

Diaphragm valve Type 72 (Manual operation)

User's Manual



Thank you for choosing our product.

This User's 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 User's 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".

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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, User's 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 User's 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	
 Forcing	<p>Serious injury can result.</p> <ul style="list-style-type: none"> ▶ When hanging or slinging a valve, pay sufficient attention to safety, and do not enter under the load.

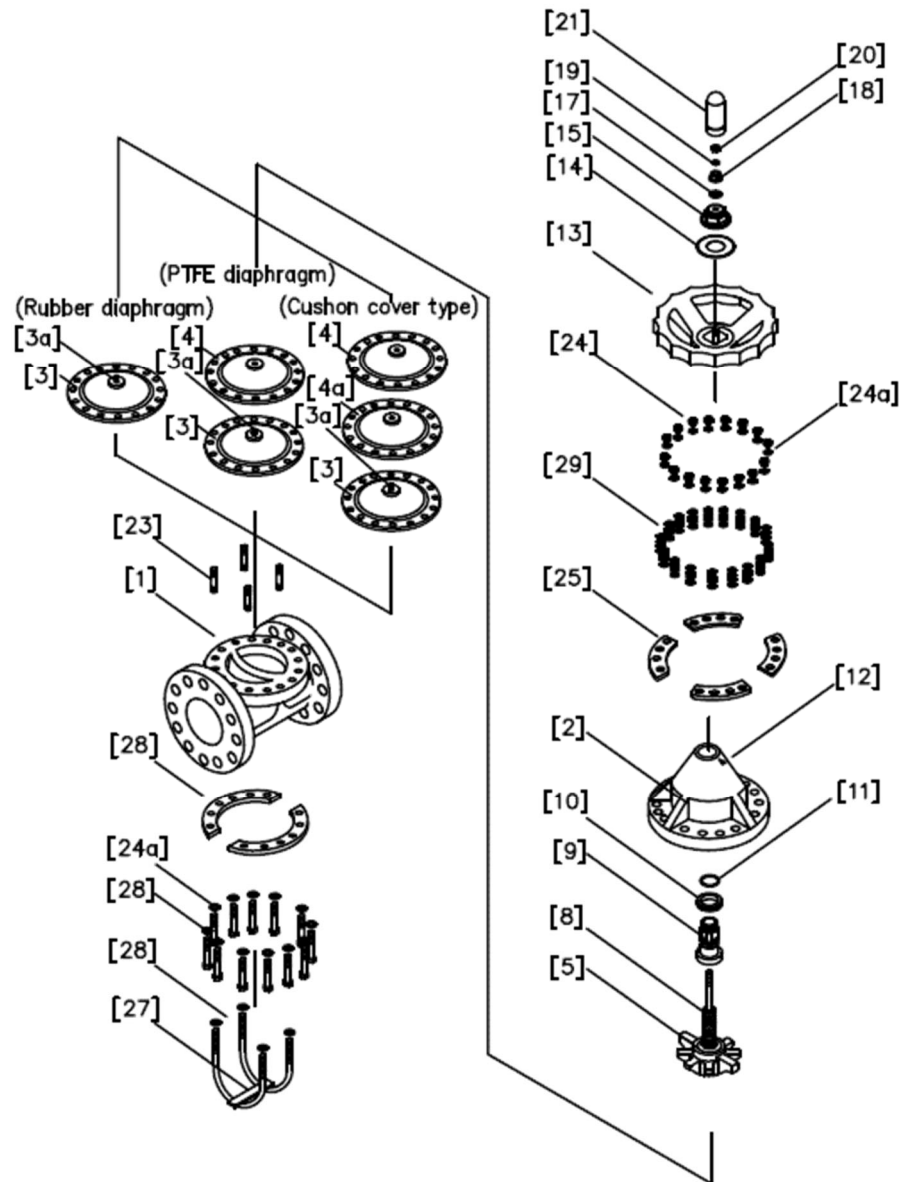
 Caution	
 Prohibition	<p>The valve can be damaged, or leak.</p> <ul style="list-style-type: none"> ▶ Do not subject the product to impact by throwing, dropping or hitting. ▶ Do not scratch or pierce the product with a sharp object such as a knife or hand hook. ▶ Do not pile up cardboard boxes forcefully 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	<p>The valve can be damaged, or leak.</p> <ul style="list-style-type: none"> ▶ 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	
 Forcing	<p>Serious injury can result.</p> <ul style="list-style-type: none"> ▶ 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.

