NIPPON VALVE CONTROLS, INC.

Instruction manual

Pneumatic Actuated Ball Valve PA PL

SP-1522

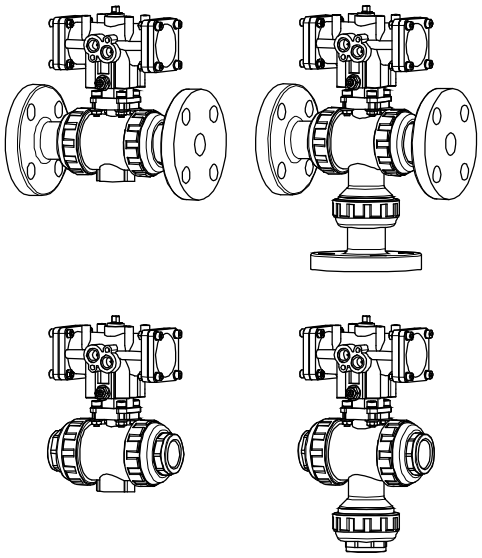
Please read this manual before installation and use.

GENERAL

Compact and light weight plastic valve.
This type accepts simple-structured actuator,
and designed for various types of fluid.
Various control selections and connections are available.
(Various materials can be selected.)

Actuator
- Double-acting type
  - PND TAD
- Single-acting type (Airless: SHUT)
  - PSO TAO
- Single-acting type (Airless: OPEN)
  - PSC TAC

Valve
- PA type 2-way ball valve
- PL type 3-way ball valve



J10K Flanged-end, Threaded End Rc, Socket

PRODUCT CODE

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
PA, PL type	J10K Flanged-end			9		1	P	P		-	-
				9		1	H	H		-	-
				9		1	R	R		-	-
				9		1	Q	Q		-	-
	Threaded End Rc			9		5	P	P		-	-
				9		5	H	H		-	-
				9		5	R	R		-	-
				9		5	Q	Q		-	-
	Socket			9		7	P	P		-	-
				9		7	H	H		-	-
				9		7	Q	Q		-	-

(1) Actuator
- PND TAD
- PSO TAO
- PSC TAC

(2) Valve
- PA
- PL

(3) Voltage
- 9 : Air

(4) Sizing code
- 0 : Standard
- 1 : Light
- 2 : Heavy

(5) Connection
- 1 : J10K Flanged-end
- 5 : Threaded End Rc
- 7 : Socket

(6) Body material
- P : PVC
- H : C-PVC
- R : PVDF
- Q : PP

(7) Ball material
- same as body material

(8) Stem seal
- E : EPDM
- V : FKM

(9) Size [mm]
- ex. 25A → 025

(10) Option
- FR : Filter Regulator Unit
- LB : Limit Switch Box

VALVES SPECIFICATIONS

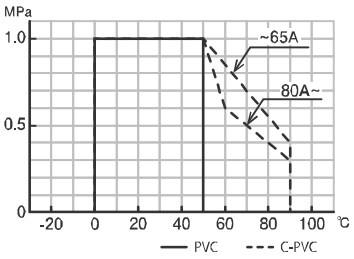
Water Oil Air, Gas Steam Chemicals Sea water Slurry Negative pressure

PA PL type

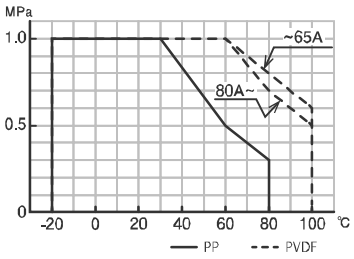
Valve type		PA				PL			
Design		2 way, Full port				3 way, Full port			
Connection		J10K Flanged-end Threaded End Rc	Socket			J10K Flanged-end Threaded End Rc	Socket		
Fluid									
Max pressure		1 MPa				1 MPa			
Size [mm]		015 to 100	015 to 025	032	040 to 100	015 to 100	015 to 025	032	040 to100
Material	Body Ball	PVC C-PVC PVDF PP	PVC C-PVC PP	PVC C-PVC -	PVC C-PVC PP	PVC C-PVC PVDF PP	PVC C-PVC PP	PVC C-PVC -	PVC C-PVC PP
	Seat	PTFE				PTFE			
Stem seal	O-ring	EPDM FKM				EPDM FKM			

PRESSURE & TEMPERATURE RATING (PA)

