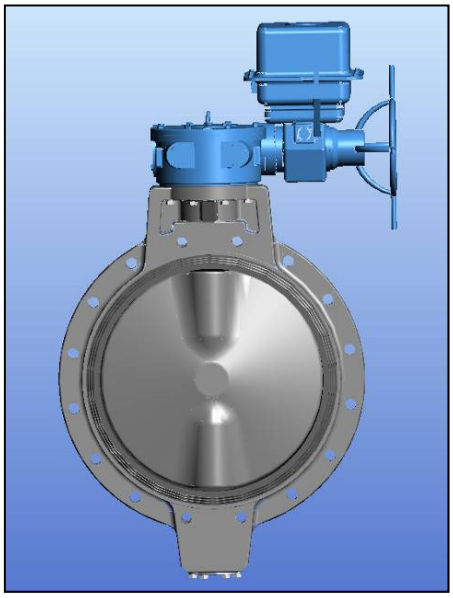
PDCPD Butterfly Valve
Electric Type S
700～1200mm

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, 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, 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.

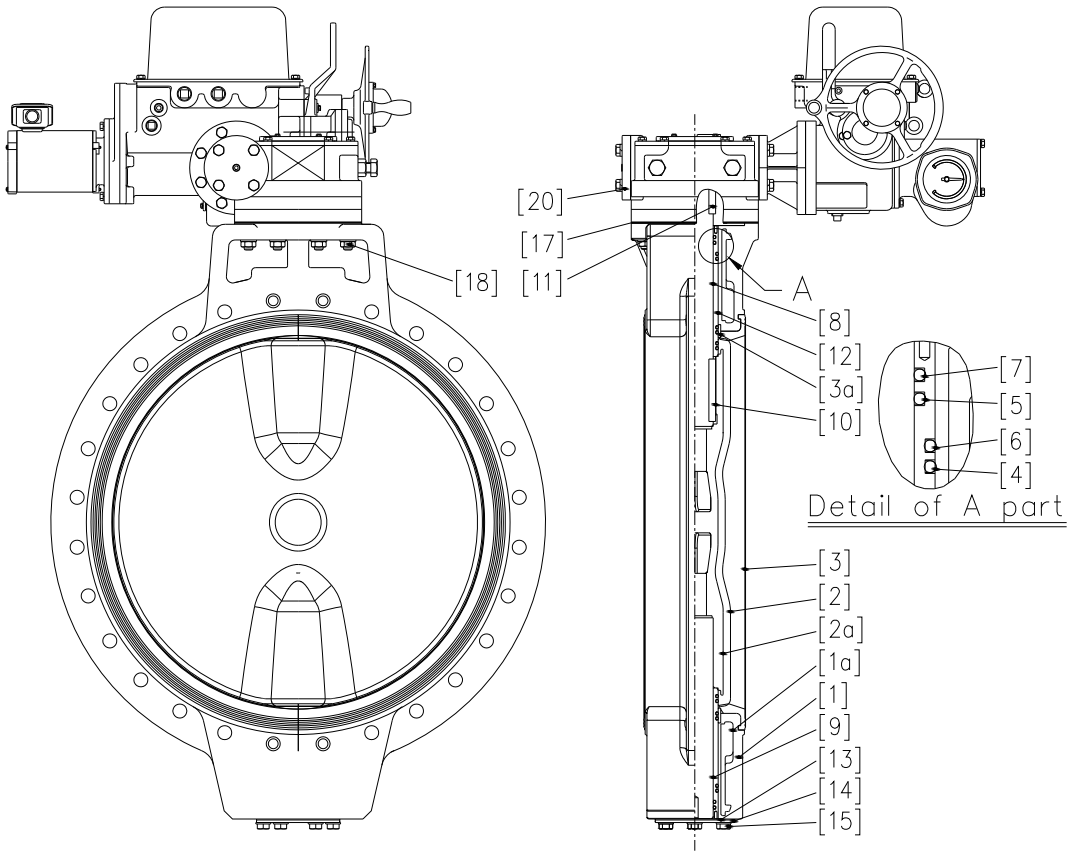
Product Handling

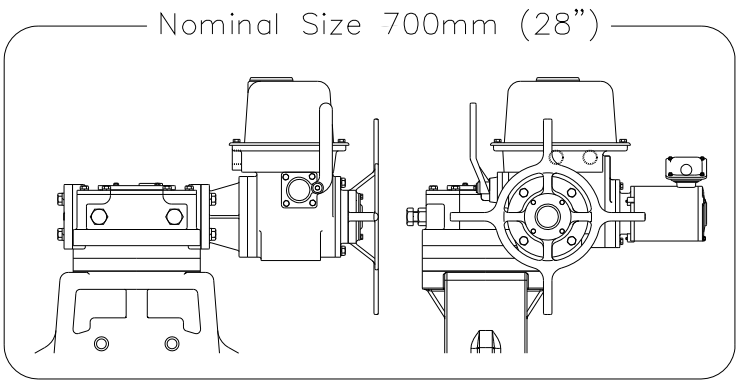
⚠ Warning	
Prohibition	**Serious injury can result.** ▶ Do not disassemble the actuator. ▶ Never touch the moving parts during operation. (Hand or arm may become entangled.)
Forcing	**Serious injury can result.** ▶ If positive pressure gas is used for our resin piping material, a dangerous condition 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. ▶ Check the voltage on the power supply and nameplate before use. A different voltage may cause damage or malfunction of the equipment. ▶ Perform manual operation after confirming that the actuator is not operated by the motor.

⚠Caution	
Prohibition	**The valve can be damaged, 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.
Forcing	**The valve can be damaged, damaged, or leak.** ▶ Keep the pressure and temperature of the fluid within the allowable range. (The maximum allowable pressure includes water hammer pressure.) ▶ Allow sufficient space for maintenance and inspection. ▶ 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. ▶「10. Perform maintenance on a regular basis referring to "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. ▶ Avoid places with corrosive gases or poor atmospheres, and provide a cover or the like to cover the entire area. ▶ If you notice an unusual odor, heat, or smoke, immediately turn off the power supply. If any abnormality is found, be sure to consult your dealer or us for inspection. ▶ 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 site within the range of-10° C to 50° C. ▶ Do not leave the actuator in a soil or a water reservoir other than the water resistant type.

