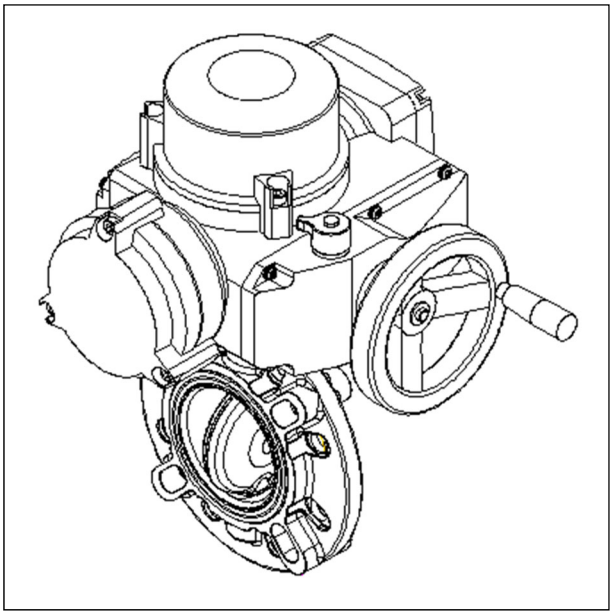
Serial No.: H-A043-E-12

Butterfly valve Type 57
Butterfly valve Type 56
Butterfly valve Type 56D
Electric Actuated Type S

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.

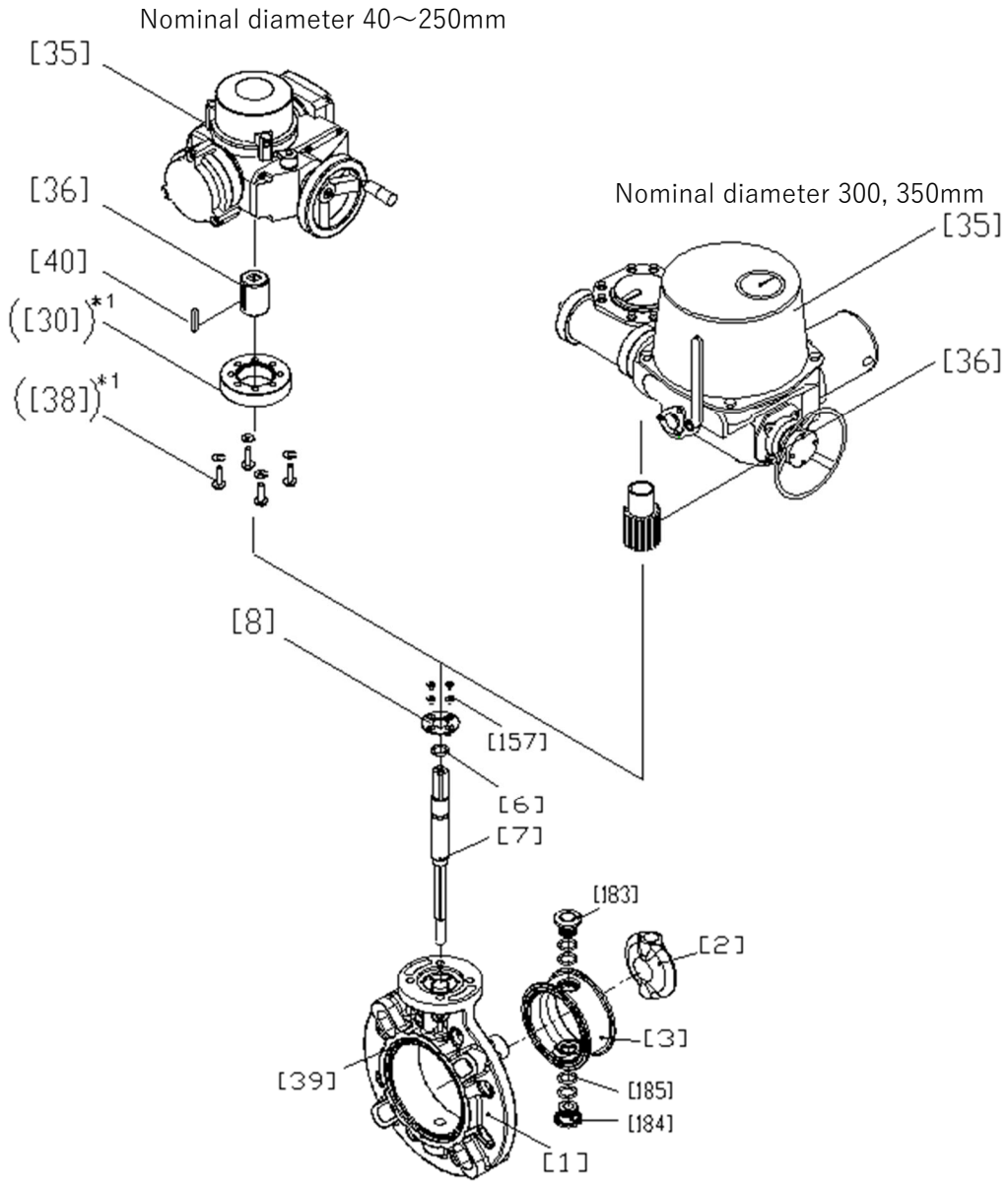
Product Handling

⚠ Warning	
Prohibition	**Serious injury can result.** ▶ Do not disassemble the actuator. ▶ Do not touch moving parts during operation with hands, feet or tools.
Forcing	**There is a danger of injury.** ▶ 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. **The valve can be damaged, or leak.** ▶ Check the voltage on the power supply and nameplate before use. ▶ Perform manual operation after confirming that the actuator is not operated by the motor.

⚠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. ▶ Do not use the product in places where it may be submerged. ▶ Pay attention to the atmosphere where the valve is installed. Avoid locations where the product is exposed to sea breezes, corrosive gases, chemical liquids, sea water, steam, etc. ▶ Do not subject the valve to large vibrations. ▶ Do not leave the actuator in a soil or a water reservoir other than the water resistant type.
Forcing	**There is a danger of injury.** ▶ Secure sufficient space for maintenance and inspection when piping. **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 "11. 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. ▶ If you notice an unusual odor, heat, or smoke, immediately turn off the power supply. ▶ Use the supplied handle for manual operation. ▶ When using in an explosive atmosphere, make sure that the actuator conforms to the explosion-proof specifications. ▶ Keep the ambient temperature of the installation location within-10 to 50° C. ▶ Avoid locations with volatile gases or poor atmospheres. Provide a cover, etc., to cover the entire area.

3. Name of each part

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

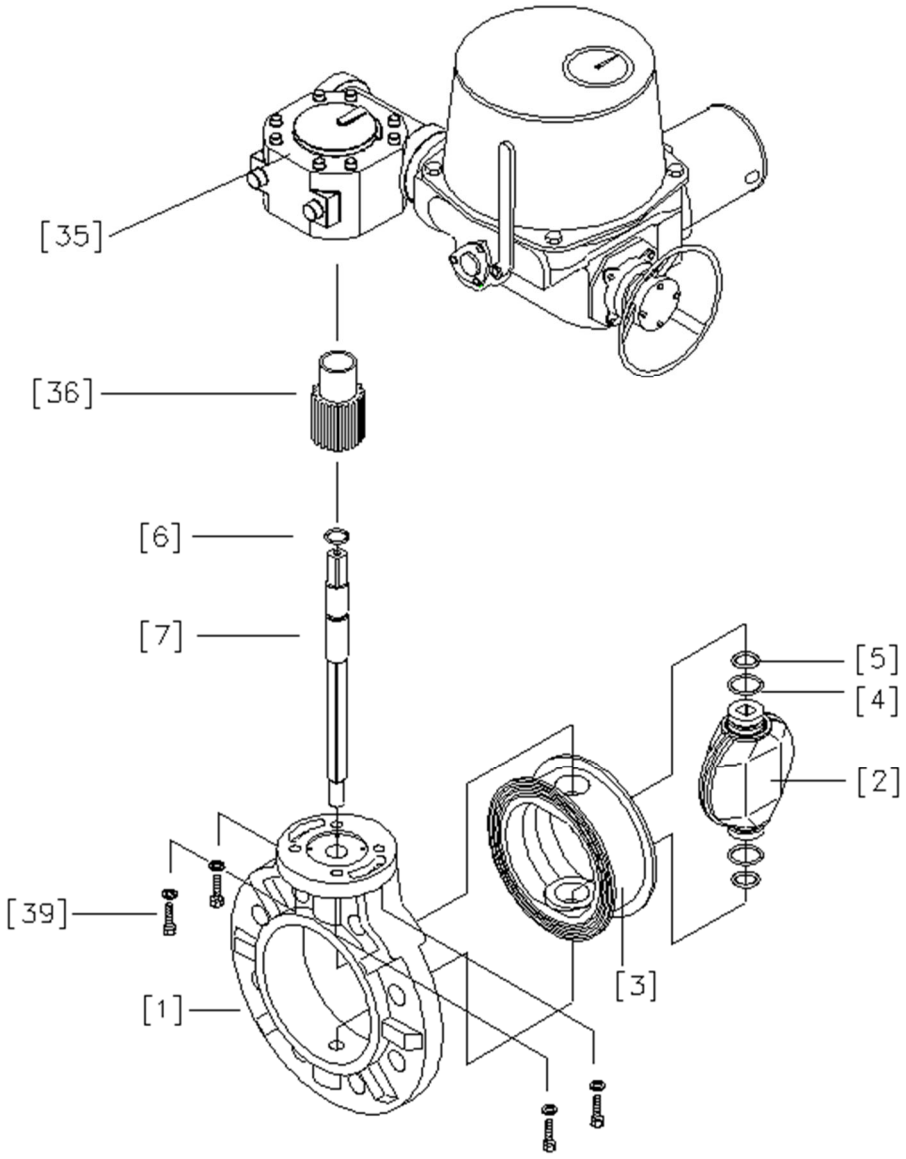


[1]	Body	[30]	Stand	[157]	Set screw (F)
[2]	Disc	[35]	Actuator	[183]	Seat bush A
[3]	Seat	[36]	Stem bush	[184]	Seat bush B
[6]	O-ring (C)	[38]	Bolt (E)	[185]	O-ring (I)
[7]	Stem	[39]	Bolt (K)		
[8]	Stem Holder (A)	[40]	Key (B)		

***1)** Components in parentheses are used for Nominal size 125・150mm.

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

*Body material PDCPD (Type 56D) differs slightly in construction



[1]	Body	[5]	O-ring (B)	[36]	Stem bush
[2]	Disc	[6]	O-ring (C)	[39]	Bolt/Nut (P) *1)
[3]	Seat	[7]	Stem		Bolt(K) *2)
[4]	O-ring (A)	[35]	Actuator		