Body material: PVC, C-PVC

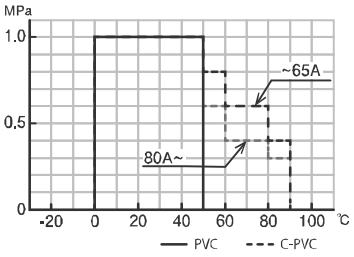


Body material: PVDF, PP

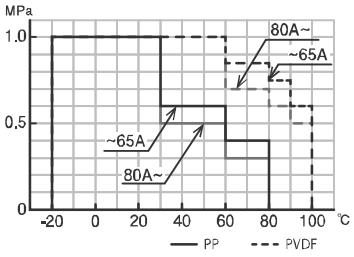


PRESSURE & TEMPERATURE RATING (PL)

Body material: PVC, C-PVC



Body material: PVDF, PP



FLOW PATHS (Position① / P1) (Position② / P2)

PL	
P1	P2
	

Note) When a closed path is exposed to high pressure, it may leak slightly to an open path.

PNEUMATIC ACTUATOR SPECIFICATIONS

3 way valve: SHUT / Position①, OPEN / Position②

PND type

Classification	Double-acting type			
Actuator type	PND-03S	PND-03D	PND-04D	PND-05D
Weight [kg]	0.2	0.3	0.5	0.8
Air consumption [ℓ] (round-trip)	0.05	0.08	0.19	0.35
Operation time [s]	Less than 1.			
Operation	SHUT by air to port A. ↔ OPEN by air to port B.			
Air pressure	0.4 to 0.7 MPa			
Piping connection	Rc 1/8			
Method of operation	Scotch yoke			
Housing material	PPS resin			
Ambient temperature	-10 to 50 °C (Please be careful when you use in 5 °C or less, so that there no freeze.)			
Manual operation	Operates the upper shaft of the actuator directly.			

PSO PSC type

Classification	Single-acting type (Spring-return)				
Actuator type	PSO - 03S PSC - 03S	PSO - 03D PSC - 03D	PSO - 04D PSC - 04D	PSO - 05D PSC - 05D	PSO - 05W PSC - 05W
Weight [kg]	0.2	0.4	0.6	1.2	1.8
Air consumption [ℓ] (round-trip)	0.03	0.04	0.1	0.2	0.53
Air exit	One side	Both sides			
Operation time [s]	Less than 1.				
Operation	PSO : OPEN by air to intake port. ↔ SHUT by spring-return. (Airless: SHUT) PSC : SHUT by air to intake port. ↔ OPEN by spring-return. (Airless: OPEN)				
Air pressure	0.4 to 0.7 MPa				
Piping connection	Rc 1/8				
Method of operation	Scotch yoke				
Housing material	PPS resin				
Ambient temperature	-10 to 50 °C (Please be careful when you use in 5 °C or less, so that there no freeze.)				
Manual operation	No manual operation.				

PNEUMATIC ACTUATOR SPECIFICATIONS

3 way valve: SHUT / Position①, OPEN / Position②

TAD type

Classification	Double-acting type						
Actuator type	TAD-040	TAD-050	TAD-063	TAD-080	TAD-100	TAD-125	TAD-160
Weight [kg]	0.9	1.3	2.1	3.4	6.1	9.8	18.2
Air consumption [ℓ] (round-trip)	0.11	0.18	0.34	0.66	1.36	2.72	5.56
Operation	SHUT by air to port A. ↔ OPEN by air to port B.						
Air pressure	0.4 to 0.7 MPa						
Piping connection	Rc 1/8	Rc 1/4					
Method of operation	Rack-and-pinion	Scotch yoke					
Housing material	Aluminum alloy						
Ambient temperature	-10 to 50 °C (Please be careful when you use in 5 °C or less, so that there no freeze.)						
Manual operation	Operates the upper shaft of the actuator directly.						