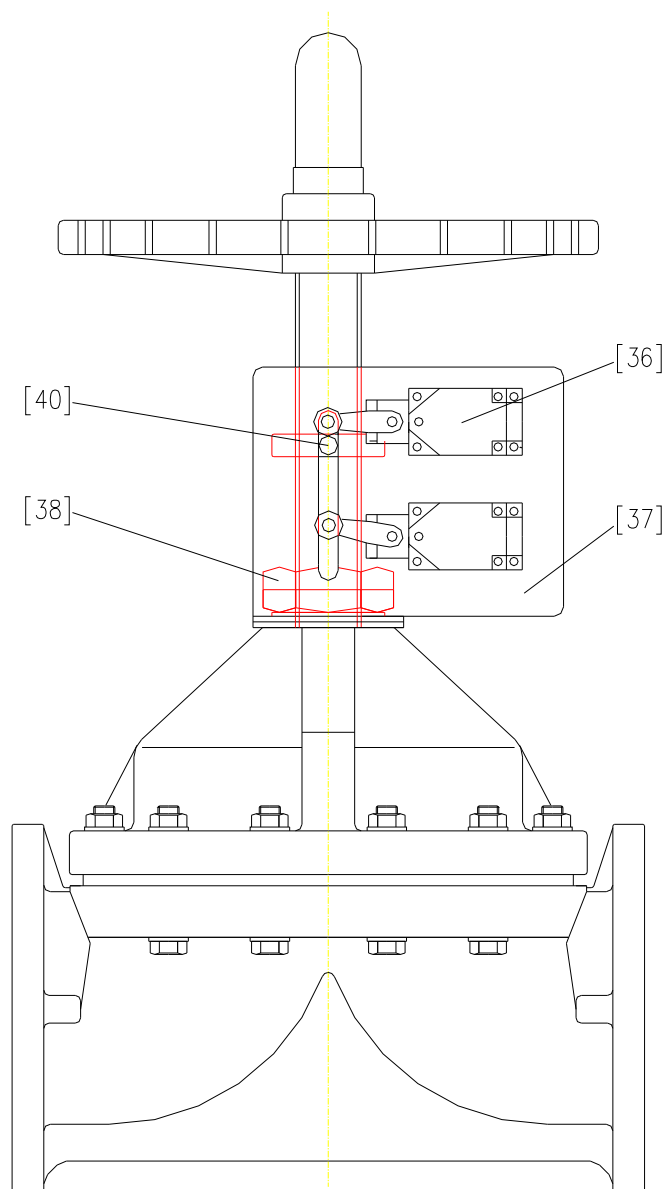
 Caution	
 Prohibition	<p>The valve can be damaged, or leak.</p> <ul style="list-style-type: none"> ▶ Do not step on the valve or place heavy objects on it. ▶ Keep away from fire and hot objects.
 Forcing	<p>The valve can be damaged, or leak.</p> <ul style="list-style-type: none"> ▶ Keep the pressure and temperature of the fluid within the allowable range. (The maximum allowable pressure includes water hammer pressure.) ▶ Use fluids containing crystalline material under conditions that do not recrystallize. ▶ 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.) ▶ 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. ▶ If internal leakage occurs when the valve is fully closed, adjust the stopper. ▶ The tightening bolts and nuts of the diaphragm (between the bonnet and body) may become loose due to changes in temperature or creep during storage or use. After checking, tighten the bolts and nuts diagonally to the values listed in the bonnet tightening torque table. <p>There is a danger of injury.</p> <ul style="list-style-type: none"> ▶ Allow sufficient space for maintenance and inspection.

3. Name of each part



[1]	Body	[11]	O-ring (A)	[23]	Stud bolt and nut
[2]	Bonnet	[12]	Grease nipple	[24]	Bolts and nuts
[3]	Diaphragm	[13]	Handle	[24a]	Washer
[3a]	Inserted metal of diaphragm(A)	[14]	Name plate	[25]	Bonnet top liner
[4]	Cushion	[15]	Cap	[26]	Body liner
[4a]	Cushion cover	[17]	Valve seat	[27]	Rib liner
[5]	Compressor	[18]	Stopper	[28]	U-bolt and nut
[8]	Stem	[19]	Spring Washer	[29]	Disc spring washer
[9]	Sleeve (A)	[20]	Set nut		
[10]	Thrust bearing (A)	[21]	Gauge cover		

With limit switch (option)



