing

■ Setting

For 4–20 mA model

On the PCB (printed circuit board) of the actuator, the selector switches are provided.

⚠ CAUTION	
❗	Before beginning setup work, be sure to turn off the power to this product. Failure to do so may result in electric shock or device failure.
❗	After changing the settings, be sure to reattach the terminal cover. Failure to do so may result in electric shock.
✋	Do not touch any parts unless instructed to do so in this manual. Failure to observe these precautions may result in burns, because actuator parts reach a high temperature.

IMPORTANT:

- Set the DIP switches using a precision screwdriver or a finger.
  If a tool larger than a precision screwdriver is used, the DIP switches or the printed circuit board may be damaged.
- The service life of ACTIVAL operated with small dead band can be shortened since the ACTIVAL operates more frequently with small dead band than with normal dead band.
- To operate the product with small dead band, provide shielded cable for input/output signal lines and power line. Unshielded cable can cause error due to noise.

● Identification of the selector switches

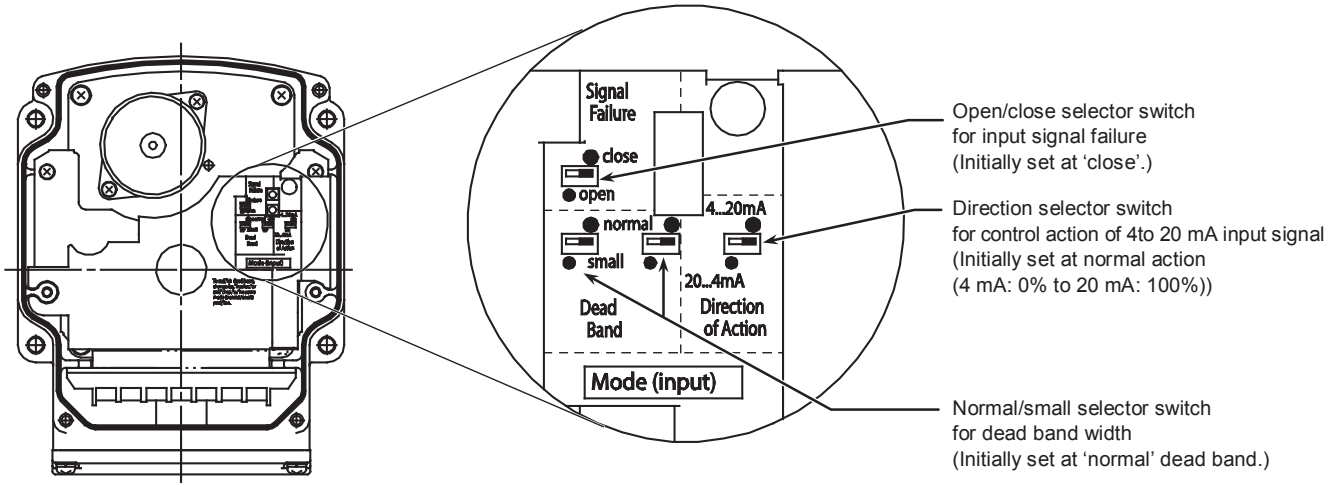


Figure 10. Selector switches

Open/close selector switch for input signal failure:

If no control signal is input, the actuator automatically closes (0 %) or opens (100 %) the valve by setting the selector switch at 'open' (100 %) or 'close' (0 %).

Direction selector switch for control action of 4 to 20 mA input signal:

Direction of control action by 4 to 20 mA DC input signal can be reversely switched.

Normal action: 4 mA for 0 % to 20 mA for 100 %

Reverse action: 20 mA for 0 % to 4 mA for 100 %

Normal/small selector switch for dead band width:

To more precisely operate the valve, smaller dead band (than the normal) of the control signal input can be set. Two selector switches are provided for the normal/small dead band width. Always set the both switches at the same mode ('normal' or 'small').

■ Installation

⚠ WARNING
When handling or transporting any heavy product (more than 39.7 lb (18Kg)), carefully move the product with a handtruck or the like, or with 2 or more people. Careless lifting or accidental dropping of the product may result in injury or product damage.

⚠ CAUTION
Do not freeze this product. Doing so may damage the valve body and cause leakage.
When piping this product, be sure there is no foreign matter in the pipes. If foreign matter remains in the pipes, the product may break down.
Install, wire, and use this product under the conditions specified by this manual. Failure to do so may cause fire or device failure.
Use full face gaskets for flat face flanges. Failure to do so may damage the flanges or cause leakage outside of the valve.

● Precautions for installation

Observe the following cautions in order to avoid failure of this product.

