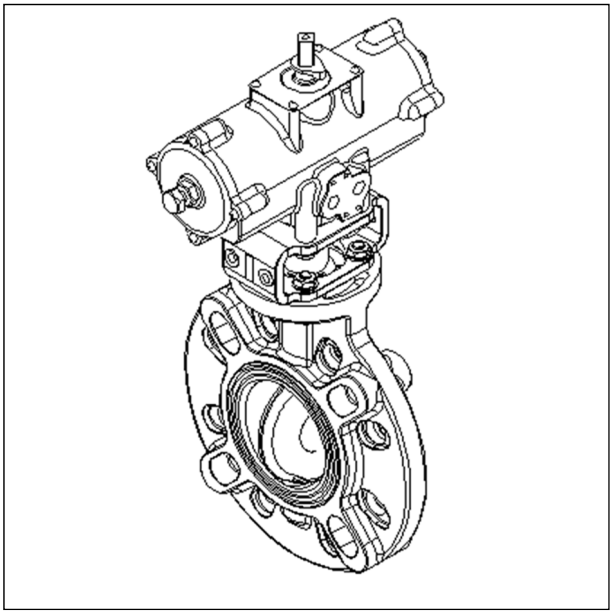
Serial No.: H-A044-E-15

Butterfly valve type 57
Butterfly valve type 56
Butterfly valve 56D type
Pneumatic Actuated Type TA/TW

User's Manual



Thank you for choosing our product.
This instruction manual contains important information for safe use of our product, so please be sure to read it before handling the product.
After reading this manual, please be sure to keep it in a place where the user can see it at any time.

ASAHI YUKIZAI CORPORATION

-SAFETY PRECAUTIONS-

This instruction manual is written on the assumption that the person who handles our products has a basic knowledge of our products, electrical equipment, machinery, control, etc., and it contains technical terms depending on the handling contents.
Please read this manual carefully and fully understand the contents and observe the safety precautions for proper use.

In this manual, the warning, caution, prohibition, and enforcement are categorized together with the symbol to inform the situation and scale of human injury or property damage.
Failure to observe this precaution may result in unexpected failure or damage. Be sure to observe this precaution.

<WARNING/CAUTION indications>

Warning	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
Caution	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or property damage.

<Prohibited/Forced display>

Prohibition	In the handling of the product, it is prohibited to do it in "Do not do it".
Forcing	In the handling of the product, it is forced by "contents to be carried out without fail".

Table of contents

1. Our product warranty coverage

Unless otherwise stated in the Contract or Specifications, etc., the warranty for the piping material products (hereinafter referred to as "applicable products") such as valves manufactured or sold by us is as follows.

Applicable to

This warranty applies only when the product is used in Japan. If you intend to use the product overseas, please contact us.

Warranty Period

The warranty period is one year after delivery.

Guaranteed range

In the event of failure or malfunction due to our responsibility during the above warranty period, we will replace or repair the product with a substitute free of charge.
Provided, however, that even within the warranty period, the warranty shall not apply to any of the following cases (charged service).

- ▶ When the storage, operating conditions, precautions, etc. described in the specifications, instruction manual, etc. are not adhered to in the construction, installation, handling, maintenance, etc.
- ▶ Defects, such as the design of the customer's equipment or software, caused by other than the target product.
- ▶ The fault is due to modification or secondary processing of the product by something other than us.
- ▶ In the case of a failure which can be deemed to have been avoided if the periodic inspection described in the instruction manual, etc. or the maintenance or replacement of consumable parts has been performed normally.
- ▶ The component is used for purposes other than the product's intended use.
- ▶ Failure or malfunction due to causes that could not be foreseen by our level of science and technology at the time of shipment.
- ▶ The fault is due to an external factor that is not our responsibility, such as natural disaster or disaster.

Disclaimer

- ▶ The warranty will not cover secondary damage (damage to equipment, loss of opportunity, loss of profit, etc.) or any other damage caused by the failure of our product.
- ▶ Although we strive to improve the quality and reliability of our products, we do not guarantee their integrity. Especially when using this product for equipment that may infringe human life, body or property, take appropriate safety design measures, etc., with full consideration of problems that may normally occur. We assume no responsibility for such use if we have not obtained our consent in advance in writing of specifications, etc.
- ▶ Please observe the product specifications and precautions when using our products. We shall not assume any responsibility for any damage to the customer caused by the customer's negligence. However, this does not apply to damage caused by a defect in our product.

2. Safety Instructions

Unpacking, Transportation and Storage

Warning	
Prohibition	**Serious injury can result.** ▶ When hanging or slinging a valve, pay sufficient attention to safety, and do not enter under the load.

Caution	
Prohibition	**The valve can be damaged, or leak.** ▶ Do not subject the product to impact by throwing, dropping or hitting. ▶ Do not scratch or pierce the product with a sharp object such as a knife or hand hook. ▶ Do not pile up cardboard boxes forcefully to prevent the load from collapsing. ▶ Avoid contact with coal tar, creosote (a wood preservative), white pesticides, insecticides, paints, etc. ▶ Do not hang the handle when transporting the valve.
Forcing	**The valve can be damaged, or leak.** ▶ Keep in cardboard until just before piping, and store indoors (at room temperature) away from direct sunlight. Also, avoid storing the product in places of high temperature. (The strength of cardboard packaging decreases when it gets wet. Be very careful when storing and handling it.) ▶ After unpacking, make sure that the product is correct and that it meets the specifications.

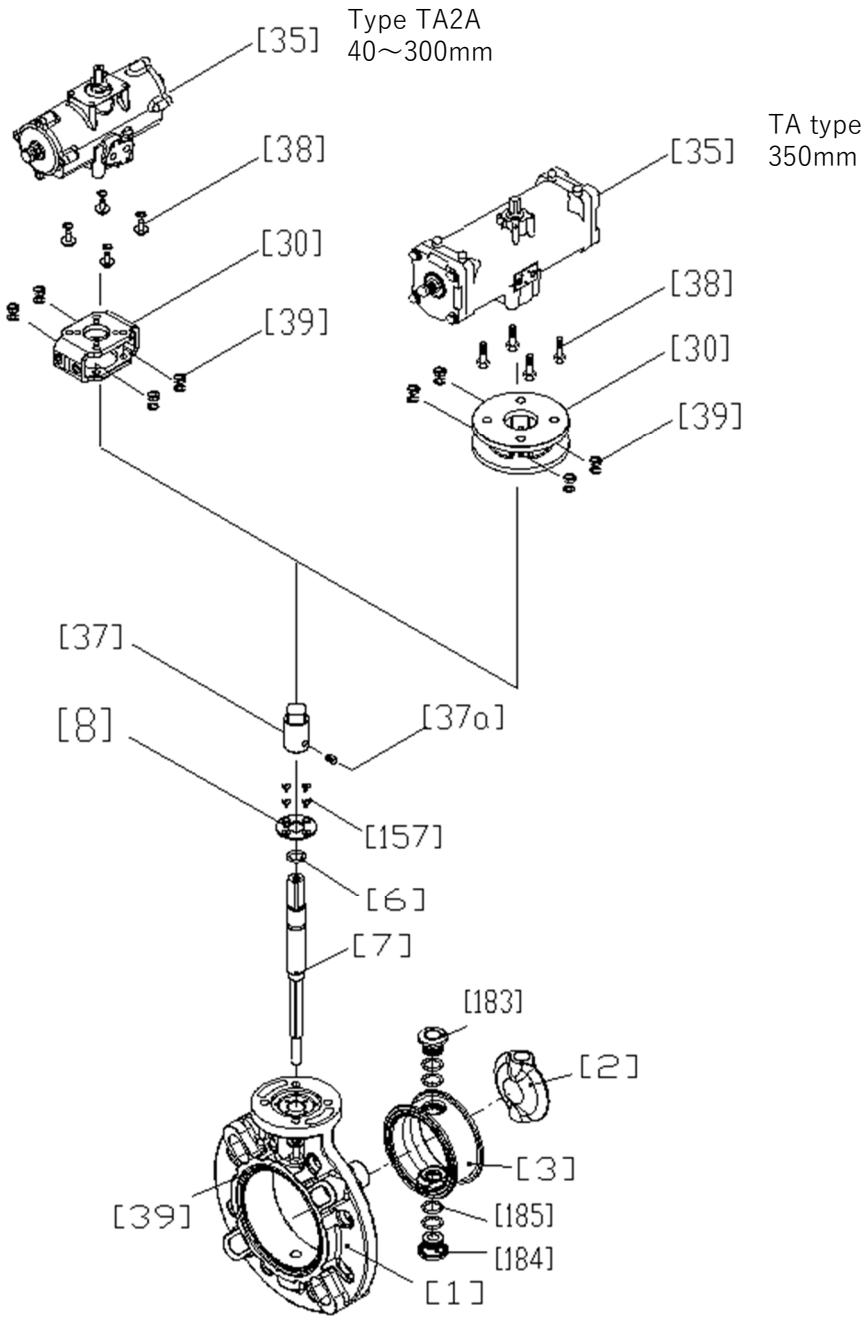
Product Handling

⚠ Warning	
Prohibition	**Serious injury can result.** ▶ Do not disassemble the actuator.
Forcing	**The valve can be damaged, or leak.** ▶ If positive pressure gas is used for our resin piping material, a dangerous condition may occur due to the repulsive force peculiar to compressible fluids even if the pressure is the same as the water pressure. Therefore, be sure to take safety measures for the surrounding area, such as covering the piping with protective materials. If you have any questions, please contact us separately. ▶ When conducting a pipe leak test after completion of piping construction, be sure to check with water pressure. Contact us in advance if you are unavoidable to test with a gas. ▶ When installing piping, gaskets are basically not required. However, when connecting to a resin flange that is prone to dents, scratches, or warping, use gaskets to ensure stable sealing performance.

⚠ Caution	
Prohibition	**The valve can be damaged, or leak.** ▶ Do not step on the valve or place heavy objects on it. ▶ Keep away from fire and hot objects.
Forcing	**There is a danger of injury.** ▶ Allow sufficient space for maintenance and inspection. **The valve can be damaged, or leak.** ▶ Keep the pressure and temperature of the fluid within the allowable range. (The maximum allowable pressure includes water hammer pressure.) ▶ Use a valve of suitable material for the operating conditions. (Depending on the type of chemical liquid, the parts may be damaged. Contact us in advance for details.) ▶ Use fluids containing crystalline material under conditions that do not recrystallize. ▶ Avoid any place where the valve is constantly exposed to splashes of water and dust, or direct sunlight, or protect the valve with a cover or the like to cover the entire area. ▶ Perform maintenance periodically by referring to "**14. Inspection items**". Pay particular attention to temperature changes and aging during long-term storage or shutdown or use. ▶ When installing a valve, provide an appropriate valve support so that excessive force is not applied to the valve and piping. ▶ Always use the product within the indicated product specifications. ▶ It is recommended to cover the entire valve with a protective plastic bag when it is used outdoors or in a badly atmospheric environment. (Rust may cause operation failure.) ▶ When using at an ambient temperature of 5°C or less, remove moisture from the operation air to prevent freezing. ▶ Use clean, dehumidified and dust-free air. However, consult with CKD when using high dry air with a dew point of-40°C or less.