[36]	Limit switch	[38]	Nut (A)
[37]	Bracket (A)	[40]	Limit switch retainer

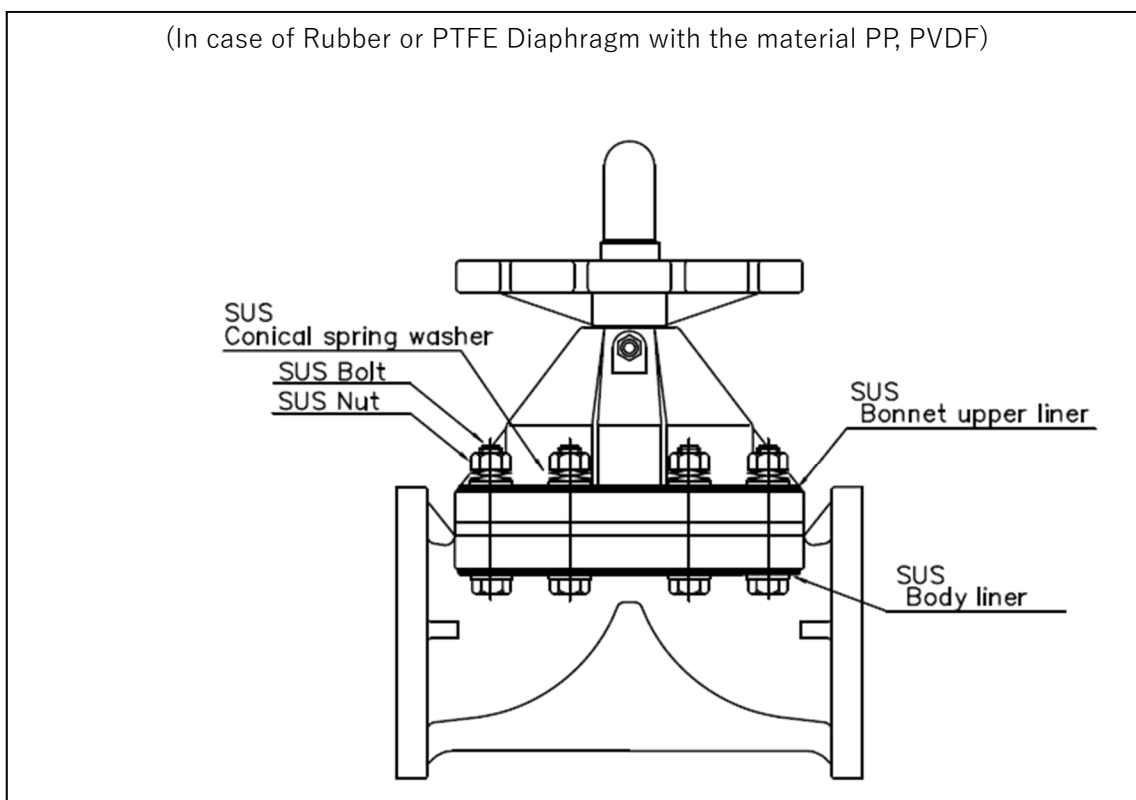
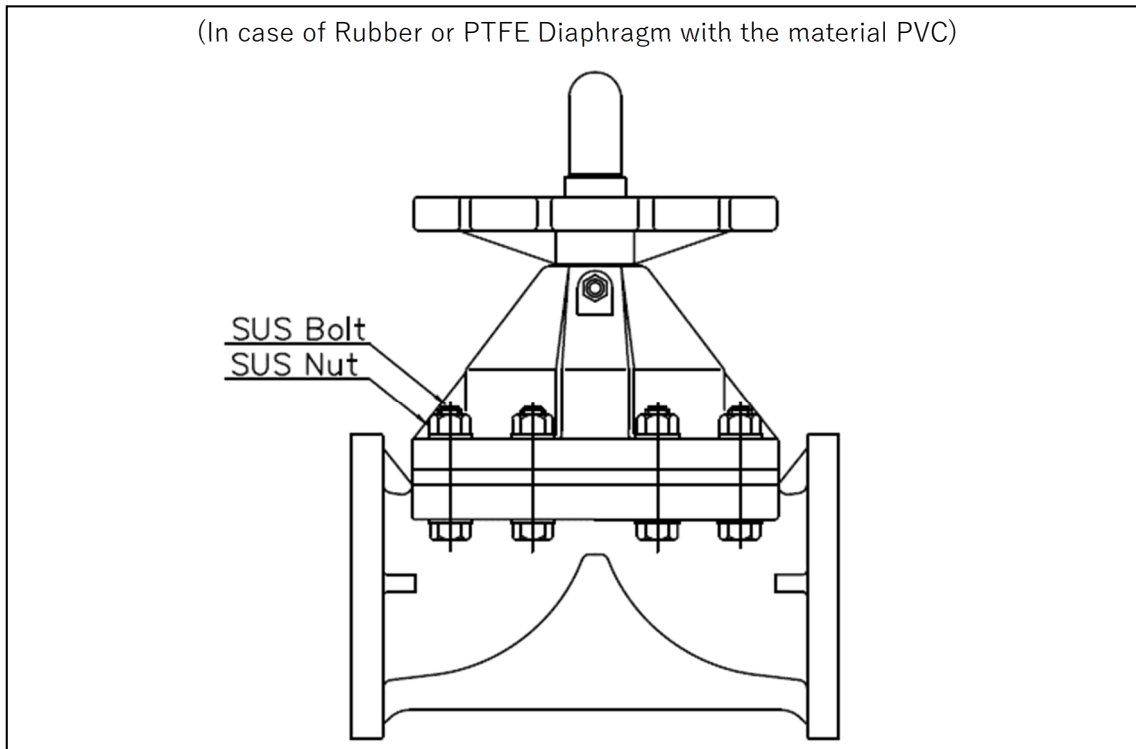
4. Product Specifications

Model number table

ACTUATION	TYPE	OPERATING SYSTEM	BODY MATERIAL	SEAL MATERIAL	CONNECTION	STANDARD	SIZE
V	72	MH	*	*	F	*	* * *
V MANUAL VALVE	72 TYPE 72	MH ROUND HANDLE	U U-PVC P PP F PVDF G PVDF+PPG	E EPDM T PTFE V FKM	F FLANGED	1 JIS 10K 5 JIS 5K D DIN A ANSI	200 200mm · 250 250mm