- Do not strike or jar this product.
- Be sure there is no foreign matter in the pipes. Observe the following instructions to remove foreign matter.
  - Install a strainer on the upstream side of the product.
    For chilled/hot water: 40 or more mesh
  - If the strainer cannot be installed just before the inlet of each valve, install it on the pipe diverting sections for each piping group.
- Do not install this product near a steam coil, hot-water coil, etc. High-temperature radiant heat may cause failure of the actuator.
- Avoid connecting the product to piping where water hammer may occur or slag, etc. easily collects.

In addition, observe the following cautions.

- Install a bypass pipe and gate valves on the inflow, outflow, and bypass sides.
- Install the product so that maintenance and inspection can be done easily.
  Refer to ■ "Dimensions."
- When installing the product in the ceiling, provide a trapdoor within 20" (508 mm) around the valve. And, place a drain pan under the valve.

● Mounting position

- Application for mixing
  Mount the valve so that fluid flows in the direction pointed by the arrow on the valve body.
- Application for diverting
  Mount the valve so that fluid flows in the direction opposite to the arrow direction on the valve body.

Check the fluid direction and mount the valve in any position from upright to sideways (90° tilted).
Note: If the product is installed outdoors, place it in upright position.

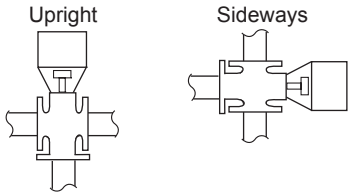


Figure 11. Correct mounting

Actuator is below the valve.

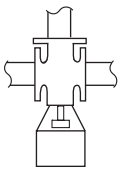


Figure 12. Incorrect mounting

● Piping

⚠ CAUTION
When installing this product, hold it in the proper position and securely fasten it to the pipes. Excessive tightening or improper installation position may damage the valve.

(1) Check that the model number of the product is what you ordered. The model number is shown on the label attached on the yoke.

(2) Install the valve so that fluid flows in the direction pointed by the arrow on the valve body.
Refer to ● "Mounting position."

- When piping, do not apply too much sealing material, such as solidifying liquid and tape, to the pipe connection sections.
- Do not allow chippings, sealing material, etc. to get into the pipes.

The foreign matter, such as chippings, seal material for screwing the pipes, may be caught in, resulting damages on the valve seat and the valve may not be fully closed.

(3) Fully open the valve for each port and flush the pipes at the maximum flow rate.
When fluid flows for the first time, it is to clean out the foreign matter and refuse in the pipes.
The port A is set to fully open when it is shipped from the factory.

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

● Heat insulation

- Apply heat insulation in the area illustrated by ⬚ in Fig. 13.
- If the heat insulation material is placed above the yoke, the indicator may be hidden from sight or be deformed by being entangled with the insulation material.

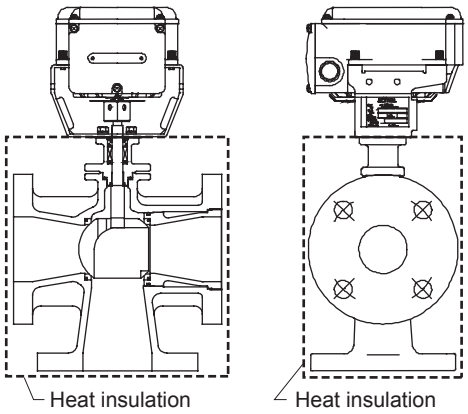


Figure 13. Heat insulation

● Factory preset position

Actuator shaft: fully open for port A
Pointer: completely turned clockwise

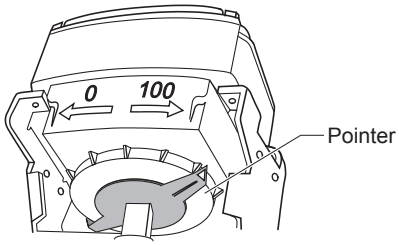


Figure 14. Pointer position for shipment

● Manually opening/closing operation

IMPORTANT

- Before opening or closing the valve manually, turn off the power.
  If the valve is manually opened or closed while the power (24 V AC) is applied, the actuator may break down.
- Do not manually open or close the valve beyond the fully open or fully closed scale.

(1) Turn off the power.

(2) Hold the joint using a wrench, etc., gently turn the wrench to the desired position, open or close.
Note: If the valve is subject to shock, the actuator may break down.