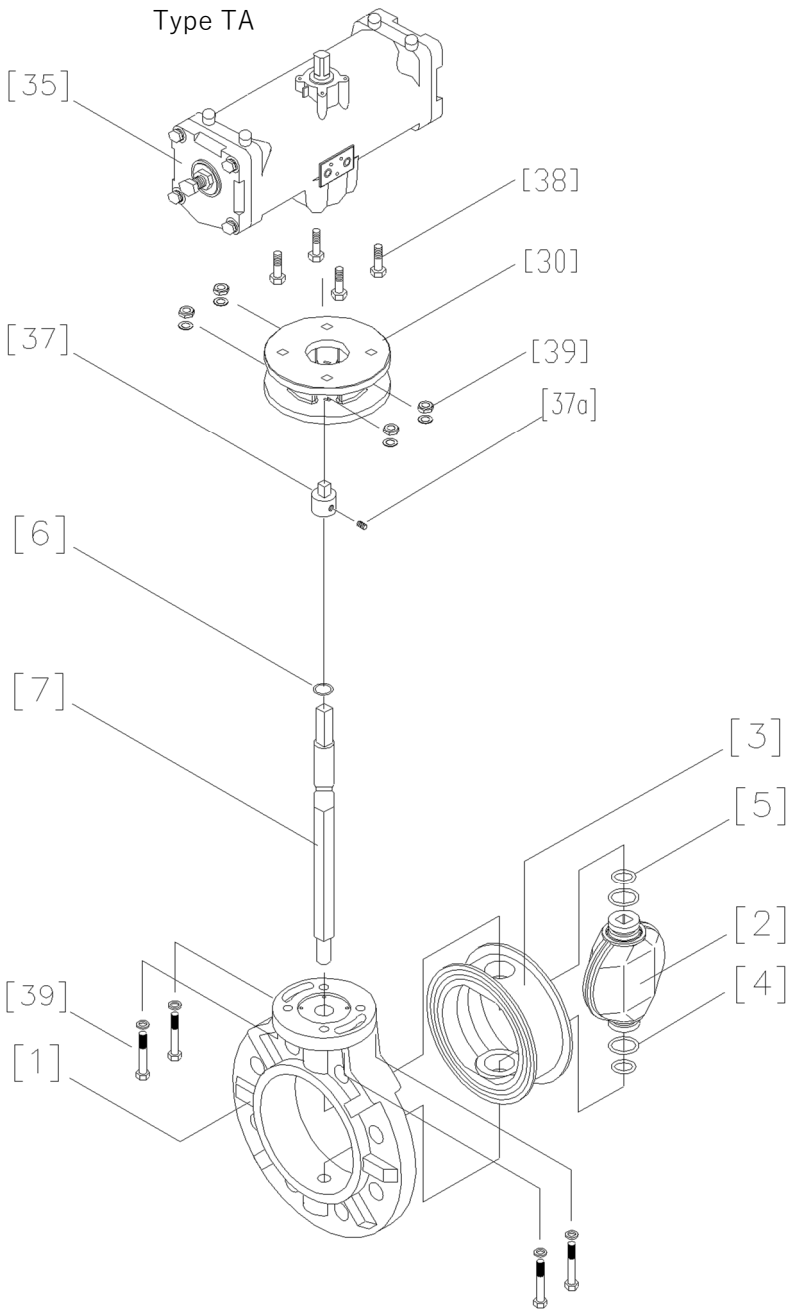
3. Name of each part

Type 57 (40～350mm) / Body material: U-PVC, PP, PVDF



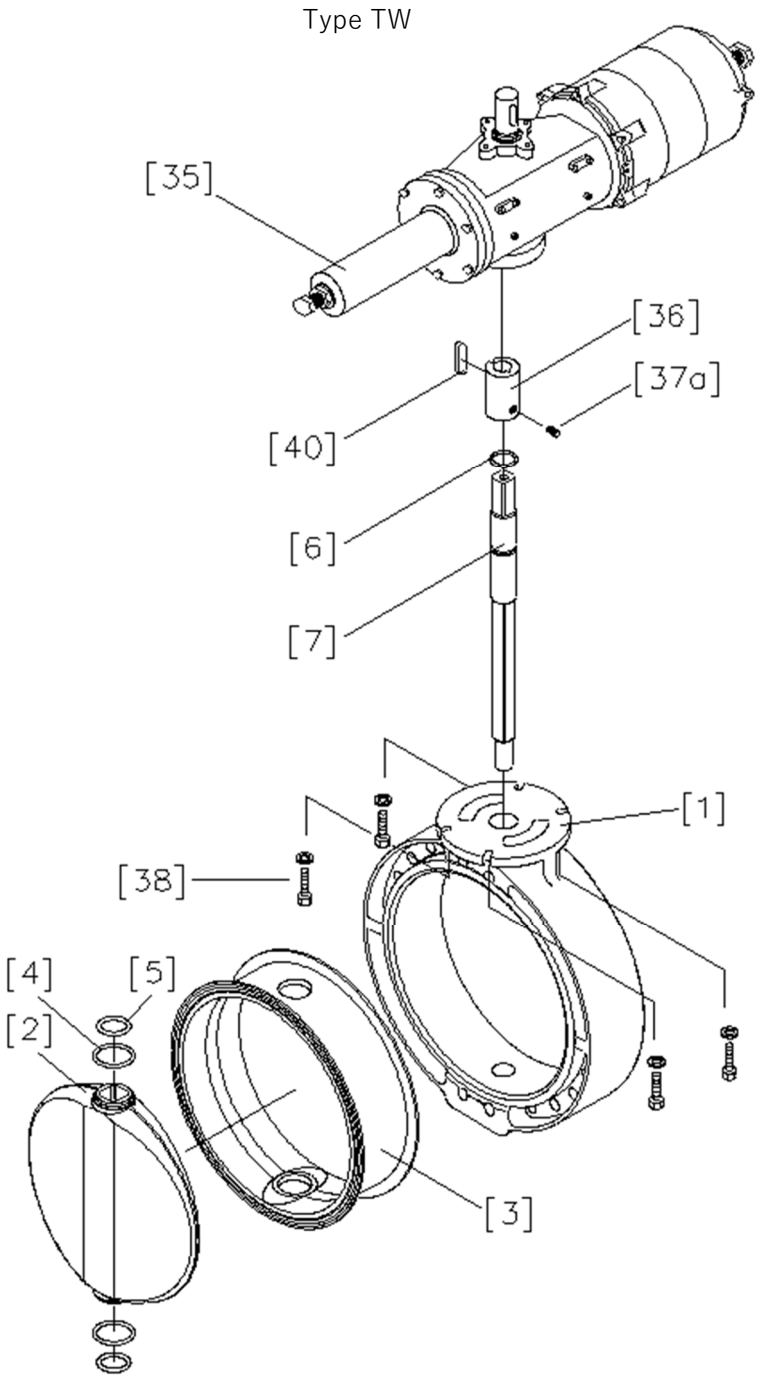
[1]	Body	[30]	Standr	[157]	Set screw (F)
[2]	Disc	[35]	Actuator	[183]	Sheet bush A
[3]	Seat	[37]	Joint	[184]	Sheet bush B
[6]	O-ring (C)	[37a]	Screw (C)	[185]	O-ring (I)
[7]	Stem	[38]	Bolt (E)		
[8]	Stem Holder (A)	[39]	Bolt/nut (A)		

Type 56 (400mm) / Body material: PP, PVDF



[1]	Body	[6]	O-ring (C)	[37a]	Screw (C)
[2]	Disc	[7]	Stem	[38]	Bolt (E)
[3]	Seat	[30]	Stand	[39]	Bolt/nut (P)
[4]	O-ring (A)	[35]	Actuator		
[5]	O-ring (B)	[37]	Joint		

Type 56D (400mm) / Body material: PDCPD



[1]	Body	[5]	O-ring (B)	[36]	Stem bush
[2]	Disc	[6]	O-ring (C)	[37a]	Set screw (C)
[3]	Seat	[7]	Stem	[38]	Bolt (E)
[4]	O-ring (A)	[35]	Actuator	[40]	Key (B)

4. Product Specifications

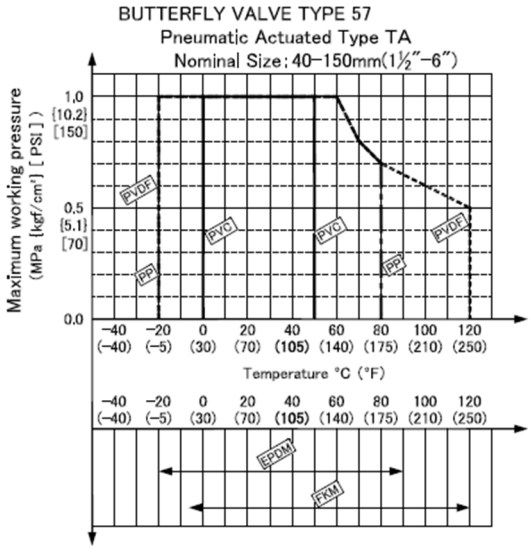
Model number table

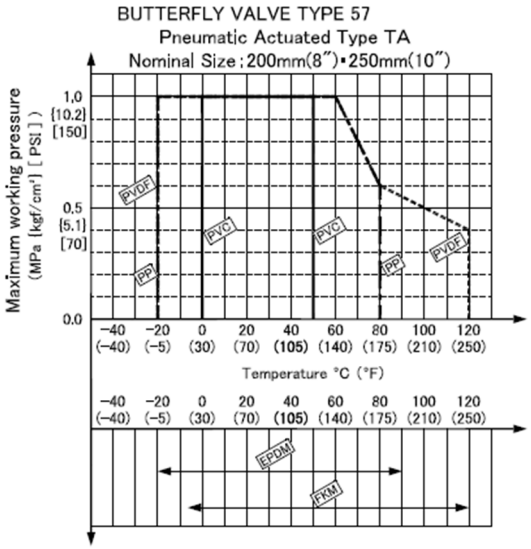
ACTUATION	TYPE	ACTUATOR TYPE	ACTION / POWER SOURCE	BODY MATERIAL	SEAL MATERIAL	CONNECTION	STANDARD	SIZE	DISC PVDF
A	56	K	F	D	*	W	*	400	0Q※
A AUTOMATIC VALVE	56 TYPE 56D	K TYPE TW	F DOUBLE ACTING	D PDCPD	E EPDM V FKM	W WAFER	1 JIS 10K D DIN A ANSI	400 400mm	※ Used when the disc material is PVDF.

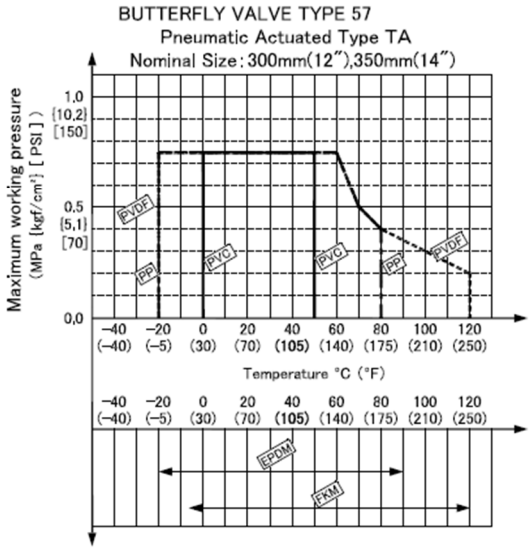
ACTUATION	TYPE	ACTUATOR TYPE	ACTION / POWER SOURCE	BODY MATERIAL	SEAL MATERIAL	CONNECTION	STANDARD	SIZE
A	56	K	*	*	*	W	*	400
A AUTOMATIC VALVE	56 TYPE 56	K TYPE TA	F DOUBLE ACTING G AIR TO OPEN S AIR TO CLOSE	P PP F PVDF	E EPDM V FKM	W WAFER	1 JIS 10K D DIN A ANSI	400 400mm

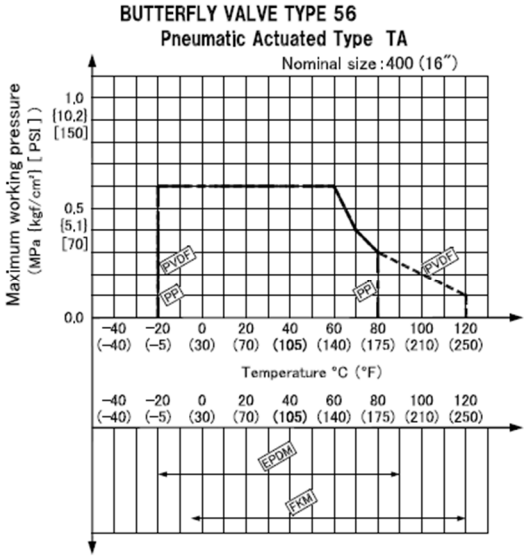
ACTUATION	TYPE	ACTUATOR TYPE	ACTION / POWER SOURCE	BODY MATERIAL	SEAL MATERIAL	CONNECTION	STANDARD	SIZE
A	57	K	*	*	*	W	*	* * *
A AUTOMATIC VALVE	57 TYPE 57	K TYPE TA	F DOUBLE ACTING G AIR TO OPEN S AIR TO CLOSE	P PP F PVDF	E EPDM V FKM	W WAFER	1 JIS 10K 5 JIS 5K D DIN A ANSI	040 40mm 050 50mm 065 65mm 080 80mm 100 100mm 125 125mm 150 150mm 200 200mm 250 250mm 300 300mm 350 350mm

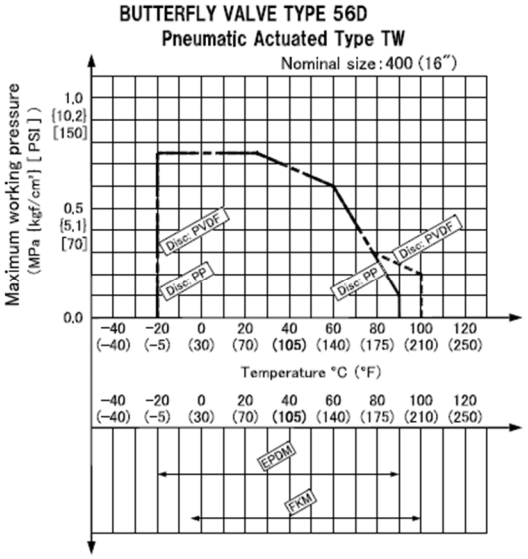
Relationship between maximum allowable pressure and temperature











Actuator

Specifications List

Model	Actuation	Nominal size (mm)	Actuator model	Angle adjustment range	Operating pressure range (MPa)	Air consumption NL/ open/close (0.4MPa)	Air supply port size
Type 57 Type 56	Double acting	40 50	TA2A-050D	±5°	0.4～0.7	0.9	Rc 1/4
		65 80	TA2A-063D	±5°	0.4～0.7	1.7	Rc 1/4
		100	TA2A-080D	±5°	0.4～0.7	3.2	Rc 1/4
		125 150	TA2A-100D	±5°	0.4～0.7	6.6	Rc 1/4
		200	TA2A-125D	±5°	0.4～0.7	13.3	Rc 1/4
		250 300	TA2A-160D	±5°	0.4～0.7	27.1	Rc 1/4
		350 400	TA-200D	±5°	0.4～0.7	56.8	Rc 3/8
	Air to open Air to close	40 50	TA2A-050R	±5°	0.4～0.7	1.7	Rc 1/4
		65 80	TA2A-063R	±5°	0.4～0.7	3.3	Rc 1/4
		100	TA2A-080R	±5°	0.4～0.7	6.1	Rc 1/4
		125 150	TA2A-100R2	±5°	0.4～0.7	12.8	Rc 1/4
		200	TA2A-125R2	±5°	0.4～0.7	21.6	Rc 1/4
		250 300	TA2A-160R2	±5°	0.4～0.7	42.7	Rc 1/4
		350 400	TA-200R	±5°	0.4～0.7	68.4	Rc 3/8
56D type	Double action	400	TW-250D	±5°	0.4	99	Rc 3/8

