

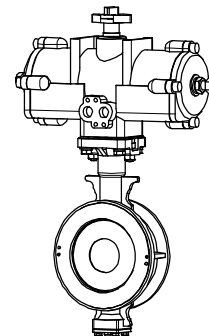


Please read this manual before installation and use.

GENERAL

It composed of wafer type butterfly valve and pneumatic actuator.

Actuator Double-acting type TAD Valve DN type Double centering structure.



Single-acting type (Airless: SHUT) TAO


Single-acting type (Airless: OPEN) TAC

PRODUCT CODE

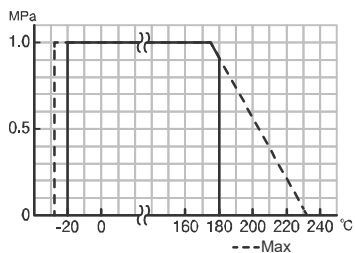
DN type <input type="text"/> <input type="text"/> <input type="text"/> D N 9 <input type="text"/> 1 T T F - <input type="text"/> <input type="text"/> <input type="text"/> - <input type="text"/> <input type="text"/> - <input type="text"/>		
(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11)		
(1) Actuator TAD TAO TAC	(6) Body material T : SCS13A (7) Disc material T : SCS13A	(10) Option FR : Filter Regulator Unit LB : Limit Switch Box LC : Built-in limit switch EN : Positioner EP : Positioner ER, ER, ET, EU : Smart Positioner
(2) Valve DN	(8) Seat material F : F-PTFE	(11) Positioner control pattern (TAD) A : SHUT by 4 mA ↔ OPEN by 20 mA B : SHUT by 20 mA ↔ OPEN by 4 mA
(3) Voltage 9 : Air	(9) Size [mm] ex. 80 A → 080	(11) Positioner control pattern (TAO) C : OPEN by 20 mA ↔ SHUT by 4 mA (Airless: SHUT) D : OPEN by 4 mA ↔ SHUT by 20 mA (Airless: SHUT)
(4) Sizing code 0 : Standard 1 : Light 2 : Heavy		(11) Positioner control pattern (TAC) E : SHUT by 4 mA ↔ OPEN by 20 mA (Airless: OPEN) T : SHUT by 20 mA ↔ OPEN by 4 mA (Airless: OPEN)
(5) Connection 1 : JIS 5K / 10K		

VALVES SPECIFICATIONS

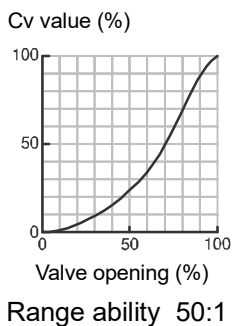
 Water
  Oil
  Air, Gas
  Steam
  Chemicals
  Sea water
  Slurry
  Negative pressure

Valve type	DN	
Design	Wafer type	
Connection	JIS Flanges 5K / 10K	
Fluid		
Max pressure	1 MPa	
Size [mm]	080 to 300	
Material	Body	SCS13A
	Disc	SCS13A
	Seat	F-PTFE
Stem seal	Packing	PTFE

PRESSURE & TEMPERATURE RATING



INHERENT FLOW CHARACTERISTIC



PNEUMATIC ACTUATOR SPECIFICATIONS

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 (round-trip) [ℓ]	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 (round-trip) [ℓ]	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

OPTIONAL PARTS

Classification	Code	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	○	○	○
Built-in limit switch	LC	○	○	○
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		○	○
Explosion Proof Electro-Pneumatic Positioner EXd II BT5 (TIIS)	EN			
Explosion Proof Electro-Pneumatic Positioner Ex dmb II B T5 (TIIS)	EP	○	○	○
Smart positioner	ES	○		
	ER		○	○
Smart positioner (with 4 to 20 mA DC, output)	ET	○		
	EU		○	○

Positioner operation (Input signal: 4 to 20 mA DC)	EN EP	SHUT by 4 mA. ↔ OPEN by 20 mA.		A	○			
		SHUT by 20 mA. ↔ OPEN by 4 mA.		B	○			
		OPEN by 20 mA. ↔ SHUT by 4 mA. (Airless: SHUT)		C		○		
		OPEN by 4 mA. ↔ SHUT by 20 mA. (Airless: SHUT)		D		○		
		SHUT by 4 mA. ↔ OPEN by 20 mA. (Airless: OPEN)		E			○	
		SHUT by 20 mA. ↔ OPEN by 4 mA. (Airless: OPEN)		T			○	
	ES ET	0 mA: SHUT	SHUT by 4 mA. ↔ OPEN by 20 mA. (Airless: HOLD)		A	○		
			SHUT by 20 mA. ↔ OPEN by 4 mA. (Airless: HOLD)		B	○		
	ER EU	0 mA: SHUT	SHUT by 20 mA. ↔ OPEN by 4 mA. (Airless: HOLD)		W	○		
			OPEN by 20 mA. ↔ SHUT by 4 mA. (Airless: SHUT)		C		○	
			OPEN by 4 mA. ↔ SHUT by 20 mA. (Airless: SHUT)		D		○	
		0 mA: OPEN	SHUT by 4 mA. ↔ OPEN by 20 mA. (Airless: OPEN)		Y			○
			SHUT by 4 mA. ↔ OPEN by 20 mA. (Airless: OPEN)		E			○
			SHUT by 20 mA. ↔ OPEN by 4 mA. (Airless: OPEN)		T			○
	OPEN by 4 mA. ↔ SHUT by 20 mA. (Airless: SHUT)		X		○			

PNEUMATIC ACTUATOR SPECIFICATIONS

SOLENOID VALVE

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)

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

INSTALLATION, OPERATION & MAINTENANCE INSTRUCTIONS

HANDLING & STORAGE

①HANDLING

Do not drop or throw the product as it may break.