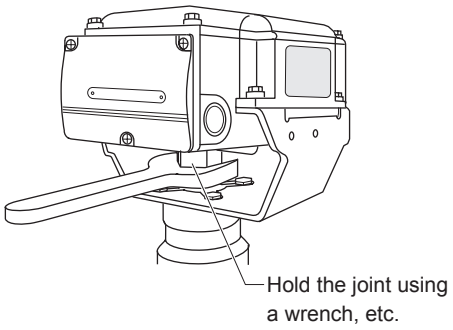


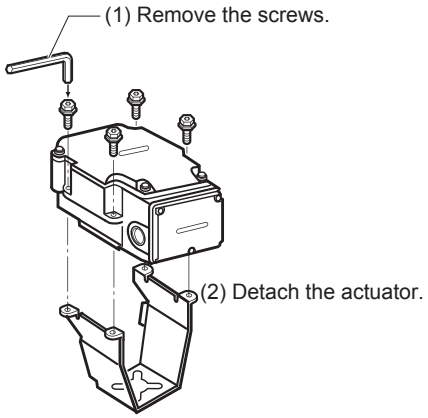
Figure 15. Manually opening/closing operation

● **Changing the actuator mounting position**

IMPORTANT

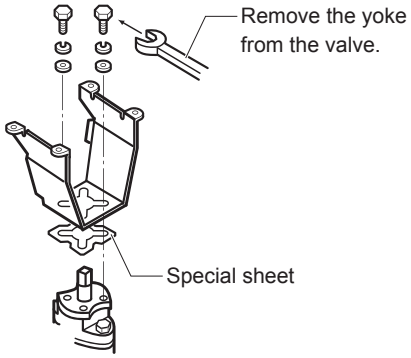
- Do not break combination of the valve, yoke, and actuator.
- When changing the mounting position of the actuator, set thee position to 100 % (fully open) for the valve (port A) and actuator.
  If the valve and actuator are assembled in different valve positions, gears in the actuator will be damaged because the actuator will try to close or open the valve although the valve stops at the fully closed or fully open position.

(1) Remove the screws connecting the actuator and the yoke.



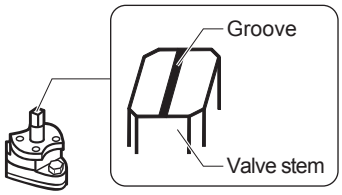
(2) Lift the actuator and detach it from the yoke.

(3) Remove the screws connecting the yoke and the valve.

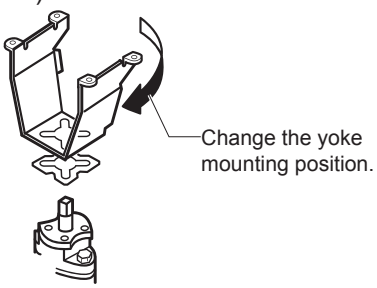


Note: A special sheet is inserted between the yoke and valve for heat insulation.
When you changed the mounting position, be careful not to lose the sheet.

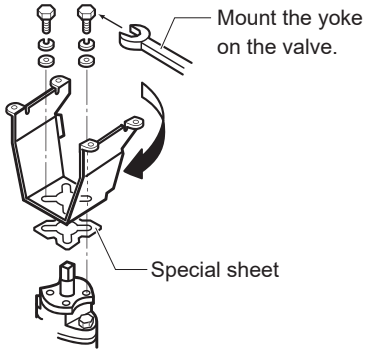
(4) Make sure that the groove on the tip of the valve stem is parallel to the pipes (indicating the valve in 100 % position).



(5) Align the yoke to the desired orientation. Orientation of the actuator can be changed by 90° steps from the factory preset position. (0°/90°/180°/270°)



(6) Reinsert the sheet removed in step (3) between the yoke and the valve, and then mount the yoke on the valve with the screws.



(7) Check that the pointer on the actuator indicates the fully open, and that the actuator can be properly seated on the valve stem.

(8) Mount the actuator on the yoke using the screws removed in step (1).

(9) Check that the valve smoothly operates from the fully closed to the fully open positions.

■ Wiring

⚠ CAUTION	
❗	Provide a circuit protector (e.g., a fuse or circuit breaker) for the power source. Failure to do so may cause a short circuit leading to fire or device failure.
❗	Install, wire, and use this product under the conditions specified by this manual. Failure to do so may cause fire or device failure.
❗	Installation and wiring of the actuator must be performed by personnel qualified to do instrumentation and electrical work. Mistakes in installation or wiring may cause fire or electric shock.
❗	Before wiring, be sure to turn off the power to this product. Failure to do so may result in electric shock or device failure.
❗	All wiring must comply with applicable codes and ordinances. Otherwise there is a danger of fire.
❗	Use crimp terminals with insulation for connections to the product terminals. Failure to do so may cause short circuit leading to fire or device failure.
❗	Tighten the terminal screws with the specified torque. Insufficient tightening of the terminal screws may cause fire or overheating.