Standard option

Solenoid valve

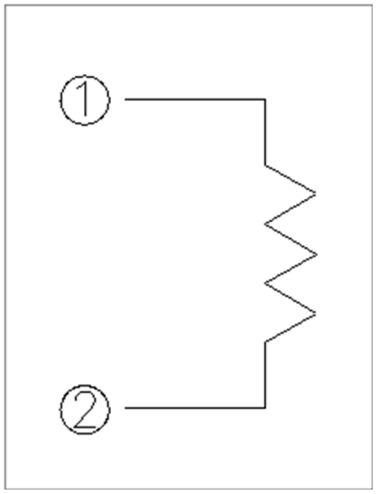
Operation	Nominal size (mm)	Model code	Piping port size	Stress area	Power consumption	Additional functions
Double action Single action	40～300	4N3S102K-W□-G31193	Rc 1/4	10mm² or higher	AC ; 6VA DC ; 5.5W	○Built-in bypass valve ○Installation of silencer with throttle valve (used as speed controller)
Double action Single action	350、400 (57•56 type)	453S403C-W□ -G30800	Rc 3/8	40mm² or higher	AC ; 6VA DC ; 5W	
Double action	400 (56D type)	453S403C-W□	Rc 3/8	40mm² or higher	AC ; 6VA DC ; 5W	○Installation of silencer with throttle valve (used as speed controller)

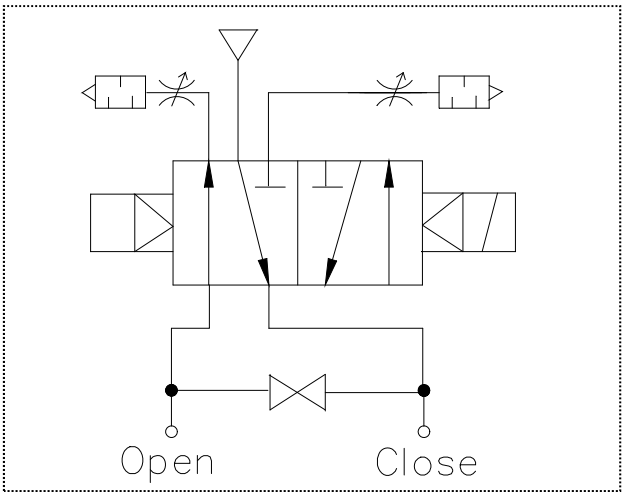
40 to 300mm (Type 57) 4N3S102K-W□-G31193
350, 400mm (Type 57/56) 453S403C-W□-G30800
400mm (Type 56D) 453S403C-W□

Rated voltage	Text entry
100VAC 50/60Hz	1
110VAC 50/60Hz	(2)
200VAC 50/60Hz	3
220VAC 50/60Hz	(4)
24VDC	5
48VDC	(6)
100VDC	(7)
125VDC	(9)

※ The letters marked with () are special items.

Wiring diagram JIS symbol





Limit switch

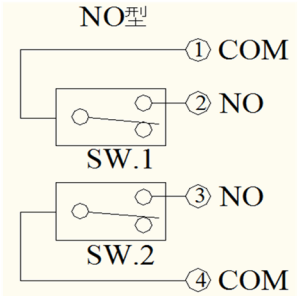
Model	Actuation	Nominal size (mm)	Model code	Protection grade	Limit switch model
Type 57 Type 56	Double action Single action	40～80	SB2-11	IP 65 equivalent	V-112-1C24 (Made of OMRON)
		100～150	SB2-16		
		200～300	SB2-22		
		350、400	TA-200-SB	IP 55 equivalent	
56D type	Double action	400	1LS1-J	IP67	-

Limit switch rating

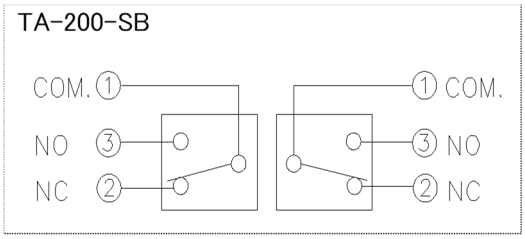
Model	Rated voltage	Resistance load (A)	Induction load (A)
SB2-11, 16, 22 TA-200-SB	125VAC	11	7
	250VAC	11	7
	125VDC	0.5	0.1
	250VDC	0.25	0.04
1LS1-J	125VAC	10	6
	250VAC	10	6
	125VDC	0.8	0.2
	250VDC	0.4	0.1

Internal circuit diagram (at intermediate position)

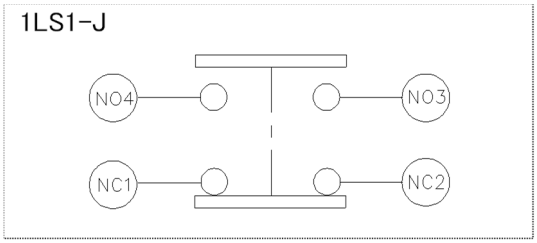
SB2-11, 16, 22



TA-200-SB



1LS1-J

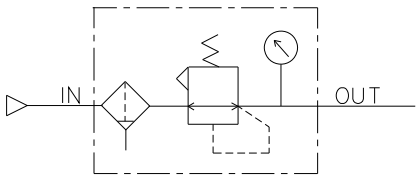


SW.1: Contact closes when valve is closed
(Double acting and Air to open)
Contact closes when valve is opened (Air to close)
SW2: Contact closes when valve is opened
(Double acting and Air to open)
Contact closes when valve is closed (Air to close)

Filter-regulator

Model	Actuation	Nominal size (mm)	Model code	Piping port size	Element filtration rating
Type 57 Type 56	Double acting Air to open Air to close	40～300	ARU2-02-8A-G	Rc 1/4	5 μm
		350、400	ARU3A-03-10A	Rc 3/8	40 μm
Type 56D	Double acting	400	ARU3A-03-10A	Rc 3/8	40 μm

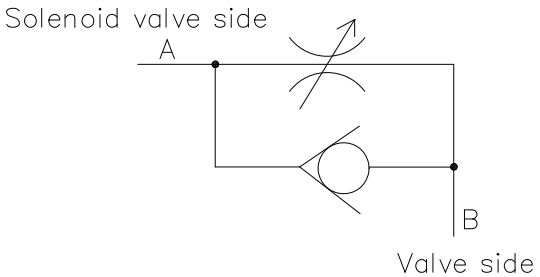
JIS symbol



Speed controller

Model	Actuation	Nominal size (mm)	Model code	Piping port size	Effective area(mm^2)		Flow adjustment needle revolution
					Free flow	Control flow	
Type 57 Type 56	Double acting Air to open Air to close	40～300	SC7-08A	Rc 1/4	11	8.3	8 rotations
		350、400	SC7-10A	Rc 3/8	16	14	
Type 56D	Double acting	400	SC6-04-10A	Rc 3/8	38	32	20 revolutions

JIS Sign

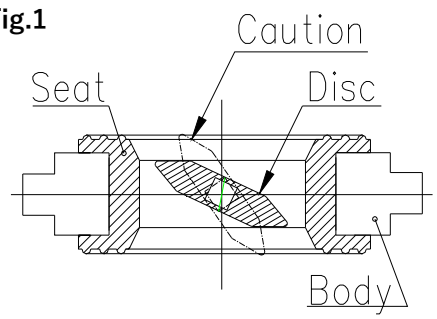


5. Piping method

Warning	
Prohibition	**Serious injury can result.** ▶ When hanging or slinging a valve, pay sufficient attention to safety, and do not enter under the load.
Forcing	**Serious injury can result.** ▶ Be sure to perform safety inspections of the machine tool and power tool beforehand. ▶ Wear appropriate protective equipment according to the type of work being performed.

Caution	
Prohibition	**The valve can be damaged or leak.** ▶ When installing piping, gaskets are basically not required. However, when connecting to a resin flange that is prone to dents, scratches, or warping, use gaskets to ensure stable sealing performance. ▶ Be careful not to overtighten the pipe support when you remove it with a U band or the like. ▶ When installing piping, do not install it in the fully closed state. (The disc may bite into the seat, causing the operation torque to become heavy and the open/close operation may become impossible.)
Forcing	**The valve can be damaged or leak.** ▶ When installing the product, make sure that no excessive stress such as tension, compression, bending or impact is applied to the piping or valve. ▶ Use a connection flange with a full-face seat. ▶ Check that the flange standards of each other are correct. ▶ When installing piping, do not install it in the fully closed state. (The disc may bite into the seat, causing the operation torque to become heavy and the open/close operation may become impossible.) ▶ Be careful when transporting or installing the disc in the condition of "CAUTION OF DAMAGE" shown in the figure, as there is a risk of damaging the sealing surface of the disc. (The disc may be damaged, resulting in improper sealing.)

Fig.1



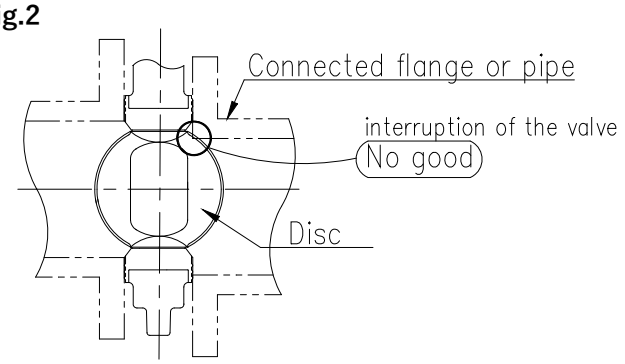
⚠Caution

Forcing

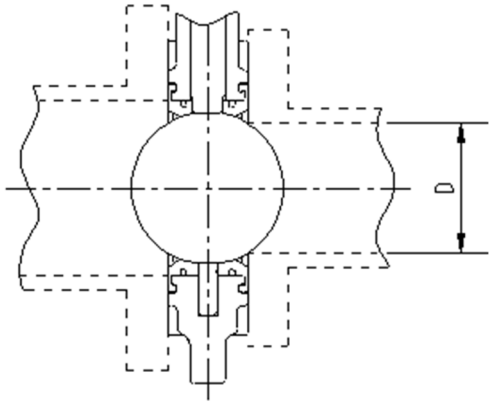
The valve can be damaged or leak.

▶ If the inner diameter of the connection (flange/pipe) is small, chamfer the inside of the connection to avoid contact between the valve Disc and the inner surface of the connection.

Fig.2



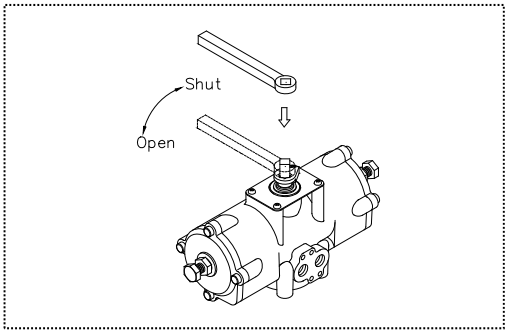
The butterfly valve is designed to be used for piping of various materials. However, especially when a large wall thickness of the connecting part (flange pipe) with the valve is used, it is necessary to chamfer the inner end of the connecting part in order to avoid contact between the valve Disc and the inner surface of the connecting part. There is no problem if the inner diameter of the connecting part is equal to or greater than the following value.



Nominal size (mm)	Bore diameter D (mm)
40	31
50	43
65	57
80	67
100	91
125	115
150	137
200	179
250	231
300	280
350	333
400	370

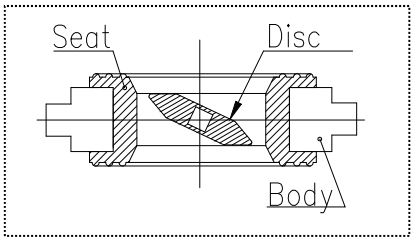
Preparations	▶ Torque Wrench ▶ Through bolts, nuts, and washers (see dimensions on page 20) ▶ Lever-handle for TA (sold separately) or wrench

[Procedure]



1) <**TA type**>
Slightly open the disc [2] with TA lever handle (optional) or wrench.
(When the actuator is restored)

<**TW type**>
Set the valve to the half-open state.
※Make sure that the disc [2] does not protrude from between the seat surfaces.
(The disc [2] may be damaged.)



2) Set the valve between the connecting flanges.

3) Temporarily set by hand with through bolts, nuts, and washers for connection.

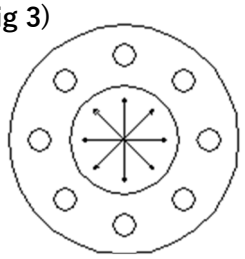
4) Gradually tighten to the specified torque value diagonally (see Fig. 3) with a torque wrench.

⚠Caution

Forcing

The valve can be damaged or leak.
▶ Tighten the bolts and nuts of the connection flange diagonally to the specified torque.

(Fig 3)



Specified torque value Units: N•m {kgf・cm}

Nominal size	40mm	50、65 mm	80、100 mm	125、150 mm
Torque value	20.0{204}	22.5{230}	30.0{306}	40.0{408}

Nominal size	200、250 mm	300、350 mm	400mm
Torque value	55.0{561}	60.0{612}	80.0{816}

Dimensions of through bolt (bolt A) and screw-in bolt (bolt B)

▼JIS10K

Nominal size (mm)	Bolt A			Bolt B		Quantity		
	D	L (mm)	S (mm)	D1	L1 (mm)	Bolt A	Bolt B	Nut and washer
40	M16	115	40	-	-	4	-	8
50		125						
65		135	45					
80		135				8		16
100		145						
125	M20	165	50					
150		175	55					
200		195				12		24
250	M22	225	60					
300		245				16		32
350		255	65					
400	M24	290	60	M24	120	14	4	32

Note 1. "Cast iron pipe flange" where the Nominal size 40～350mm is AVTS and the Nominal size 400mm is JIS B 2220.Dimensions when nominal 10K type is used.

Note 2. The quantity of nuts and washers is 2 sets in the case of bolt A (1 bolt/2 nuts, 2 washers), Quantity of one set (1 bolt/1 nut, 1 washer) in case of bolt B.