***1)**: Body material PP, PVDF ***2)**: Body material PDCPD

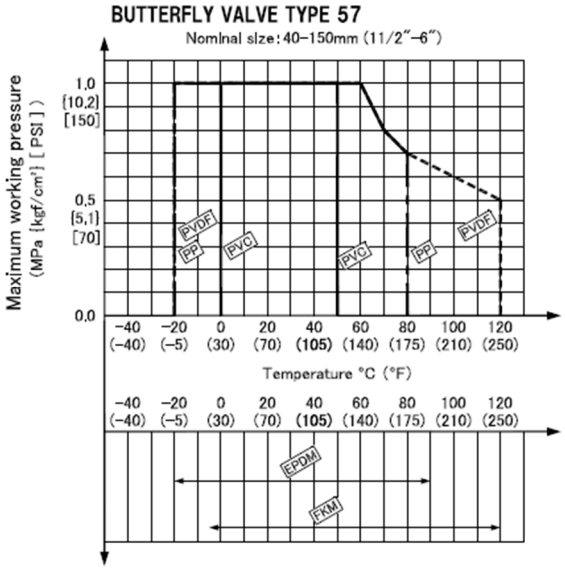
4. Product Specifications

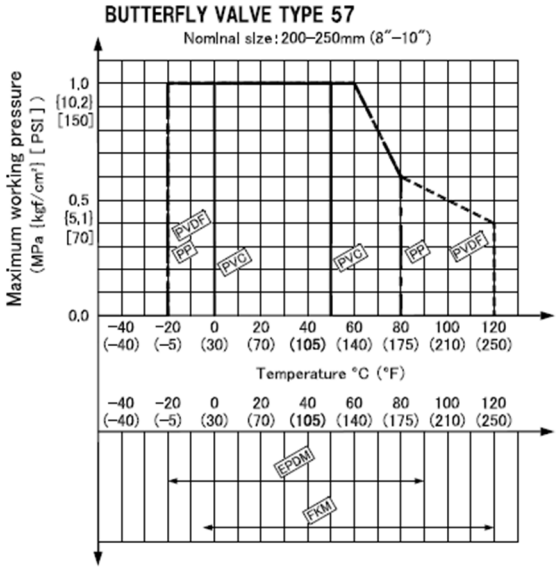
Model number table

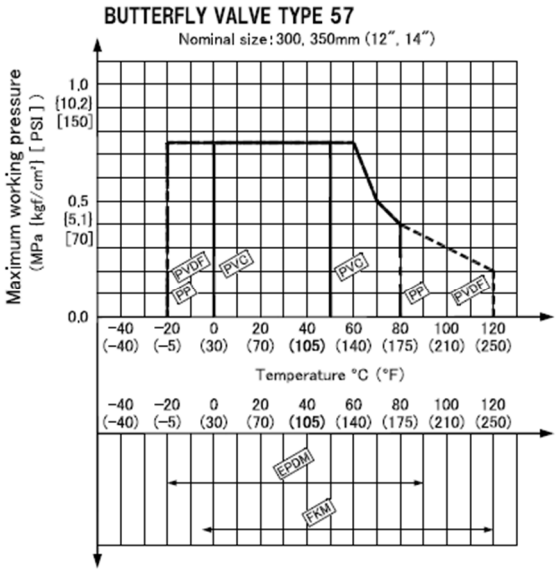
ACTUATION	TYPE	ACTUATOR TYPE	ACTION / POWER SOURCE	BODY MATERIAL	SEAL MATERIAL	CONNECTION	STANDARD	SIZE
A	57	S	*	*	*	W	*	* * *
A AUTOMATIC VALVE	57 TYPE 57	S TYPE S	3 Three-Phase AC200V 4 Three-Phase AC400V	P PP F PVDF	E EPDM V FKM	W WAFER	1 JIS 10K D DIN A ANSI	040 40mm 050 50mm 065 65mm 080 80mm 100 100mm 125 125mm 150 150mm 200 200mm 250 250mm 300 300mm 350 350mm

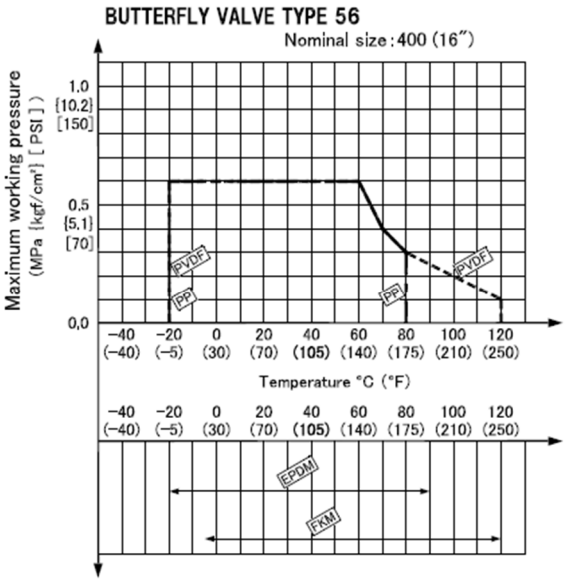
ACTUATION	TYPE	ACTUATOR TYPE	ACTION / POWER SOURCE	BODY MATERIAL	SEAL MATERIAL	CONNECTION	STANDARD	SIZE	DISC PVDF
A	* *	S	*	*	*	W	*	400	0Q※
A AUTOMATIC VALVE	56 TYPE 56 56 TYPE 56D	S TYPE S	3 Three-Phase AC200V 4 Three-Phase AC400V	P PP F PVDF D PDCPD	E EPDM V FKM	W WAFER	1 JIS 10K D DIN A ANSI	400 400mm	※ Used when the disc material is PVDF.

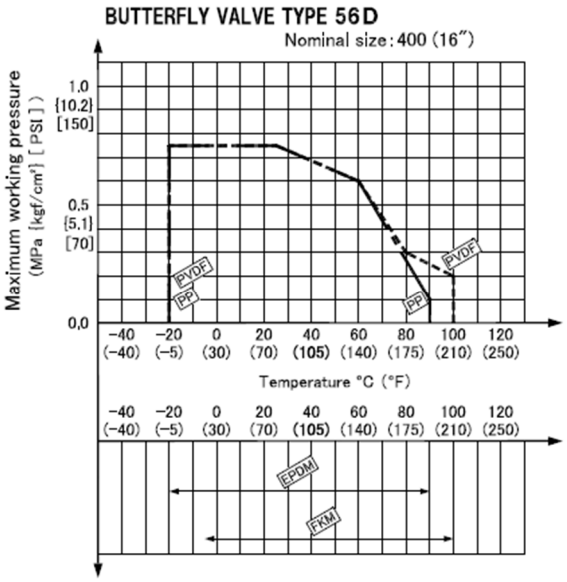
Relationship between maximum allowable pressure and temperature











Actuator

Specifications List

40～250mm

Applicable Nominal size (mm)		40～100	125	150	200	250
Body material		U-PVC, PP, PVDF				
Actuator model		SRJ-010	SRJ-020		SRJ-060	
Open/close time (sec)	50Hz	18	36		36	
	60Hz	15	30		30	
Degree of protection		IP 68				
Motor start current (A) 50/60Hz	200VAC	1.27/1.19			1.89/1.77	
	400VAC	0.63/0.58			0.94/0.90	
Motor Rated Current (A) 50/60Hz	200VAC	0.53/0.45			0.74/0.67	
	400VAC	0.26/0.22			0.37/0.34	
Manual operation handle revolution		21			26	
Electricity consumption (W) 50/60Hz	200VAC	82.7/76.0			162/156	
	400VAC	84.7/78.8			163/159	
Cable connector Nominal size		G1				
Motor rated output (W)		40			100	
Motor insulation type		Class B				
Motor rated time		15 minutes				
Limit switch capacity		250VAC 2A				
Number of motor poles (P)		4				
Space heater rated output (W)		8				
Potentiometer Between 1 and 3 Max. applied voltage (V)	135 (Ω)	7.3V				
	200 (Ω)	12.6V				
	500 (Ω)	14V				

*The power supply used is single phase (100VAC, 200VAC) for the type with E-E positioner.