TAO TAC type

Classification	Single-acting type (Spring-return)						
Actuator type	TAO-040 TAC-040	TAO-050 TAC-050	TAO-063 TAC-063	TAO-080 TAC-080	TAO-100 TAC-100	TAO-125 TAC-125	TAO-160 TAC-160
Weight [kg]	2.3	3	4.9	8.5	16.4	27.6	51.2
Air consumption [ℓ] (round-trip)	0.23	0.34	0.67	1.26	2.62	4.44	8.77
Operation	TAO : OPEN by air to intake port. ↔ SHUT by spring-return. (Airless: SHUT) TAC : SHUT by air to intake port. ↔ OPEN by spring-return. (Airless: OPEN)						
Air pressure	0.4 to 0.7 MPa						
Piping connection	Rc 1/4						
Method of operation	Rack-and-pinion	Scotch yoke					
Housing material	Aluminum alloy						
Ambient temperature	-10 to 50 °C (Please be careful when you use in 5 °C or less, so that there no freeze.)						
Manual operation	No manual operation.	Option: MT (Manual handle unit)					

PNEUMATIC ACTUATOR SPECIFICATIONS

3 way valve: SHUT / Position①, OPEN / Position②

OPTIONAL PARTS

Classification		Code	PND	PSO	PSC	TAD	TAO	TAC
Speed Controller with bypass valve (Housing material: PPS)		BS				○		
FR Unit (Regulator with Filter) TA2-FR (KONAN)		FR	○	○	○	○	○	○
Limit Switch Box (Standard load signal)		LB	○	○	○	○	○	○
Explosion Proof Limit Switch, VCX7001 (azbil) Ex d e II C T6		LR				○	○	○
Speed Controller (with One-touch Fitting) One set		SE	○	○	○	○	○	○
Speed Controller (with One-touch Fitting) Two sets		SS	○			○		
Speed Controller (with One-touch Fitting) Dual Speed Controller		SF		○	○		○	○
Manual handle unit (Except 040)		MT					○	○
Sealing the spring unit. (Oil-free)		92					○	○
5-Port Solenoid Valve (with speed controller, silencer)	Voltage: 100V AC	1S	○	○	○			
	Voltage: 200V AC	2S	○	○	○			
	Voltage: 110V AC	3S	○	○	○			
	Voltage: 220V AC	4S	○	○	○			
	Voltage: 24V DC	5S	○	○	○			

SOLENOID VALVE (PND-05D) (TAD, TAO, TAC)

Classification			Code (□: Voltage)	
5-port Solenoid Valve Return (with bypass valve)	Lead wire	4N3S102K-L□	N43SL□	□: Voltage 1 : 100V AC 3 : 200V AC 5 : 24V DC
	DIN Connector	4N3S102K-D□	N43SD□	
	DIN Connector (with lamp)	4N3S102K-N□	N43SN□	
	Watertight cover	4N3S102K-W□	N43SW□	
5-port Explosion proof solenoid valve Return (with bypass valve)	Conduit	4N4S102K-E01-H□B0-R	4N4S01-□B0, NO	
	Flame proof packing (Cable size Φ9.5 to 10.4 mm)	4N4S102K-E10-H□B0-R	4N4S10-□B0, NO	

Operate by solenoid valve (Normally Open)

PND, TAD	SHUT by solenoid off.	↔	OPEN by power to solenoid.
PSO, TAO (Airless: SHUT)	OPEN by power to solenoid.	↔	SHUT by solenoid off. (Spring-return)
PSC, TAC (Airless: OPEN)	SHUT by power to solenoid.	↔	OPEN by solenoid off. (Spring-return)

GENERAL OPERATING INSTRUCTIONS

①WARNING

- Using a positive-pressure gas with our plastic piping may pose a dangerous condition due to the repellent force particular to compressible fluids even when the gas is under similar pressures used for liquids. Therefore, be sure to take the necessary safety precautions such as covering the piping with protective material. For inquiries, please contact us. For conducting a leak test on newly installed piping, be sure to check for leaks under water pressure. If absolutely necessary to use a gas in testing, please consult your nearest service station beforehand.
- Certain liquid such as H_2O_2, NaClO, etc may be prone to vaporization (Off-Gassing) which may cause irregular pressure increases, which may destroy the valve.

②CAUTION

- Do not step on or apply excessive weight on valve. (It can be damaged.)
- Keep the valve away from excessive heat or fire. (It can be damaged, or destroyed.)
- Do not use the valve to fluid containing slurry. (The valve will not operate properly.)
- Always operate the valve within the pressure vs. temperature range. (The valve can be damaged or deformed by operating beyond the allowable range.)
- Allow sufficient space for maintenance and inspection.
- Select a valve material that is compatible with the media. For chemical resistance information, refer to “CHEMICAL RESISTANCE ON ASAHI AV VALVE”. (Some chemicals may damage incompatible valve materials.)
- Do not use the valve in conditions where the fluid may have crystallized. (The valve will not operate properly.)
- Keep the valve out of direct sunlight, water and dust. Use cover to shield the valve. (The valve will not operate properly.)
- Perform periodic maintenance. (Leakage may develop due to temperature changes or periods of prolonged storage, rest, or operation.)
- Regarding the ball valve type, we recommend that you use fully open or fully closed. This is because the edge of the ball opening remains on the seat (PTFE) when used at an intermediate opening, so that the sealing performance temporarily deteriorates at the time of full closing.