3. Name of each part

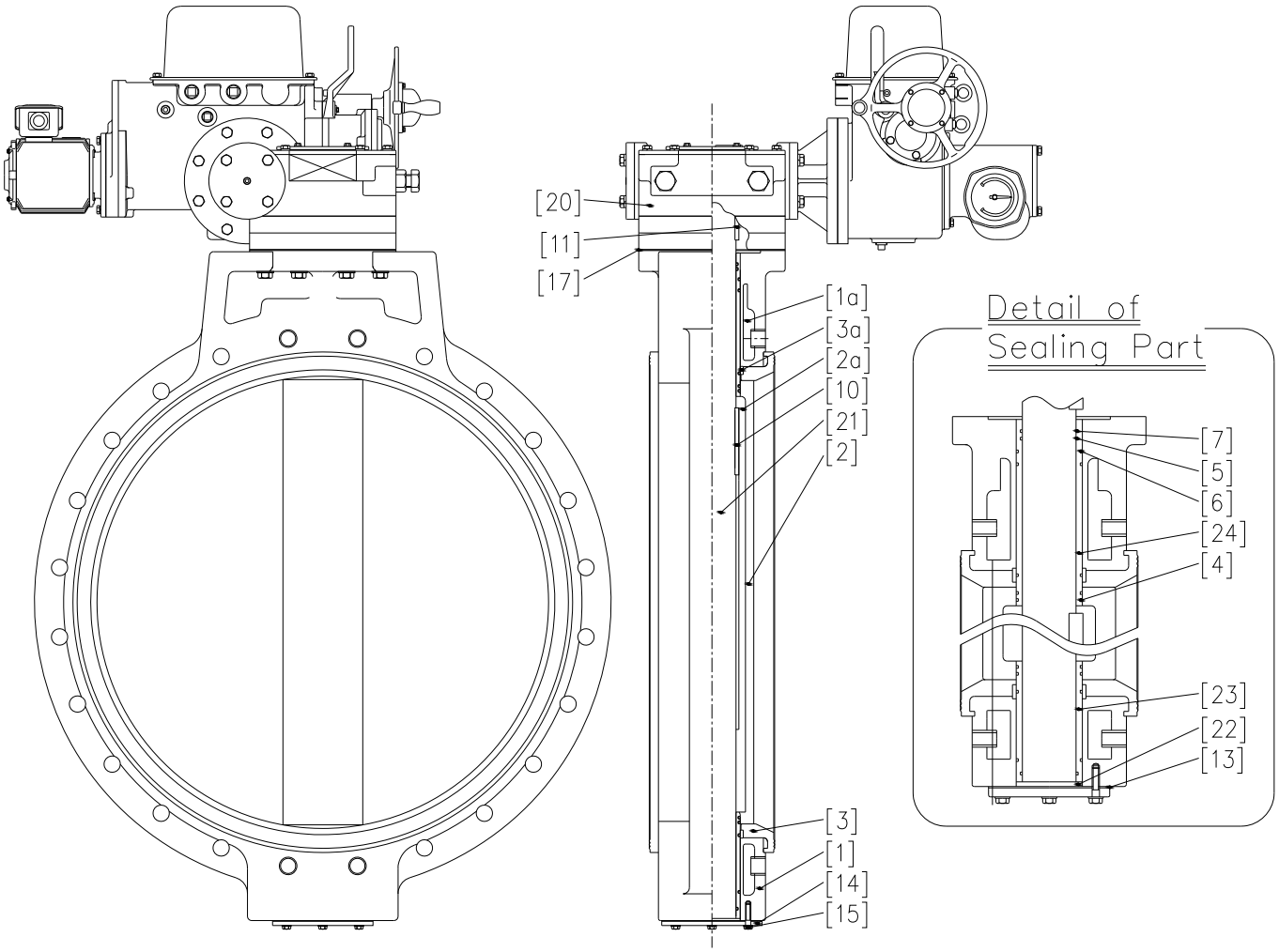
700～1000mm





[1]	Body	[5]	O-ring (B)	[12]	Bush
[1a]	Inserted Metal of Body	[6]	O-ring (C)	[13]	Gasket (A)
[2]	Disc	[7]	O-ring (D)	[14]	Stem support (A)
[2a]	Inserted Metal of Disc	[8]	Stem (A)	[15]	Bolt (A)
[3]	Seat	[9]	Stem (B)	[17]	Gasket (B)
[3a]	Seat ring	[10]	Key (A)	[18]	Bolt (B)
[4]	O-ring (A)	[11]	Key (B)	[20]	Actuator

1100, 1200mm



[1]	Body	[5]	O-ring (B)	[15]	Bolt (A)
[1a]	Inserted Metal of Body	[6]	O-ring (C)	[17]	Gasket (B)
[2]	Disc	[7]	O-ring (D)	[20]	Electric actuator
[2a]	Inserted Metal of Disc	[10]	Key (A)	[21]	Stem
[3]	Seat	[11]	Key (B)	[22]	Thrust
[3a]	Seat ring	[13]	Gasket (A)	[23]	Bush (A)
[4]	O-ring (A)	[14]	Stem support (A)	[24]	Bush (B)