Specifications List

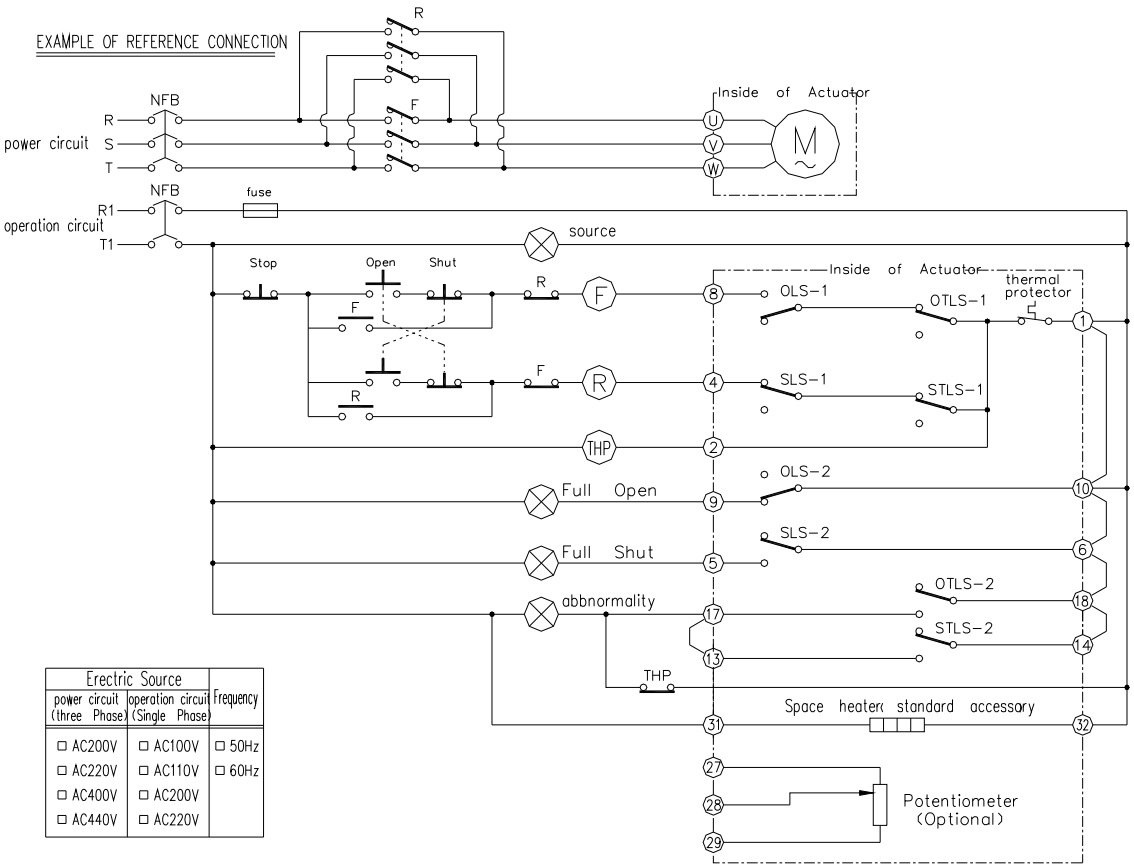
300～400mm

Applicable Nominal size (mm)		300、 350	400	
Body material		U-PVC, PP, PVDF	PP, PVDF	PDCPD
Actuator model		LTRM-01/BRM-1	LTRM-01/BRM-2	LTMD-01/BRM-3
Open/close time (sec)	50Hz	43	41	38
	60Hz	36	34	41
Degree of protection		IP 55		
Motor start current (A) 50/60Hz	200VAC	7.60/7.00	10.2/9.6	
	400VAC	4.10/3.80	4.6/4.4	
Motor Rated Current (A) 50/60Hz	200VAC	1.8/1.4	2.5/2.2	
	400VAC	0.91/0.75	1.2/0.99	
Manual operation handle revolution		15		
Electricity consumption (Watts) 50/60Hz	200VAC	240/215	620/593	
	400VAC	229/220	625/556	
Cable connector Nominal size		Operating Circuit: 3-G1, Motor Circuit: 1-$G^3/_4$		Operating circuitry: 2-G1 Motor Circuit: 1-$G^3/_4$
Motor rated output (W)		200	400	
Motor insulation type		Class B		
Motor rated time		15 minutes		
Limit switch capacity		250VAC 5A		
Number of motor poles (P)		4		
Space heater rated output (W)		10		30
Potentiometer Between 1 and 3 Max. applied voltage (V)	100 (Ω)	15		
	200 (Ω)	20		
	500 (Ω)	30		
	1000 (Ω)	45		

*For 300～400mm with an E-E positioner, the actuator model is LTMD-01Z/BRM-1 to 3.

Wiring diagram

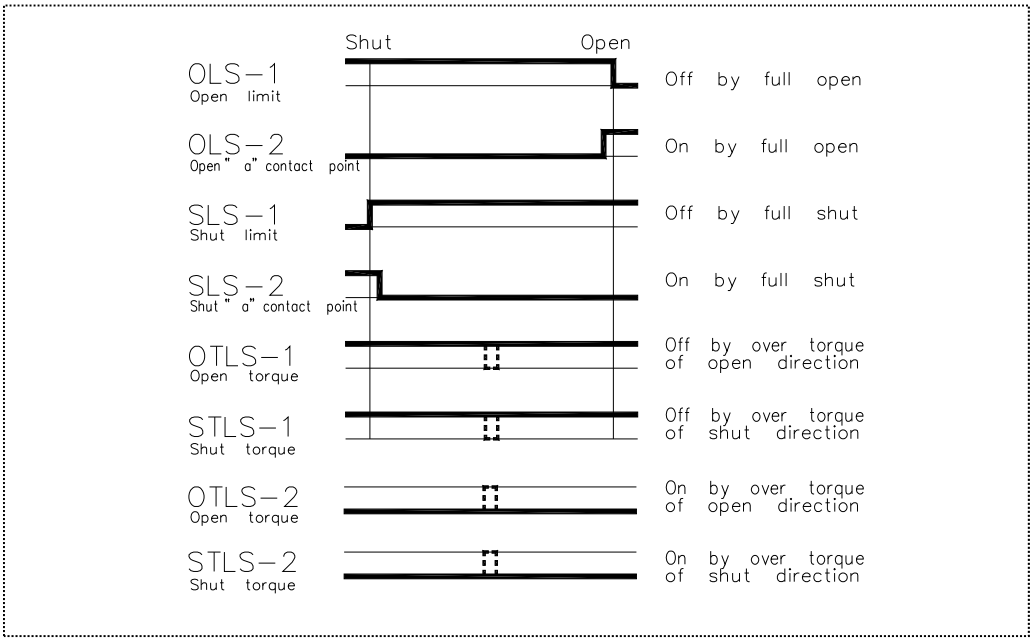
Actuator model: SRJ



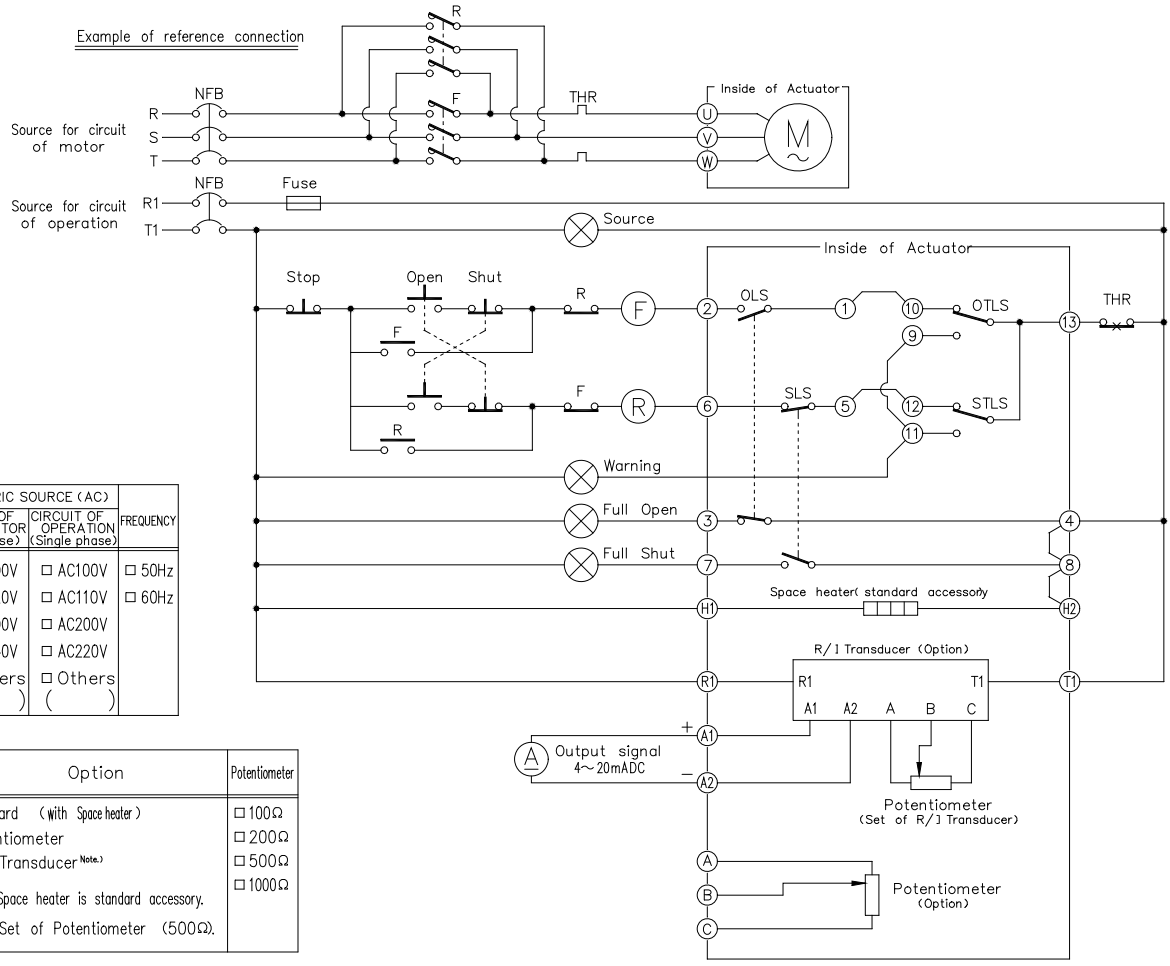
Erectric Source		Frequency
power circuit (three Phase)	operation circuit (Single Phase)	
□ AC200V	□ AC100V	□ 50Hz
□ AC220V	□ AC110V	□ 60Hz
□ AC400V	□ AC200V	
□ AC440V	□ AC220V	

Spec.	Potentiometer
□ Standard(with Space heater)	□ 135Ω
□ Potentiometer	□ 200Ω
	□ 500Ω
	□ 1000Ω

Switching chart



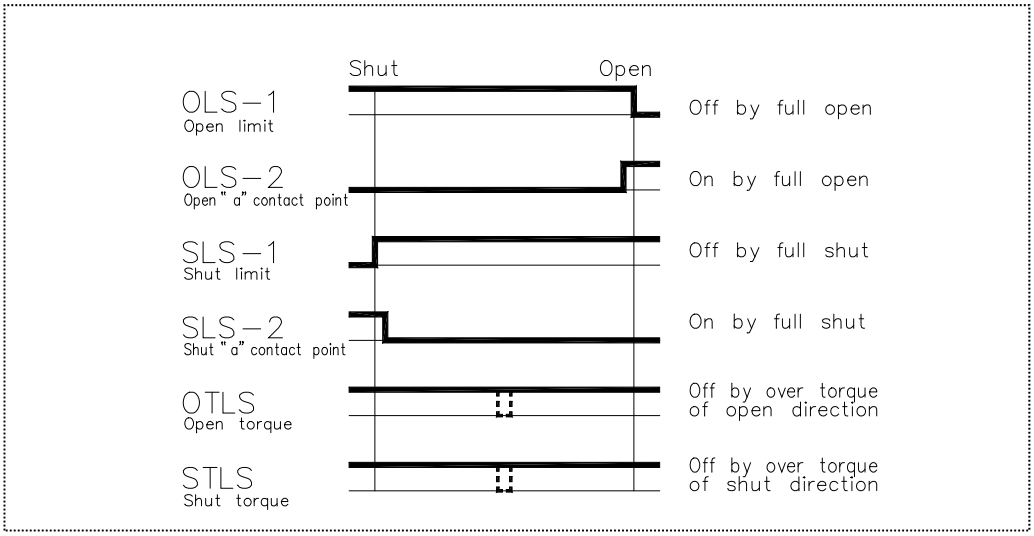
Actuator model: LTRM, LTMD



ELECTRIC SOURCE (AC)		
CIRCUIT OF MOTOR (3 phase)	CIRCUIT OF OPERATION (Single phase)	FREQUENCY
□ AC200V	□ AC100V	□ 50Hz
□ AC220V	□ AC110V	□ 60Hz
□ AC400V	□ AC200V	
□ AC440V	□ AC220V	
□ Others ( )	□ Others ( )	

Option	Potentiometer
□ Standard (with Space heater)	□ 100Ω
□ Potentiometer	□ 200Ω
□ R/J Transducer Note.)	□ 500Ω
* Space heater is standard accessory.	□ 1000Ω
Note.) Set of Potentiometer (500Ω).	