▼JIS5K

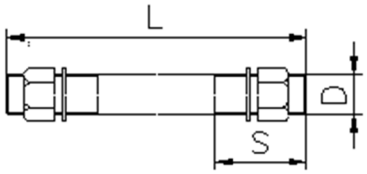
Nominal size (mm)	Bolt A			Bolt B		Quantity		
	D	L (mm)	S (mm)	D1	L1 (mm)	Bolt A	Bolt B	Nut and washer
40	M12	100	30	-	-	4	-	8
50		105						
65		110						
80	M16	120	35					
100		130	40			8	-	16
125		140						
150		150						
200	M20	195	55					
250		225				12	-	24
300		240						
350		245	60					
400	M22	260	55			16	-	32

Note 1. "Cast iron pipe flange" where the Nominal size 40～350mm is AVTS and the Nominal size 400mm is JIS B 2220.Dimensions when nominal 5K is used.

Note 2. The quantity of nuts and washers is the quantity of two sets (one bolt/two nuts and two washers) in the case of bolt A.

Note 1. The above values are the dimensions when the Nominal size 40～350mm is AVTS and the Nominal size 400mm is JIS G 5527 "Ductile cast iron deformed pipe" nominal pressure 7.5K is used.
Note 2. The quantity of nuts and washers is the quantity of two sets (one bolt/two nuts and two washers) in the case of bolt A.

Bolt A



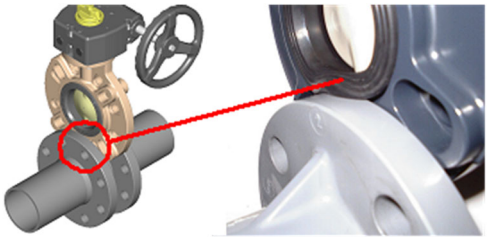
Bolt B

⚠Caution

Forcing

The valve can be damaged, or leak.

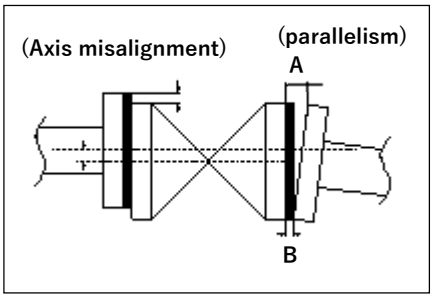
▶ When inserting the valve between the flanges, fully widen the space between the faces before inserting.
(If the valve is forcibly inserted without sufficiently expanding the space between the flanges, the seat may be flipped off and scratches may occur.)



▶ Flange surface parallelism and shaft misalignment should be less than the values shown in the table below.

Units: mm

Nominal size	Shaft misalignment	Parallelism (a-b)
40～80	1.0	0.8
100～150	1.0	1.0
200～400	1.5	1.0



6. Support installation method

⚠Caution	
Prohibition	**The valve can be damaged or leak.** ▶ Do not cause large vibrations to the valve by the piping around the pump.
Forcing	**The valve can be damaged or leak.** ▶ Install a valve support.

Preparations ▶ Wrench ▶ U-band (with bolt) ▶ Rubber sheet

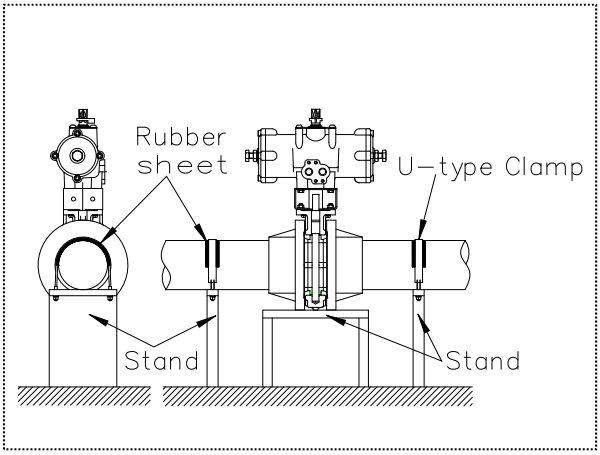
Horizontal piping

[Procedure]

Place the frame under the valve.

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

(Support installation example)



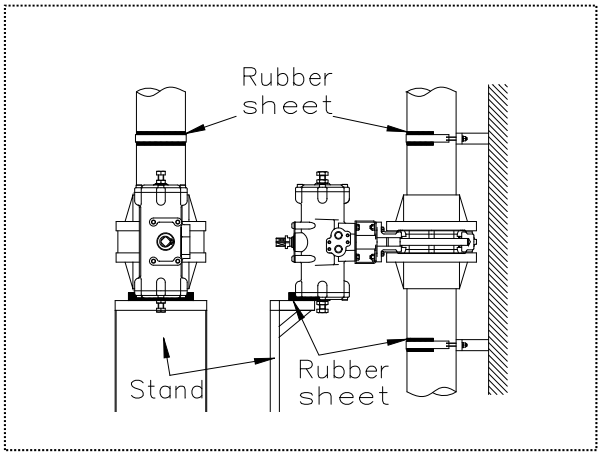
Vertical piping

[Procedure]

Place a rubber sheet on the actuator and install the frame.

Lay a rubber sheet on the pipe and secure it with the U-band.

(Support installation example)



7. Air piping method

Without option or with speed controller

⚠Caution	
Prohibition	**The valve can be damaged or leak.** ▶ Do not remove the protective plug until just before connecting the air piping. ▶ Do not over-tighten the Joint for air piping.
Forcing	**The valve can be damaged or leak.** ▶ Check the connection location, air piping size, and screw type from the approval drawing of the product, and then connect the air piping. ▶ Use clean, dehumidified and dust-free air. Consult with CKD when using high dry air with a dew point of-40° C or less. ▶ When using at an ambient temperature of 5° C or less, remove moisture from the operation air to prevent freezing. ▶ When using steel pipes for air piping, use the inner surface of the pipe treated with anti-rust treatment. ▶ Flush the inside of the air piping thoroughly before connecting the air piping. ▶ When connecting the air piping, be careful that foreign matter, such as sealant, does not enter the piping. ▶ Be sure to remove burrs on the threads of the pipe Joints. (This may cause galling or air leakage.)

Preparations	▶ Copper or tube for air piping ▶ Wrench ▶ Copper or tube Joints ▶ Sealing tape (other than sealing tape may leak)

[Procedure]

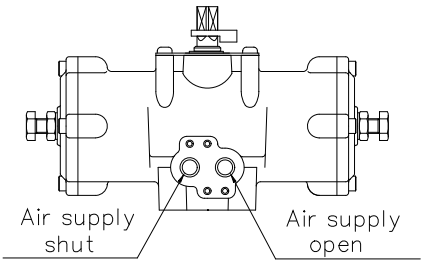
1) Wrap sealing tape around the male thread of the Joint, leaving approximately 3mm at the end.

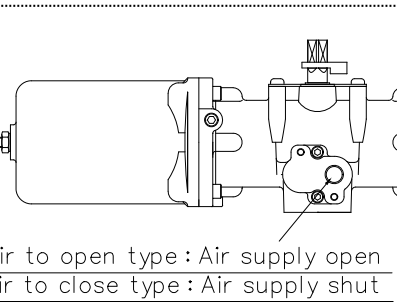
2) Tighten the Joint to the piping port of the actuator.

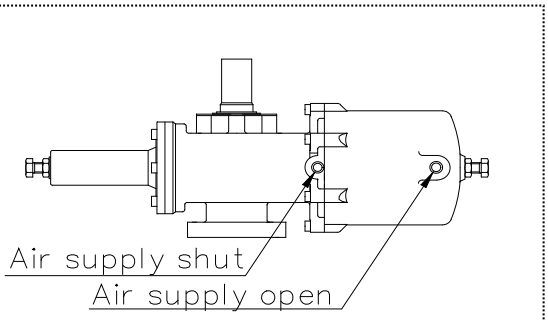
3) Screw the Joint in one turn with a wrench.

4) Install copper or tube tubes for air piping.

※Picture is without speed controller, but piping procedure is the same.







With solenoid valve and regulator with filter

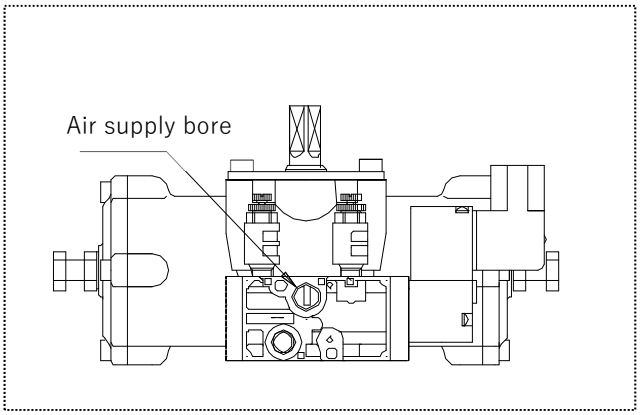
⚠Caution	
Prohibition	**The valve can be damaged or leak.** ▶ Do not remove the protective plug until just before connecting the air piping. ▶ Do not over-tighten the Joint for air piping.
Forcing	**The valve can be damaged or leak.** ▶ When using steel pipes for air piping, use the inner surface of the pipe treated with anti-rust treatment. ▶ Flush the inside of the air piping thoroughly before connecting the air piping. ▶ When connecting the air piping, be careful that foreign matter, such as sealant, does not enter the piping. ▶ Be sure to remove burrs on the threads of the pipe Joints. (This may cause gargling or air leakage.) ▶ Be sure to lock the adjustment knob of the solenoid valve after adjustment. ▶ Regularly drain the drain from the pressure regulator with filter. ▶ Set the secondary pressure of the regulator with filter according to the equipment specifications. (Otherwise, malfunction or failure may result.)

Preparations	▶ Copper or tube for air piping ▶ Copper or tube Joints ▶ Sealing tape (other than sealing tape may leak) ▶ Wrench

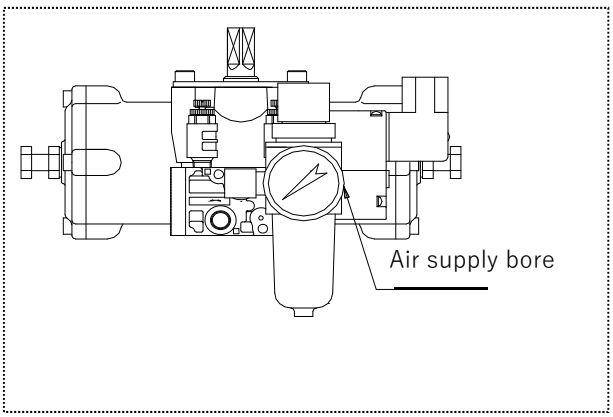
[Procedure]

1) Wrap sealing tape around the male thread of the Joint, leaving approximately 3mm at the end.
2) Tighten the Joint to the air piping port (see Fig. 1 to Fig. 4) with a Joint.
3) Screw the Joint in one turn with a wrench.
4) Install copper or tube tubes for air piping.

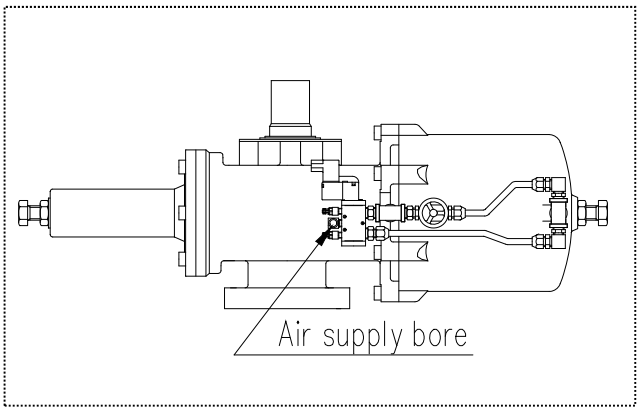
(Fig. 1) With TA type solenoid valve



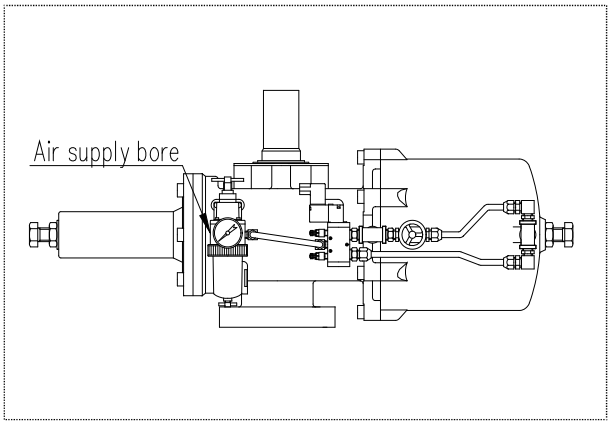
(Fig. 2) TA type solenoid valve /pressure regulator with



(Fig. 3) With TW type solenoid valve



(Fig. 4) TW type solenoid valve /pressure regulator with fi lter



8. Standard Option Wiring Method

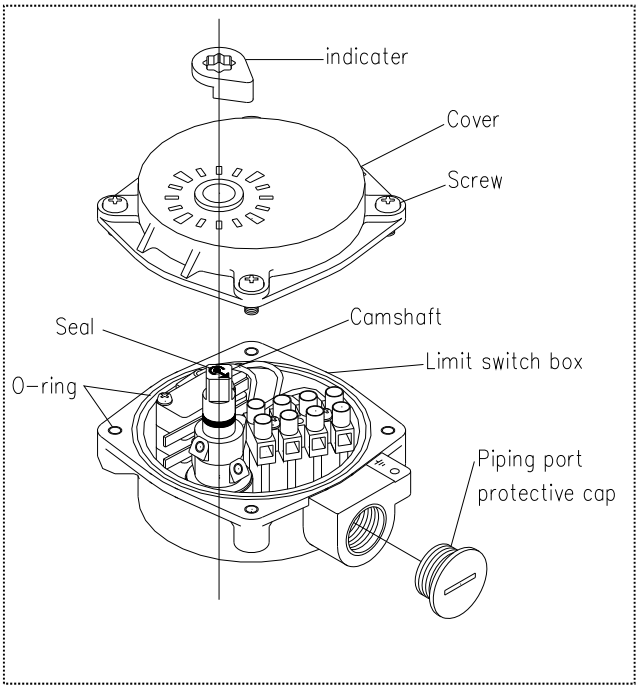
Limit switch

⚠Caution	
Prohibition	**Serious injury can result.** ▶ Do not connect or separate lines to the limit switch in the power supply status. (electric shock or sudden start of the machine) **The valve can be damaged or leak.** ▶ Do not leave or use with the cover open. (Water or dust may penetrate and cause operation failure.)
Forcing	**The valve can be damaged or leak.** ▶ Connect the wires using solderless terminals with insulation covering so that they do not come into contact with the cover or housing. (If the crimp terminal comes into contact with the cover, the cover may not be tightened or a ground fault may occur.) ▶ Contact CKD when using the limit switch in a 1mA～100mA, 5～30V. ▶ Securely attach the cover. (Rainwater, etc. may enter the product and cause malfunction.)

