

Intelligent Component Series ACTIVAL™ Motorized Two-Way Valve with Flanged-End Connection (JIS 10K / FC200, SCS13A) (Spring Return Type Actuator)

General

ACTIVAL™ Models VY516XK and VY616XH are series of motorized two-way valves with flanged-end connection. Rotary valve and actuator are integrated in a single unit.

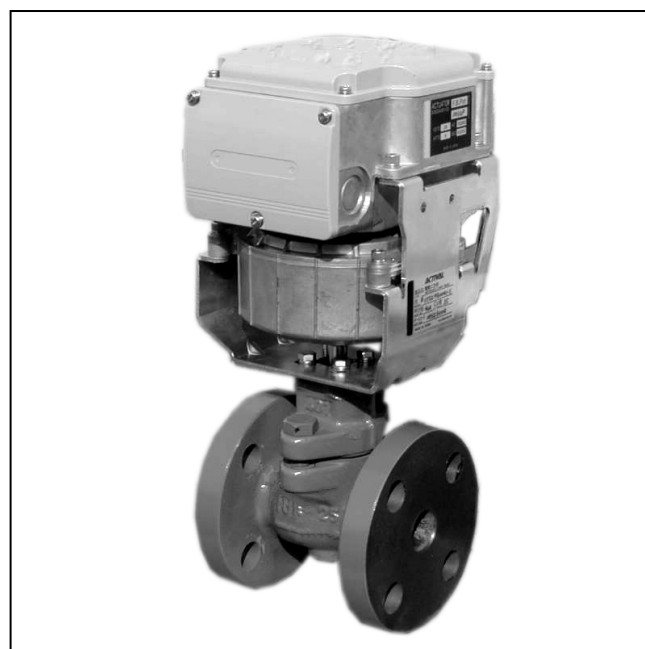
Valve size ranges from DN15 (1/2") to DN80 (3"), and valve body rating corresponds to JIS 10K.

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.

Model VY516XK/VY516XH communicates with a controller via SAnet (Azbil Corporation's communication protocol).

* Note

JIS: Japanese Industrial Standards



Features

- Compact and lightweight:
Rotary valve actualizes small body and light weight.
- Valve and actuator integrated in a single unit:
- SAnet communication:
Intelligent Component Series ACTIVAL communicates with a controller via SAnet, and thus position control signal/position feedback signal is input/output from/to the controller.
- Valves for chilled/hot water control and for steam control applicable to large Cv value, high rangeability, and low leakage.
- Durable actuator with low power consumption.
- Equal percentage flow characteristic.
- Spring return actuator:
Actuator automatically closes the valve in 0 % position in case that the power is down.
- Interlock signal input to fully close the valve:
Interlock input signal to forcibly close the valve in 0 % position is provided.
- Sub-DO for wire saving:
Sub-DO (digital output) provided takes a signal, including a humidifying output of a neighboring device, leading to wire saving.
- CE Marking certified product:
Models VY516XK and VY516XH conform to all the applicable standards of CE Marking.







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

-  • DANGER: To prevent the risk of severe or fatal electrical shock, always disconnect power source and product power supply before performing any wiring.
-  • Be sure to reattach the terminal cover after wiring and engineering work. Without the terminal cover, electrical shock may occur.
-  • 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. Disassembly may result in electrical shock or equipment damage.
-  • 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.
-  • Do not detach the actuator from the valve in open position. Detaching the actuator in open position may cause severe injury.

CAUTION

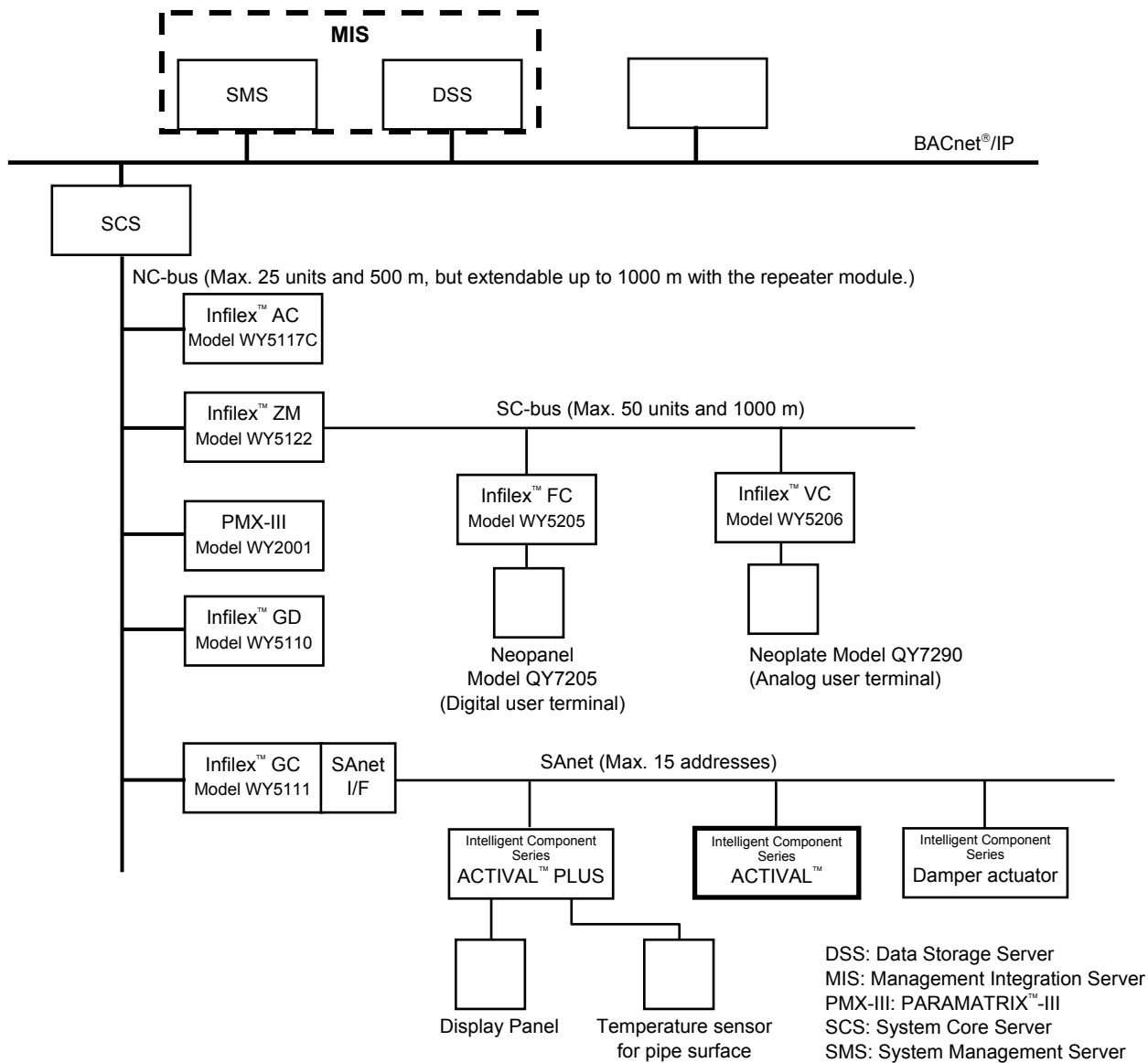
(1/2)