Switching chart



5. Mounting 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.

▶ 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

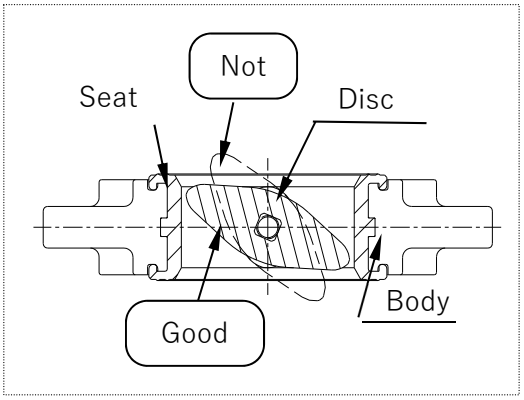
The valve can be damaged, or leak.

▶ 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.

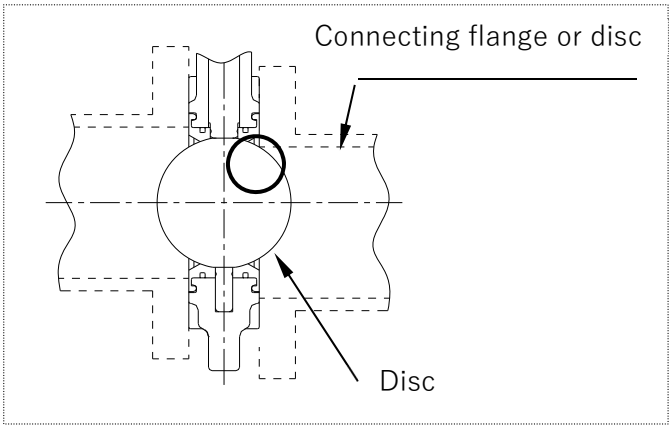
▶ Check that the flange standards of each other are correct.

▶ The product is in the "Good" state as shown in the figure at the right. If you open or close the valve when installing the piping, be sure to return the disc to the normal position (as shown in the figure) after operation. Never transport or install the disc in the condition "impossible" as shown in the right figure. Doing so will scratch the sealing surface of the disc.



▶ For the eyebolts attached to the actuator,
Do not lift the entire valve using only eyebolts, as the design strength is designed to lift the actuator only. Even if it is unavoidable to use the eyebolt, limit it to the assistance to stand the valve vertically.

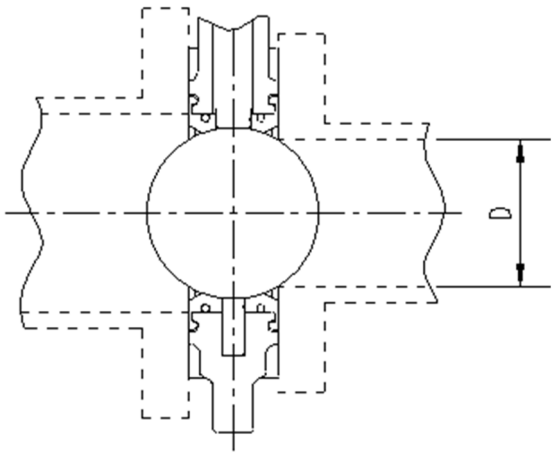
▶ When piping, if the valving element is fully opened, confirm that it does not hit the corner of the inside diameter of the connection flange or connection flange, and align the centers before installing. (Refer to the right figure.)



⚠Caution

Forcing

▶ 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.



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 ▶ Wrench ▶ Through bolts, nuts, and washers (See the dimension table on page 20.)

[Procedure]

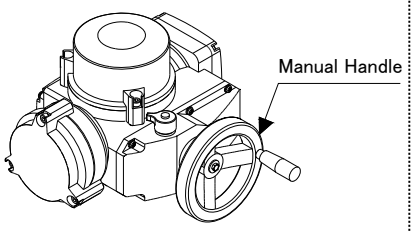
1) Slightly open the disc [2] with the hand wheel.
(Refer to page 26 for manual operation)
※Make sure that the disc [2] does not protrude from between the seat surfaces.
(The disc [2] may be damaged.)

2) Set the valve between the connecting flanges.

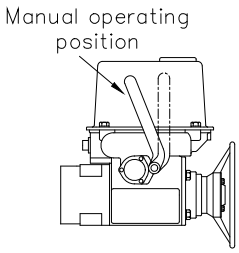
3) Temporarily set by hand with through bolts, nuts, and washers for connection.

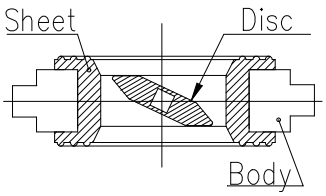
4) Gradually tighten to the specified torque value diagonally (see Fig. 1) with a torque wrench.

Actuator type: SRJ



Actuator type: LTRM





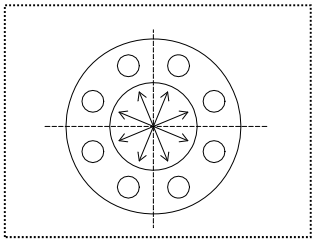
⚠Caution

Forcing

Damage or leakage may occur.

▶ Tighten the bolts and nuts of the connection flange diagonally to the specified torque.

Fig. 1



Specified torque value

Nominal size	40mm	50、65 mm	80、100 mm	125、150 mm	200、250 mm	300、350 mm	400mm
Torque value	20.0 {204}	22.5 {230}	30.0 {306}	40.0 {408}	55.0 {561}	60.0 {612}	80.0 {816}

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

Body material: U-PVC, PP, PVDF, PDCPD

▼JIS10K

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

Note 1. The above values are the dimensions when the Nominal size 40～350mm is AVTS and the Nominal size 400mm is JIS B2220 "steel pipe flange" nominal pressure 10K is used.

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

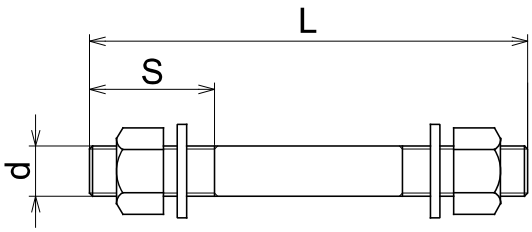
Body material: U-PVC, PP, PVDF

▼JIS5K

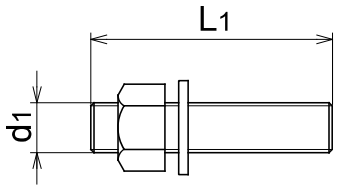
Size (mm)	Body material	Bolt A			Bolt B		Quantity		
		D	L (mm)	S (mm)	D1	L1 (mm)	Bolt A	Bolt B	Nut and washer
40	U-PVC, PP, PVDF	M12	100	30	-	-	4	-	8
50			105						
65			110						
80		M16	120	35					
100			130	40			8	-	16
125			140						
150			150						
200		M20	195	55					
250			225				12	-	24
300	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

Note 1. The above values are the dimensions when the Nominal size 40～350mm is a AVTS flange and the Nominal size 400mm is a JIS B2220 "steel pipe flange" nominal pressure 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



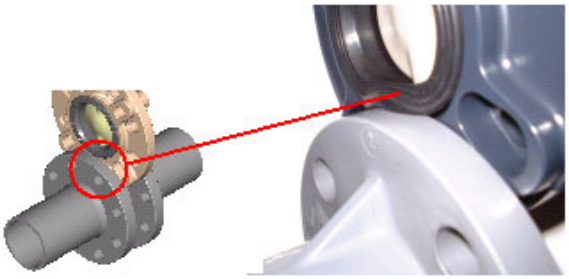
Bolt B

⚠Caution

Forcing

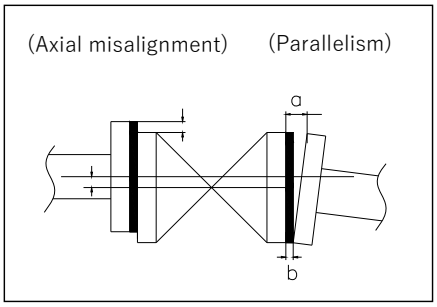
Doing so may cause damage.

▶ 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.

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



6. Support installation method

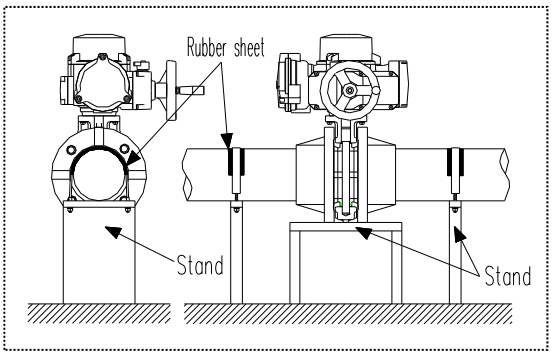
Caution	
Prohibition	**Doing so may cause malfunction or damage.** ▶ Do not cause large vibrations to the valve by the piping around the pump.
Forcing	**Otherwise, excessive force may be applied to the valve body and piping, resulting in damage.** ▶ Install a valve support.

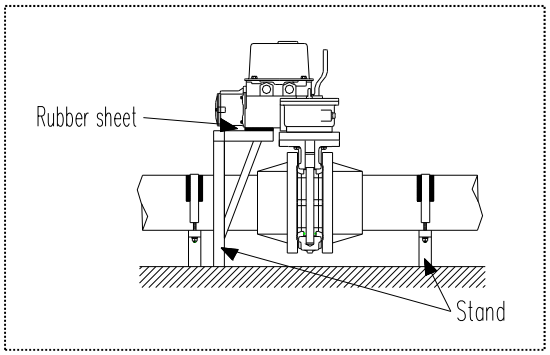
Preparations ▶ Spanner ▶ U-band (with bolt) ▶ Rubber seat

Horizontal piping

1) Place the frame under the valve.

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



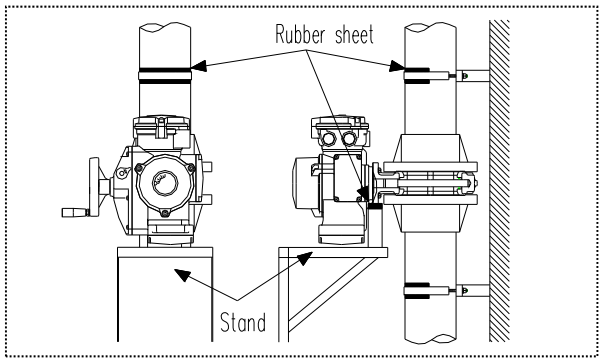


Vertical piping

(For 40～250mm)

1) Lay a rubber Seat on the connecting part of the actuator and the body, and fix it with the frame.