IMPORTANT

- This product is designed for 24 V AC power supply voltage.
  Do not apply power supply voltage other than 24 V AC.
- For the 2–10 V DC input type and 4–20 mA input type, check the polarity of the power supply and feedback signal, and then correctly wire the product. Incorrect wiring may result in PCB (print circuit board) burnout.

● To keep NEMA 4X, Type 4 Enclosure, and IP54 protection

In order to maintain NEMA 4X, Type 4 Enclosure, and IEC IP54 performance, use waterproof connectors etc. when the product is used in high humidity environment or outdoor.

- Close the terminal cover and top cover firmly. (Screw tightening torque: 7.08 lbf•in (0.8 Nm))
- Apply a waterproofing treatment for the knockout holes. (In order to satisfy the Type 4 Enclosure requirements, use the UL listed conduit fittings that are equivalent to Type 4 or more stringent.)
- Use waterproof connectors to pull out the cables. (Seal connector Part No. 83104346-003 is recommended.)
- If cables are connected by cable glands, use waterproof plica tubes etc.

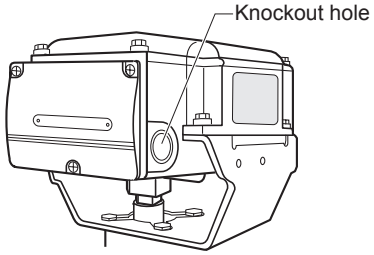
● Control signals type

The type of control signals is printed on the actuator label and the wiring diagram label as shown below.

4–20 mA	: 4–20 mA DC input
2–10V	: 2–10 V DC Input

● Wiring procedure

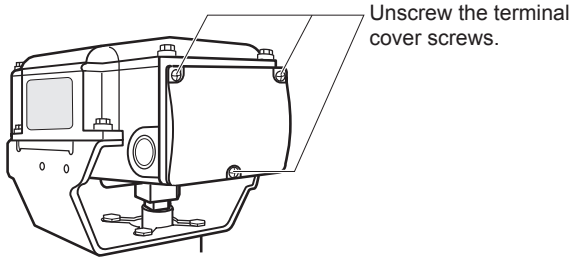
(1) Select a knockout hole according to the wire outlet direction, and open a knockout hole. Two knockout holes are provided on the bilateral sides of the actuator. The knockout holes can be easily opened by lightly knocking the hole using a screwdriver.

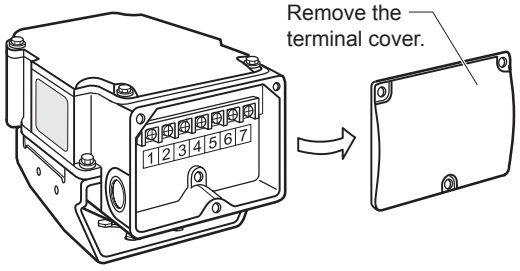


IMPORTANT

- Do not leave pieces of metal (generated by making the knockout hole) inside the actuator.

(2) Unscrew the 3 setscrews (M4 x 10) on the terminal cover to remove the cover.





(3) Correctly connect the wires to the terminals with the M3.5 screw terminal screws.

Do not apply 24 V AC to terminals 4 to 7.

Note: Correctly connect the wires referring to Fig. 16 to Fig. 17, “Terminals Connection”, Fig. 18 to Fig. 25, “Wiring Examples” and “Advanced Wiring Examples.”

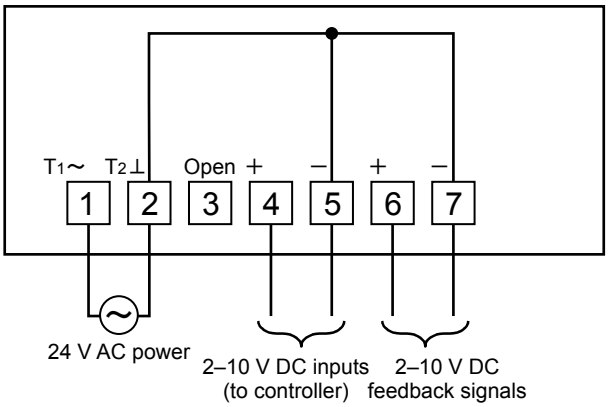
(4) Mount the terminal cover and attach it with the setscrews.

> **⚠ CAUTION**
>
> After wiring, be sure to reattach the cover. Failure to do so may result in electric shock.