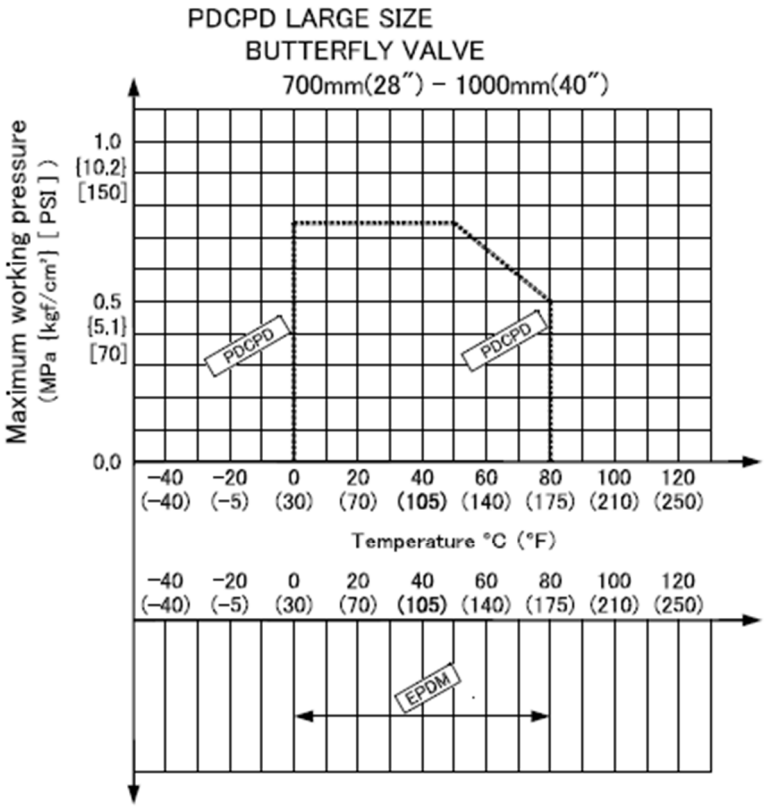
4. Product Specifications

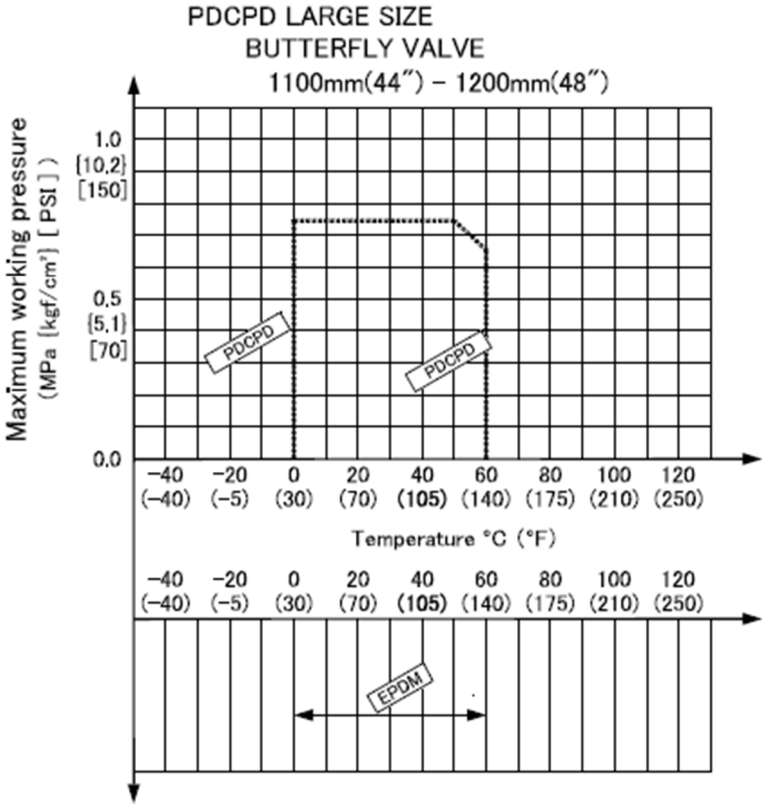
Model number table

ACTUATION	TYPE	ACTUATOR TYPE	ACTION / POWER SOURCE	BODY MATERIAL	SEAL MATERIAL	CONNECTION	STANDARD	SIZE
A	P D	S	*	D	E	W	*	* * *

ACTUATION	TYPE	ACTUATOR TYPE	ACTION / POWER SOURCE	BODY MATERIAL	SEAL MATERIAL	CONNECTION	STANDARD	SIZE
A AUTOMATIC VALVE	PD LARGE SIZE	S TYPE S	3 Three-Phase 200VAC 4 Three-Phase 400VAC	D PDCPD	E EPDM	W WAFER	1 JIS 10K W – D DIN A ANSI	700 700mm 800 800mm 900 900mm A00 1000mm A10 1100mm A20 1200mm

Relationship between maximum allowable pressure and temperature





Actuator

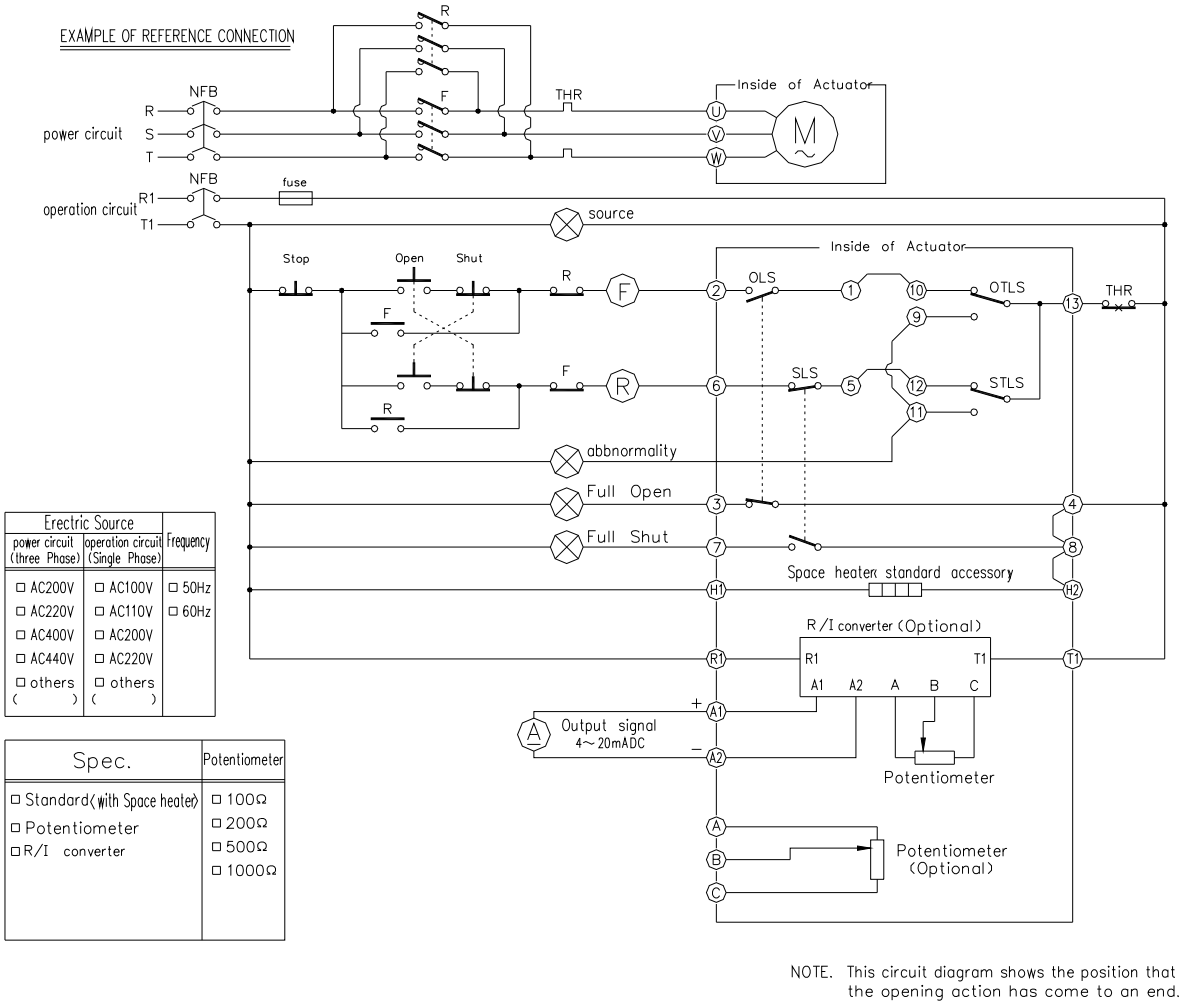
Specifications List

DN (mm)		700	800	900	1000	1100	1200
Actuator Model	Automatic reset	LTMD-02 /BRM-10	LTMD-05 /BRM-10	LTMD-05 /BRM-10	LTMD-05 /BRM-18	LTMD-1 /BRM-18	LTMD-1 /BRM-18
	Manual return	LTKD-02 /BRM-10	LTKD-05 /BRM-10	LTKD-05 /BRM-10	LTKD-05 /BRM-18	LTKD-1 /BRM-18	LTKD-1 /BRM-18
Open/close time (sec)	50Hz	75	68	43	50	50	68
	60Hz	63	76	51	49	57	69
Degree of protection		IP 55					
Motor starting current (A) 50/60Hz	200VAC	18.9/17.3	18.9/17.3	38.0/35.0	57.8/51.7	57.8/51.7	57.8/51.7
	400VAC	9.0/8.4	9.0/8.4	19.0/17.5	28.9/25.9	28.9/25.9	28.9/25.9
Motor Rated Current (A) 50/60Hz	200VAC	3.9/3.5	3.9/3.5	7.7/6.9	11/9.8	11/9.8	11/9.8
	400VAC	1.9/1.8	1.9/1.8	3.9/3.5	5.3/4.8	5.3/4.8	5.3/4.8
Manual operation handle revolution		15	333	333	333	615	615
Insulation resistance		100MΩ					
Cable connector Nominal size		Operating circuit: 2-G1, motor circuit: 1-G3/4					
Motor rated output (kW)		0.75	0.75	1.5	2.2	2.2	2.2
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)		30					