-  • This product must be operated under the operating conditions (power, temperature, humidity, vibration, installation position, atmospheric condition, etc) specified in this manual to prevent equipment damage.
-  • This product must be operated within its rated operating ranges specified in this manual. Failure to comply will cause equipment damage.
-  • Installation and wiring must be performed by qualified personnel in accordance with all applicable safety standards.
-  • Avoid application that keeps the operating cycle of the product excessively frequent. Excessively frequent operation may cause fire or equipment failure. Service life of the actuator spring is 30,000 returns. Do not keep using the product beyond the service life.
-  • All wiring must comply with local codes of indoor wiring and electric installation rules.
-  • Install externally the protective device such as fuse or circuit breaker for your safety.
-  • Do not touch the moving parts of the product to prevent personal injury.
-  • Install the product 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. Flush the piping so that no foreign substance remains. Attach a strainer in a pipe on the inflow side of the product to prevent equipment damage.
-  • Avoid using the product in an atmosphere containing oxidizing gas, explosive gas, etc. since it may damage the actuator, valve, or their components.
-  • Do not leave the controlled fluid frozen to prevent equipment damage or fluid leakage.
-  • Do not put heavy load on the actuator.
-  • User full gaskets for the flat-face flange type valve.
-  • Do not install the product nearby a steam coil or a hot-water (in high temperature) coil. High heat radiation may result in an actuator malfunction.
-  • Avoid touching the installed product. When being used to control hot water or steam, it may reach high temperature and may cause burn injury.

⚠ CAUTION		(2/2)
!	• 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.	
!	• Do not stack unpacked products. Piled products without package will be polluted or damaged.	
!	• 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, Inflex, and savic-net are trademarks or registered trademarks of Azbil Corporation in Japan or in other countries.
 BACnet is a registered trademark of American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE).
 KPEV is a registered trademark of Furukawa Electric Co., Ltd.

System Configurations



Notes:

- * MIS may be used instead of SMS and DSS for your system. Note that MIS cannot be mixed with SMS or DSS in the same system.
- * Up to two SAnet I/F (interface) module can be connected to one Inflex GC/Inflex GD.
- * For detailed specifications of SAnet, refer to Installation Manual of Intelligent Component Series for SAnet Communication (AB-6713).
- * 1 ACTIVAL or 1 damper actuator requires 1 SAnet address. 1 ACTIVAL PLUS requires 2 SAnet addresses.

Figure 1. System configuration example: SAnet connection in savic-net™ FX system

Model Numbers

Models VY516XK00XX and VY516XH00XX are the models for the valve and actuator integrated into a single unit. The model number label is attached to the yoke.

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
	6						SAnet
		5					JIS 10K / JIS FC 200
		6					JIS 10K / JIS SCS13A
			K				IEC IP54 protected, standard torque, and spring return type actuator with terminal block for standard differential pressure application (Mountable valve sizes: DN15 to DN80)
			H				IEC IP54 protected, standard torque, and spring return type actuator with terminal block for high differential pressure application (Mountable valve sizes: DN65 to DN80)
				00			Fixed
					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
						-B	Fixed

* Note:

To use DN65 and DN80 models for chilled/hot water or high temperature water control, high differential pressure type (Model VY516XH) is only applicable.

Specifications

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

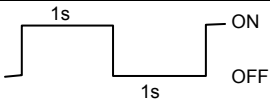
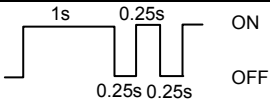
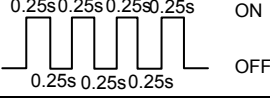
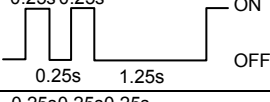
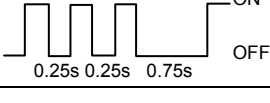
Valve specifications

Item	Specification				
Type	Two-way valve with flanged-end connection, proportional control				
Body pressure rating	JIS 10K (Max. working pressure: 1.0 MPa)				
Size, Cv, Close-off rating 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 High temperature water
	VY516XK0011	DN15 (1/2")	1.0	1.0 MPa	1.0 MPa
	VY516XK0012	DN15 (1/2")	2.5	1.0 MPa	1.0 MPa
	VY516XK0013	DN15 (1/2")	6.0	1.0 MPa	1.0 MPa
	VY516XK0014	DN15 (1/2")	1.6	1.0 MPa	1.0 MPa
	VY516XK0015	DN15 (1/2")	4.0	1.0 MPa	1.0 MPa
	VY516XK0021	DN25 (1")	10	1.0 MPa	1.0 MPa
	VY516XK0022	DN25 (1")	16	1.0 MPa	1.0 MPa
	VY516XK0041	DN40 (1 1/2")	25	1.0 MPa	1.0 MPa
	VY516XK0042	DN40 (1 1/2")	40	1.0 MPa	1.0 MPa
	VY516XK0051	DN50 (2")	65	1.0 MPa	1.0 MPa
	VY516XK0061	DN65 (2 1/2")	95	0.3 MPa	—
	VY516XK0081	DN80 (3")	125	0.1 MPa	—
	VY516XH0061	DN65 (2 1/2")	95	1.0 MPa	0.7 MPa
VY516XH0081	DN80 (3")	125	0.7 MPa	0.4 MPa	
Materials	Body	Gray cast iron (equivalent to JIS FC200) for Model VY5165 Cast stainless steel (equivalent to JIS SCS13A) for Model VY5166			
	Plug, stem	Stainless steel (equivalent to JIS SCS)			
	Seat ring	Heat-resistant PTFE			
	Gland packing	Inorganic fiber			
	Gasket	Non-asbestos joint sheet			
End connection	JIS 10K flanged-end, flat face flange (FF) for Model VY5165 raised face flange (RF) for Model VY5166				
Applicable fluid	Chilled/hot water, high temperature water, steam, brine (ethylene glycol solutions, 50 % max.)				
Allowable fluid temperature	0 °C to 175 °C* (Non-freezing)				
Flow characteristic	Equal percentage				
Rangeability	100 : 1				
Seat leakage	0.01 % of rated Cv value (0.0006 Cv or less for DN15 model)				
Paint	Gray (equivalent to Munsell 5B 4/1): Model VY5165 (Gray cast iron valve body) Unpainted: Model VY5166 (Cast stainless steel valve body)				
Actuator to be combined	Integrated with the valve				

* Note:

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

Actuator specifications

Item		Specification
Power supply		24 V AC \pm 15 %, 50 Hz/60 Hz
Type		Spring return actuator for standard/high differential pressure application
Power consumption		15 VA or less in operating state, 10 VA or less in non-operating state
Timing		63 \pm 5 sec (50 Hz) / 53 \pm 5 sec (60 Hz) Return time: 3 to 40 seconds (fully open \rightarrow fully close operation)
Control signal		SAnet
Forced fully-close input (contact input)	Input type	Potential free (dry) contact input
	Voltage, current	20 V DC, 5 mA (* This contact input is only for interlock operation.)
Sub-DO (contact output)	Output type	Potential free (dry) contact output
	Contact rating	200 V AC/30 V DC, Max. 0.5 A (2 A at startup)
	Min. applicable load	24 V DC, 5 mA
LED indication		Description
Initializing		Continuous ON \rightarrow LED indication corresponding to the operating status (after initializing is complete.)
Normal		Repetition of 1-second ON \rightarrow 1-second OFF. 
Major alarm		Continuous ON.
Minor alarm		Repetition of 1-second ON \rightarrow 0.25-second OFF \rightarrow 0.25-second ON \rightarrow 0.25-second OFF. 
Communication error (and minor alarm)		Repetition of 0.25-second ON \rightarrow 0.25-second OFF 
Manual operation		Repetition of 0.25-second ON \rightarrow 0.25-second OFF \rightarrow 0.25-second ON \rightarrow 1.25-second OFF. 
Error during manual operation		Repetition of 0.25-second ON \rightarrow 0.25-second OFF \rightarrow 0.25-second ON \rightarrow 0.25-second OFF \rightarrow 0.25-second ON \rightarrow 0.75-second OFF. 
Communication (via SAnet)	Transmission system	Voltage transmission (SAnet)
	Transmission speed	1200 bps
	Transmission distance	Transmission distance varies depending on the number of devices and the type of devices to be connected to. For details on the transmission distance, refer to Installation Manual of Intelligent Component Series for SAnet Communication (AB-6713).
Materials	Case	Die cast aluminum
	Top cover, terminal cover	Polycarbonate resin (Color: gray)
	Yoke	Steel plate
	Case and cover of spring unit	Die cast aluminum
	Spring	Stainless steel
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.	
Manual operation	Not available.	
Terminals connection	M3.5 screw terminal connection	
Enclosure rating	IEC IP54 (dust-proof and splash-proof)	
Insulation resistance	Between terminal and case: 5 M Ω or higher at 500 V DC	
Dielectric strength	Between terminal and case: 500 V AC/min with 0.5 mA or less leakage current	
Service life of spring return operation	30,000 operations	

Valve and actuator (as a single unit) specifications

Item	Specification		
	Rated operating condition	Limit operating condition	Transport/storage conditions (packaged*2)
Environmental conditions			
Ambient temperature*1	-20 °C to 50 °C (Fluid temperature 0 °C to 150 °C)	-20 °C to 60 °C	-20 °C to 70 °C
	-20 °C to 40 °C (Fluid temperature 150 °C to 175 °C)		
Ambient humidity	5 %RH to 95 %RH		
Vibration	4.9 m/s ² (10 Hz to 150 Hz)	9.8 m/s ² (10 Hz to 150 Hz)	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.		
Installation locations	Indoor / outdoor (Keep away from direct sunlight.)		
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) preset at factory.		

Function

Function	Specification
Data monitoring	Following items can be monitored/operated from the host system (savic-net FX) and Inflex GC/Inflex GD. Valve position setting, valve position measuring, sub-DO output, sub- DI monitoring

* Note:

Above function is available in combination with Inflex GC/Inflex GD and savic-net FX.

Wire specifications

For details regarding specifications of SAnet communication line (24 V (~), GND (⊥), SAnet), refer to the Installation Manual of SAnet for Intelligent Component Series (AB-6713).

Item	Specification	Length
Contact input (sub-DI)	JIS CVV, JIS VCT, JIS IV, KPEV for low power 0.75 mm ² , 0.9 mm ² , 1.25 mm ² , 2.0 mm ²	30 m
Contact output (sub-DO)	JIS CVV, JIS VCT, JIS IV, KPEV for low power 0.75 mm ² , 0.9 mm ² , 1.25 mm ² , 2.0 mm ²	30 m

Note

* KPEV: Wire standard provided by Furukawa Electric Co., Ltd.

Options

For options, separate order is required.

Item		Specification	Note	
Seal connector	Part No. 83104346-003	Applicable wire size: ϕ 7 mm to ϕ 9 mm	Seal connector is necessary for IEC IP54 protection.	
	Part No. 83104346-004	Applicable wire size: ϕ 9 mm to ϕ 11 mm		
	Part No. 83104346-005	Applicable wire size: ϕ 11 mm to ϕ 13 mm		
Seal connector for SAnet cable gland	Part No. 83104346-012	Applicable wire size: ϕ 6 mm to ϕ 8 mm	Seal connector for SAnet cable gland with three ports is necessary for IEC IP54 protection.	
	Part No. 83104346-013	Applicable wire size: ϕ 7 mm to ϕ 9 mm		
	Part No. 83104346-014	Applicable wire size: ϕ 9 mm to ϕ 11 mm		
SAnet cable gland with three ports Part No. DY7000A1000		For the specifications of SAnet cable gland with three ports, refer to the Specifications (AS-923E). For the installation of SAnet cable gland with three ports, refer to the Installation Manual of Intelligent Component Series for SAnet Communication (AB-6713).		
Outdoor cover Part No. DY3001A1017		Required when the product is installed outdoors.		
Valve flange adapter kit (for replacing Model V5063/V5064 with Model VY51XX)		Hot-rolled steel (JIS SS4400), 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		