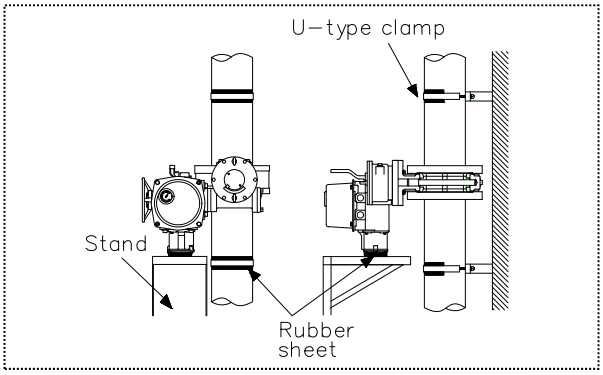
2) Wrap the rubber Seat around the pipe and secure it with the U-band.



(For 300～400mm)

1) Lay a rubber Seat on the connecting part of the actuator and the body, and fix it with the frame.

2) Wrap the rubber Seat around the pipe and secure it with the U-band.



7. Electrical Wiring

Warning	
Prohibition	**Serious injury can result.** ▶ Do not connect or separate lines when the power is on. Also, do not touch any other parts on the board or the terminal block wiring part. (Otherwise, an electric shock or damage to the equipment may occur.)
Forcing	**Serious injury can result.** ▶ Be sure to connect the ground wire. (Poor grounding may cause electric shock, fire, etc. due to electric leakage.) ▶ Keep hands free of moisture and oil when adjusting or checking. (risk of electric shock or damage to equipment)

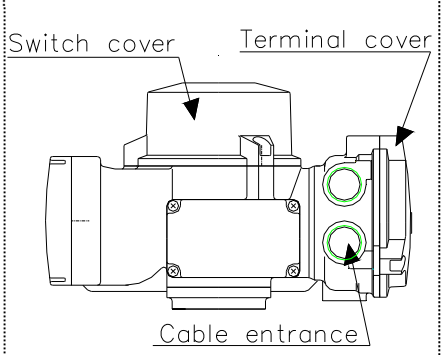
⚠Caution	
Prohibition	**The valve can be damaged or leak.** ▶ Do not apply a load to the non-voltage limit switch exceeding the contact capacity. Also consult with CKD when using this product under a minute load (1mA～100mA, 5V～30V). ▶ Do not connect multiple (two or more) motorized valves in series. In addition, open/close switches (or relay contacts) should be provided for each electric valve. ▶ Do not use the product near high-voltage lines, inverters, or other objects that generate noise or magnetism. (Doing so may cause malfunction or failure.)
Forcing	**The valve can be damaged or leak.** ▶ Check that there is no insulation defect when performing wiring work. ▶ Securely tighten the covers of each part. (Rainwater, dust, etc. may penetrate and cause malfunction.) ▶ Be sure to connect the wires correctly as shown in the wiring diagram. After wiring, be sure to check that the connection is secure, and then turn on the power. (Failure to do so may cause malfunction or failure.) ▶ Each lid part is sealed by an O-ring. When removing and reinstalling the cover, such as when wiring, be sure to confirm that the O-ring is set in place and securely sealed. (If the seal is insufficient, rainwater or other liquid may enter the actuator and cause electric shock or malfunction.) ▶ If the actuator is used outdoors or in a location where it will be exposed to rainwater or water drops, make sure that rainwater does not enter the actuator through the wiring port. (Rainwater or other liquid may enter the actuator, causing electric shock or malfunction.) ▶ Check the power supply and voltage on the nameplate before use. A different voltage may cause damage or malfunction of the equipment. ▶ Do not connect or separate lines when the power is on. Also, do not touch any other parts on the board or the terminal block wiring part. (risk of electric shock or damage to equipment)

Preparations	▶ Phillips screwdriver ▶ Wire stripper ▶ hex key ▶ Crimp terminal ▶ connector ▶ terminal Crimp tool ▶ Wrench

[Procedure]

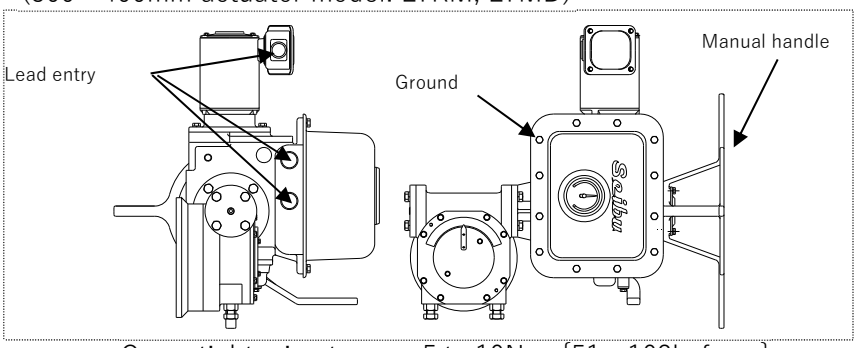
1) Loosen the screws holding the terminal cover (actuator cover) with an Allen wrench and remove the cover.
2) Remove the lead entry plug with a spanner.
3) Attach the connector to the lead entry.
4) Pass the cable through the connector.
5) Peel off the outer skin of the cable with a wire stripper.
6) Use a terminal crimping tool to attach the crimping terminal to the lead wire.
7) Wire the terminal block with a Phillips screwdriver as shown in the wiring diagram.
※Tighten the screws securely. (There is a risk of electric leakage or electric shock.)

Actuator type: SRJ



8) Tighten the connector.
※Tighten the connector securely. (There is a risk of electric leakage or electric shock.)
9) Tighten the bolts securing the terminal cover (actuator cover) with a hex wrench (spanner) to attach the cover.
10) Attach the ground.

(300～400mm actuator model: LTRM, LTMD)



Cover tightening torque: 5 to 10N m {51～102kgf･cm}

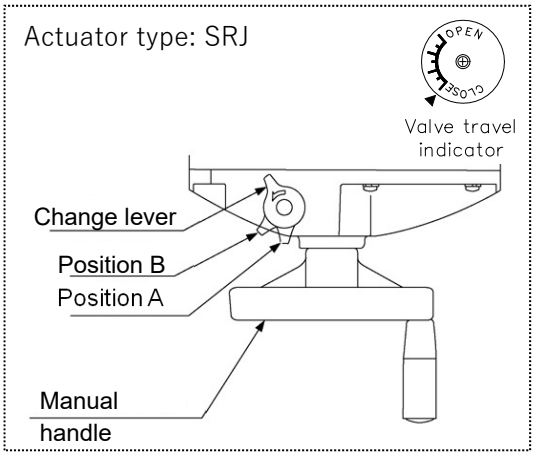
8. Commissioning method

Warning	
Prohibition	**Serious injury can result.** ▶ Do not connect or separate lines when the power is on. Also, do not touch any other parts on the board or the terminal block wiring part. (risk of electric shock or damage to equipment) ▶ Be sure to connect the ground wire. (Poor grounding may cause electric shock, fire, etc. due to electric leakage.) ▶ Never touch the moving parts during operation. (Hand or arm may become entangled.)
Forcing	**Serious injury can result.** ▶ Keep hands free of moisture and oil when adjusting or checking. (risk of electric shock or damage to equipment) ▶ Perform manual operation after confirming that the actuator is not operated by the motor.

⚠Caution	
Prohibition	**The valve can be damaged or leak.** ▶ Do not connect multiple (two or more) motorized valves in series. In addition, open/close switches (or relay contacts) should be provided for each electric valve. ▶ Do not use the product near high-voltage lines, inverters, or other objects that generate noise or magnetism. (Doing so may cause malfunction or failure.)
Forcing	**The valve can be damaged or leak.** ▶ Check that there is no insulation defect when performing wiring work. (Danger of damage to wiring) ▶ Securely tighten the covers of each part. (Rainwater, dust, etc. may penetrate and cause malfunction.) ▶ Be sure to connect the wires correctly as shown in the wiring diagram. After wiring, be sure to check that the connection is secure, and then turn on the power. (Failure to do so may cause malfunction or failure.) ▶ Each lid part is sealed by an O-ring. When removing and reinstalling the cover, such as when wiring, be sure to confirm that the O-ring is set in place and securely sealed. (If the seal is insufficient, rainwater or other liquid may enter the actuator and cause electric shock or malfunction.) ▶ If the actuator is used outdoors or in a location where it will be exposed to rainwater or water drops, make sure that rainwater does not enter the actuator through the wiring port. (Rainwater or other liquid may enter the actuator, causing electric shock or malfunction.) ▶ If you notice an unusual odor, heat, or smoke, immediately turn off the power supply. (There is a possibility that a fire may occur if you use the watch without feeling any abnormality. If you find any abnormality, contact your dealer or us for inspection.)

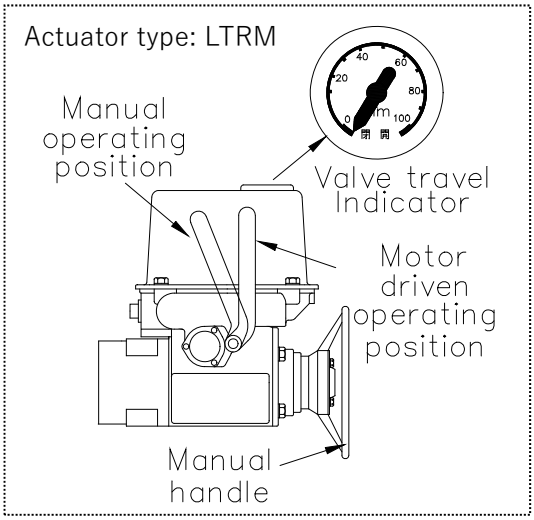
Manual operation

[Procedure] (40～250mm Actuator Model: SRJ)



1) Turning the changeover lever in the direction of the arrow (until the A state shown in the right figure) cuts the motor and enters the manual state.
   The changeover lever is an auto return.
   (If the switchover lever stops in the state shown in Fig. B on the right, the crests of the internal clutch are aligned. Do not turn it forcibly. Operate the switchover lever while turning the handle either left or right.)
2) Turn the manual handle while watching the valve travel meter.
   Rotate clockwise → Close direction
   Counterclockwise rotation → Open direction
   ※Opening and closing operations with the manual handle must be performed by hand.
   Do not forcibly turn the manual handle further from the fully open "O" and fully closed "S" positions. (It will malfunction.)