<Type TA>

Preparations	▶ Phillips screwdriver ▶ Connector (G1/2) ▶ Flat-blade screwdriver ▶ Wire stripper

[Procedure]



1) Remove the pointer by hand.

2) Loosen the four screws holding the lid with a Phillips screwdriver and remove them.
※Do not lose the O-ring.

3) Turn the pipe port protection cap counterclockwise to remove it.

4) Pass the cable through the connector.

5) Peel off the outer skin of the cable with a wire stripper

6) Wire the terminal screw with a flathead screwdriver according to the internal circuit diagram on page 15.

7) Tighten the connector to secure the cable.

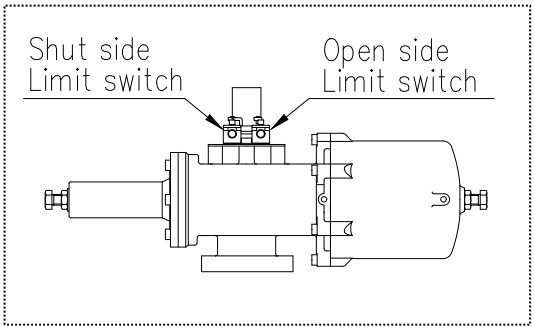
8) After attaching the lid, tighten the four screws alternately and evenly with a Phillips screwdriver.

9) Insert the pointer so that the direction of the seal arrow on the camshaft head matches the direction of the pointer.

<Type TW>

Preparations	▶ Phillips screwdriver	▶ Connector (G1/2)	▶ Crimp terminal
	▶ Crimp Contact Tool	▶ Wire stripper	

[Procedure]

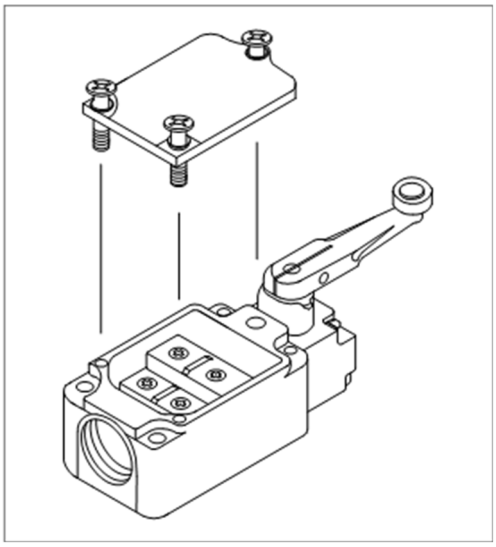


1) Loosen the three screws holding the limit switch cover with a Phillips screwdriver and remove the cover.
(The screws are structured so that they do not come off the cover.)

2) Pull out the resin protective cap.

3) Pass the cable through the connector.

4) Peel off the outer skin of the cable with a wire stripper.



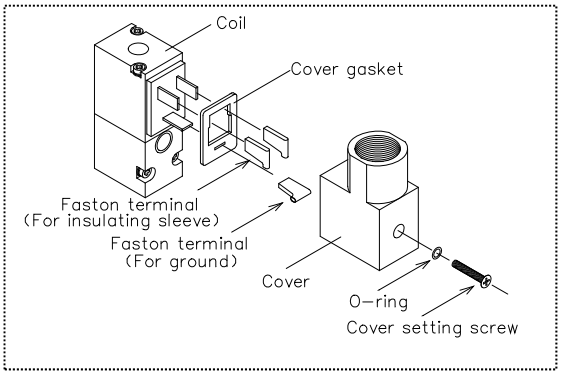
5) Wire the terminal screw with a flathead screwdriver according to the internal circuit diagram on page 15.
※Tighten the screws securely.
(There is a risk of electric leakage or electric shock.)

Solenoid valve

⚠Caution	
Prohibition	**Serious injury can result.** ▶ Do not connect or separate lines to the solenoid valves in the power supply status. Doing so may result in electric shock or sudden machine start.
Forcing	**The valve can be damaged or leak.** ▶ Be sure to lock the adjustment knob of the solenoid valve after adjustment. ▶ Confirm that the power supply voltage indicated on the solenoid valve matches the voltage to be wired.

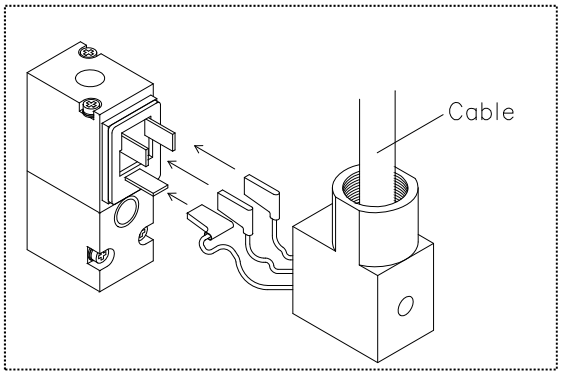
Preparations	▶ Phillips screwdriver ▶ Terminal crimping tool ▶ Connector (G1/2) ▶ Wire stripper

[Procedure]



1) Loosen the cover setscrew with a Phillips screwdriver and remove the cover.
※Do not lose the O-ring.

2) Pull out the Faston terminal and the insulation cover inserted in the coil side terminal.
※The grounding terminal is not provided with an insulating sleeve.



3) Pass the cables in the order of the connector and cover.

4) Peel off the outer skin of the cable with a wire stripper.

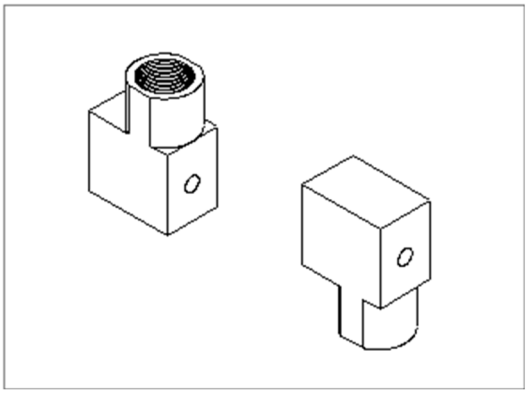
5) Pass the lead wire through the insulation cover.

6) Use a terminal crimping tool to attach the Faston terminal to the lead wire.

7) Insert the Faston terminal into the coil side terminal and put the insulation cover on.

8) Attach the cover by tightening the cover set screw with a Phillips screwdriver.
[The cover can be attached with the wiring outlet facing up or down.(Fig.1)]

(Fig 1)



9) Tighten the cable with the connector.

9. Commissioning method

Manual override (double acting)

⚠ Warning	
Prohibition	**Serious injury can result.** ▶ Do not supply air during manual operation. (Risk of injury)

⚠ Caution	
Prohibition	**The valve can be damaged or leak.** ▶ Do not force TA type lever-handle (optional item) or wrench to rotate further from the fully open/closed position. (It will malfunction.)

<Type TA>

Preparations	▶ Lever-handle for TA (sold separately) or wrench

[Procedure]

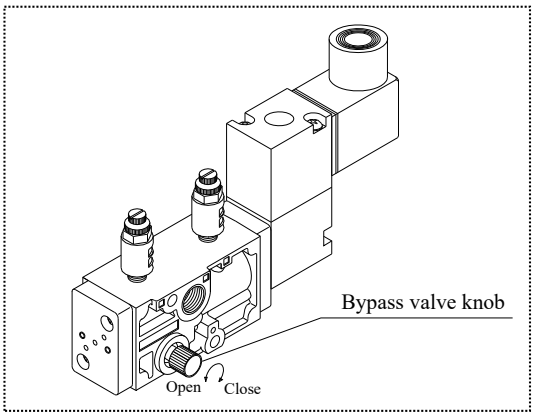
※For models with a solenoid valve, turn the knob of the bypass valve counterclockwise. (Opening and closing operations are not possible)

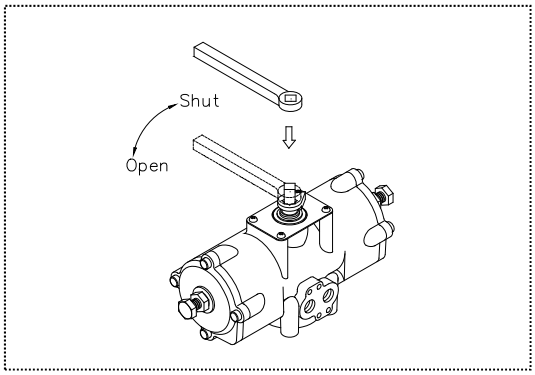
1) Engage TA type lever handle (optional) or wrench with the upper output shaft of the actuator, and fully open ⇔ fully close once or twice while looking at the valve travel indicator.

Rotate Right (Clockwise) ⇨ Closing direction
Left Rotation (Counterturn) ⇨ Open direction

2) Fully open or closed to remove TA type lever-handle (sold separately) or wrench from the upper output shaft of the actuator.
※For models with a solenoid valve, turn the knob of the bypass valve clockwise. (Air leaks)

With a solenoid valve



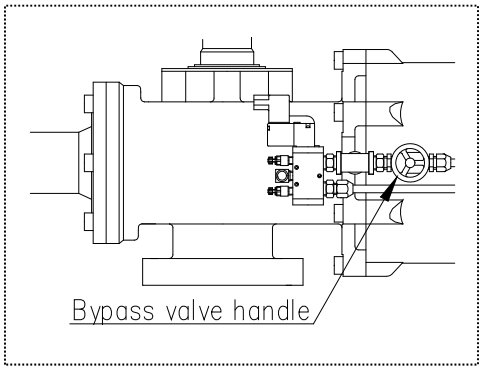


<Type TW>

Preparations ▶ Padlock key

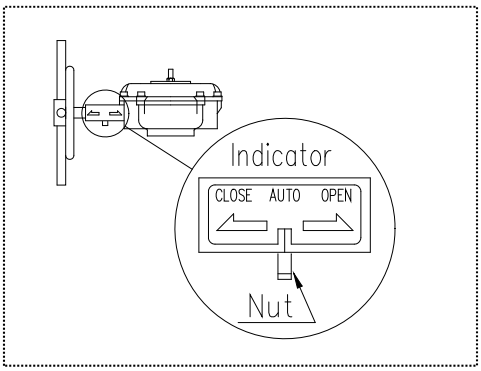
[Procedure]

*For models with a solenoid valve, turn the bypass valve handle to the left. (Opening and closing operations are not possible)



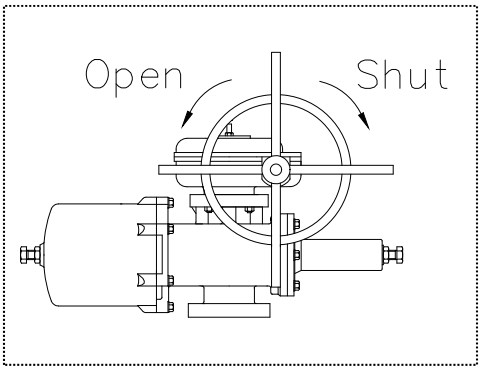
1) Open the padlock with a key to remove the chain.

2) ully open ⇔ fully close while looking at the opening finger meter.
Rotate Right (Clockwise) ⇨ Closing direction
Left rotation (counterclockwise) ⇨ Open direction
Handle revolution; approx. 13 revolutions
※When opening from OPEN to CLOSE or from CLOSE,
There is a "idling" of about 13 revolutions.



3) Turn the handwheel to align the nut with the "AUTO" on the indicator.

4) Pass the chain through the handle and the gear case and connect it with the padlock to lock the handle.
※For models with a solenoid valve, turn the knob of the bypass valve clockwise. (Air leaks)



Manual override (Single action)

⚠ Warning	
Prohibition	Serious injury can result. ▶ Do not supply air during manual operation.

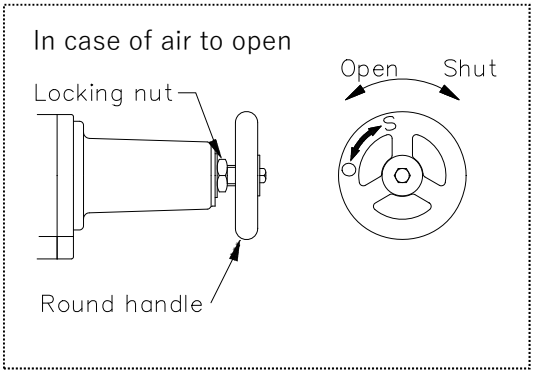
Preparations ▶ Wrench

[Procedure]

1) Loosen the lock nut with a spanner to remove it.