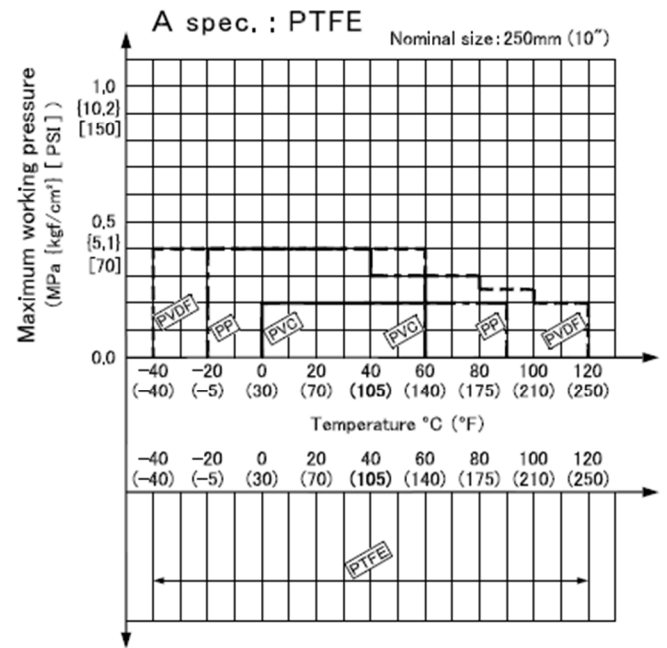
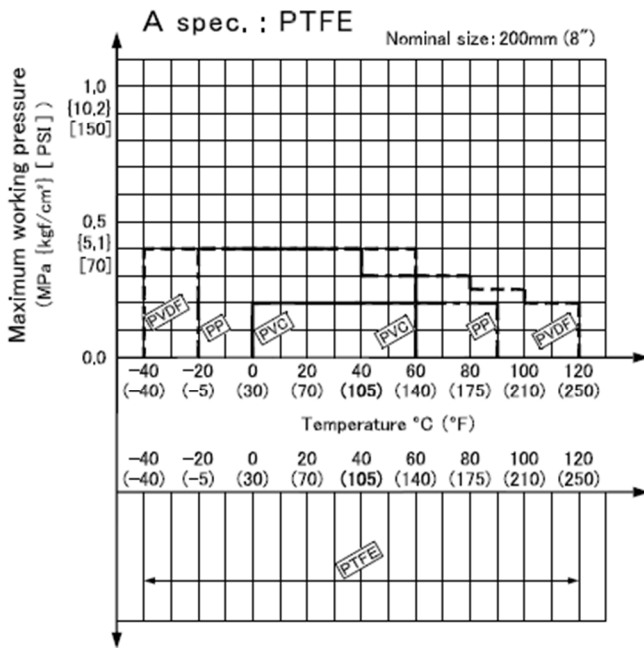
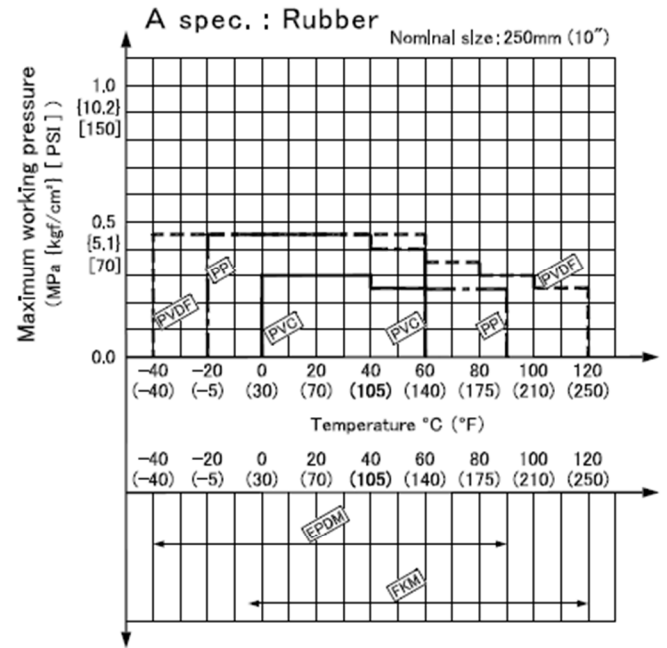
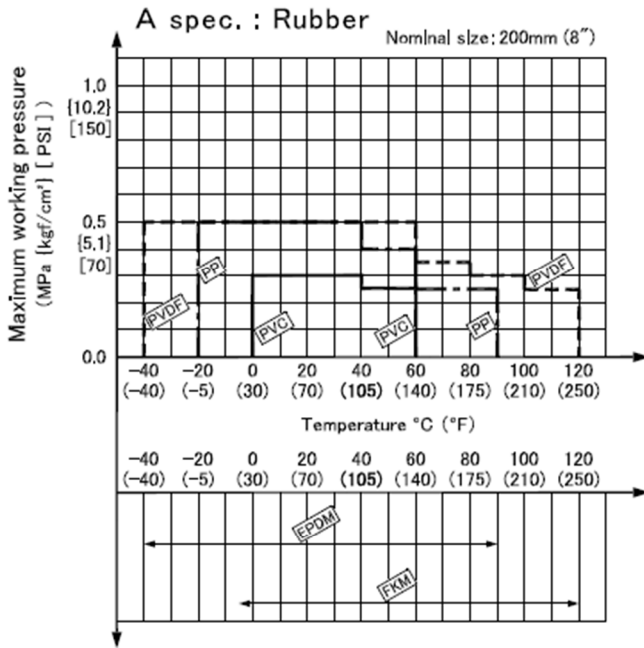
Relationship between maximum allowable pressure and temperature