■ Terminals Connection

● 2–10 V DC input

(Model VY544FF00_ _)

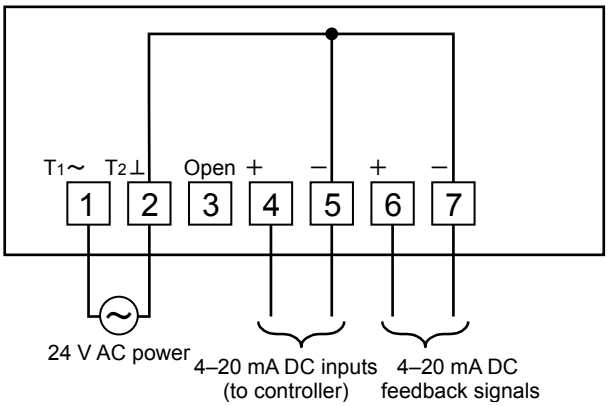


Note: The terminal 2 (power), terminal 5 (2–10 V DC input), and terminal 7 (2–10 V DC feedback signal) are internally connected.

Figure 16.

● 4–20 mA DC input

(Model VY549FF00_ _)



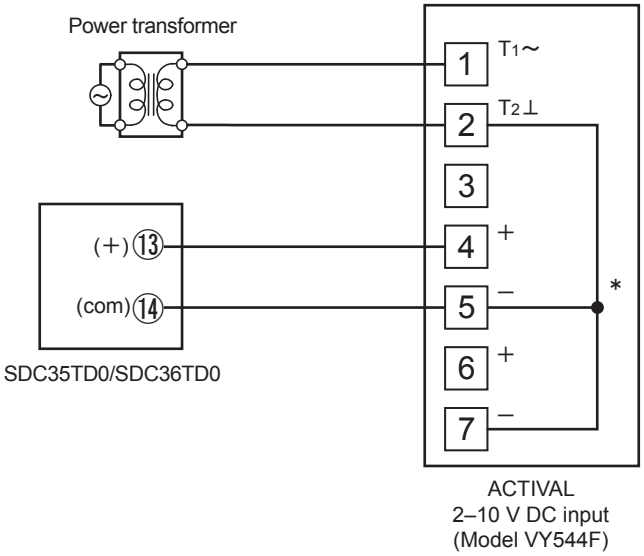
Note: The terminal 2 (power), terminal 5 (4–20 mA DC input), and terminal 7 (4–20 mA DC feedback signal) are internally connected.

Figure 17.

■ Wiring Examples

● 2–10 V DC input

(Model VY544F)



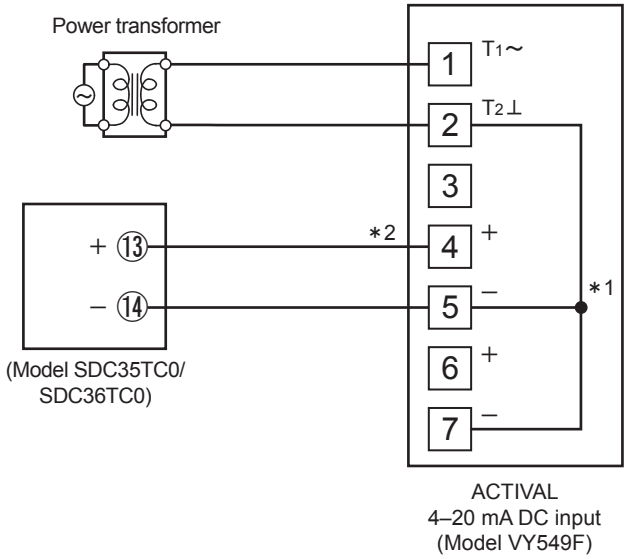
∗ Terminals 2, 5, and 7 are internally connected.

Note: Do not implement a daisy chain wiring passing through the actuator’s power terminals.

Figure 18. Connection example: Model VY514F to Model SDC35/SDC36

● 4–20 mA DC input

(Model VY549F)



∗1 The terminal 2 (power), terminal 5 (4–20 mA DC input), and terminal 7 (4–20 mA DC input feedback signal) are internally connected.

∗2 Input impedance of 4–20 mA DC input of the actuator is 100 Ω.
4–20 mA DC input is not isolated.
Install the power transformer separately.

Figure 19. Connection example: Model VY549F to Model SDC35/SDC36

■ Advanced Wiring Examples

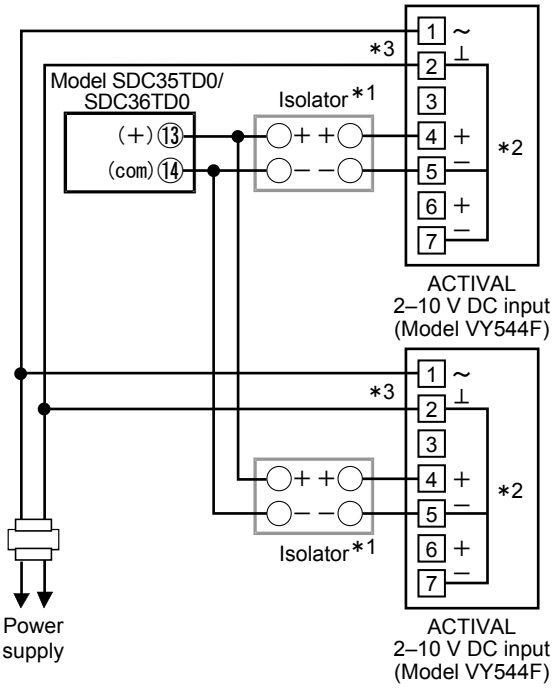
● 2–10 V DC input

(Model VY544F)