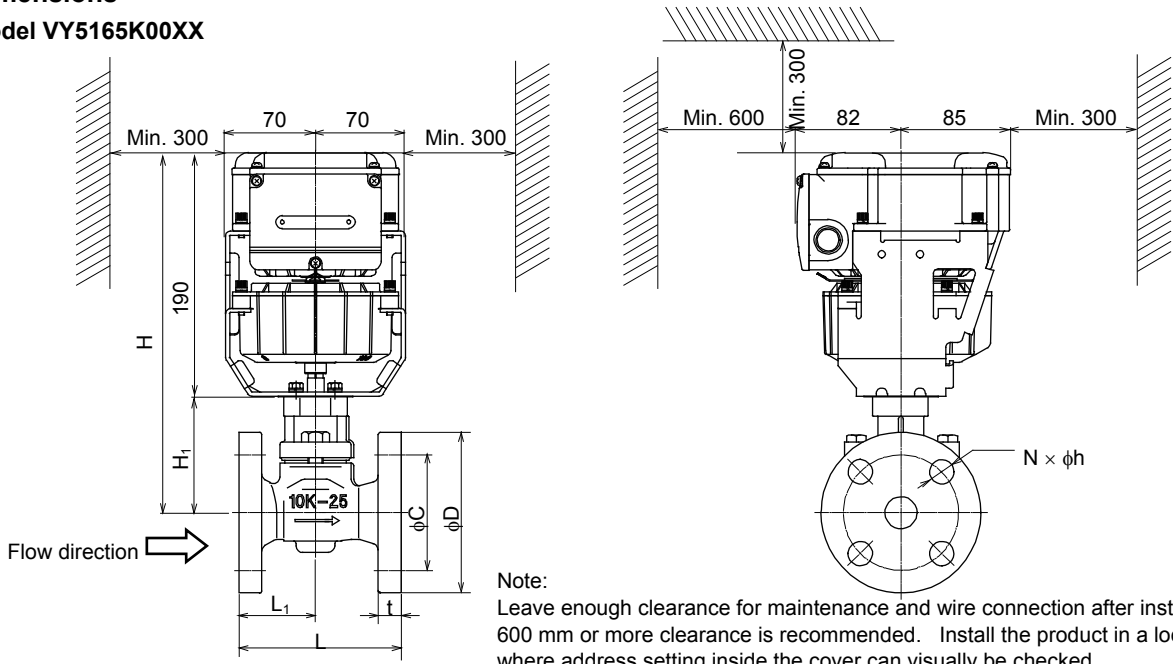
CE Marking Conformity

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

EMC : EN61000-6-2, EN55011 Class A

Dimensions

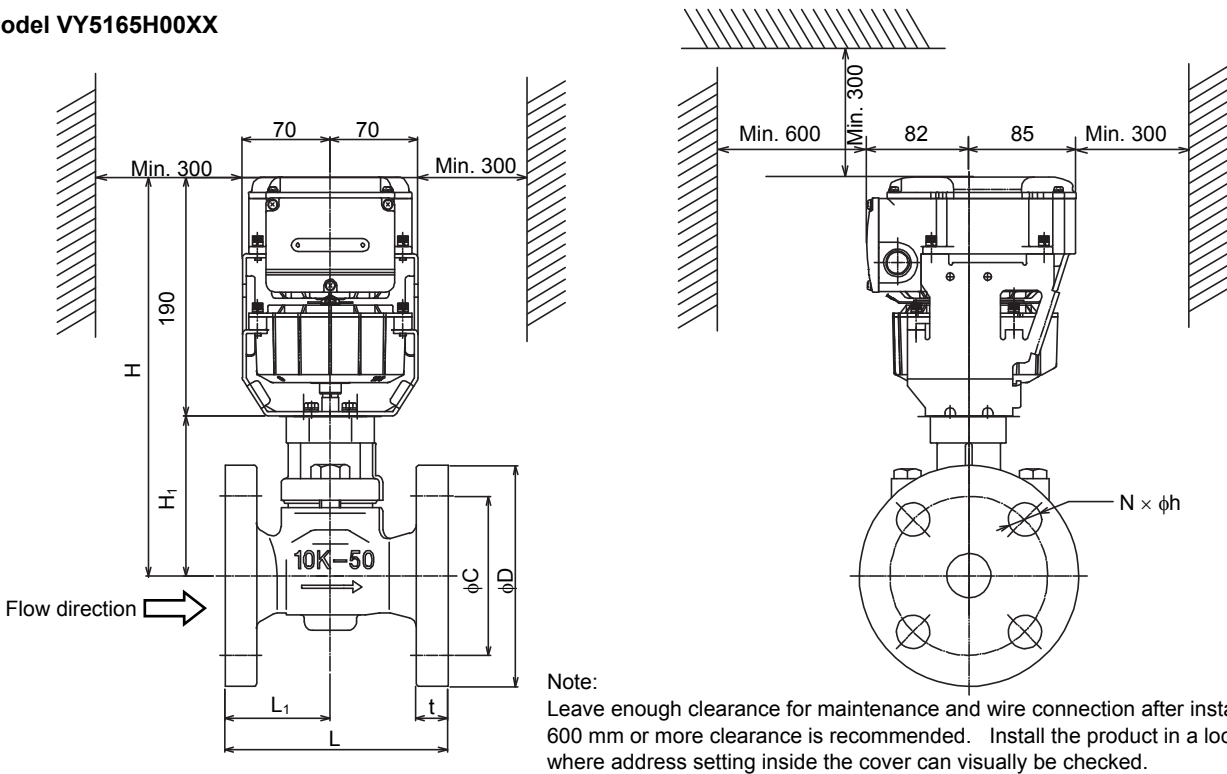
Model VY5165K00XX



Model number	Valve size (DN)	H (mm)	H ₁ (mm)	L (mm)	L ₁ (mm)	t (mm)	ϕC (mm)	ϕD (mm)	ϕh (mm)	N	Weight (kg)
VY5165K001X	15	265	75	108	50	16	70	95	15	4	6.6
VY5165K002X	25	280	90	127	60	18	90	125	19	4	8.6
VY5165K004X	40	293	103	165	82.5	20	105	140	19	4	12.0
VY5165K0051	50	297	107	178	89	20	120	155	19	4	13.5
VY5165K0061	65	314	124	190	90	22	140	175	19	4	18.0
VY5165K0081	80	315	125	203	100	22	150	185	19	8	20.5

Figure 2. Dimensions and maintenance clearance (mm): Models VY5165K00XX

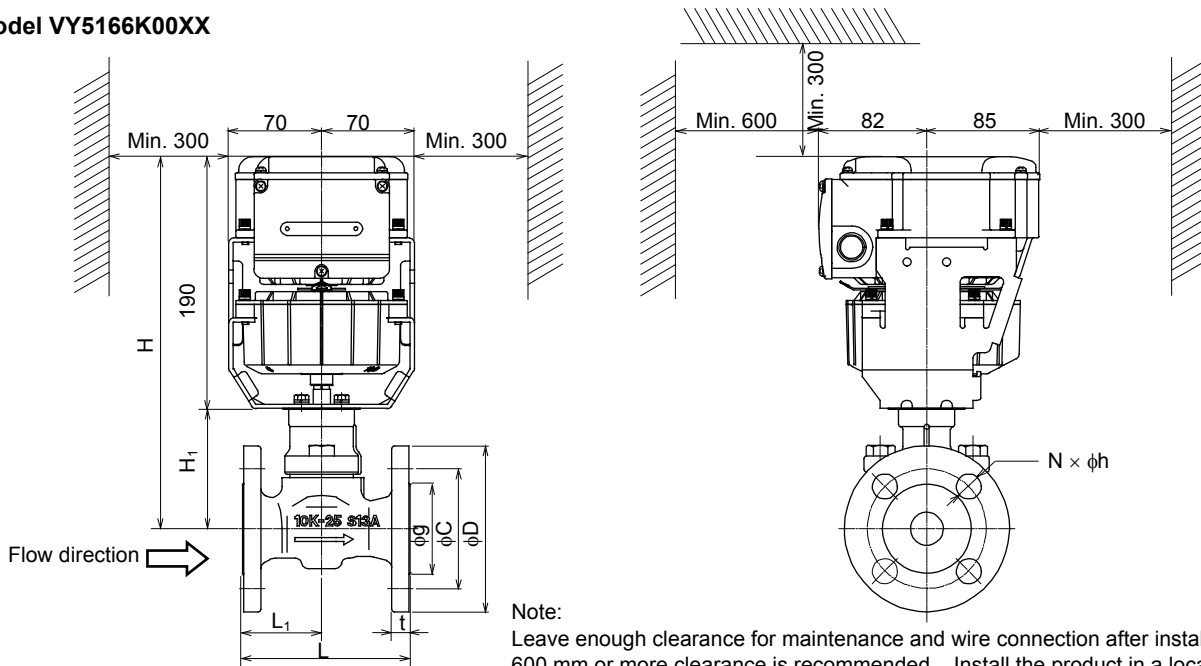
Model VY5165H00XX



Model number	Valve size (DN)	H (mm)	H ₁ (mm)	L (mm)	L ₁ (mm)	t (mm)	ϕC (mm)	ϕD (mm)	ϕh (mm)	N	Weight (kg)
VY5165H0061	65	314	124	190	90	22	140	175	19	4	18.5
VY5165H0081	80	315	125	203	100	22	150	185	19	8	21.0