(1) AV Diaphragm (Type 72) Tightening Specification (A Specification)



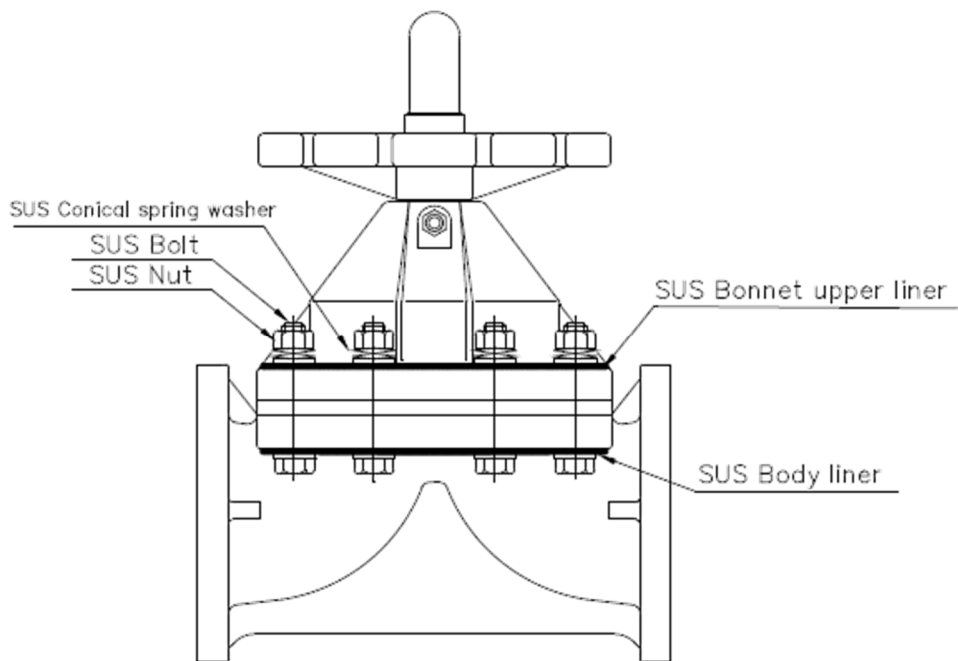
※SUS Disc Spring Washer is used for PVDF only

(1)AV Diaphragm (Type 72) Tightening Specification (Type A)

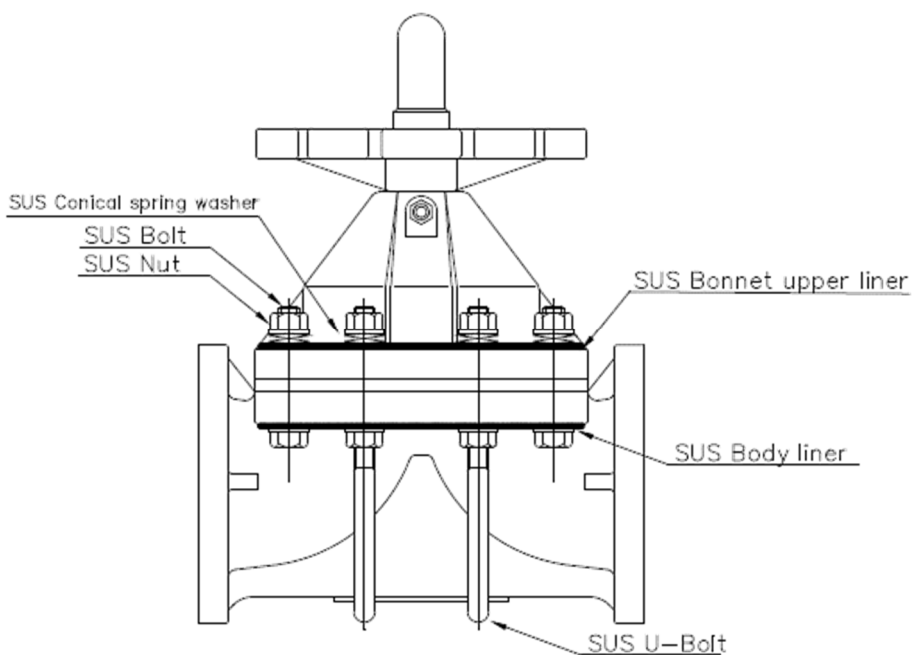


(2)AV Diaphragm Valve (Type 72) Fastening Specification (B Specification)