Precautions

- Power transformer is shared
  If a power transformer is shared by two products, connect the terminal 1 of each actuator to the transformer with the same polarity. Connect the terminal 2 in the same way.
  It the terminals are connected with different polarities, the product may break down (see Fig. 21).

Input signals and power are shared



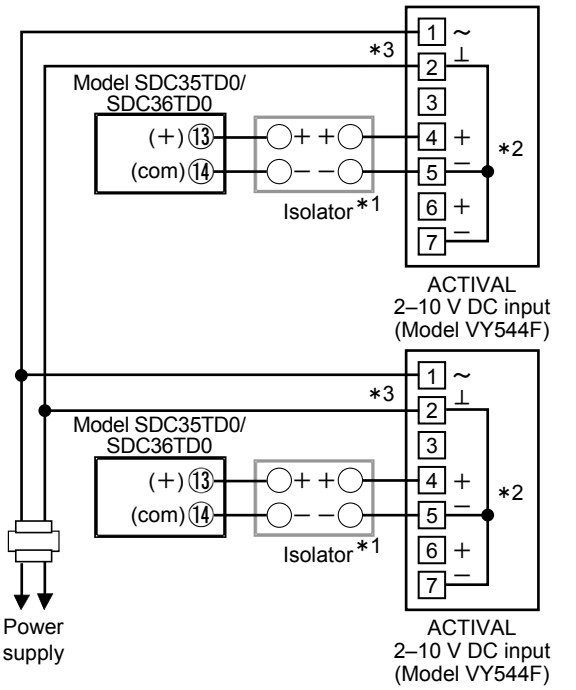
∗1 Provide an isolator for the controller that is not internally isolated.

∗2 Terminals 2, 5, and 7 are internally connected.

∗3 Refer to notes under “Power transformer is shared.”

Figure 20.

Power is shared



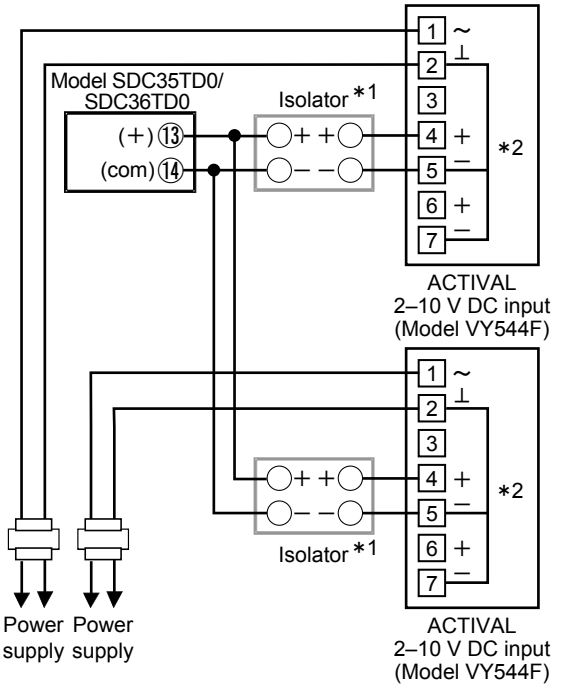
∗1 Provide an isolator for the controller that is not internally isolated.

∗2 Terminals 2, 5, and 7 are internally connected.

∗3 Refer to notes under “Power transformer is shared.”

Figure 21.

Input signals are shared



∗1 Provide an isolator for the controller not internally isolated.

∗2 Terminals 2, 5, and 7 are internally connected.

Figure 22.