※When an E-E positioner is provided, "Z" is added to the end of the model. (e.g. LTMD - 02Z/BRM - 10)

Wiring diagram

Actuator model: LTMD

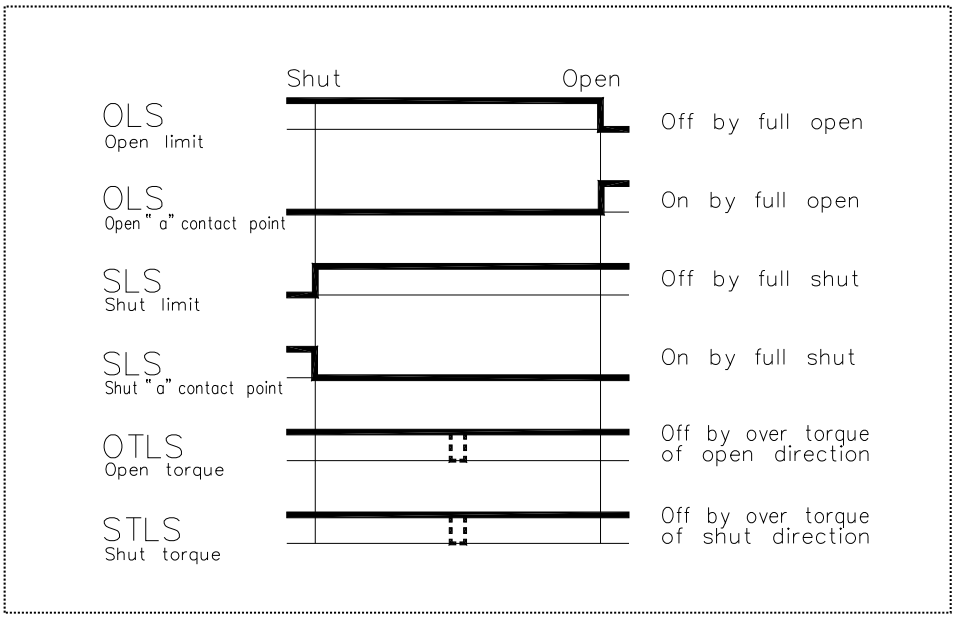


Erectric Source		
power circuit (three Phase)	operation circuit (Single Phase)	Frequency
□ AC200V	□ AC100V	□ 50Hz
□ AC220V	□ AC110V	□ 60Hz
□ AC400V	□ AC200V	
□ AC440V	□ AC220V	
□ others ( )	□ others ( )	

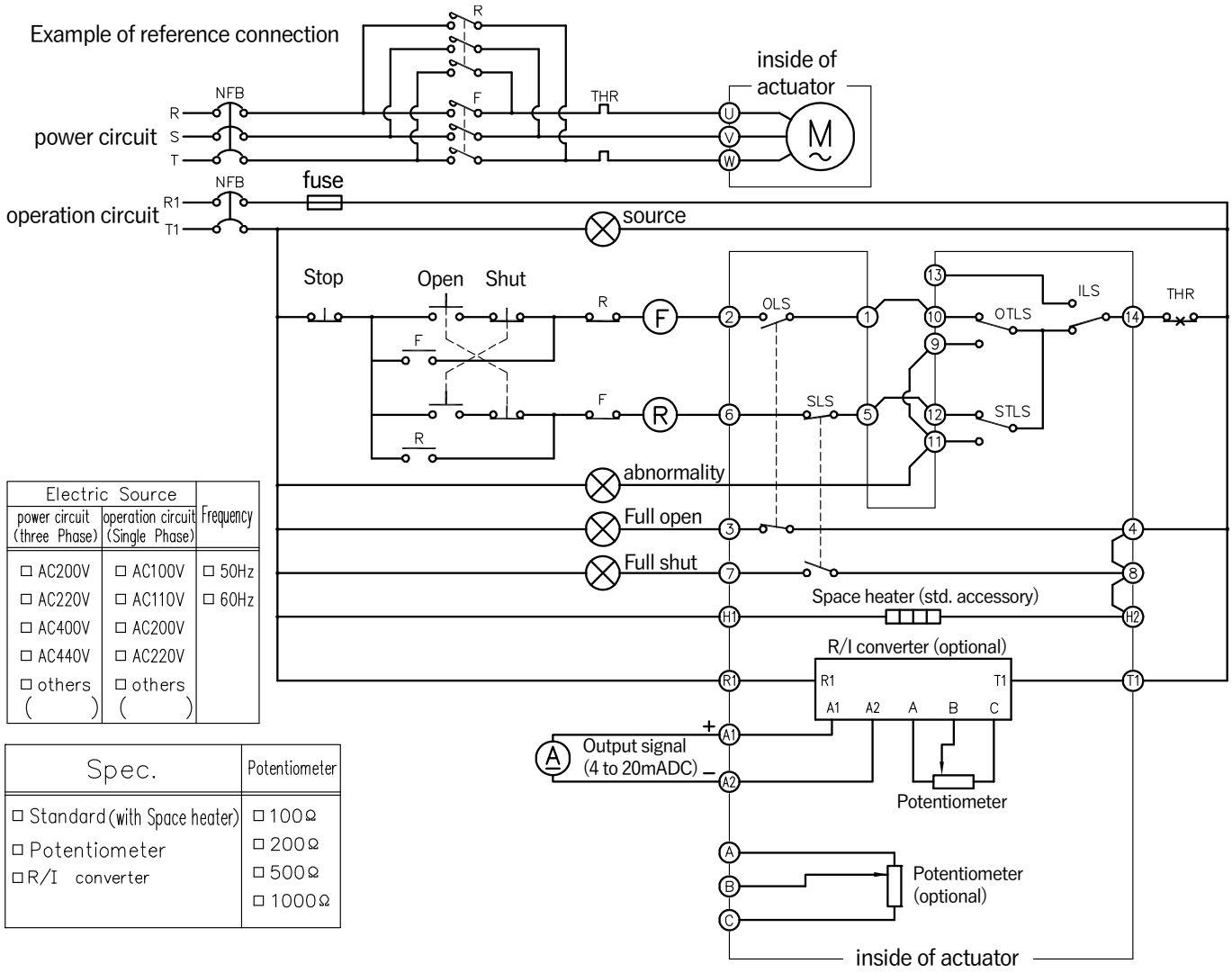
Spec.	Potentiometer
□ Standard(with Space heater)	□ 100Ω
□ Potentiometer	□ 200Ω
□ R/I converter	□ 500Ω
	□ 1000Ω

NOTE. This circuit diagram shows the position that the opening action has come to an end.

NOTE; The wiring diagram shows the end of the opening operation.