UNPACKING AND STORAGE

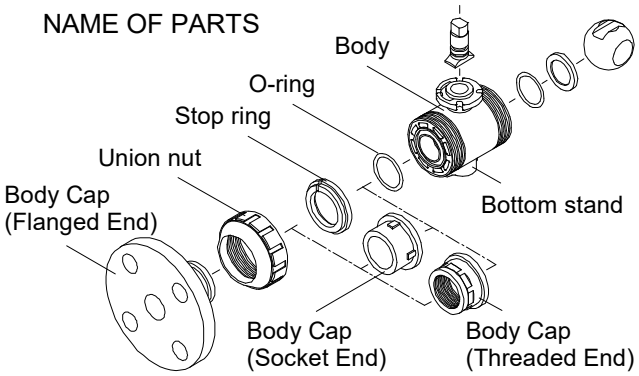
①WARNING

When suspending and supporting a valve, take care and do not stand under a suspended valve.

②CAUTION

- This valve is not designed to handle impacts of any kind. Avoid throwing or dropping the valve.
- Avoid scratching the valve with any sharp object.
- Do not over-stack cardboard shipping boxes. Excessively stacked packages may collapse.
- Avoid contact with any coal tar creosote, insecticides, vermicides or paint. (These chemicals may cause damage to the valve.)
- When transporting a valve, do not carry it by the handle.
- Store products in their corrugated cardboard boxes. Avoid exposing products to direct sunlight, and store them indoors (at room temperature). Also avoid storing products in areas with excessive temperatures. (Corrugated cardboard packages become weaker as they become wet with water or other liquid. Take care in storage and handling.)
- After unpacking the products, check that they are defect-free and meet the specifications.

NAME OF PARTS



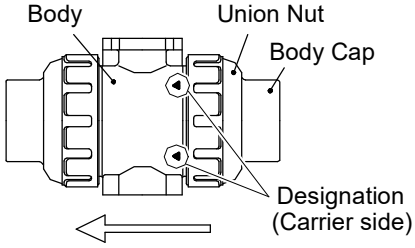
HOW TO INSTALL A PLASTIC BALL VALVE

①WARNING

- When suspending and supporting a valve, take care and do not stand under a suspended valve.
- Be sure to conduct a safety check on all hand and power tools to be used before beginning work.
- Wear protective gloves and safety goggles as fluid remain in the valve even if the pipeline is empty. (You may be injured.)

②CAUTION

- When installing a pipe support by means of a U-band or something similar, take care not to over-tighten. (Excessive force may damage the pipe.)
- When installing pipes and valves, ensure that they are not subjected to tension, compression, bending, impact, or other excessive stress.
- When installing a piece of equipment at the end of the piping line, be sure to keep the secondary (Downstream) Body Cap and Union Nut installed on the valve.
- When installing Ball Valve, 15 to 50 mm (1/2" to 2") at the end, note the direction of flow.
- Find the mark ◄ molded on the Carrier-side body.
- The mark side is the primary side (upstream side).
- On the secondary (Downstream) side, the Carrier is integral with the valve body.
- This is the preferred method if installation when installing the equipment at the end of the line for safety purposes.



- When installing, disassembling, or reassembling the piping, fix the Body Cap.
- Before a water test, be sure that the Union Nut is tightly fastened.
- Fasten the Union Nut while avoiding the parallelism and axial misalignment of the flange surface.
- When connecting an ASAHI AV Valve to metal piping, take care not to let the pipe stress on the ASAHI AV Valve.
- When screwing in a Metal Insert (Ensat), install it vertically. Refer to the User's Manual for Metal Insert (Ensat) by the Maker.
- When loosening the union nut on the union side, fix the body cap (hold it with your hand) and do work. (If the body cap turns, the union will turn together, resulting in the union and ball separating from the body.) If the union is loosened, retighten the union.
- Take care not to over-tighten the Union Nut. (The valve can be damaged.)
- Do not use the pipe wrench. (The valve can be damaged.)