[Procedure] (300～400mm Actuator Model: LTRM, LTMD, LTRH)



1) Set the switching lever to the manual position. If it does not change smoothly, turn the manual handle to either side and turn the lever.
   ※By forcing the manual handle from fully open "O" and fully closed "S"
   Do not turn. (It will malfunction.)
2) Turn the manual handle while watching the valve travel meter.
   Rotate clockwise → Close direction
   Counterclockwise rotation → Open direction
3) Actuator model: LTRM, LTMD (auto-reset)
   Turn on the power and press the OPEN or CLOSE button. (Switching lever automatically returns to the electric position)

⚠Caution	
Prohibition	**The valve can be damaged or leak.** ▶ The switch lever cannot be returned to the electric side by manual operation. Do not perform manual operation to the motorized side. (It will malfunction.)

Actuator model: LTRH (manual return)

Move the switching lever to the electric position manually.

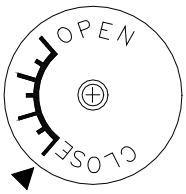
⚠Caution	
Prohibition	**The valve can be damaged or leak.** ▶ Do not operate the switching lever with excessive force. (It will malfunction.)

Electric operation method

⚠Caution	
Prohibition	**The valve can be damaged or leak.** ▶ Do not leave the actuator cover open. (If the terminal is touched, an electric shock will occur.)

[Procedure] (40～250mm Actuator Model: SRJ)

1) Turn on the power.
2) Open or close the external selector switch to check that the displayed direction of the valve matches the operating direction. If they do not match, check the wiring diagram (see pages 15 and 16) and perform the operation from 1) again.
3) Fully open "O" or fully closed "S" to turn off the power.

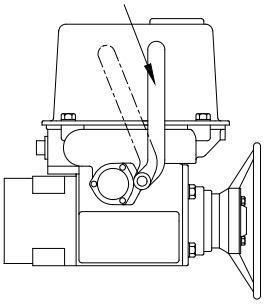


Valve travel indicator

[Procedure] (300～400mm Actuator Model: LTRM, LTMD, LTRH)

1) Turn on the power.
2) Push the pushbutton to open or close to check that the indicated direction of the valve matches the operating direction. If they do not match, check the wiring diagram (see pages 15 and 16) and perform the operation from 1) again.
3) Fully open "O" or fully closed "S" to turn off the power.

Motor driven operating position



Valve travel indicator

9. How to disassemble/assemble parts for replacement

Warning	
Prohibition	**Serious injury can result.** ▶ Do not disassemble the actuator. ▶ Do not connect or separate lines when the power is on. Also, do not touch any other parts on the board or the terminal block wiring part. (risk of electric shock or damage to equipment)
Forcing	**There is a danger of injury.** ▶ Be sure to perform safety inspections of the machine tool and power tool beforehand. ▶ When installing piping, be sure to wear the appropriate protective equipment according to the operation details. **Serious injury can result.** ▶ Completely drain the fluid in the piping when replacing the valve or replacing parts. If the fluid does not escape, reduce the fluid pressure to zero.

Caution	
Forcing	**The valve can be damaged or leak.** ▶ Securely tighten the covers of each part. (Rainwater, dust, etc. may penetrate and cause malfunction.) ▶ The actuator is adjusted at the factory before shipment. However, if the setting needs to be changed or adjusted, perform the adjustment properly as described in the instruction manual. (Failure to do so may cause malfunction or failure.) ▶ Each lid part is sealed by an O-ring. When removing and reinstalling the cover, such as when wiring, be sure to confirm that the O-ring is set in place and securely sealed. (If the seal is insufficient, rainwater or other liquid may enter the actuator and cause electric shock or malfunction.)

Nominal size 40～350mm

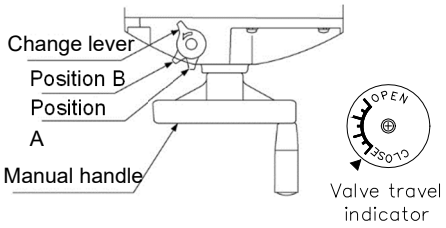
Preparations	▶ Jack ▶ pipe ▶ plate ▶ pliers ▶ silicone grease ▶ Hex key ▶ Thrust bearing ▶ Phillips screwdriver ▶ Flat head screwdriver ▶ Protective gloves and goggles

<**Disassembly**>

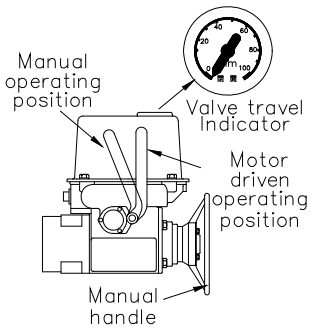
[**Procedure**]

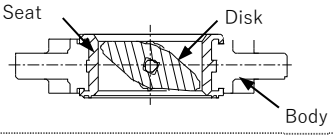
1) Completely drain the fluid in the piping.
2) Fully close the valve by motor or manual operation.
3) Turn off the power.
4) Push the changeover lever to the manual side and slightly open the valve with the manual handle.
5) Loosen screws (K) [39] and remove actuator [35] (including mounting bracket [30]) from body [1].
6) Loosen the connecting bolts and nuts with a spanner and remove the valve.
7) Use a Phillips screwdriver to remove the Stem Holder [8].
8) For Nominal size 40～100mm
Pull out stem [4] with pliers or hand.
For Nominal size 125～350mm
Attach the jack, thrust bearing, plate and pipe to the valve and screw the jack shaft into the stem [4].
Turn jack handle and pull out stem [4]. Remove stem [4] from jack.
9) Put the disc [2] in the fully open state.
10) Use a flat-blade screwdriver to create a gap between the body [1] and the Seat [3]. Insert a flat-blade screwdriver or a Phillips screwdriver into the gap and remove the Seat [3] and the disc [2] by pushing them out.
11) Remove the disc [2], seat bush A [183] and seat bush B [184] from the seat [3].
12) Remove O-ring (C) [6] and O-ring (I) [185].

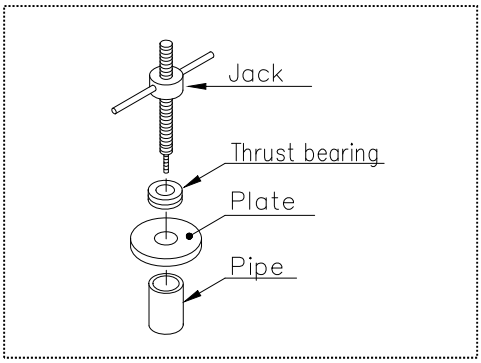
Actuator type: SRJ

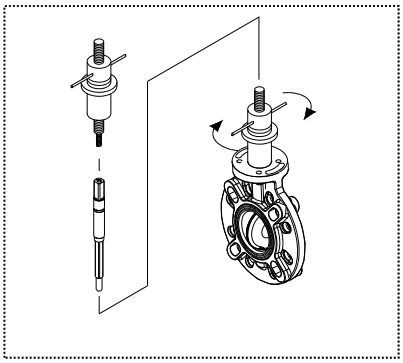


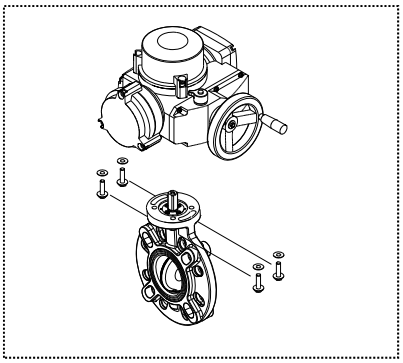
Actuator type: LTRM, LTMD, LTRH





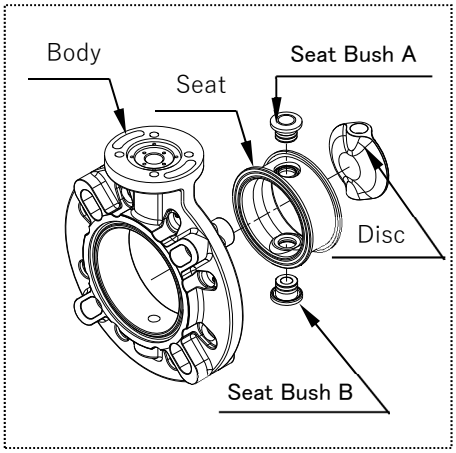






<Assembly>
[Procedure]

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 Seat [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 Seat 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].

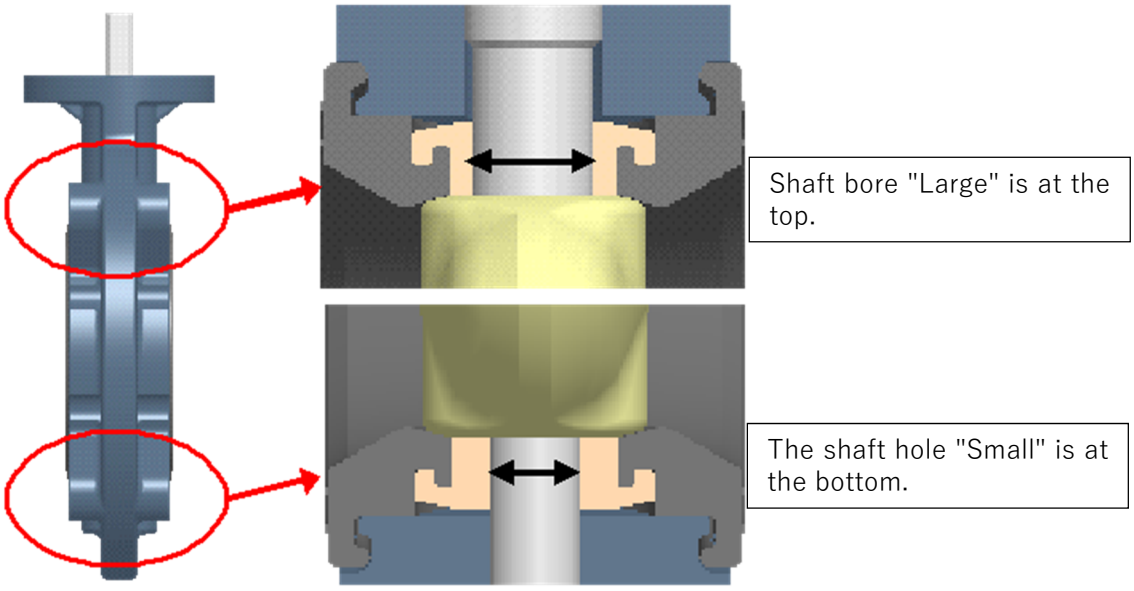


⚠Caution

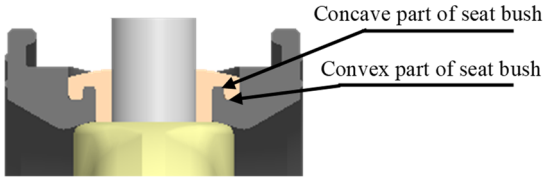
Forcing

The valve can be damaged or leak.