Actuator model: LTKD

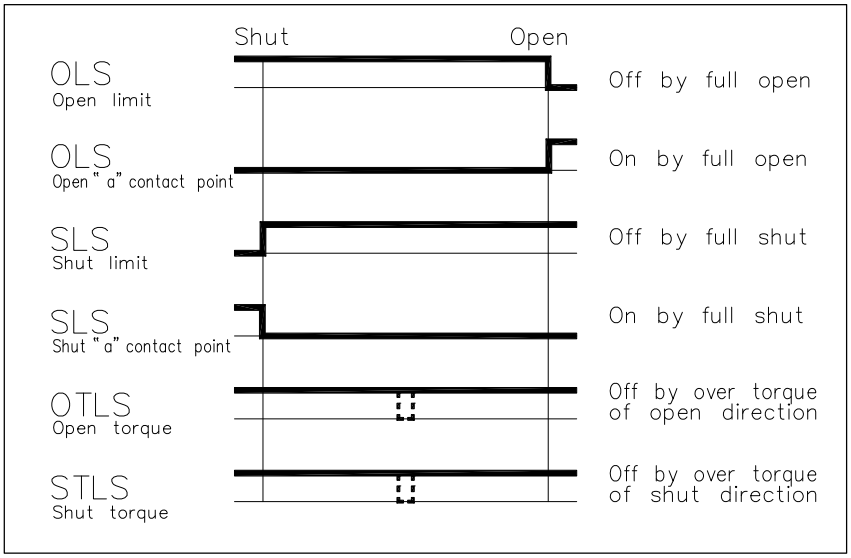


Electric Source		
power circuit (three Phase)	operation circuit (Single Phase)	Frequency
☐ AC200V	☐ AC100V	☐ 50Hz
☐ AC220V	☐ AC110V	☐ 60Hz
☐ AC400V	☐ AC200V	
☐ AC440V	☐ AC220V	
☐ others ( )	☐ others ( )	

Spec.	Potentiometer
☐ Standard (with Space heater)	☐ 100Ω
☐ Potentiometer	☐ 200Ω
☐ R/I converter	☐ 500Ω
	☐ 1000Ω

NOTE; The wiring diagram shows the end of the opening operation.

Switching chart

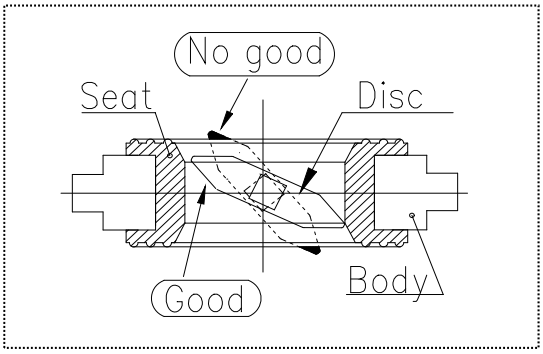


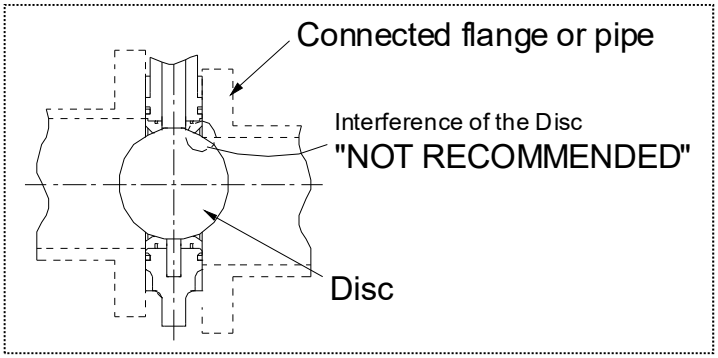
5. Piping method

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

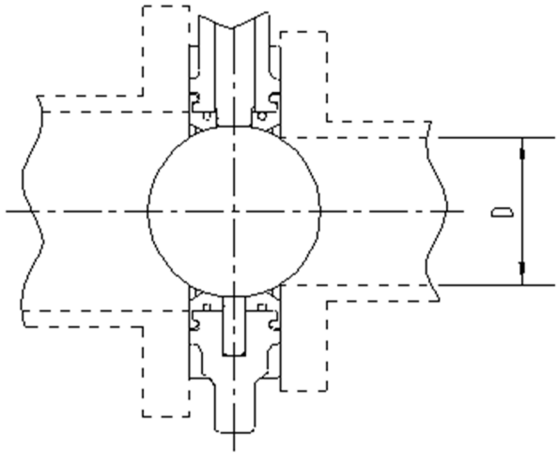
Caution	
Prohibition	**The valve can be damaged or leak.** ▶ Be careful not to overtighten the pipe support when you remove it with a U band or the like. (This will cause damage.) ▶ When installing piping, do not install it in the fully closed state. (The disc may bite into the seat, causing the operation torque to become heavy and the open/close operation may become impossible.) ▶ Even after installing the valve, do not open or close the valve when sand or other foreign matter has entered the pipeline.
Forcing	**The valve can be damaged or leak.** ▶ When piping, if the valving element is fully opened, confirm that it does not hit the connection flange or the corner of the inner diameter of the connection pipe, and then fit it correctly. (Refer to Fig. 1.) ▶ 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.

About chamfering





Large bore butterfly valves made of PDCPD are designed to be used for piping of various materials. In particular, when using large wall thicknesses of the connecting part (flange/pipe) with the valve, chamfering of the inner end of the connecting part is required to avoid contacting the valve disc with 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.



Units: mm

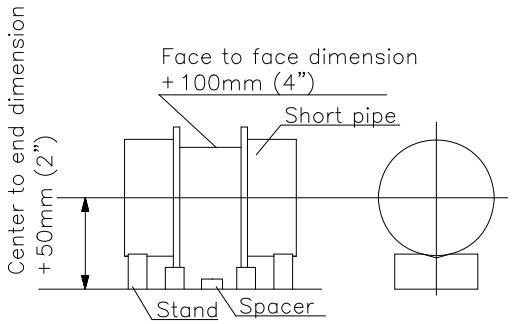
Nominal size	Inner diameter D
700	649
800	743
900	848
1000	936
1100	1054
1200	1136

[Procedure]

1) Set the short tube in advance.

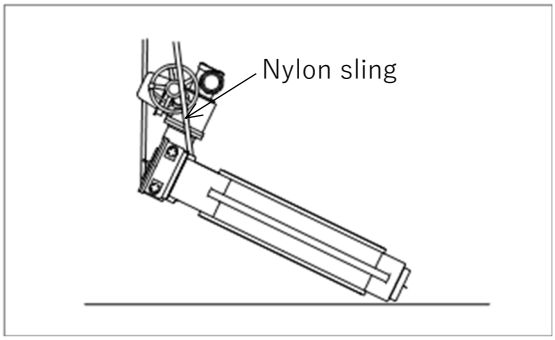
Set the short tube with an appropriate stand so that the valve center and the short tube center are roughly the same when the valve is raised. Wipe off any foreign matter from the flange surface of the short pipe with a cloth.

Fig. 1



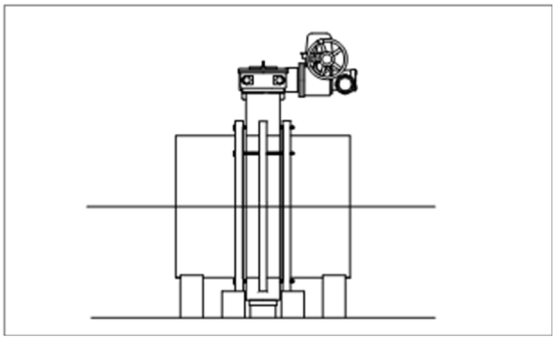
2) Raise the valve.