2) Turn the manual operation round handle while looking at the opening finger meter to fully open ⇔ fully close 1 to 2 times.

Round handle rotation direction	Reverse action	Direct action
Rotate Right (Clockwise)	Closing direction	Open direction
Left Rotation (Counterturn)	Open direction	Closing direction



Handle revolutions

Nominal size (mm)	40、50	65、80	100	125、150	200	250、300	350、400
Handle revolutions (Rotate)	About 24	About 25	About 27	About 28	About 36	About 38	About 40

3) Turn the round handle for manual operation clockwise until it is fully opened and fully closed.

4) Tighten the lock nut with a spanner.

Automatic operation

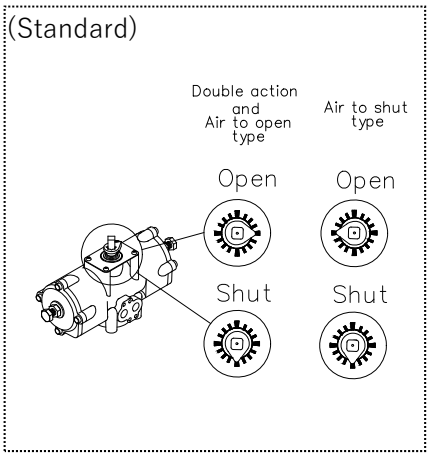
⚠ Warning	
Prohibition	**Serious injury can result.** ▶ Check that the spanner for manual operation is not mated with the upper output shaft of the actuator. (The wrench may be touched and cause injury.)

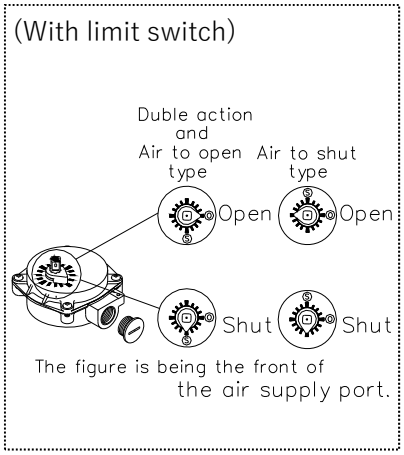
⚠ Caution	
Forcing	**The valve can be damaged or leak.** ▶ Always use the product within the indicated product specifications. (May not operate)

<Type TA>

[Procedure]

1) Supplies air to the air piping port.
2) Check that the air supply side and the display position match.
   ※The position of the pointer when fully closed may not reach the position shown in the figure slightly due to the tightening interference of the disc [2].
3) Stop the air supply.



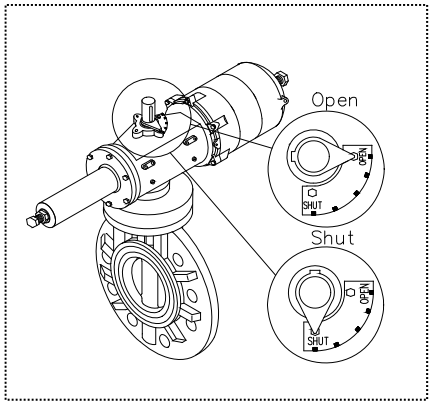


<Type TW>

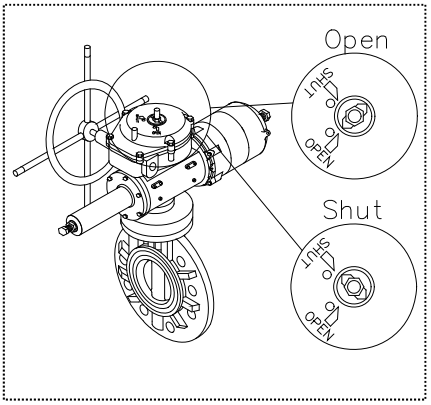
[Procedure]

1) Supplies air to the air piping port.
2) Check that the air supply side and the display position match.
(Refer to the figure below for the status of display depending on each model and specification.)
※The position of the pointer when fully closed may not reach the position shown in the figure slightly due to the tightening interference of the disc [2].
3) Stop the air supply.

(Standard)



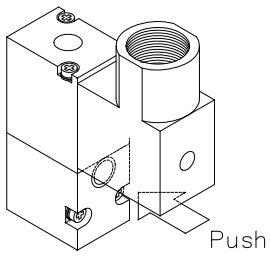
(With manual operating option)



<For models with solenoid valve>

[Procedure]

1) Supplies air to the solenoid valve.
2) Confirm the operation shown in the table below by pressing the push button (Fig. 1) below the solenoid valve terminal cover with your finger.
3) Confirm that the solenoid valve operates as shown in the table below by energizing or de-energizing.
4) Turn off the power to the solenoid valve.



(Fig 1)

Push button	Power supply	Recovery/ Single action (Air to open)	Single action (Air to close)
Press	Energizing	Valve fully open	Valve fully closed
Do not press	De-energizing	Valve fully closed	Valve fully open

Adjusting Opening/Closing Speed

⚠Caution	
Prohibition	Doing so may damage the solenoid valve. ▶ Be sure to lock the adjustment knob of the solenoid valve after adjustment. (Do not tighten the lock nut with excessive force.)

Preparations ▶ Wrench

<**Return**>

[**Procedure**]

1) While holding the speed controller adjustment knob of both open and close with your fingers, rotate the lock nut counterclockwise with a spanner to release the adjustment knob.

2) Turn the adjustment knob clockwise until it does not turn.

3) Supplies air to the solenoid valve.

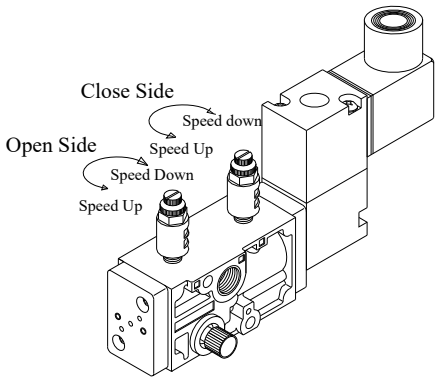
4) Energize the solenoid valve and turn the adjusting knob of the open-side speed controller counterclockwise little by little.

5) Turn off the solenoid valve side and turn the adjusting knob of the closed side speed controller counterclockwise little by little.

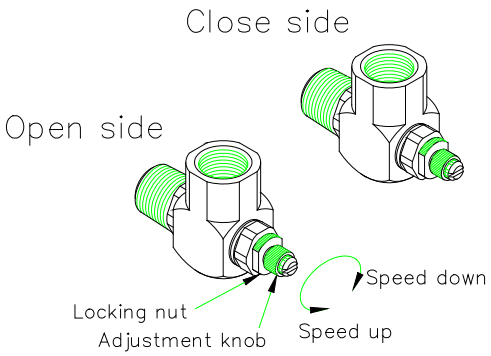
6) Repeat steps 4) and 5) to set the desired opening/closing speed.

7) When the desired speed is achieved, hold the adjustment knob with your finger and rotate the lock nut clockwise with the spanner to secure the adjustment knob.

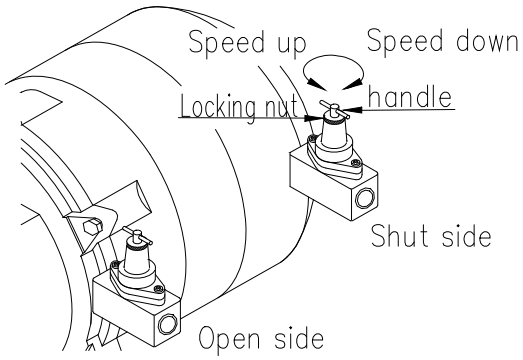
With a solenoid valve



For models with speed controller



(Type TW)



<**Single action**>

Actuation type	Speed at which it opened	Speed at which it closes
Air to open	Cannot adjust	Can be adjusted
Air to close	Can be adjusted	Cannot adjust

[**Procedure**]

1) While holding the speed controller adjustment knob of both open and close with your fingers, rotate the lock nut counterclockwise with a spanner to release the adjustment knob.

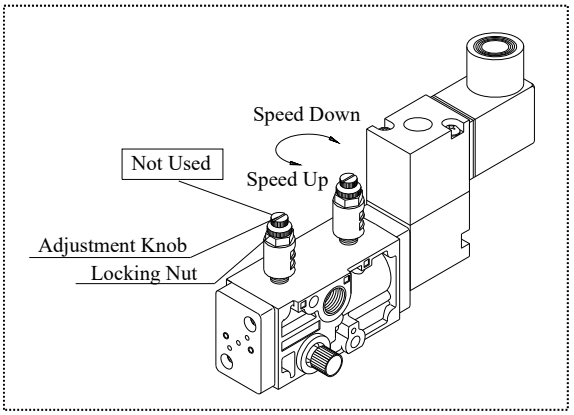
2) Turn the adjustment knob clockwise until it does not turn.

3) Supplies air to the solenoid valve.

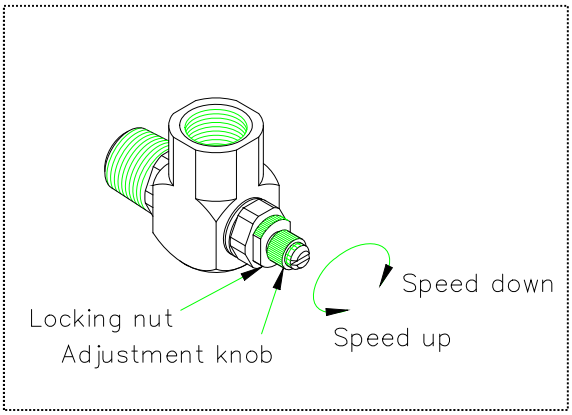
4) After energizing the solenoid valve, turn off the power, and turn the speed controller adjustment knob counterclockwise little by little to match the desired opening/closing speed.

5) When the desired speed is achieved, hold the adjustment knob with your finger and rotate the lock nut clockwise with the spanner to secure the adjustment knob.

With a solenoid valve



For models with speed controller



10. How to disassemble/assemble for parts replacement

Warning	
Prohibition	**Serious injury can result.** ▶ Wear appropriate protective equipment for the work details when installing piping.

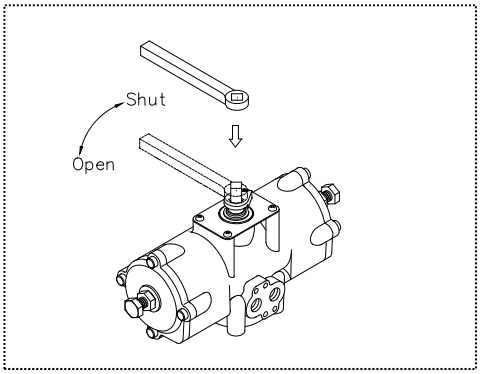
Caution	
Forcing	**The valve can be damaged or leak.** ▶ When installing the product, make sure that no excessive stress such as tension, compression, bending or impact is applied to the piping or valve. ▶ When replacing the valve, reduce the fluid pressure to zero and completely drain the fluid from the piping.

40～350mm

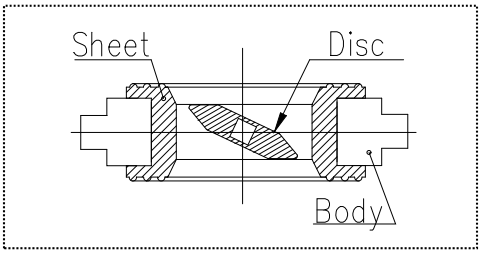
Preparations	▶ Jack ▶ pipe ▶ plate ▶ pliers ▶ silicone grease ▶ hex key ▶ Thrust bearing ▶ Phillips screwdriver ▶ Flat head screwdriver ▶ Protective gloves ▶ Protective glasses

<**Disassembly**>

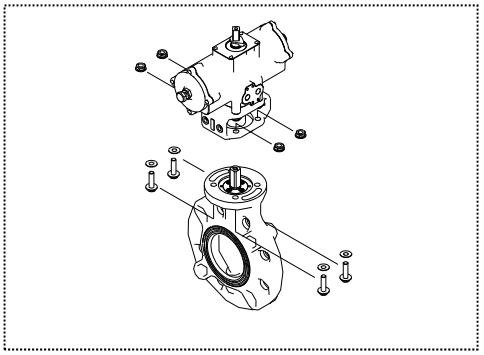
[**Procedure**]



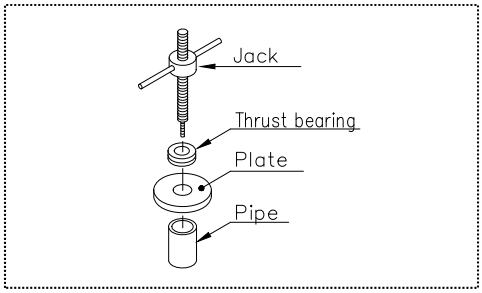
1) Completely drain the fluid in the piping.
2) Fully close the valve by air or manual operation.
3) Tighten the air source valve and open the bypass valve to exhaust air from the actuator.
4) Disconnect air piping.
5) Slightly open the valve with the hand lever handle (return only).
6) Loosen the connecting bolts and nuts and remove the valve.
7) Loosen the screw (C) [37a] with a hex key.
8) Remove bolts and nuts (A) [39], and remove actuator [35] and mount [30] from body [1].
※At this point the mounting [30] is secured to the actuator [35]
I do.