FLANGED END

①CAUTION

- Do not use the valve to fluid containing slurry. (The valve will not operate properly.)
- The installed valve must never be opened or closed when foreign matter such as sand is present in the pipeline.
- Use flat faced flanges for connection to AV Valves.
- Ensure that the mating flanges are of the same standards.
- Be sure to use sealing gaskets (AV Gasket), bolts, nuts, and washers and tighten them to specified torques. (When a non-AV gasket is used, a different tightening torque specification should be followed.)

Necessary items

Torque wrench Spanner wrench

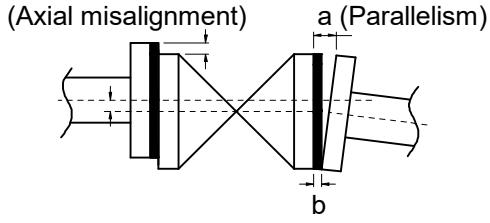
AV gasket Bolt Nut

Washer (For many flanges specification)

②PROCEDURE

1) Set the AV gasket between the flanges.
2) Insert washers and bolts from the pipe side, insert washers and nuts from the valve side, then temporarily tighten them by hand.

   The parallelism and axial misalignment of the flange surface should be under the values shown in the following table to prevent damage the valve. (A failure to observe them can cause destruction due to stress application to the pipe)



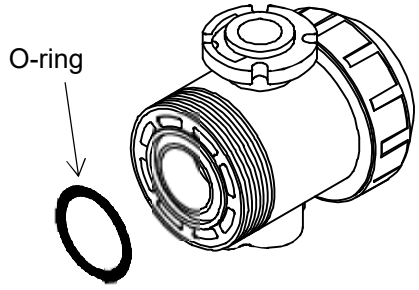
Valve size [mm]	Dimensions [mm]	
	Axial Misalignment	Parallelism (a-b)
015 020 025 032	1	0.5
040 050 065 080	1	0.8
100	1	1

3) Tighten the bolts and nuts gradually with a torque wrench to the specified torque level in a diagonal manner.
4) Tighten it more than 2 turns clockwise with specified torque.
   Do not tighten above the specified torque value. (The valve can be damaged or leaks.)

Valve size [mm]	Torque [N·m]	
	PTFE coated PVDF coated	Rubber
015 020	17.5	8
025 032 040	20	20
050 065	22.5	22.5
080 100	30	30

When the Union Nut is Loosened or Removed

If the union nut has been removed from the body (or loosened), install it in the following manner.



1) Make sure that the O-ring is mounted.
2) Set the body cap and union nut directly on the body without allowing the O-ring to come off.
3) Tighten union nuts on each valve until hand tight.
4) Using a strap wrench tighten union nuts uniformly on each side approx 90°-180° turns, 1/4 to 1/2 turns.

Threaded End

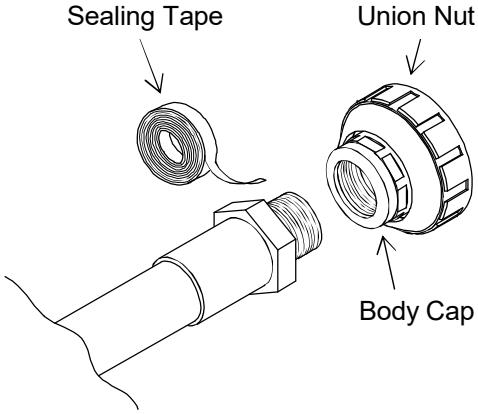
①CAUTION

- Avoid excessive tightening. (The valve can be damaged.)
- Make sure that the threaded connections are plastic × plastic. (Metallic thread can cause damage.)
- Wrap the threaded joints on our plastic piping with sealing tape.
  Using a liquid sealing agent or liquid gasket may cause stress cracks (Environmental Stress Cracking). Our product warranty shall not apply in case of said use, even when said use is unavoidable.

Necessary items

Sealing tape	Strap wrench	Spanner wrench

②PROCEDURE



1) Wind a sealing tape around the external thread of joint, leaving the end (about 3 mm) free.
2) Loosen the union nut with a strap wrench.
3) Remove the union nut and the Body Cap.
4) Tighten the external thread of the joint and the Body Cap hardly with hand.
5) Using a spanner wrench, screw in the Body Cap by turning 180°-360° carefully without damaging it.
6) Make sure that the O-ring is mounted.
7) Set the body cap and union nut directly on the body without allowing the O-ring to come off.
8) Tighten union nuts on each valve until hand tight.
9) Using a strap wrench tighten union nuts uniformly on each side approx 90°-180° turns, 1/4 to 1/2 turns.