Wind the nylon sling around the body neck and raise it gradually. Wipe off any foreign matter from the seat surface with a cloth after raising.
※For lifting, band the gear box as shown in the figure.
Lift the unit. Be attached to the gearbox
Eyebolts against gearbox weight (approx. 500kg)
It is designed and should not be hung entirely.
Please do it. The eyebolts allow the valve to stand vertically.
It should be used as an adjunct.



3) Gradually lower the valve between the set pipes.

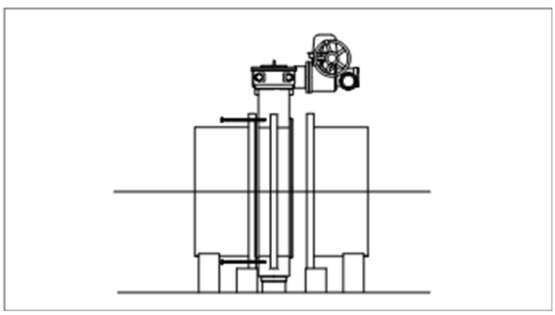
At this time, be careful not to damage the valve seat by hitting the flange surface of the short pipe.
The flange face-to-face dimensions for mounting are as follows.
Be sure to close the valve before installing.



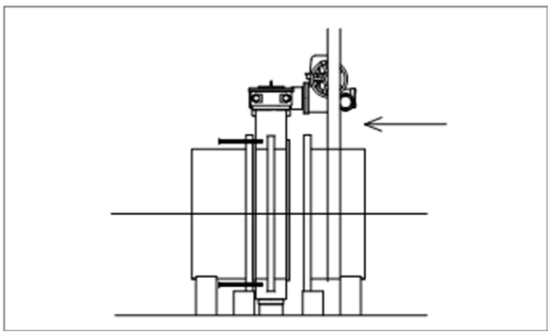
Units: mm

Nominal size	Face-to-face dimension
700	210
800	240
900	240
1000	300
1100	300
1200	350

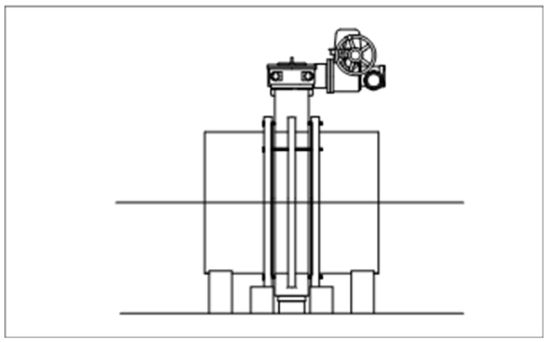
4) Temporarily connect the short pipe on one side and the valve.
At the position where the bolt hole of the short pipe and the bolt hole of the valve coalesce roughly, set the four stud bolts to the embedded metal fitting part and lightly fix them with the nuts.



5) Set the other short tube to the valve.
Hang the short pipe with the nylon sling, set the stud on the embedded metal fitting part in the same manner as in Step 4, and lightly fix it with the nut.



6) Pass the bolt through the through hole and connect the piping.
Move the pipe a little at a time so that all bolts can pass through without difficulty. Align the holes and set them with the nuts.
※Tighten and fix the bolt nuts of the valve and flange from the through hole. Do not tighten the metal fitting of the main body first.



7) Tighten the nut.
Tighten the nut diagonally. Tighten the recessed brackets after completion of tightening other through bolts.

Unit: kgf･cm (N･m)

DN (mm)	Bolt clamping torque
700, 800	1,300 (130)
900, 1000	1,700 (170)
1100	2,000 (200)
1200	2,200 (220)

8) Lift up the flanges of the short pipes on both sides with nylon sling and set them in place.
At this time, apply a wire to the eyebolt of the upper gearbox to prevent the entire valve from turning.

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

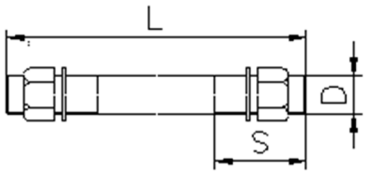
▼JIS10K

Nominal size		Bolt A			Bolt B		Quantity		
Mm	(inch)	D	L (mm)	S (mm)	D1	L1 (mm)	Bolt A	Bolt B	Nut・Washer
700	(28")	M30	370	70	M30	130	20	8	48
800	(32")		410	80		140	24		56
900	(36")		420			150			
1000	(40")	M36	500	90	M36	180			
1100	(44")		520	100		190			
1200	(48")		570			200	28		64

Note 1. The above values are the bolt dimensions when JIS B 2220 "Steel pipe flange" nominal pressure 10K 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.

Bolt A



Bolt B

6. Support installation method

⚠Caution	
Prohibition	**Otherwise malfunction can result.** ▶ Do not cause large vibrations to the valve by the piping around the pump. (Failure to do so may cause malfunction or damage.)
Forcing	**Otherwise malfunction can result.** ▶ Install a valve support. (Excessive force is applied to the valve body and piping, which may cause damage.)

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

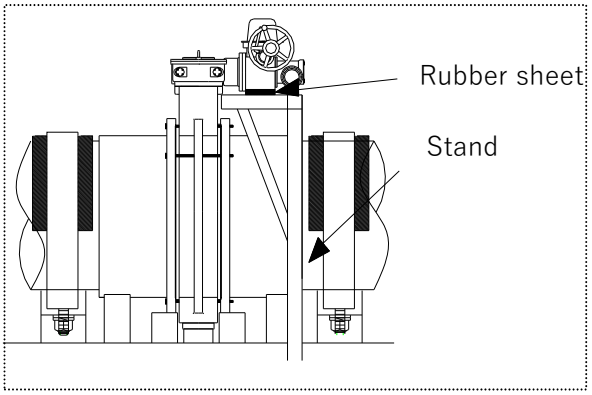
Horizontal piping

Place the frame under the valve.

Lay a rubber sheet under the actuator and fix it with the frame.

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

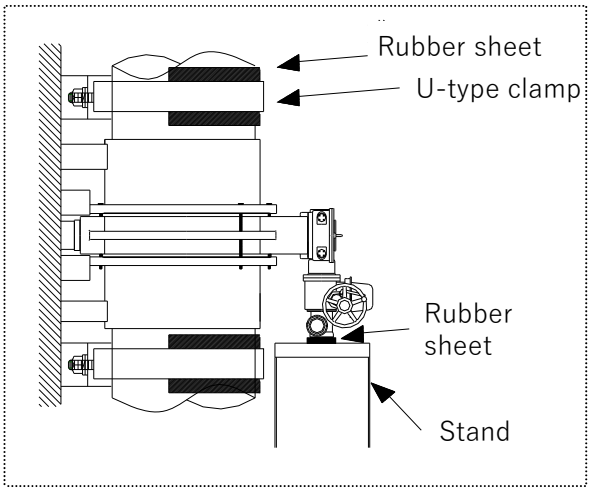
(Support installation example)



Vertical piping

Lay a rubber sheet under the actuator and fix it with the frame.

Wrap the rubber sheet around the pipe and secure it with the U-band.