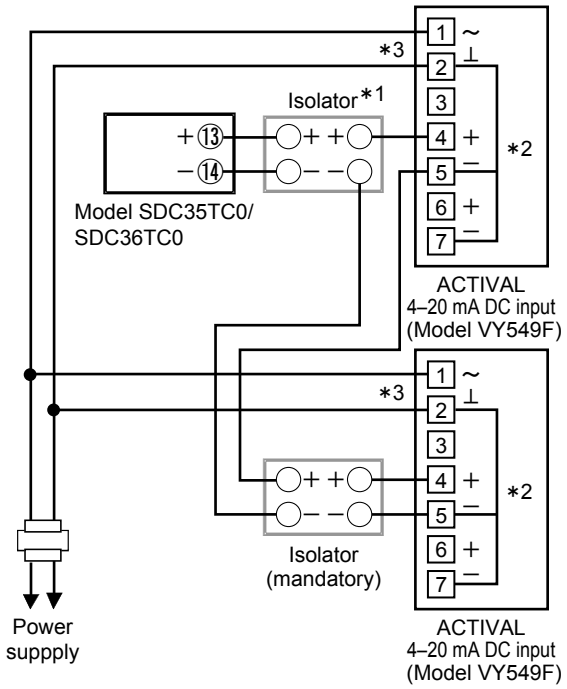
● 4–20 mA DC input

(Model VY549F)

Precautions

- Power transformer is shared If a power transformer is shared by two products, connect the terminal 1 of each actuator to the transformer with the same polarity. Connect the terminal 2 in the same way.
  It the terminals are connected with different polarities, the product may break down (see Fig. 24).
- Control signals are shared for 4–20 mA DC input
  The 4–20 mA DC input signals of this product are not isolated from the power.
  And, the input impedance of 4–20 mA DC signals is 100 Ω. The relations among the input impedance of the product, the output load resistance of the controller, and the output load resistance and input impedance of an isolator (if necessary) must meet the following formula.
  Applicable load resistance > Total of input impedance
  If two products are operated by one controller, configure the system referring to Fig. 25 for two individual transformers, Fig. 23 for a shared transformer. To share a power transformer, install an isolator to the 4–20 mA DC input terminals of the second product. Otherwise, the product will malfunction.

Input signals and power are shared



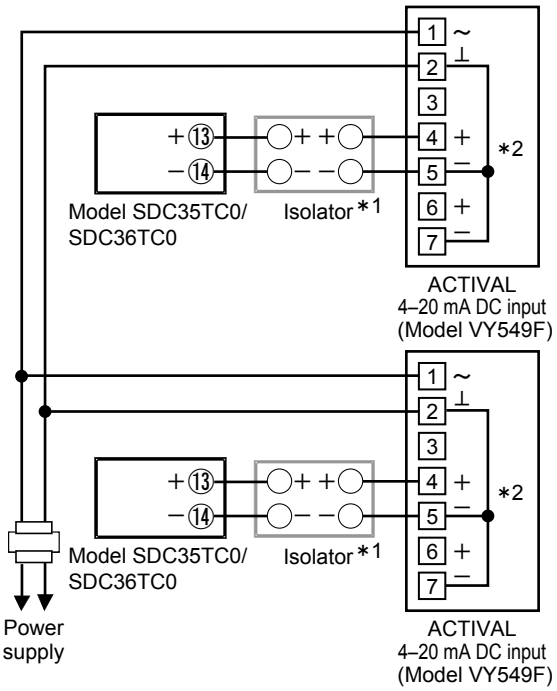
∗1 Provide an isolator for the controller that is not internally isolated.

∗2 Terminals 2, 5, and 7 are internally connected.

∗3 Refer to notes under “Power transformer is shared.”

Figure 23.

Power is shared

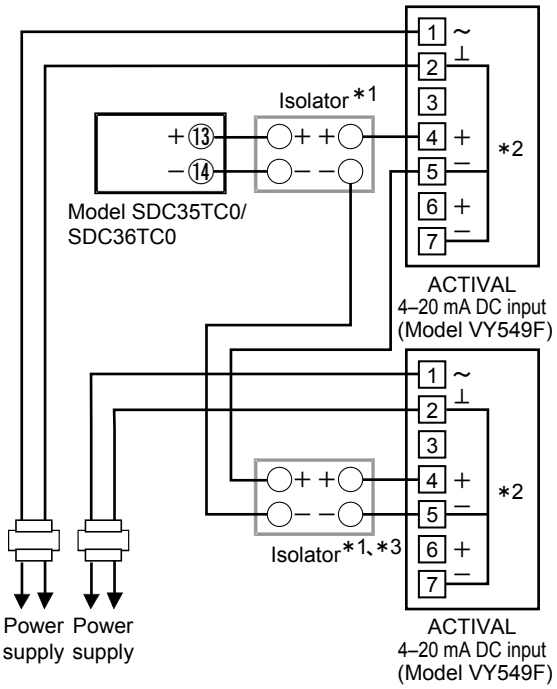


∗1 Provide an isolator for the controller that is not internally isolated.

∗2 Terminals 2, 5, and 7 are internally connected.

Figure 24.

Input signals are shared



∗1 Provide an isolator for the controller not internally isolated.

∗2 Terminals 2, 5, and 7 are internally connected.