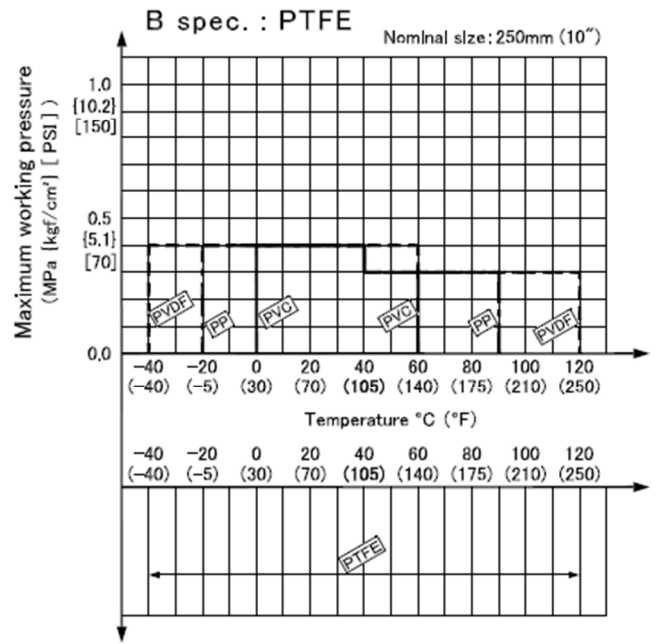
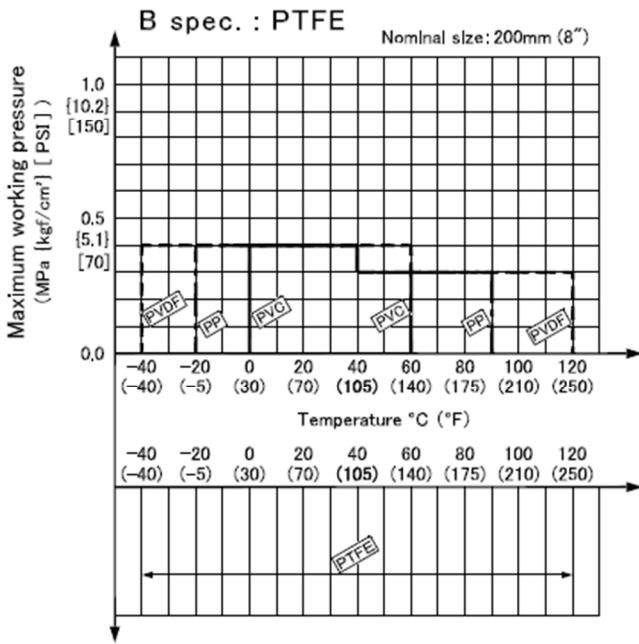
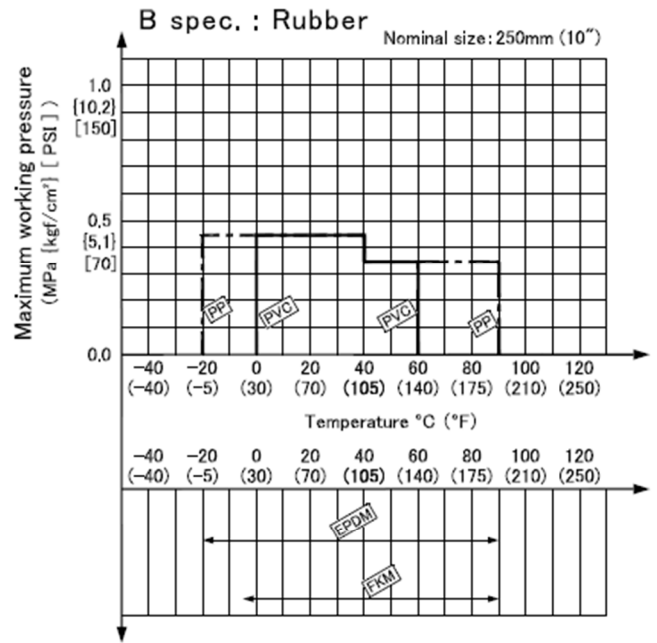
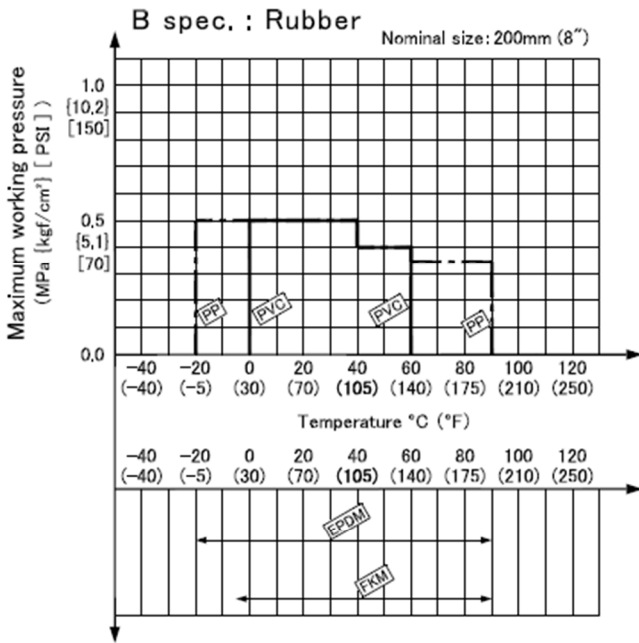
(In case of Rubber or PTFE Diaphragm of the material PVC)



In case of Rubber or PTFE Diaphragm with the material PP, PVDF, with high pressure, when the temperature is 80°C or more (100°C or more with PVDF) on special request.