Socket End (PVC / C-PVC)

①WARNING

- When using an adhesive, ventilate the space sufficiently, prohibit the use of a fire in the vicinity, and do not inhale adhesive vapors directly.
- If an adhesive gets into contact with your skin, wash it off immediately. If you feel sick or find any anomaly, receive a physician's diagnosis and take appropriate measures promptly.

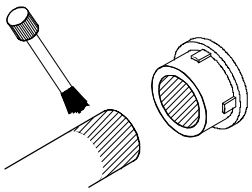
②CAUTION

- Take care in doing work at low temperatures. Solvent vapors are hard to evaporate and are likely to remain. (Solvent cracks may occur, damaging the equipment.) After assembling the piping system, open both ends of the piping and use a fan (of the Low-Voltage Type) or something similar to ventilate the space, thus removing the solvent vapors.
- Use the appropriate Asahi AV cement.
- Conduct a water test at least 24 hours after joining the pipes with an adhesive / cement.

Necessary items

Adhesive for hard vinyl chloride pipes
Strap wrench

③PROCEDURE



1) Loosen the union nut with a strap wrench.
2) Remove the union nut and the Body Cap.
3) Lead the union nut through the pipe.
4) Clean the hub part of the Body Cap by wiping the waste cloth.
5) Apply adhesive evenly to the hub part of the Body Cap and the pipe spigot.

   Do not apply more adhesive than necessary. (The valve can be damaged due to solvent cracking.)

Valve size [mm]	Adhesive quantity (guideline) [g]
015	1
020	1.3
025	2
032	2.4
040	3.5
050	4.8
065	6.9
080	9
100	13

6) After applying adhesive, insert the pipe quickly to the Body Cap and leave it alone for at least 60 seconds.

   Do not under any circumstances try to insert a pipe into another fitting or valve by striking it, which may break the piping.

7) Wipe away overflowing adhesive.
8) Make sure that O-ring is mounted.
9) Set the Body Cap and union nut directly on the body without allowing the O-ring to come off.
10) Tighten union nut hardly with hand.
11) Using a strap wrench tighten union nuts uniformly on each side approx 90°-180°turns, 1/4 to 1/2 turns.

Socket End (PP)

Necessary items

Strap wrench
Sleeve welder or automatic welding machine
User's manual for the above equipment

PROCEDURE

1) Loosen the union nut with a strap wrench.
2) Remove the union nut and the Body Cap.
3) Lead the union nut through the pipe.
4) For the next step, refer to the user's manual for the sleeve welder or the automatic welding machine.
5) After welding, make sure that the O-ring is mounted.
6) Set the Body Cap and the union nut directly without allowing the O-ring to come off.
7) Tighten union nut hardly with hand.
8) Using a strap wrench tighten union nuts uniformly on each side approx 90°-180° turns, 1/4 to 1/2 turns.

How to install the support for the valve (PA)

①CAUTION

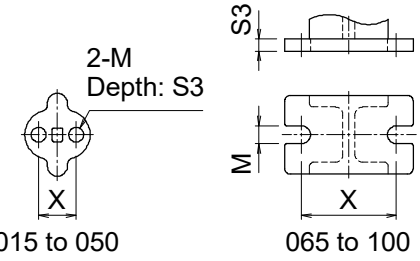
- Do not allow the piping around the pump to cause significant vibration to the valve. Failure to do so may result in failure or damage.
- Install the valve support. If the valve body and piping are subjected to excessive force, it may cause damage to the valve.

Necessary items

Wrench U-band (with bolts) Rubber sheet

②Attach Inserted metal to the bottom stand.
- When screwing in a Metal Insert (Ensat), install it vertically. Refer to the User's Manual for Metal Insert (Ensat) by the Maker.
- If specifying additional ensat fittings (option: 32), add ensat (off-the-shelf) to the valve. It will be shipped with it installed.