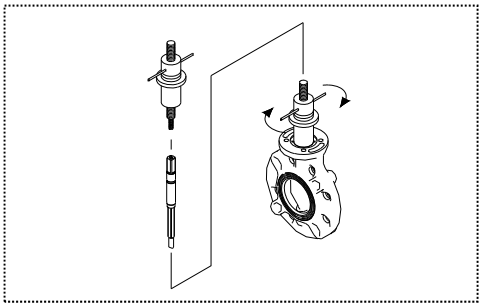


9) Use a Phillips screwdriver to remove the Stem Holder [8].
10) For Nominal size 40mm～100mm
Remove stem [7] with pliers or hands.
For Nominal size 125mm～350mm
Attach the jack, thrust bearing, plate, and pipe to the valve, screw the jack shaft into the stem [7], and turn the handle of the jack to remove the stem [7].



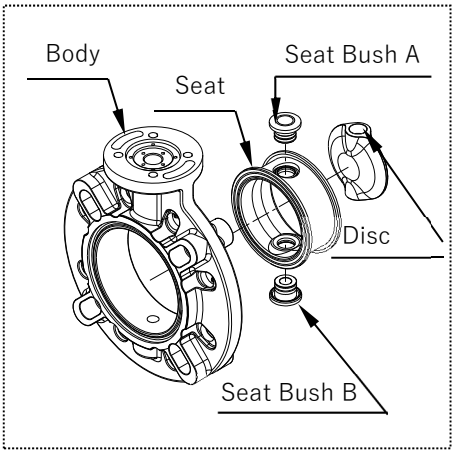
11) Put the disc [2] in the fully open state.
12) Use a flat-blade screwdriver to create a gap between the body [1] and the sheet [3]. Insert a flat-blade screwdriver or a Phillips screwdriver into the gap and remove the sheet [3] and the disc [2] by pushing them out.
13) Remove the disc [2], seat bush A [183] and seat bush B [184] from the seat [3].
14) Remove O-ring (C) [6] and O-ring (I) [185].





<**Assembly**>

[**Procedure**]



1) Before assembly, apply silicone grease to O-rings (C) [6] and O-rings (I) [185].

2) Install O-ring (C) [6] on stem [7], and O-ring (I) [185] on seat bush A [183] and seat bush B [184].

3) Apply silicone grease to disc [2] and sheet [3] (sliding section).

4) Mount the disc [2] on the inside of the seat [3] and the seat bushes A [183] and B [184] on the outside. (The attached one is referred to as the sheet disc set below.)
※The seat [3] can be deformed into an ellipse for smooth attachment.

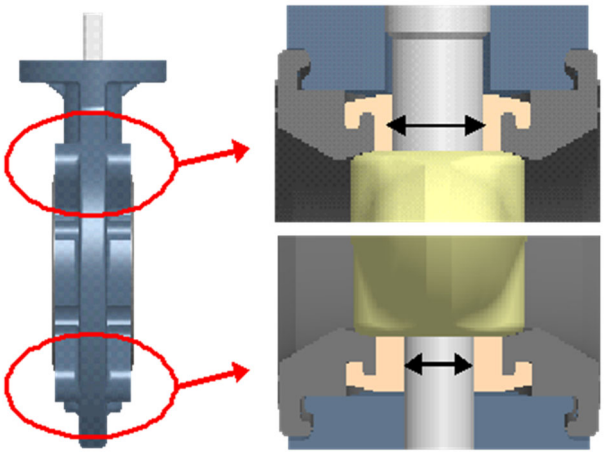
5) Put the disc [2] of the seat disc set in half-open position, align the stem hole of the body [1] with the stem hole of the seat disc set and fit the seat [3] inside the body [1].

⚠Caution

Forcing

The valve can be damaged or leak.

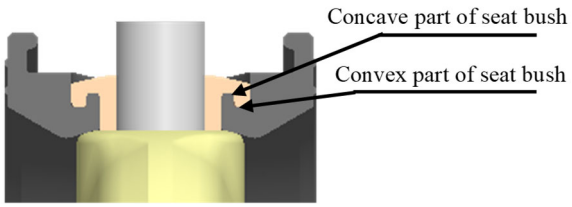
▶ Note that the size of the shaft holes for sheet bush A [183] and sheet bush B [184] of the sheet/Disc set differs. Sheet bush A [183] (shaft hole "large") is at the top. If assembled upside down, the stem [7] cannot be inserted.



Shaft bore "Large" is at the top.

The shaft hole "Small" is at the bottom.

▶ After inserting into the body, make sure that the convex part of the seat shaft hole and the convex part of the seat bush are not detached.



6) Insert stem [7].

7) Tighten the Stem Holder [8] with the flat side facing downwards and with the setscrew (F) in the groove of the body [1].

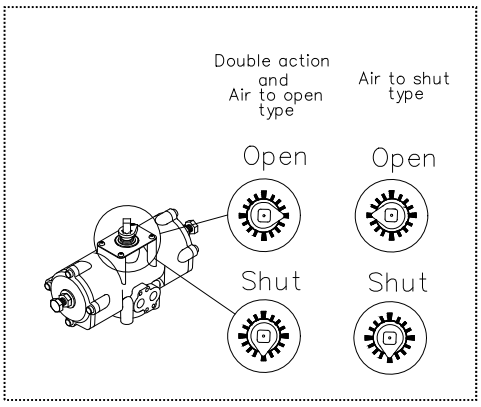
8) Align the positions of the bolt holes on the actuator [35] and Standr [30], and install the bolts (E) [38] and bolts and nuts (A) [39]. (Refer to the specified tightening torque table.)
※Check that the actuator position indication and the disc orientation match.

9) After assembly is complete, perform manual operation and check if the disc [2] fits sufficiently in the seat [3].

10) Check the operation with air (see page 36).

Tightening torque for bolts and nuts (A)

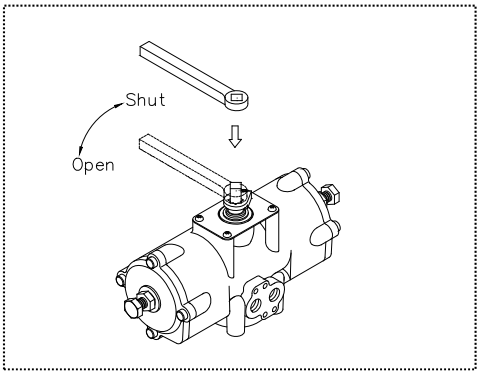
Nominal size	Tightening torque
40-100mm	20N・m
125-350mm	40N・m



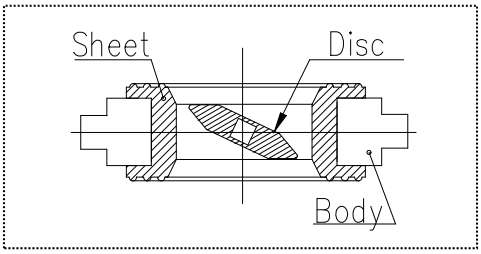
400mm

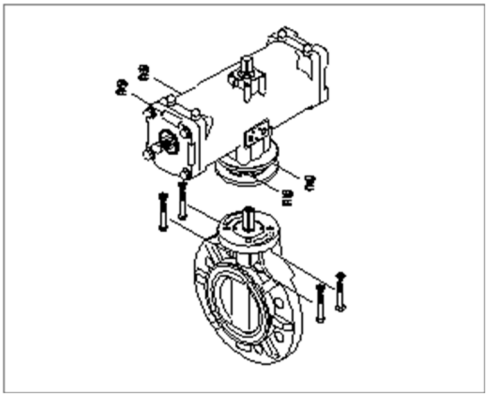
Preparations	▶ Jack ▶ Pipe ▶ Plate ▶ Pliers ▶ Thrust Bearing ▶ Hex Key ▶ Protective Gloves ▶ Protective Glasses

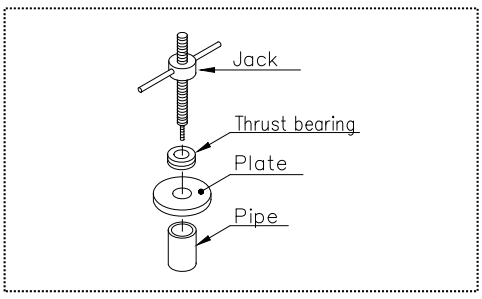
<T TA>
<Disassembly>
[Procedure]

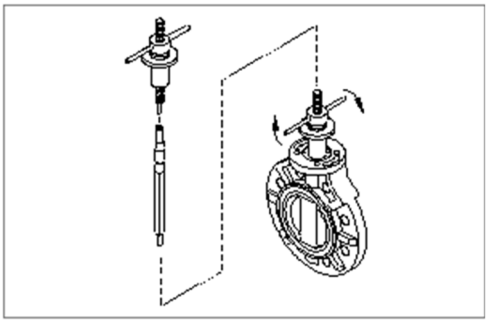


1) Completely drain the fluid in the piping.
2) Fully close the valve by air or manual operation.
3) Tighten the air source valve and open the bypass valve to exhaust air from the actuator.
4) Disconnect air piping.
5) Slightly open the valve with the hand lever handle (return only).
6) Loosen and remove the connecting bolts and nuts.
7) Remove the valve from the piping.
8) Loosen the screw (C) [37a].
9) Loosen bolts and nuts (P) [39] and remove body [1] and actuator [35].
※At this point, the Stand [30] is fixed to the actuator [35].
10) Attach the jack, thrust bearing, plate and pipe to the valve and screw the jack shaft into the stem [7].
11) Turn jack handle to remove stem [7].
12) Remove stem [7] from jack.
13) Remove the O-ring (C) [6].
14) Put the disc [2] in the fully open state.
15) Pull out both ends of the sheet [3] and remove the sheet [3] and the disc [2] gradually while shaking them.
16) Remove disc [2] from sheet [3].
17) Take out O-ring (A) [4] and O-ring (B) [5].









<**Assembly**>
[**Procedure**]

1) Before assembly, apply silicone grease to O-rings (A) [4], O-rings (B) [5], and O-rings (C) [6].

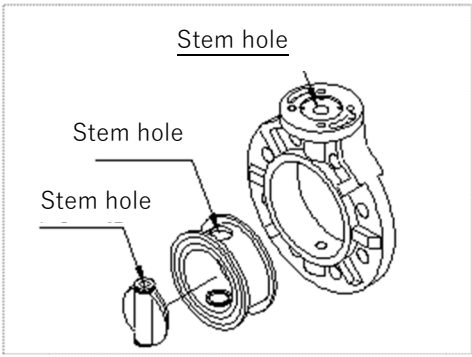
2) Assemble the parts in the reverse order from 17) of disassembly on page 44.

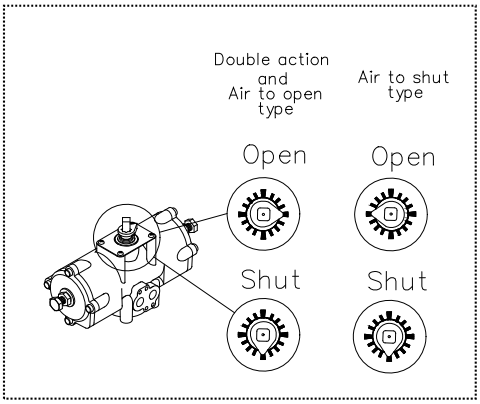
3) However, when inserting the sheet [3] with the disc [2] set into the body [1], insert the outer rim of the sheet [3] inside the body [1] around the hole direction of the stem [7] (align the stem hole positions of the body [1] and the sheet [3]) and hold it in place by hand.

4) Carry out manual operation (see page 33) and check if the disc [2] fits sufficiently in the seat [3].

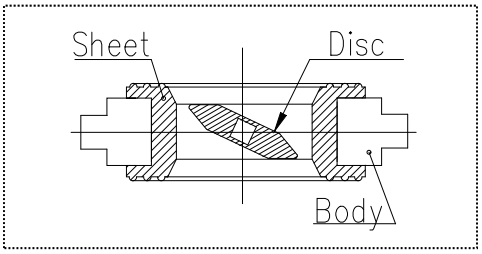
5) Check whether the opening of the disc [2] and the value indicated by the valve gauge are correct.

6) Check the operation with air (see page 36).
※If the degree of opening and the position gauge are misaligned, adjust according to 13. Stopper Adjustment Method on page 48.





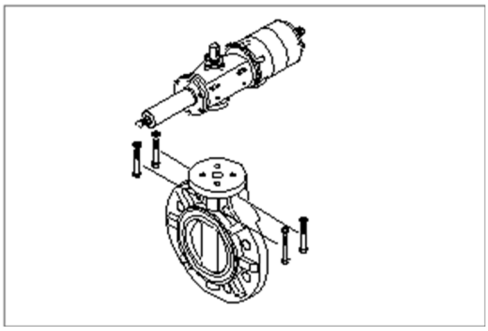
<Type TW>
<Disassembly>
[Procedure]



1) Completely drain the fluid in the piping.

2) Fully close the valve by air or manual operation.

3) Tighten the air source valve and open the bypass valve to exhaust air from the actuator.

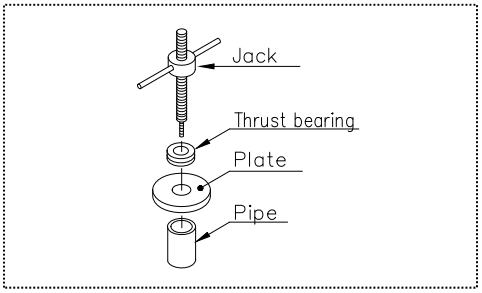


4) Disconnect air piping.

5) Slightly open the valve with the manual lever handle.

6) Loosen and remove the connecting bolts and nuts.

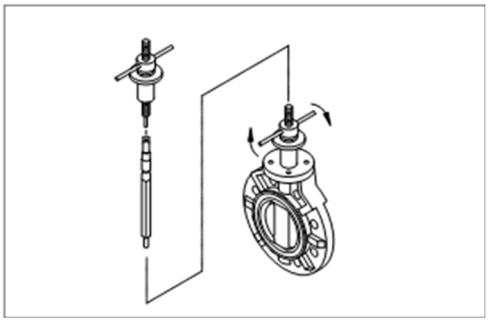
7) Remove the valve from the piping.