Figure 3. Dimensions and maintenance clearance (mm): Models VY5165K00XX

Model VY5166K00XX

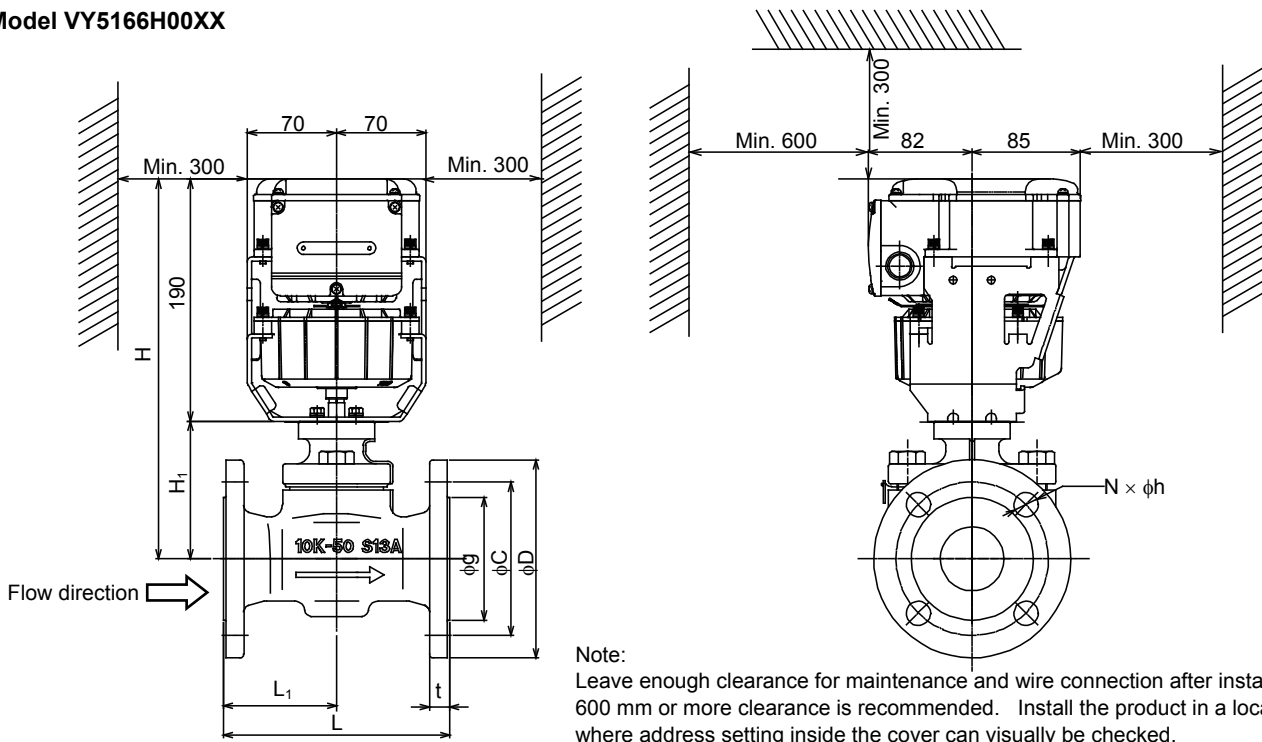


Note:
Leave enough clearance for maintenance and wire connection after installation. 600 mm or more clearance is recommended. Install the product in a location where address setting inside the cover can visually be checked.

Model number	Valve size (DN)	H (mm)	H ₁ (mm)	L (mm)	L ₁ (mm)	t (mm)	φC (mm)	φD (mm)	φg (mm)	φh (mm)	N	Weight (kg)
VY5166K001X	15	265	75	108	50	12	70	95	51	15	4	6.6
VY5166K002X	25	280	90	127	60	14	90	125	67	19	4	8.6
VY5166K004X	40	293	103	165	82.5	16	105	140	81	19	4	12.0
VY5166K0051	50	297	107	178	89	16	120	155	96	19	4	13.5
VY5166K0061	65	314	124	190	90	18	140	175	116	19	4	18.0
VY5166K0081	80	315	125	203	100	18	150	185	126	19	8	20.5

Figure 4. Dimensions and maintenance clearance (mm): Model VY5166K00XX

Model VY5166H00XX



Note:
Leave enough clearance for maintenance and wire connection after installation. 600 mm or more clearance is recommended. Install the product in a location where address setting inside the cover can visually be checked.

Model number	Valve size (DN)	H (mm)	H ₁ (mm)	L (mm)	L ₁ (mm)	t (mm)	φC (mm)	φD (mm)	φg (mm)	φh (mm)	N	Weight (kg)
VY5166H0061	65	314	124	190	90	18	140	175	116	19	4	18.5
VY5166H0081	80	315	125	203	100	18	150	185	126	19	8	21.0