Bottom stand



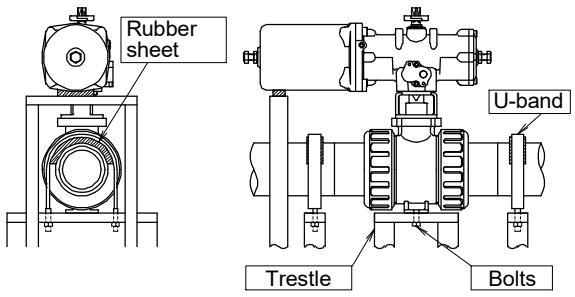
Valve size [mm]	Bottom stand [mm]			Ensat
	X	M	S3	
015 020 025	19	Φ7.3	11	M5 × 10
032 040 050	30	Φ9	15	M6 × 14
065	48	M9	6	-
080	55	M11	7	-
100	65	M11	8	-

③HORIZONTAL PIPING
- If a bottom stand (ensat) is used and a support is installed, bolt the ensat section and the trestle together.

Valve size [mm]	Bolt size [mm]
015 020 025	M5
032 040 050	M6

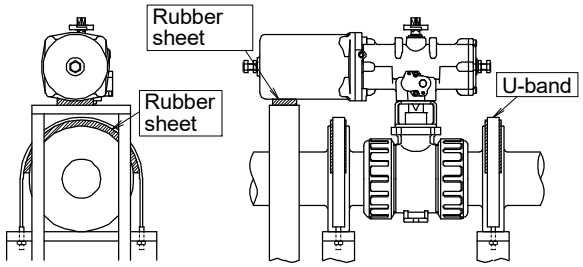
- Put a rubber sheet on the top of the pipe and secure it with a U-band.

HORIZONTAL PIPING



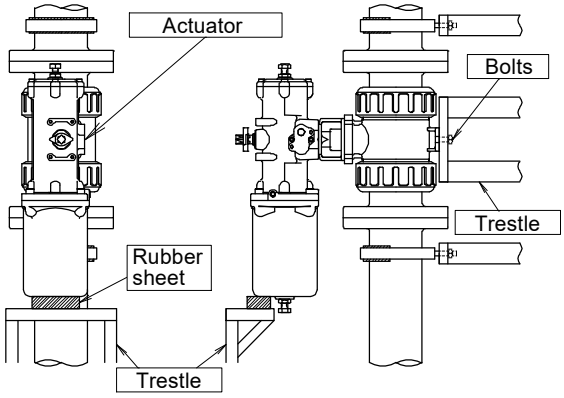
③HORIZONTAL PIPING (FLANGE TYPE)
If you do not use a bottom stand (ensat) and you are installing a support, you may need to install a support at the valve flange. Lay down a rubber sheet and secure it with a U-band. (Body caps are flanged only.)

HORIZONTAL PIPING (Flange type)



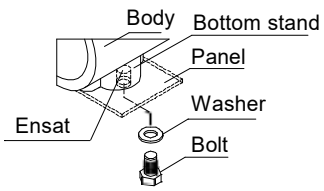
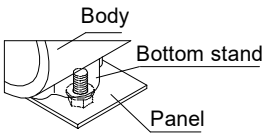
④VERTICAL PIPING
- Bolt the bottom stand (ensat) to the trestle.
- Put a rubber sheet on the top of the pipe and fix it with a U-band.

VERTICAL PIPING

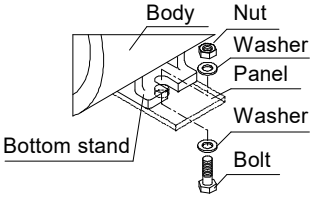
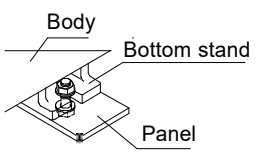


⑤FIXATION OF BOTTOM STAND WITH PANEL

015 to 050 mm

Before the fixation	After the fixation
	

065 to 100 mm

Before the fixation	After the fixation
	

INSTALLATION

①PRECAUTIONS

- Flush the pipeline carefully before installing the valve. Foreign particles, such as sand or pieces of welding electrode, will damage the ball and seats.
- When the flow path is subjected to a high pressure from arrow, it may leak slightly to the low pressure port. (PL)

②ENVIRONMENT

- Do not install in place where corrosive gas is present or where vibration is heavy (0.5 G or more).
- When radiant heat causes the surface temperature of the control unit to exceed 50 °C, provide an appropriate shielding plate.
- If there is a possibility that the fluid and drive part freeze, please take measures to prevent freezing.
- For single-acting type, prevent water and dust from coming into air exit.