7. Electrical Wiring

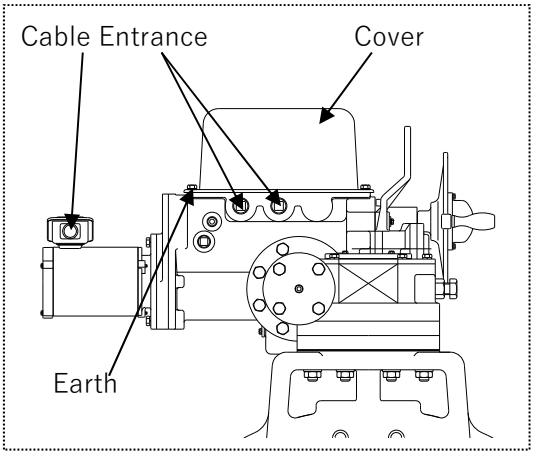
Warning	
Prohibition	**Serious injury can result.** ▶ Do not connect or separate lines when the power is on. Also, do not touch any other parts on the board or the terminal block wiring part. (risk of electric shock or damage to equipment) ▶ Never touch the moving parts during operation. (Hand or arm may become entangled.)
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) ▶ Perform manual operation after confirming that the actuator is not operated by the motor.

Caution	
Prohibition	**Otherwise malfunction can result.** ▶ 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	**Otherwise malfunction can result.** ▶ 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.) ▶ Check the voltage on the power supply and nameplate before use. Improper voltage may cause damage or malfunction of the equipment.

Preparations	▶ Phillips screwdriver ▶ wire stripper ▶ Crimp terminal ▶ connector ▶ Terminal crimping tool ▶ wrench

[Procedure]

1) Loosen the screws fixing the actuator cover with a 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 according to page 14.
※Tighten the screws securely.
(There is a risk of electric leakage or electric shock.)
8) Tighten the connector.
※Tighten the connector securely.
(There is a risk of electric leakage or electric shock.)
9) Tighten the screws holding the actuator cover with a wrench to attach the cover.
10) Attach the ground.



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	**Otherwise malfunction can result.** ▶ 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	**Doing so may cause malfunction or failure.** ▶ 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.) ▶ If the valve body and seat are not wet, they may not operate properly. This phenomenon occurs because there is no lubrication between the valve body and the seat. When operating the valve alone, operate with the valve body and seat wet or with water after piping.

Manual operation

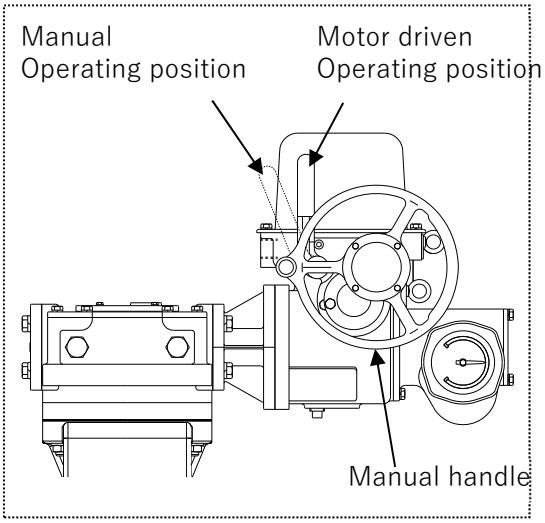
⚠Caution	
Prohibition	**Doing so may damage the actuator.** ▶ Do not operate the switching lever with excessive force. ▶ Do not forcibly turn the manual handle further from the fully open "O" and fully closed "S".

[**Procedure**]

1) Push the selector lever to the manual position. If the switch is not smooth, press the switch lever while turning the manual handle to either side.

2) Turn the manual handle while watching the valve travel meter.
Rotate clockwise → Close direction
Counterclockwise rotation → Open direction

3) The manual operation ends differently for the automatic return type and manual return type.



For 3a) LTMD (auto-return type)

Turn on the power and press the OPEN or CLOSE button.

⚠Caution	
Prohibition	**It can cause failure.** ▶ The switch lever is designed to automatically return to the motor-operated position. Do not manually return the switch lever to the motor-operated position. (It will malfunction.)

For 3b) LTKD (manual return type)

Switch the switch lever to the motor-operated position manually. (The structure is different from the automatic return type, and the operation cannot be returned to the electric operation unless it is switched manually.)

If the switch is not smooth, press the switch lever while turning the manual handle to either side.

Electric operation method

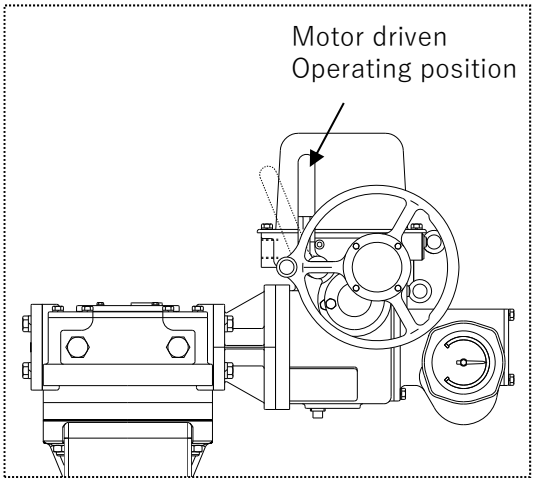
⚠Caution	
Prohibition	**Serious injury can result.** ▶ Do not leave the actuator cover open. (If the terminal is touched, an electric shock will occur.)

[Procedure]

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 14 and 15) and perform the operation from 1) again.

3) Fully open "O" or fully close "S" the valve to turn off the power.



9. How to adjust the limit switch

Warning	
Prohibition	**Serious injury can result.** ▶ Do not connect or disconnect wires to the limit switch while the power is on. (electric shock or sudden start of the machine) ▶ Do not leave or use the cover open. (Water or dust may penetrate and cause operation failure.)
Forcing	**Serious injury can result.** ▶ Contact CKD when using the limit switch in a 1mA～100mA, 5V～30V.

Preparations ▶ Hex Wrench ▶ Wrench

[Procedure]

1) Turn off the power, remove the fluid in the piping completely, and then loosen the actuator cover with a spanner to 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.
   ※Operation without operation 3) Move to operation 4) and limit switch mechanism.
   Otherwise, it may cause damage.
4) Check the switch assigned to the moved opening (set opening display ②, and settle the switch "O" when fully open, for example).
5) Insert the special handle into the reduction shaft ③ (Fig. 2) closest to the applicable switch, turn the reduction shaft in the direction that requires less number of turns, 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 (see page 27). Make sure that the opening scale is pointing to fully closed "0".
    ※ If they are misaligned, loosen the actuator cover with a wrench.
    Remove it, remove the switch cover, pull out the pointer, and scale the opening.
    Push in the pointer according to "0".