②STORAGE

- Store away from dust, moisture and direct sunlight. If possible, store in the original package.
- Do not remove a dust proof cap until the piping.

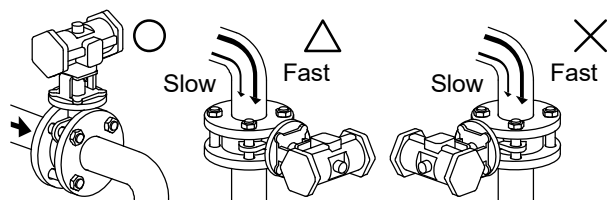
③CHECKING

- Check the product code before installation.
- Make sure that the bolts are not loose.

INSTALLATION

①PRECAUTIONS

- Flush the pipeline carefully before installing the valve. Foreign particles, such as sand or pieces of welding electrode, will damage the disk and seats.
- For valves with specified flow direction (DN), check the arrows on the product before piping.
- Valve is shipped closed. (TAC: closed with a manual unit. Without a manual unit is open.)
- The butterfly valve should be piped upstream of the elbow. When piping downstream from the elbow, considered a straight line that is at least five times the length of the pipe.



- The valve stem should be mounted perpendicular to the flow for biased fluid.
- Disc interference may also occur when valve is installed in pipeline with smaller than normal inside diameter such as thick wall pipe, or lining pipe. Suitable corrective measurement must be taken (taper boring the pipe or pipe liner, etc.)

②PIPING FLANGES

- Gasket should be selected appropriately to suit the fluid, pressure and temperature. Use spring washer to prevent from decreasing surface pressure gasket when the temperature change happens frequently.
- Wafer type butterfly valve is put between two seats of flanged-end and tightened with long bolts.
- Before bolts are tightened, valve should be centered within the bolts to prevent possible disc interference or damage by contact with the pipe or flange.
- Tighten all bolts using crossover method to load the joint evenly.

③ENVIRONMENT

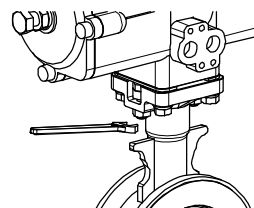
- Do not install in place where corrosive gas is present or where vibration is heavy (0.5 G or more).
- When radiant heat causes the surface temperature of the control unit to exceed 50 °C, provide an appropriate shielding plate.
- If there is a possibility that the fluid and drive part freeze, please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

④POSITIONING

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

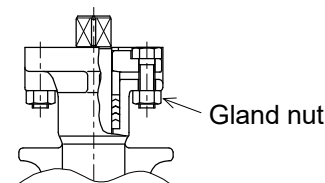
⑤CAUTIONS FOR MAINTENANCE

Do not keep warm for maintenance of the valve gland.



TIGHTEN THE GLAND NUTS

- Check that there is no leakage from the gland packing.
- If it leakage, tighten gland nuts by alternately. Do not over-tighten the gland nuts.



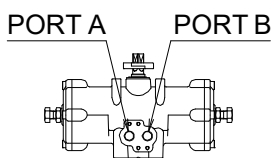
Valve size [mm]	Recommended torques [N·m]
080	3.5
100	7
125	
150	
200	14
250	
300	

INSTALLATION, OPERATION & MAINTENANCE INSTRUCTIONS

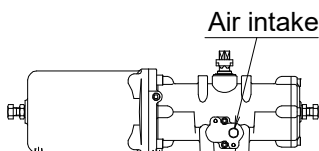
AIR PIPING

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

Double-acting type
Rc 1/4



Single-acting type
Rc 1/4



TAD, TAO, TAC (050 to 160)

- 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.
- The air supply port may be damaged if over-tightened. 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 valve 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.
050 or more	More than 2 seconds

INSTALLATION, OPERATION & MAINTENANCE INSTRUCTIONS

MANUAL OPERATION

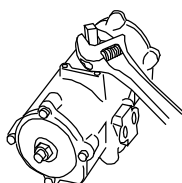
- Double-acting; stop the air supply and do not leave the air inside of cylinder.
- Single-acting; cannot be operated manually.

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

- Before automatic operation, be sure to remove wrench.

OPERATION (TAD)

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



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.	There is a foreign object in the butterfly valve.	Remove a foreign object.
	Valve is distorted.	Replace the valve.
Leakage from valve seat	Damaged on valve seat.	Replace the valve.
		Replace the valve seat.
Leakage from valve stem	Gland packing is worn or distorted.	Tighten the gland nut.
		Replace the gland packing.

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