③POSITIONING

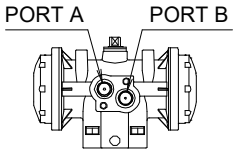
Should be positioned through 90° upward from horizontal. Provide space around the product to allow manual operation, inspection and replacement work.

AIR PIPING

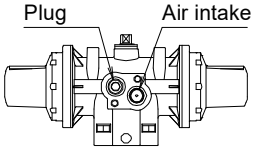
- Pneumatic actuator has an air supply ports to operate piston.

Double-acting type
PND : Rc 1/8
Coupling OD
less than 14.5 Φ

TAD-040 : Rc 1/8
TAD-050 to 160 : Rc 1/4



Single-acting type
PSO, PSC : Rc 1/8
TAO, TAC : Rc 1/4



- Piping of double-acting type is connected by seal tape on PORT A / B. Piping of single-acting type is put seal tape only on the air intake port.
- PND, PSO, PSC: PPS resin air supply port may be damaged if over tighten, please lightly tighten by hand.
- Never put anything on the actuator or make it into a foothold.

OPERATION

①AIR SOURCE

- Use the filtered dry air (less than 40 μ).
- Extra attention is needed where it's cold climate (below 5 °C).
- When air pressure is high, reduce it to standard pressure (0.4 to 0.7 MPa). Air pressure should not exceed 0.7 MPa during operation test.
- Capacity of compressor and air tank are to be calculated by capacity of piping and air consumption. A margin of 30 % is required.

②TEST OPERATION

Check the operation of pneumatic actuator before fluid enters the piping.

Double-acting type	Stop the air from the air source. Release the residual pressure in the air cylinder. Open the air equalizer. Move the manual shaft of actuator with a wrench.
Single-acting type	Send the standard pressure air. Confirm the opening / closing operation by slowly moving the actuator.

③TESTING

After piping, check following points.

- Piping is correct.
- Air or fluid leakage from connection. Flow direction of air is correct.
- Air pressure is in the range.
- Nothing interferes with operation when limit switch or solenoid damper is attached.

④ATTENTION

The opening and closing operation of the pneumatic actuator is fast, which may affect the product life. Please adjust the operation time of pneumatic actuator using a speed controller.

Valve size [mm]	Adjustment of operation time.
Less than 040	More than 1 second
050 or more	More than 2 seconds

MANUAL OPERATION

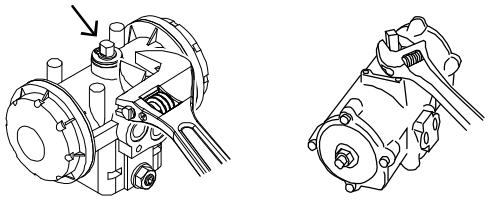
- Double-acting; stop the air supply and do not leave the air inside of cylinder.
- Single-acting; cannot be operated manually.

Optional code with the handle: TAO-MT, TAC-MT

- Before automatic operation, be sure to remove wrench.

OPERATION (PND, TAD)

After turning air pressure to 0, turn manual shaft slowly with a smooth-jawed wrench to check the direction of OPEN/SHUT position.



PND TAD

MAINTENANCE

- Do the routine maintenance at least once in half a year.
- Do not set or take spring unit parts apart after installing the pneumatic single-acting actuator.

Can be used with no oil supply.

- Confirm the air leakage.
- Confirm the air supply pressure.
- Confirm the dirt or grit inside of cylinder.

Lubrication Procedure (TAD, TAO, TAC)
In case of lubricating, use turbine oil or the equivalent through a lubricator. (ISO VG 32.46).
Once lubricate, do the regularly.

Inspection items

- Confirm operation of opening and closing.
- Confirm whether screws are loose or not.
- Confirm the fluid temperature or pressure.
- Confirm the leak from valve stem.
- Confirm the bolt tightening torque.

TROUBLESHOOTING

Problem	Cause	Solution
Fail to operate.	Air doesn't come out.	Supply air.
	Air pressure is too low.	Adjust to standard pressure level.
Stop in the mid position.	• Biting of valve seat. • The scale has adhered to the valve ball.	Remove a foreign object.
Leakage from valve body	• Valve cap get loose. • Valve body is damaged.	Replace the valve.
Leakage from valve seat	Seat is worn or damaged.	
Leakage from valve stem	Stem packing is worn or distorted.	

For more information contact
NIPPON VALVE CONTROLS, INC. for consultation.

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