(2)AV Diaphragm Valve (Type 72) Fastening Specification (B Specification)



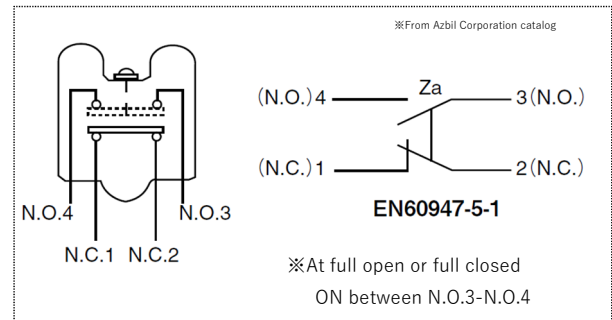
Limit switch specifications (option)

Size (mm)	Model	Protection grade
200, 250	1LS1-J	IP67



Limit switch rating




Rated voltage (V)	Resistance load (A)	Induction load (A)
125AC	10	6
250AC	10	6
115DC	0.8	0.2
230DC	0.4	0.1

Internal circuit





5. Piping method

 Warning	
 Prohibition	<p>Serious injury can result.</p> <ul style="list-style-type: none"> ▶ 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.

 Caution	
 Prohibition	<p>The valve can be damaged, or leak.</p> <ul style="list-style-type: none"> ▶ Do not over-tighten when supporting piping with a U-band, etc. ▶ When installing the product, make sure that no excessive stress such as tension, compression, bending or impact is applied to the piping or valve. ▶ When connecting a resin valve to metal piping, be careful not to apply piping stress to the resin valve.
 Forcing	<p>Serious injury can result.</p> <ul style="list-style-type: none"> ▶ Wear appropriate protective equipment for the work details when installing piping.

Flanged end

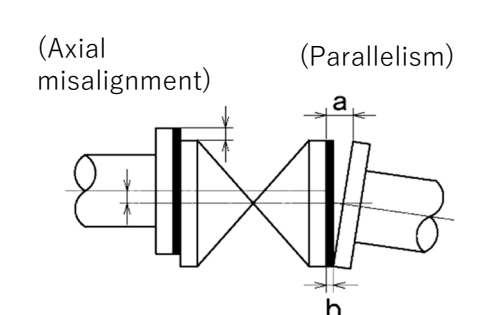
 Caution	
 Prohibition	<p>The valve can be damaged, or leak.</p> <ul style="list-style-type: none"> ▶ Use a connection flange with a full-face seat. ▶ Check that there is no difference in mutual flange standards. ▶ Be sure to use the sealing gaskets (AV packing), bolts/nuts, and washers, and tighten them to the specified tightening torque. (The tightening torque will change if the gasket is not a AV gasket.)

Preparations ▶ Torque Wrench ▶ AV packing

[Procedure]

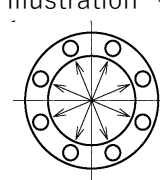
- 1) Set AV packing between the flanges.
- 2) Insert the washer and bolt from the connecting flange side, insert the washer and nut from the valve side, and tighten temporarily by hand.

⚠ **Caution**

⊘ Prohibition	<p>The valve can be damaged, or leak.</p> <p>▶ Keep the parallelism of the flange surface and the dimension of the shaft misalignment below the values shown below.</p> <p style="text-align: center;">Unit: mm (inch)</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <thead> <tr> <th style="padding: 5px;">Size</th> <th style="padding: 5px;">Axial Misalignment</th> <th style="padding: 5px;">Parallelism (a-b)</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;">200, 250mm (8", 10")</td> <td style="padding: 5px;">1.5 (0.06")</td> <td style="padding: 5px;">1.0 (0.04")</td> </tr> </tbody> </table>	Size	Axial Misalignment	Parallelism (a-b)	200, 250mm (8", 10")	1.5 (0.06")	1.0 (0.04")	<div style="display: flex; justify-content: space-around; font-size: 0.8em;"> (Axial misalignment) (Parallelism) </div> 
Size	Axial Misalignment	Parallelism (a-b)						
200, 250mm (8", 10")	1.5 (0.06")	1.0 (0.04")						

- 3) Tighten the screws diagonally to the specified flange tightening torque using a torque wrench.

⚠ **Caution**

⊘ Prohibition	<p>The valve can be damaged, or leak.</p> <p>▶ Tighten the bolts and nuts gradually with a torque wrench to the specified torque level in a diagonal manner.</p>	<p>Illustration -</p> 
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Flange tightening torque value

Units: N•m

Size	200, 250 (8", 10")
Torque value	55

6. How to wire a limit switch (Option)

Warning



Prohibition

Serious injury can result.