∗3 Provide an isolator if an isolator is not provided to the 4–20 mA DC input of the first product AND the applicable load resistance of controller is less than 200 Ω.

Figure 25.

■ Maintenance

⚠ CAUTION
Do not put a load or weight on this product. Doing so may damage the product.
Before doing maintenance, be sure to turn off the power to this product. Failure to do so may result in electric shock or device failure.
After maintenance, be sure to reattach the terminal cover. Failure to do so may result in electric shock.
Do not carelessly touch this product when it is used to control hot water. Doing so may result in burns, because the product reaches a high temperature.

- After piping the product, if it is not operated for a long period, execute valve open and close operations once a month or so.
- Execute maintenance according to table 1.
- Once every six months or so, visually check that there is no leakage of fluid to the outside of the valve and the actuator operates smoothly.
  if a trouble occurs as described in Table 2, take appropriate measures according to the symptom. Although the measures are taken, if the trouble cannot be recovered, please contact Azbil Corporation.

Table 1 Inspection items and inspection method

Item	Inspection cycle	Inspection method
Visual check	6 months	• There is no leakage from the grand and flange. • Loose bolts. • There is no damage on the valve and actuator.
Operation status	6 months	• The valve is smoothly opened or closed. • Check that no abnormal sound or vibration is observed.
Daily inspection	Any time	• Check that there is no leakage of fluid to the outside of the valve. • Check that no abnormal sound or vibration is observed. • The valve is smoothly opened or closed. • Check that there is no hunting observed with the valve.

Table 2 Troubleshooting

Abnormal phenomenon	Where to inspect	Measure
Leakage from the flange	Loose flange bolts Gasket on the flange. Misaligned pipes	Retighten the flange bolts. Replace the gasket. Do piping again.
Leakage from the gland	—————	Contact Azbil Corporation
Leakage from the top lid joint.	Loose bolts	Retighten the bolts.
The valve is not smoothly opened or closed. The valve stops halfway. The valve does not move.	Check that the power line and the input signal are correctly fed. Loose terminals Check that wires are firmly connected, no disconnected wire.	Check the power supply voltage and the regulator. Retighten the terminals. Check the wirings.
Leakage is observed when the valve is fully closed.	Pointer position when the valve is fully closed	Fully close the valve.
Abnormal sound or vibration is observed.	Check that level of pressure at the primary is adequate. Check the level of differential pressure.	Adjust the mounting conditions.
The auxiliary switch does not work.	Check the conditions of the auxiliary switch cam. Loose terminals Check that wires are firmly connected, no disconnected wire.	Do settings again. Retighten the terminals. Check the wirings.
The auxiliary potentiometer does not work.	Resistance value Loose terminals Check that wires are firmly connected, no disconnected wire.	Check the resistance. (1 kΩ) Retighten the terminals. Check the wirings.
Valve hunting	Level of pressure and differential pressure at the secondary Stability of control	Adjust the mounting conditions. Adjust the settings of control parameter such as PI.
Mismatch between the input signal and the feedback signal in the voltage/current input specifications	—————	If the input specification is voltage or current, the valve moves from 0 % to 100 % corresponding to the input signal from 10 % to 90 % in order to fully close the valve. Therefore, the input signal and the feedback signal do not match, but it is not abnormal.

■ Disposal

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

This blank page was added for page layout purposes.

This blank page was added for page layout purposes.

■ 基于SJ/T11364-2014「电子电气产品有害物质限制使用标识要求」的表示式样

产品中有害物质的名称及含量

部件名称	有害物质					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷电路板组件	×	○	○	○	○	○
执行器	×	○	○	○	○	○
连接支架	×	○	○	○	○	○
阀	×	○	○	○	○	○

本表格依据 SJ/T 11364 的规定编制。
○： 表示该有害物质在该部件所有均质材料中的含量均在 GB/T 26572 规定的限量要求以下。
×： 表示该有害物质至少在该部件的某一均质材料中的含量超出 GB/T 26572 规定的限量要求。

环境保护使用期限
含量标识年限：10年

CE This product complies with the following harmonised standards of the Electromagnetic Compatibility Directive (EMCD) and the Restriction of the use of certain Hazardous Substances in Electrical and Electronic Equipment Directive (RoHSD).

EMCD : EN 61000-6-2
EN 55011 Class A, Group 1
RoHSD: EN 50581

Azbil North America, Inc.

9033 N. 24th Ave., Suite 6
Phoenix, AZ 85021
888-262-4639
602-216-8199

http://us.azbil.com/

azbil

Azbil Corporation
Building Systems Company
1-12-2 Kawana, Fujisawa, Kanagawa
251-8522 JAPAN
http://www.azbil.com/

AB-7493-U
Rev. 0.0 Mar. 2018