Fig. 1

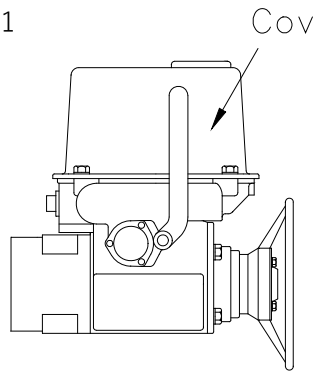


Fig. 2

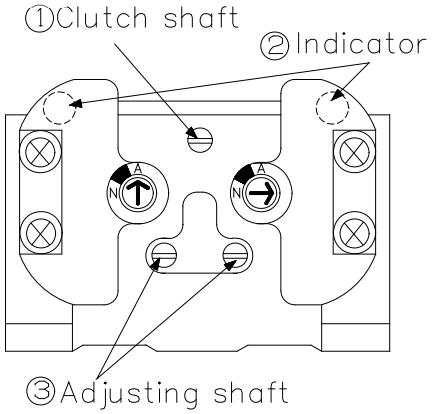
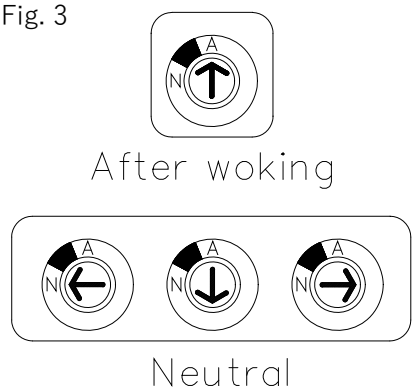


Fig. 3



There are four states of limit switch as shown above. The switch is activated when the indicator shows position [A].

Dedicated handle (accessory)

10. 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 "**11. Cause of malfunction and remedy**".

Daily inspection

Inspection items and inspection methods	Guideline of judgment	Check point	Treatment method
External leakage (visual inspection)	No leakage	Piping 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.
		Surface of the entire valve	Remove the valve from the pipe and replace the valve.
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.
		Measured values of flowmeters, pressure gauges, etc.	Remove the valve from the piping and replace the valve.
Misalignment of operating position	No deviation	Actuator opening display	Remove the actuator cover and adjust the limit switch operating position. (Ref: 9. How to adjust limit switch)
Abnormal noise (hearing)	No abnormal noise	Valves and actuators	Remove the valve from the piping and replace the valve.
		Piping around the valve	Reconfirm the conditions of use (Ref: 2. Safety Instructions)
Odor ※1) (sniffing)	No odor	Valves and actuators	Remove the valve from the piping and replace the valve.

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

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%).
			Remove the valve from the piping and replace the valve.
Vibration (palpation)	Vibration (palpation)	Valves and actuators	Recheck the operating conditions and remove the source of vibration. (Ref: 2. Safety Instructions)
			Remove the valve from the piping and replace the valve.
		Piping around the valve	Recheck the operating conditions and remove the source of vibration. (Ref: 2. Safety Instructions)

Periodic inspection

●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 piping and replace the valve.
Looseness of bolts (visual and palpation)	No Loose	For mounting base + valve	Retighten the mounting bolts
		For mounting base + actuator	Retighten the mounting bolts
		For fixing the actuator cover	Retighten the screws
		Terminal block	Retighten the screws with the following torques
		[Flange type] For flange piping	Retighten the pipe bolts to the specified torque. (Ref: 5. Piping method)
Water-intrusion ※1) (visual inspection)	No intrusion	Inside the actuator	Replace the actuator
Intrusion of foreign objects ※1) (visual inspection)	No intrusion	Inside the actuator	Replace the actuator
Measured of the isolation resistance ※1) (Measurement)	Must be 50MΩ or more	Inside the actuator	Replace the actuator
Corrosion or rust※1) (visual inspection)	No corrosion or rust	Appearance of the product and in the actuator	Remove the valve from the piping and replace the valve.
Product damage	No scratches, cracks, or deformation	Appearance of the product	Remove the valve from the piping and replace the valve.

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

11. Cause of malfunction and remedy

Failure phenomenon	Possible cause	Measures and measures
Manual hand wheel does not turn (cannot turn) during manual operation	The valve is already fully open (or fully closed).	Rotate the manual handle in the reverse direction (Ref.: 8. Commissioning method)
	The power remains supplied in the opposite direction of the handle operation direction.	Turning the power off and then manually operating
	Foreign matter caught in valve	Remove the valve from the piping, disassemble it, and remove foreign matter. (Ref: 5. Piping method)
	Torque is increasing due to piping stress	Remove valve from piping and remove piping stress (Ref: 5. Piping 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. Piping method)
	Torque is increasing due to the effect of fluid (temperature, components, pressure)	Replace the cable or the actuator. (Ref: 4. Relationship between maximum allowable pressure and temperature for product specifications)
	The cable to the actuator is disconnected.	Stop operation immediately and recheck the connection status. (Ref: 4. Wiring diagram of product specifications)
	The power is turned on at the same time.	

CAUSE OF FAILURE AND HOW TO REMEDY (continued)

Failure phenomenon	Possible cause	Measures and measures
Do not open or close with electric operation	The power is off.	Check the voltage and turn on the power.
	Wiring to the terminal block is disconnected.	Stop operation immediately and recheck the connection status. (Ref: 4. Wiring diagram for actuator specifications)
	The cable or the connection inside the actuator is broken.	Replace the cable or the actuator.
	Simultaneous switching energizing or incorrect wiring to the terminal block	Stop operation immediately and recheck the connection status. (Ref: 4. Wiring diagram for actuator specifications)
	The power supply voltage is different.	Check the voltage with a tester to obtain the correct voltage.
	Power supply voltage is low.	Check the voltage with a tester to obtain the correct voltage.
	Foreign matter caught in valve	Remove the valve from the piping, disassemble it, and remove foreign matter.

CAUSE OF FAILURE AND HOW TO REMEDY (continued)

Failure phenomenon	Possible cause	Measures and measures
Do not open or close with electric operation	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)
	The thermal protector is activated.	Stop using the product immediately, and lower the ambient temperature or the opening/closing frequency.
	The capacitor is burnt out (punctured).	Stop using the product immediately and replace the actuator.
	Water or foreign matter has entered the actuator causing a short circuit.	Stop using the product immediately and replace the actuator.
	The actuator does not move due to external corrosion of the actuator.	Stop using the product immediately and replace the actuator.
	The insulation resistance of the actuator has dropped.	Stop operation immediately, check the insulation resistance, and replace the actuator.
Fluid leaks even when fully closed (internal leak)	High fluid pressure	Use below the maximum allowable pressure
	Seat or disc is worn or scratched	Remove the valve from the piping, replace valve.
	Missing parts	Remove the valve from the piping, replace valve.
	Foreign matter caught in valve	Remove the valve from the piping, replace valve.
	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 valve.
	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 valve.
	Valve is cracked or broken	Stop using the product immediately, remove the valve from the piping, and replace the valve.
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 valve.
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.
	Wrong connection to the terminal block	Stop using the product immediately, remove the valve from the piping, and replace the actuator.
	An overcurrent is flowing to the actuator	Stop using the product immediately, remove the valve from the piping, and replace the actuator.
	The actuator is affected by lightning.	Stop using the product immediately, remove the valve from the piping, and replace the actuator.
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.
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.

12. Disposal method of residual materials and waste materials

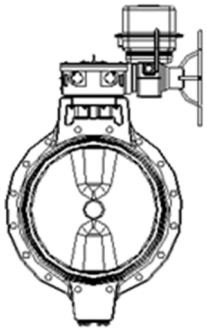
⚠Warning	
Forcing	**When burnt, toxic gas is generated.** ▶ When disposing of the product or parts, please dispose of them according to the guidelines of each local authority by a professional disposal company.

Inquiries

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

[User's Manual]

PDCPD Butterfly Valve Electric actuated Type S
700～1200mm



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