Figure 5. Dimensions and maintenance clearance (mm): Models VY5166K, VY5166H

Parts Identification

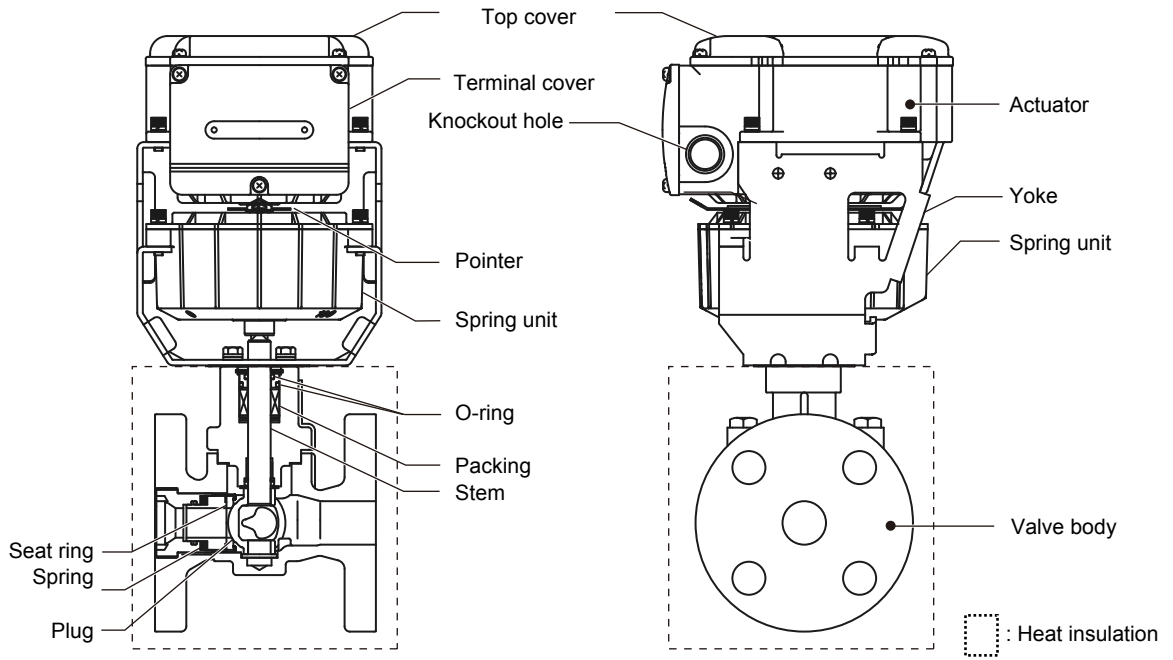


Figure 6. Parts identification

Installation

Precautions for installation

⚠ CAUTION

- ❗ • Installation and wiring must be performed by qualified personnel in accordance with all applicable safety standards.
- ❗ • Install the product in the position as specified in this manual. Excessively tight connection of piping and improper installation position may damage the valve.
- ❗ • Do not allow any foreign substance inside the piping. Flush the piping so that no foreign substance remains. Attach a strainer in a pipe on the inflow side of the product to prevent equipment damage.

- ACTIVAL Model VY516XK/VY516XH 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 40 or more meshes (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 product in an atmosphere containing oxidizing gas, explosive gas, etc. since it may damage the actuator, valve, or their components.
- ❗ • Do not install the product nearby a steam coil or a hot-water (in high temperature) coil. High heat radiation may result in an actuator malfunction.

IMPORTANT:

- The top and the terminal covers might be corroded by chemicals and organic solvent or their vapor. Do not expose the ACTIVAL to such substances/vapor.
- 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 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 install a valve interlocking with the AHU fan on the inflow side.

- Install the ACTIVAL in a position allowing easy access for maintenance and inspection. Figs. 2 and 3 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. 7.) However, the ACTIVAL must be installed always in upright position outdoors.

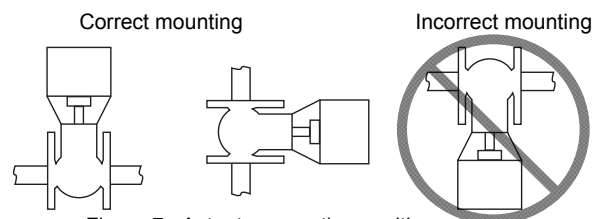


Figure 7. Actuator mounting position

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 with 40 or more meshes (with 80 or more meshes recommended for steam control) 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 close, 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 the valve (in 100 % position) and flush the pipes (with the ACTIVAL installed) at the maximum flow rate to remove all the foreign substances. (Factory preset position: 0 %)
- For steam control, drain retained water (condensate) in piping. Install a trap on a pipe run which may retain condensate. Condensate may cause water hammer or damage the valve and piping.

Heat insulation

Do not apply heat insulation to the actuator or to the yoke, as [] shows in Fig. 6. 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 closed position) for shipment. The shaft is thus completely turned counterclockwise, and the pointer points at '0'. (See Fig. 8.)

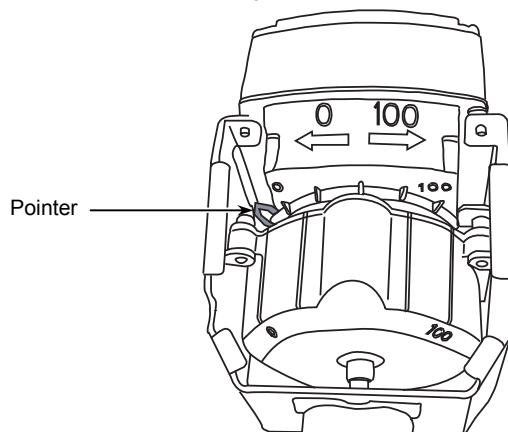


Figure 8. Pointer position for shipment

Wiring

⚠ WARNING
<p>⚠ • DANGER: To prevent the risk of severe or fatal electrical shock, always disconnect power source and product power supply before performing any wiring.</p>

⚠ CAUTION
<p>! • Installation and wiring must be performed by qualified personnel in accordance with all applicable safety standards.</p>

<p>IMPORTANT:</p> <ul style="list-style-type: none"> • 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. • To prevent damage, cover the terminals except when connecting/disconnecting wires. • Do not leave any refuse including metal chips after cutting a knockout hole and after connecting the wires inside the actuator.

Wiring precautions

- 1) To lead the wires into the terminals, cut out a knockout hole for a wiring port. Two knockout holes (φ22 mm) 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.

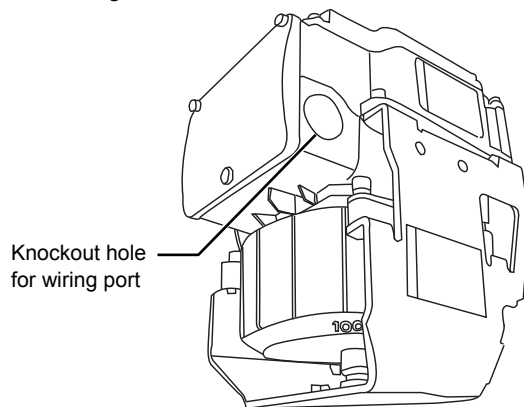


Figure 9. Knockout hole for wiring port

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

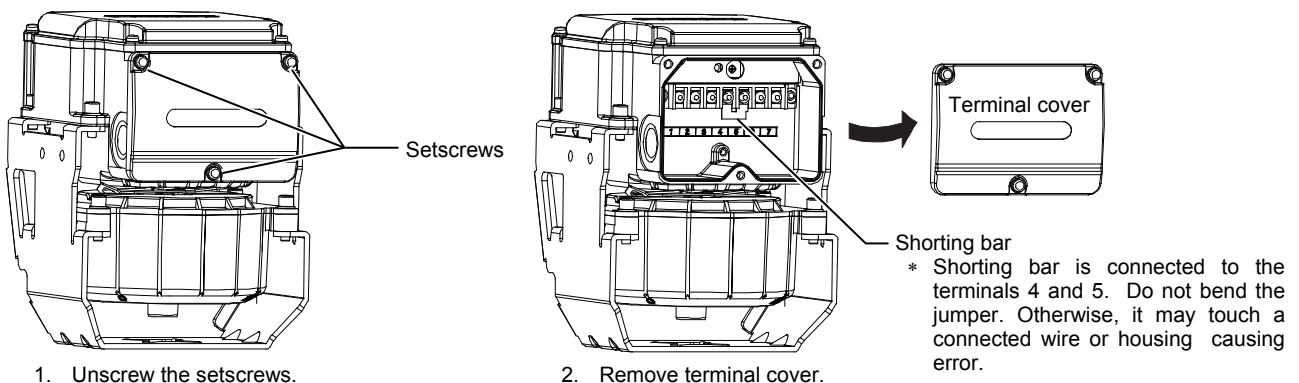


Figure 10. Terminal cover removal

- 3) Correctly connect the wires to the terminals with M3.5 screw terminal lugs, referring to Fig. 11.