8) Loosen screws (E) [38] and remove body [1] and actuator [35].

9) Attach the jack, thrust bearing, plate and pipe to the valve and screw the jack shaft into the stem [7]. Turn jack handle to remove stem [7].

10) Remove stem [7] from jack.



11) Remove the O-ring (C) [6].

12) Put the disc [2] in the fully open state.

13) Pull out both ends of the sheet [3] and remove the sheet [3] and the disc [2] gradually while shaking them.

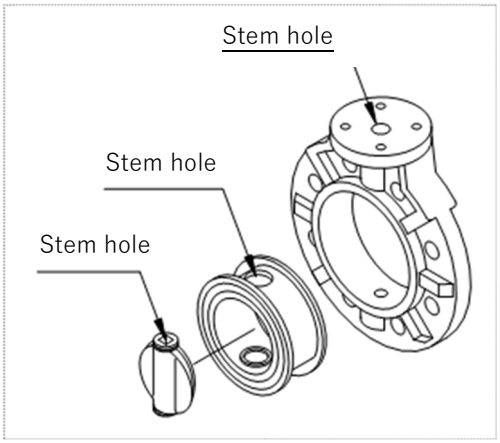
14) Remove disc [2] from sheet [3].

15) Take out O-ring (A) [4] and O-ring (B) [5].

<**Assembly**>
[**Procedure**]

1) Before assembly, apply silicone grease to O-rings (A) [4], O-rings (B) [5], and O-rings (C) [6].

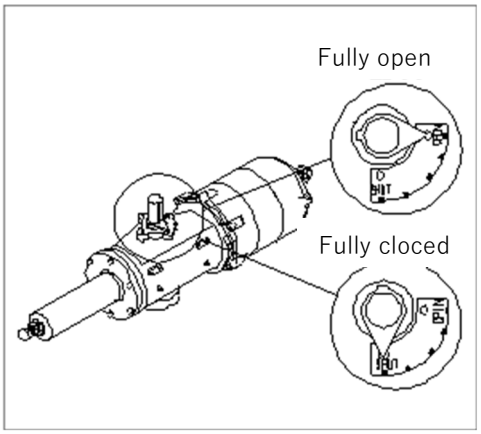
2) Assemble the parts in reverse order from Disassembly on page 46, 15).
However, when inserting the sheet [3] on which the disc [2] is set into the body [1], half-open the disc [2], align the stem hole positions of the body [1] and the sheet [3], place the outer rim of the sheet [3] inside the body [1], and insert it while holding it by hand.



3) After assembly, perform manual operation (see page 33) and check if the disc [2] fits sufficiently into the seat [3].

4) Check that the travel of the disc [2] and the gauge are aligned.

5) Check the operation with air (see page 36).
※If the stopper is misaligned, adjust it according to "13. How to adjust the stopper".



11. How to adjust the stopper

Warning	
Prohibition	**Serious injury can result.** ▶ Do not supply air during adjustment. (Risk of injury)
Forcing	**The valve can be damaged or leak.** ▶ Be sure to lock the stopper with the lock nut after adjustment. (Do not use excessive force to tighten.)

Preparations ▶ Wrench

[Procedure]

1) Close the air source valve and open the bypass valve to exhaust the air in the actuator.

2) Attach and hold a spanner or hex wrench to the stopper of the opening to be adjusted (fully open or closed), and slowly loosen the lock nut with the spanner.
※Do not damage the washer with gasket.
(Otherwise, air leakage may occur.)

3) Rotate the stopper with a spanner or hex wrench in the direction you want to adjust.

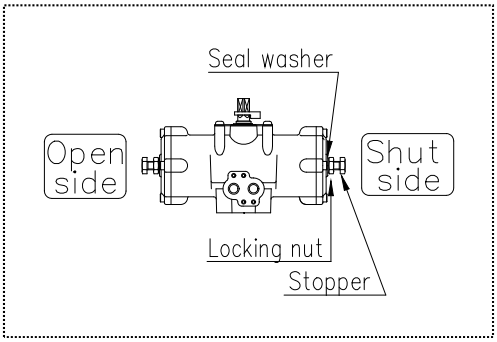
Direction to adjust	Rotate clockwise (clockwise)	Rotate Left (counterclockwise)
Open side	Decrease the opening	Increase the opening
Closed side	Increase the opening	Decrease the opening

4) Rotate the stopper with a spanner in the direction you want to adjust.
※Do not over tighten. (The washer with gasket may be damaged and air leakage may occur.)

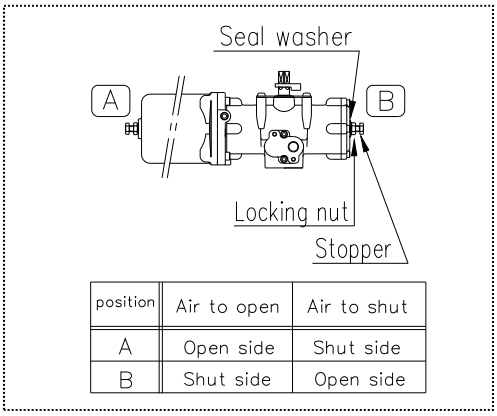
5) Close the bypass valve, open the air source valve, and check if the valve is at the position you want to adjust using air (see page 36).
If not, repeat steps 1) to 4).

TA type

(Double acting)



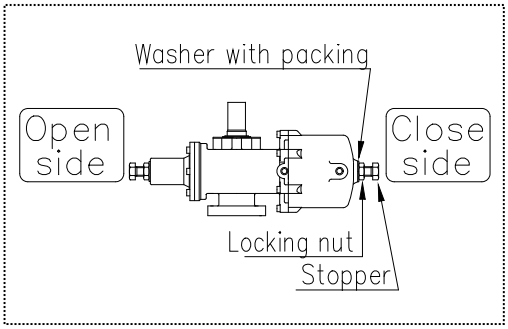
(Single acting)



position	Air to open	Air to shut
A	Open side	Shut side
B	Shut side	Open side

TW type

(Double acting)



12. Inspection item

⚠Caution	
Forcing	**The valve can be damaged or leak.** ▶ Maintenance should be performed every 3 to 6 months as a guide in order to keep the watch in normal condition and use it for a long time. Pay particular attention to temperature changes and aging during long-term storage or shutdown or use. ▶ When removing the valve from the piping when replacing the valve or parts, completely remove the fluid from the piping before starting work. ▶ If any trouble is found, take the appropriate action referring to "**13. Cause of trouble and remedy**".

Daily inspection

Inspection items and inspection methods	Guideline of judgment	Check point	Treatment method
External leakage (visual inspection)	No leakage	Pipe flange connection	① Retighten the pipe bolts to the specified torque. ② Remove the valve from the pipe and re-tighten the pipe bolts. (Ref: 5. Piping method)
		Top flange of the valve	Remove the valve from the piping and replace the valve or defective part. (Ref: 10. How to disassemble/assemble for parts replacement)
		Surface of the entire valve	Remove the valve from the pipe and replace the valve. (Ref: 10. How to disassemble/assemble for parts replacement)
Internal leakage (visual and measurement)	No leakage	Leakage to secondary side when valve is fully closed	Remove the valve from the piping and replace the valve or defective part. (Ref: 10. How to disassemble/assemble for parts replacement)
		Measured values of flowmeters, pressure gauges, etc.	Remove the valve from the piping and replace the valve or defective part. (Ref: 10. How to disassemble/assemble for parts replacement)
Abnormal noise (hearing)	No abnormal noise	Valves and actuators	Remove the valve from the pipe and replace the valve or actuator. (Ref: 10. How to disassemble/assemble for parts replacement)
		Piping around the valve	Reconfirm the conditions of use (Ref: 2. Safety Instructions)

Periodic inspection

●Guideline for the inspection cycle: 3 months

Inspection items and inspection methods	Guideline of judgment	Check point	Remedy for malfunctions
Operating time (Measurement)	Error within ±1 second	Actuator opening display	Check the power supply voltage (±10%). (Ref: Actuator nameplate)
			Remove the valve from the pipe and replace the valve or actuator. (Ref: 10. How to disassemble/assemble for parts replacement)
Vibration (palpation)	No different from other parts	Valves and actuators	Recheck the operating conditions and remove the source of vibration. (Ref: 2. Safety Instructions)
			Remove the valve from the pipe and replace the valve or actuator. (Ref: 10. How to disassemble/assemble for parts replacement)
		Piping around the valve	Recheck the operating conditions and remove the source of vibration. (Ref: 2. Safety Instructions)

●Guideline of the inspection cycle: 6 months

Inspection items and inspection methods	Guideline of judgment	Check point	Remedy for malfunctions
Operability of manual handle (touch)	Rotates smoothly	Manual operation unit	Remove the valve from the pipe and replace the valve or actuator. (Ref: 10. How to disassemble/assemble for parts replacement)
Looseness of bolts (visual and palpation)	No Loose	For Stand + valve	Retighten the mounting bolts
		For Stand + actuator	Retighten the mounting bolts
		For fixing the actuator cover	Retighten the screws
		Terminal block	Retighten the screws
		For flange piping	Retighten the pipe bolts to the specified torque. (Ref: 5. Piping method [Flange type])
Corrosion Or rust (visual inspection)	No corrosion or rust	Appearance of the product and in the actuator	Remove the valve from the pipe and replace the valve or actuator. (Ref: 10. How to disassemble/assemble for parts replacement)
Product damage	No scratches, cracks, or deformation	Appearance of the product	Remove the valve from the pipe and replace the valve or actuator. (Ref: 10. How to disassemble/assemble for parts replacement)

13. Cause of malfunction and remedy

Failure phenomenon	Possible cause	Measures and measures
During manual operation, the operating lever or the round handle does not turn (cannot turn).	The valve is already fully open (or fully closed).	Rotate the manual handle in the reverse direction (Ref: 9. Test Run Method)
	Air is supplied to the actuator.	Tighten the air source valve and open the bypass valve.
	Foreign matter caught in valve	Remove the valve from the piping, disassemble it, and remove foreign matter. (Ref: 10. How to disassemble/assemble for parts replacement)
	Piping stress is applied to the valve.	Remove the piping stress
	The torque of the valve has increased due to the effects of the fluid (temperature, components, pressure, etc.)	Reconfirm the conditions of use (Ref: 2. Safety Instructions)
Do not open or close by air operation.	The solenoid valve is turned off.	Turn on the power.
	Connection to the solenoid valve is disconnected.	Check the connection condition again. (Ref: 8. How to connect the standard option)
	Air is not supplied	Supply air.
	The power voltage of the solenoid valve is different.	Check the voltage with a tester and set the correct voltage.
	Solenoid valve voltage is low	Check the voltage with a tester and set the correct voltage.
	The bypass valve is open.	Close the bypass valve by turning the knob clockwise.

CAUSE OF FAILURE AND HOW TO REMEDY (continued)

Failure phenomenon	Possible cause	Measures and measures
Fluid leaks even when fully closed (internal leak)	High fluid pressure	Use below the maximum allowable pressure (Ref: 10. How to disassemble/assemble for parts replacement)
	Seat or disc is worn or scratched	Remove the valve from the piping, replace the relevant part, or replace the valve. (Ref: 10. How to disassemble/assemble for parts replacement)
	Missing parts	Remove the valve from the piping and attach the relevant part or replace the valve. (Ref: 10. How to disassemble/assemble for parts replacement)
	Foreign matter caught in valve	Remove the valve from the piping, disassemble it, and remove foreign matter. (Ref: 10. How to disassemble/assemble for parts replacement)
	Piping stress is applied to the valve.	Remove the piping stress

CAUSE OF FAILURE AND HOW TO REMEDY (continued)

Failure phenomenon	Possible cause	Measures and measures
Fluid leaks from valve (external leak)	O-ring is scratched, worn, melted, or altered	Stop using the product immediately, remove the valve from the piping, replace the relevant part, or replace the valve. (Ref: 10. How to disassemble/assemble for parts replacement)
	Scratches or wear are found on the sliding or fixing surfaces of the O-ring.	Stop using the product immediately, remove the valve from the piping, replace the relevant part, or replace the valve. (Ref: 10. How to disassemble/assemble for parts replacement)
	Valve is cracked or broken	Stop using the product immediately, remove the valve from the piping, and replace the valve. (Ref: 10. How to disassemble/assemble for parts replacement)
Actuator is operating but valve is not open or closed	The stem or Joint is damaged.	Stop using the product immediately, remove the valve from the piping, replace the relevant part, or replace the valve. (Ref: 10. How to disassemble/assemble for parts replacement)
Actuator is corroded	The watch is exposed to water, chemical liquids, or other liquids.	Stop using the product immediately, remove the valve from the piping, and replace the actuator. (Ref: 10. How to disassemble/assemble for parts replacement)
Valve is corroded or deformed	The watch is exposed to water, chemical liquids, or other liquids.	Stop using the product immediately, remove the valve from the piping, and replace the valve. (Ref: 10. How to disassemble/assemble for parts replacement)

14. Disposal method of residual materials and waste materials

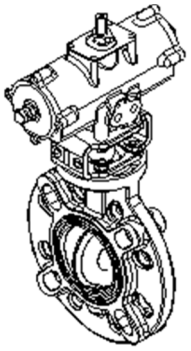
Warning	
Forcing	When burnt, toxic gas is generated. ▶ When disposing of the product or parts, please dispose of them according to the guidelines of each local authority by a professional disposal company.

Inquiries

Contact the nearest dealer, our sales office, or our web website for inquiries about this product.

[User's Manual]

Butterfly Valve Type 57/56/56D
Pneumatic actuated Type TA/TW



https://www.asahi-yukizai.co.jp/en

Please note that the content of this manual is subject to change without notice. **April 2024**