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



▶ 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 Stand [30], and install the bolts (E) [38] and bolts/nuts (A) [39].
※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].

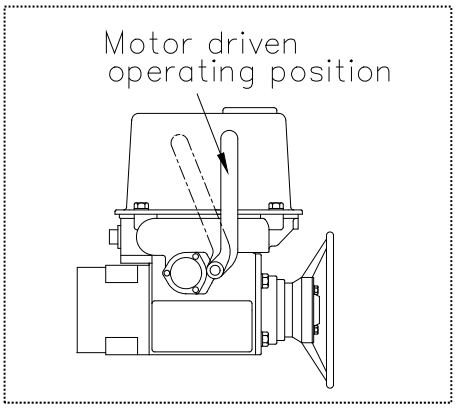
10) Check the operation with an electric operation (see page 27).
※If the degree of opening and the degree of opening are misaligned, turn off the power, remove the terminal cover (actuator cover) with a Phillips screwdriver, and adjust the degree of opening.

Nominal size 400mm

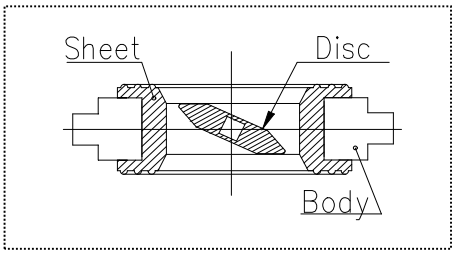
Preparations	▶ Jack ▶ Pipe ▶ Plate ▶ Pliers ▶ Thrust Bearing ▶ Hex Key ▶ Protective Gloves ▶ Protective Glasses

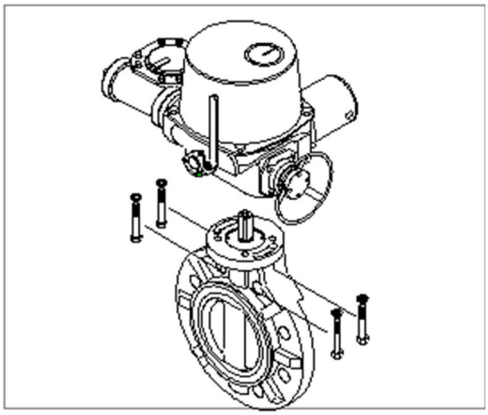
<**Disassembly**>

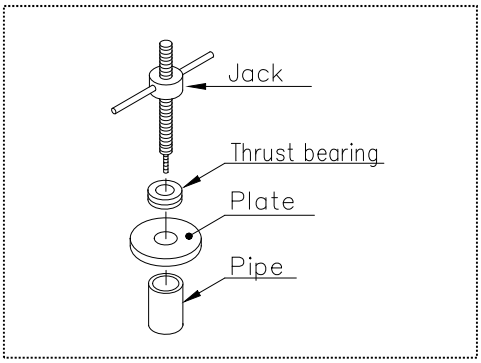
[**Procedure**]

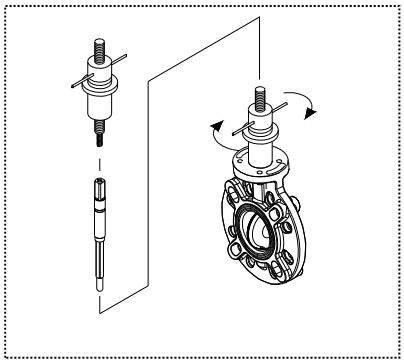


1) Completely drain the fluid in the piping.
2) Fully close the valve by motor or manual operation. (Refer to page 27.)
3) Turn off the power.
4) Push the changeover lever to the manual side and slightly open the valve with the manual handle.
5) Loosen and remove the connecting bolts and nuts.
6) Remove the valve from the piping.
7) Loosen bolt (K) [39] or bolt/nut (P) [39] and remove actuator [35].
8) Attach the jack, thrust bearing, plate and pipe to the valve and screw the jack shaft into the stem [7].
9) Turn jack handle and pull out 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 Seat [3] and remove the Seat [3] and the disc [2] gradually while shaking them.
14) Remove disc [2] from Seat [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) To assemble the parts, follow the procedure in reverse order from 15) in Disassembly on page 32.

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

4) Carry out manual operation (see page 26) 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.

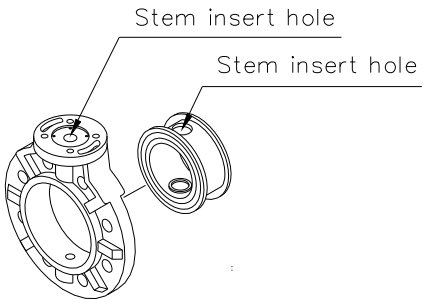
6) Check the operation with an electric operation (see page 27).

※Turn off the power if the position gauge deviates from the position gauge.

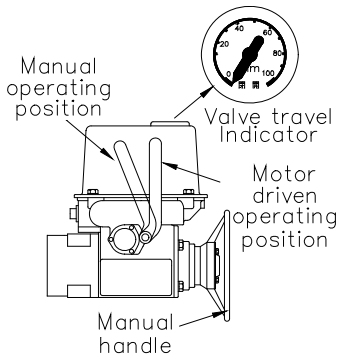
Remove the actuator cover with a wrench and adjust the valve travel indicator.

Please do it.

Nominal size: 400mm



Actuator type: LTRM, LTMD, LTRH



10. How to adjust the limit switch

Warning	
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)

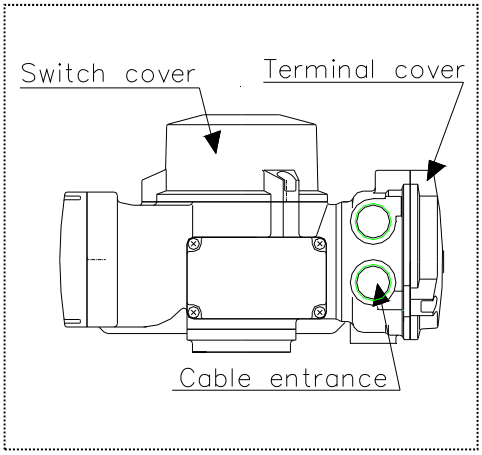
Caution	
Prohibition	**The valve can be damaged or leak.** ▶ Do not leave or use the actuator cover open.
Forcing	**The valve can be damaged or leak.** ▶ Contact CKD when using the limit switch in a 1mA～100mA, 5V～30V.

Preparations	▶ Hex key ▶ wrench ▶ flat-blade screwdriver

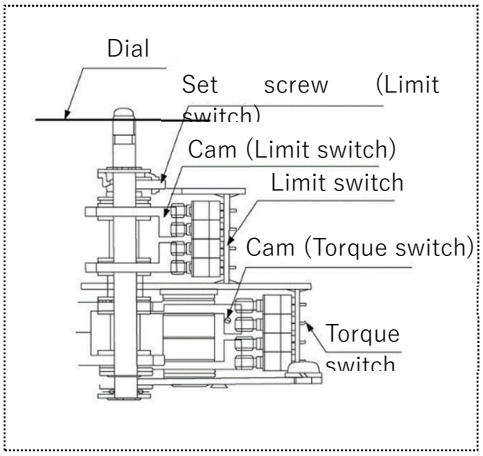
※Adjustment is not necessary as it is set at the factory. If the adjustment is necessary, follow the procedure below.

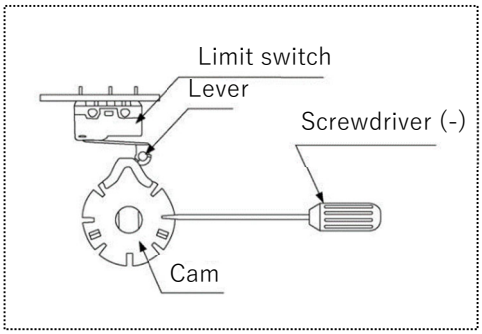
▶ The limit switch is for the upper two stages (RLS) for clockwise rotation and the lower two stages (LLS) for counterclockwise rotation. Each of the two micro switches operates with an integral cam. The lamp circuitry (RLS2, LLS2) operates a little faster.

[Procedure] (Actuator type with Nominal size 40～250mm : SRJ)



1) Turn off the power.
2) Completely drain the fluid in the piping.
3) Loosen and remove the switch cover with an Allen key (6mm).
4) Perform manual operation (refer to page 26) to the position to be adjusted (fully open or fully closed).
5) Loosen the setscrew holding the cam for limit switch with a hex key (1.5mm). (Loosen the hex wrench while pressing it.)
6) Move the cam slowly with a flathead screwdriver in the direction you want to adjust.
7) Confirm that the limit switch has been operated in two stages with a click and a click.
8) The cam is tightened by the Disc spring and fixed by frictional force. A rotation-stop washer is inserted between the two cams. Turning one cam does not cause the other cam to turn. After setting the cam, slowly tighten the set screw for the cam with an Allen wrench.
9) Make sure that the opening is adjusted manually (see page 26). If not, repeat steps 4) to 9).
10) Replace the switch cover and tighten it with an Allen wrench.
11) Fully open and closed with electric operation (see page 27).
12) Confirm that the opening is pointing to fully open "O" or fully closed "S."
※If the gauge is misaligned, loosen the switch cover with an Allen wrench to remove it, loosen the gauge with a Phillips screwdriver to point at "O" or "S" fully open, and then perform 10), 11, 12).





[Procedure] (Actuator type with Nominal size 300～400mm : LTRM)

1) Turn off the power and remove the fluid in the piping completely. Then, loosen the actuator cover with a wrench and remove it.

2) Perform manual operation (refer to page 26) to the position to be adjusted (fully open or fully closed).

3) Insert the special handle into the clutch shaft and push it in until the clutch shaft is retracted by turning it about 30 degrees.

※If operation 4) is performed without performing operation 3), limit switch

It may damage the mechanism.

4) The switch assigned to the moved opening (check the set opening [2], for example "O" switch when fully open) is settled.

5) Insert the special handle into the reduction shaft [3] (Fig. 4) closest to the applicable switch. Turn the reduction shaft in the direction that the number of turns is less, and find where the arrow on the switch changes from "N" to "A" or "A" to "N."

6) Pull out the special handle when the arrow changes from "N" to "A" with the arrow pointing to N.