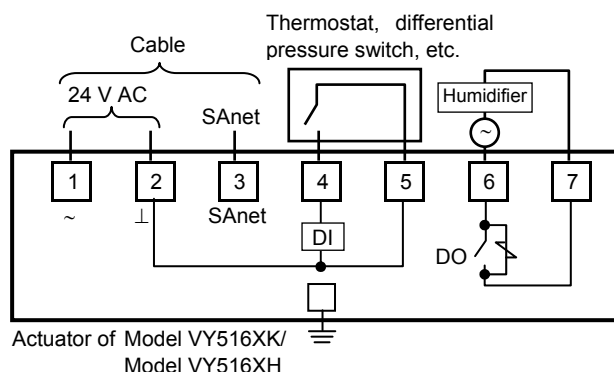


Figure 11. Basic connection example

If 100 V AC or more is output from the sub-DO terminals (6 and 7), be sure to ground with 100 Ω or lower ground resistance. To use the forced shutoff DI, remove the shorting bar connected to the terminals 4 and 5.

- 4) Separate sub-DO line from SAnet and sub-DI lines. Do not lead the sub-DO line through the wiring port (knockout hole) for SAnet and DI lines to protect sub-DO line from noise.

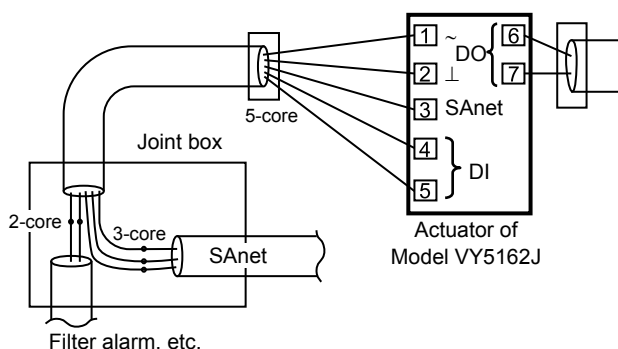


Figure 12. Separation of sub-DO line from other lines

If sub-I/O is used, SAnet line cannot be daisy-chained since the number of the wiring ports is limited. In such a case, use SAnet cable gland with three ports to daisy-chain the SAnet line, or branch the SAnet line ahead of connecting to the terminals.

Note:

For wiring of SAnet line, refer to the Installation Manual of Intelligent Component Series for SAnet Communication (AB-6713)

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. Through wiring port with the water-proof connector (Seal connector) attached to, only 1 cable can be lead in. Through wiring port with the SAnet cable gland (with three ports) and the seal connectors attached to, 3 cables can be lead in.

- 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 Nos. 83104346-003, 83104346-004, 83104346-005 are recommended.)
 - To daisy-chain the SAnet line, use the SAnet cable gland with three ports and the seal connector Azbil Corporation supplies.
SAnet cable gland with three ports: Part No. DY7000A1000
Seal connector: Part Nos. 83104346-012, 83104346-013, 83104346-014
 - For conduit connection, use a water-proof plica tube or the like.

Address Setting (Addressing)

To SAnet interface module, ACTIVAL Model VY516XK/VY516XH and other Intelligent Component Series devices including ACTIVAL PLUS and damper actuators are connected via SAnet. Set address for the terminal devices (Intelligent Component Series devices) so that the SAnet interface module can recognize all the terminal devices connected. Follow the procedure below to set the address. For details regarding address setting (addressing), ask our sales/service personnel.

- 1) Unscrew the setscrews and remove the terminal cover. See Fig. 10 for removing the terminal cover.
- 2) Set address. (See Table 1.) Address can be set with rotary switch, with service pin switch, or based on SAnet ID. Rotary switch and service pin switch are provided on this product. To set the address with rotary switch or based on SAnet ID, Data Setter or PC-MMI is required. Set the address in either way according to your availability.

Setting with rotary switch:

Turn the rotary switch using a precision screwdriver and set.

Setting with service pin switch:

1. Set the rotary switch to '0'.
2. Start addressing operation* of Data Setter or PC-MMI. Then, press the service pin switch. Do not keep the switch pressed for longer than 5 seconds.
3. Address is set within 5 seconds after pressing the service pin switch.

* For the addressing operation of Data Setter or PC-MMI, ask our sales/service personnel.

Setting based on SAnet ID:

1. Set the rotary switch to '0'.
2. With Data Setter or PC-MMI, enter the SAnet ID (on the product code label) and address number to set. The product code label is attached on the side surface of the actuator, as shown in Fig. 12.

* For the addressing operation of Data Setter or PC-MMI, ask our sales/service personnel.

- 3) Attach the terminal cover after setting the address.

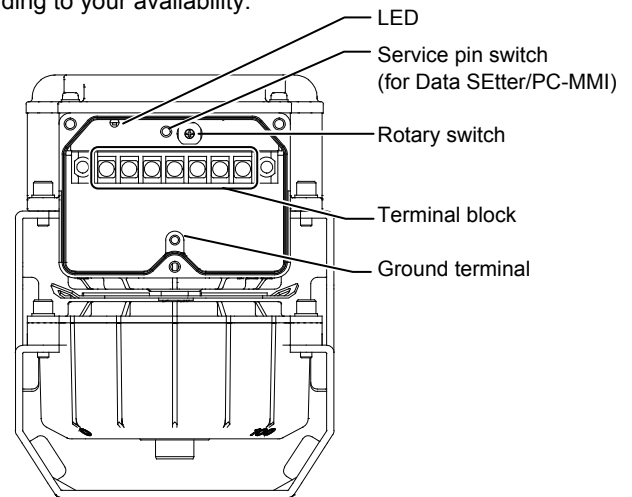


Figure 13. Terminal block, LED, setting switches (without terminal cover)

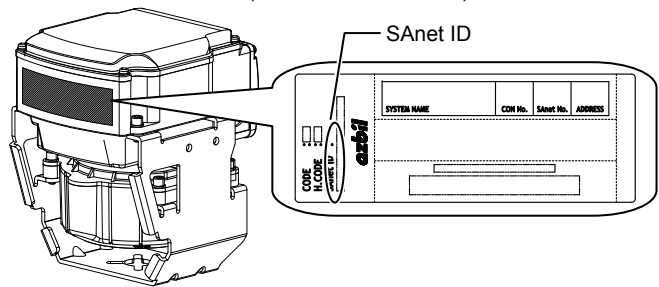


Figure 14. SAnet ID on the product code label

IMPORTANT:

- While the terminal cover is removed, do not touch the terminal block or allow anything to touch the terminal block.
- If the service pin switch is kept pressed for more than 5 seconds, address setting mode will be switched and address will not be set. In such a case, press the service pin switch again and keep it pressed for more than 10 seconds to go back to the normal mode.