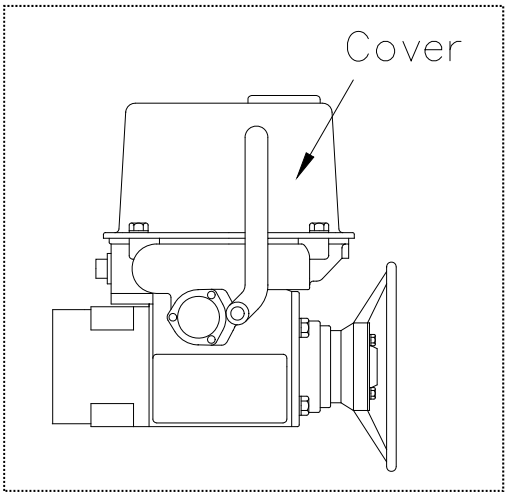
7) Insert the special handle into the clutch shaft again, and turn the handle to put the clutch shaft back on.

8) Check whether the limit switch follows the operation of the valve by manual operation (see page 26).

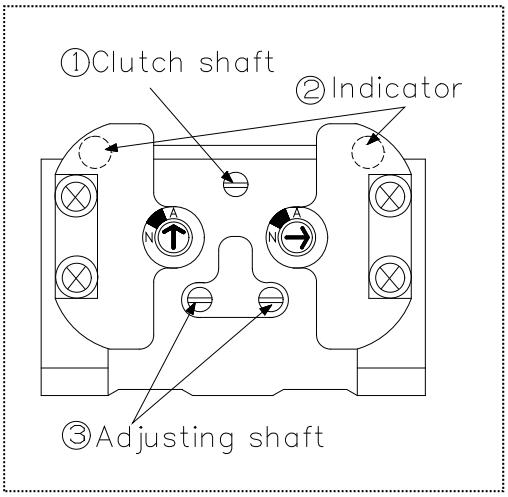
9) Attach the actuator cover and tighten with a wrench.

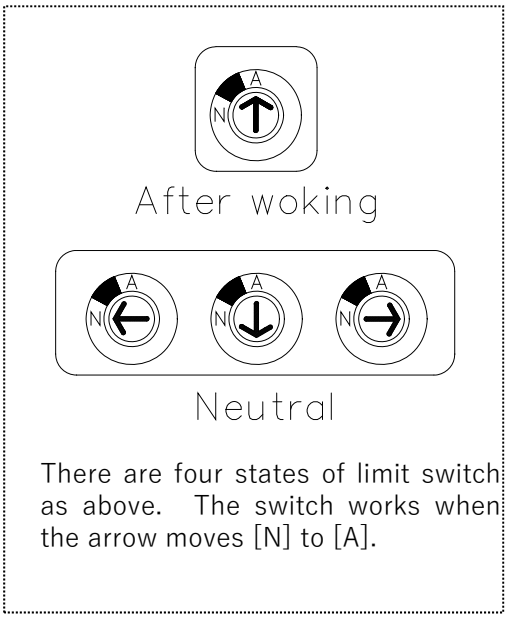
10) Fully close the valve with an electric operation (refer to page 27). Make sure that the opening scale indicates fully closed "O."

※ If they are misaligned, loosen the actuator cover with a wrench, remove the switch cover, pull out the pointer, and adjust the opening scale to "0" and push the pointer.



(Fig 4)





There are four states of limit switch as above. The switch works when the arrow moves [N] to [A].

11. 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 "12. Troubleshooting."

Inspection items and 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. Mounting method)
		Top flange of the valve	Remove the valve from the piping and replace the valve or defective part. (Ref: 9.How to disassemble for parts replacement)
		Surface of the entire valve	Remove the valve from the pipe and replace the valve. (Ref: 9.How to disassemble 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: 9.How to disassemble for parts replacement)
		Measured values of flowmeters, pressure gauges, etc.	Remove the valve from the piping and replace the valve or defective part. (Ref: 9.How to disassemble for parts replacement)
Operation position shift (visual inspection)	No misalignment	Actuator opening display	Remove the actuator cover and adjust the limit switch operating position. (Ref: 10. How to adjust limit switch)
Abnormal noise (hearing)	No abnormal noise	Valves and actuators	Remove the valve from the pipe and replace the valve or actuator. (Ref: 9.How to disassemble for parts replacement)
		Piping around the valve	Reconfirm the conditions of use (Ref: 2. Handling Precautions)
Odor ※1) (sniffing)	No abnormal odor	Valves and actuators	Remove the valve from the pipe and replace the valve or actuator. (Ref: 9.How to disassemble for parts replacement)

※1) Failure to do so may result in burnout or fire.

Periodic inspection

●Guideline for the inspection cycle: 3 months

Inspection items and methods	Guideline of judgment	Check point	Remedy for malfunctions
Opening/Closing operation 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: 9.How to disassemble for parts replacement)
Vibration (palpation)	No difference from other parts	Valves and actuators	Recheck the operating conditions and remove the source of vibration. (Ref: 2. Handling Precautions)
			Remove the valve from the pipe and replace the valve or actuator. (Ref: 9.How to disassemble for parts replacement)
		Piping around the valve	Recheck the operating conditions and remove the source of vibration. (Ref: 2. Handling Precautions)

Periodic inspection

●Guideline of the inspection cycle: 6 months

Inspection items and methods	Guideline of judgment	Check point	Remedy for malfunctions
Handwheel operability (touch)	To turn smoothly	Manual operation unit	Remove the valve from the pipe and replace the valve or actuator. (Ref: 9.How to disassemble for parts replacement)
Looseness of bolts (visual and palpation)	No looseness	For Stand + valve	Retighten the mounting bolts
		For Stand + actuator	Retighten the mounting bolts
		For flange piping	Retighten the pipe bolts to the specified torque. (Ref: 5. Mounting method)
Water-intrusion ※1) (visual inspection)	No ingress	Inside the actuator	Replace the actuator (Ref: 9.How to disassemble for parts replacement)
Intrusion ※1) of foreign objects (visual inspection)	No ingress	Inside the actuator	Replace the actuator (Ref: 9.How to disassemble for parts replacement)
Measured ※1) of the isolation resistance (Measurement)	Must be 50 MΩ or more	Inside the actuator	Replace the actuator (Ref: 9.How to disassemble for parts replacement)
Corrosion Or rust ※1) (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: 9.How to disassemble 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: 9.How to disassemble for parts replacement)

※1) Failure to do so may result in burnout or fire.

12. Cause of malfunction and remedy

Failure phenomenon	Possible cause	Measures and measures
Manual handwheel does not turn (cannot turn) during manual operation	Already fully open (or fully closed)	Turn the hand wheel in the reverse direction. (Ref.: 8. Test run method)
	The power remains supplied in the opposite direction of the handle operation direction.	Turn off the power
	Foreign matter caught in valve	Remove the valve from the piping and remove foreign matter. (Ref: 5. Mounting method)
	Torque is increasing due to piping stress	Remove the valve from the piping and remove the piping stress. (Ref: 5. Mounting method)
Do not open or close with electric operation	The operation panel is turned off.	Turn on the power.
	Torque is increasing due to piping stress	Remove the valve from the piping and remove the piping stress. (Ref: 5. Mounting method)
	Torque is increasing due to the effect of fluid (temperature, components, pressure)	Check the operating conditions. (Ref: 4. Relationship between maximum allowable pressure and temperature for product specifications)
	The cable to the actuator is disconnected.	Check the connection status again. (Ref: 4. Wiring diagram of product specifications)
	The power is turned on at the same time.	
Fluid leaks even when fully closed	Seat is worn	Replace seat (Ref: 9.How to disassemble for parts replacement)
	Scratches on disc, Seat or body	Replace applicable parts (Ref: 9.How to disassemble for parts replacement)
	Foreign matter caught in valve	Open and close several times to allow foreign matter to flow out
	Tightening, over-tightening or loosening of connecting bolts	Retighten
	Incorrect adjustment of limit switch	Adjust the limit switch normally. (Ref: 10. How to adjust limit switch)
	Low voltage	Check the voltage

CAUSE OF FAILURE AND HOW TO REMEDY (continued)

Failure phenomenon	Possible cause	Measures and measures
Fluid leaks from valve	O-ring is damaged or worn.	Replace the O-ring (Ref: 9.How to disassemble for parts replacement)
	O-ring protrudes from the groove.	Replace applicable parts
	O-ring fold surface (or fixed surface) is damaged or worn.	
Actuator is operating, but valve is not open or closed	Damaged stem or fitting	Replace stem or fitting
	The mating surfaces of the stem and disc are damaged.	Replace applicable parts
An error signal is output.	The switching microswitch is defective.	Replace the switching microswitch
	The cam of the open/close microswitch and the cam of the double microswitch are too close	Adjust to normal angle

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: 9.How to disassemble 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: 9.How to disassemble for parts replacement)
	Valve is cracked or broken	Stop using the product immediately, remove the valve from the piping, and replace the valve. (Ref: 9.How to disassemble for parts replacement)
Actuator is operating but valve is not open or closed	Damaged stem, disc, or fitting	Stop using the product immediately, remove the valve from the piping, replace the relevant part, or replace the valve. (Ref: 9.How to disassemble for parts replacement)

Failure phenomenon	Possible cause	Measures and measures
The actuator emits a bad smell, heat, or smoke.	Actuator is defective	Stop using the product immediately, remove the valve from the piping, and replace the actuator. (Ref: 9.How to disassemble for parts replacement)
	Wrong connection to the terminal block	Stop using the product immediately, remove the valve from the piping, and replace the actuator. (Ref: 9.How to disassemble for parts replacement)
	An overcurrent is flowing to the actuator	Stop using the product immediately, remove the valve from the piping, and replace the actuator. (Ref: 9.How to disassemble for parts replacement)
	The actuator is affected by lightning.	Stop using the product immediately, remove the valve from the piping, and replace the actuator. (Ref: 9.How to disassemble 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: 9.How to disassemble 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: 9.How to disassemble for parts replacement)

13. Disposal method of residual materials and waste materials

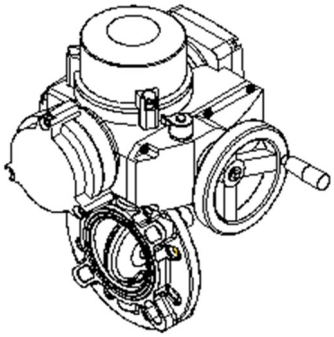
⚠Warning	
Forcing	**When burnt, toxic gas is generated.** ▶ When disposing of the product or parts, please dispose of them according to the guidelines of each local authority by a professional disposal company.

Inquiries

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

[User's Manual]

Butterfly valve 57, 56, 56D type Electric S type
40～350, 400mm
(automatic valve)



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

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