Table 1. Basic address setting of this product and other Intelligent Component Series devices

Add.	Device	Sub-DO	Sub-DI
1	Outdoor air damper		
2	Exhaust air damper		
3	Return air damper		
4	Switch damper of total heat exchanger for outdoor air		
5	Switch damper of total heat exchanger for exhaust air		
6	Chilled/hot water valve / Chilled water valve		Filter alarm
7	Hot water valve (Chilled water valve*)	Humidifying ON/OFF	
8	Humidifying valve		Forced fully-close input
D (13)	Reserved		
E (14)	Reserved		
F (15)	Reserved		

Notes:

- * For 'chilled/hot water valve + chilled water valve' application, set address 6 for chilled/hot water valve and 7 for chilled water valve.
- * Items in bold characters are the basic address to set for this product.
- * The above table is a basic setting example. Set address and use sub-I/O in response to system configuration, installation location, and wiring best suitable for your application.
- * Forced shutoff DI is for interlock operation of the spring-return type Model VY516XK, VY516XH. (Not available for the non- spring-return type Model VY516XJ).

System Indication Label

A part of the product code label can be a system indication label. Clip the part, and write down the name of the system, host controller number of the system, SAnet line number, and address. Then attach the part, as the system indication label, to a location where you can easily check.

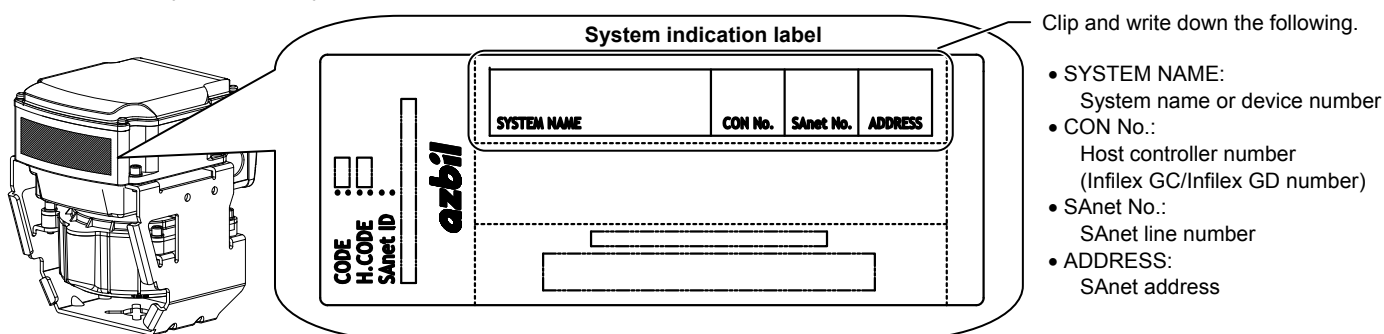


Figure 15. SAnet system indication label

IMPORTANT:

- Attach the system indication label to a clean location with no dust, oil, or moisture.
- Attach the system indication label by pressing the whole surface of the label to stick on the product surface.

Manual Operation Mode

In the manual operation mode, even when this product has not been connected via SAnet yet, the operations shown in Table 2 can be performed. Follow the procedure below for the operation check. For the locations of the service pin switch and the rotary switch, see Fig. 11.

- 1) Keep the service pin switch pressed for 10 seconds to enter the manual operation mode.
- 2) Turn the rotary switch to the desired position (See Table 2.), using a precision slotted screwdriver.
Operation will start in 3 seconds after setting the rotary switch.

Table 2. Operations in the manual operation mode

Rotary switch scale	Operation
0	Restart (to go back to the normal operation mode)
2	Fully close (in 0 % position)
4	Open in 50 % position
6	Fully open (in 100 % position)
8	Spring return operation check
A	Cancel of spring return operation check
E	Automatic adjustment of the potentiometer.

Notes:

- * Rotary switch scales 1, 3, 5, 7, 8, 9, B to D and F are not available in the manual operation mode.
- * Do not set the rotary switch to 'E'.
(Operation of the rotary switch 'E' is required only when potentiometer itself is replaced.)

- 3) After the operation, press and hold the service pin switch for 10 seconds to go back to the normal operation mode.
- 4) If the address is set with the rotary switch, be sure to reset the rotary switch at the address after entering the normal operation mode.

Interlock Operation

This product (Model VY516XK/VY516XH) has the forced shutoff DI (contact input) for interlock operation. Connect the input signal line for start/stop of air-conditioning unit in a critical steam-humidifying system.

Operation with the forced shutoff DI is as follows:

- When the contact opens, the actuator forcibly closes the valve in 0 % position.
- When the contact closes, the actuator continues normal operation.

Jumper is connected to the terminals 4 and 5. Remove the jumper to connect the forced fully-close signal input line. Note that the forced fully-close input is for interlock operation and cannot be used for any other purpose.

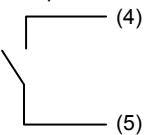
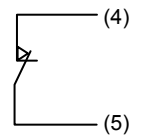
Interlock operation due to disconnection of SAnet communication

When SAnet communication is disconnected for a certain time period, this product recognizes abnormal condition and forcibly starts shutoff operation.

Notes:

- * Forced shutoff DI is applicable only for Model VY516XK/VY516XH ACTIVAL (spring-return type). This is not applicable for ACTIVAL Model VY516XJ
- * To forcibly shut off the valve, interlock the operation with the forced shutoff DI. Do not interlock with disconnection of SAnet communication.
- * In the manual operation mode, the product does not forcibly start shutoff operation even when SAnet communication is disconnected for a certain time period. But when the forced shutoff contact opens in the manual operation mode, the products forcibly starts the shutoff operation.

Table 3. Interlock operation with the forced shutoff DI

Forced fully-close input * (4) and (5) are terminal numbers	Normal operation mode		Manual peratoin mode mode	
	SAnet communicating	SAnet disconnected (for longer than a certain period)	SAnet communicating	SAnet disconnected (for longer than a certain period)
Contact open 	Forced shutoff	Forced shutoff	Forced shutoff	Forced shutoff
Contact closed 	Normal operation	Normal operation	Normal operation	Normal operation

Inspection and Troubleshooting

CAUTION



- Avoid touching the installed product (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 4.
- Visually inspect the fluid leakage of the valve and the actuator operations every six months. If any of the problems described in Table 5 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 4. Inspection items and details

Inspection item	Inspection interval	Inspection detail
Visual inspection	Semiannual	<ul style="list-style-type: none"> • Fluid leakage from the gland and the flange face • Loosened bolts • Valve and actuator damages
Operating status	Semiannual	<ul style="list-style-type: none"> • Unstable open/close operation • Abnormal noise and vibration • Incomplete spring return operation when power is off • Slow spring return operation (taking longer than the rated time (8 to 60 seconds))
Routine inspection	Any time	<ul style="list-style-type: none"> • Fluid leakage to the outside • Abnormal noise and vibration • Unstable open/close operation • Valve hunting

Table 5. 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 and change the installation location.
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.
SANet communication error occurs.	—	Consult with our sales/service personnel.

azbil

Specifications are subject to change without notice.

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