- ▶ Do not connect or separate lines to the limit switch in the power supply status.

Caution



Prohibition

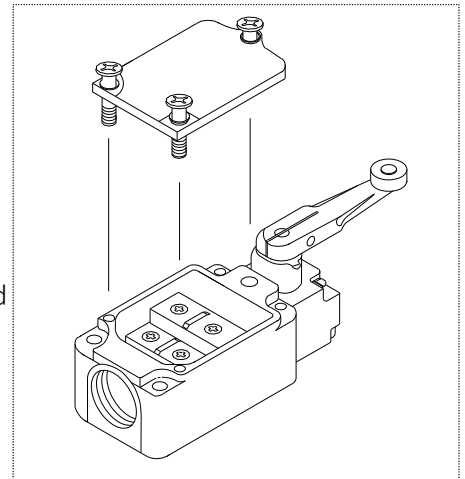
The valve can be damaged, or leak.

- ▶ Do not leave or use with the cover open. (Water or dust may penetrate and cause operation failure.)
- ▶ Contact CKD when using the limit switch in a 1mA~100mA, 5V~30V.

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

[Procedure]

- 1) Loosen the three screws holding the limit switch cover with a Phillips screwdriver and remove the cover.
(The screws are structured so that they do not come off the cover.)
- 2) Pull off the resin protective cap.
- 3) Pass the cable through the connector.
- 4) Peel off the outer skin of the cable with a wire stripper.
- 5) Use a terminal crimping tool to attach the crimping terminal to the lead wire.
- 6) Wire the terminal screws with a Phillips screwdriver according to the internal circuit diagram on page 10.
* Tighten the screws securely.
- 7) Screws holding the limit switch cover (3 places) with Phillips screwdriver
Tighten to secure the cover.
- 8) Tighten the cable with the connector.



7. Operation method

⚠ Caution



Prohibition

The valve can be damaged, or leak.

- ▶ When fully closing or opening the valve, do not turn the handle unnecessarily with excessive force.
- ▶ Do not open or close the valve with dust or other foreign matter in the fluid.
- ▶ Since foreign matter such as sand may remain in the pipeline even after the valve is installed, open and close the valve after cleaning the inside of the pipe.
- ▶ Handle operation must be done by hand. (Use of equipment may cause damage.)
- ▶ Be sure to pass water before opening/closing the oil-prohibited parts.
- ▶ If the stopper is loose, adjust the stopper.

Turn gently to open/close operation.

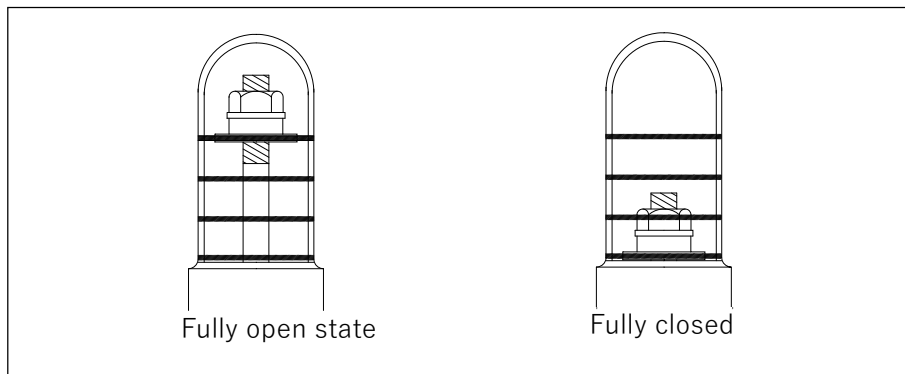
(Clockwise to close-handle display S, counterclockwise to open-handle display O)

▶ When fully closed

..... When the bottom surface of the stopper and the top surface of the cap are in close contact


▶ At full open position

..... When the blue line at the top of the gauge cover matches the red line of the stopper



8. How to adjust the stopper

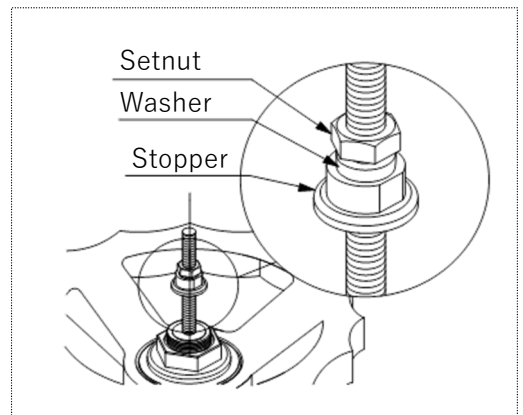
⚠ Caution

 Prohibition	<p>The valve can be damaged, or leak.</p> <ul style="list-style-type: none"> ▶ If the stopper is loose or internal leakage occurs when the valve is fully closed, the stopper may not be functioning. Adjust the stopper. ▶ Tighten the stopper securely. (If the tightening torque of the stopper is insufficient, the stopper may become loose.)
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Preparations	<ul style="list-style-type: none"> ▶ Spanner (2 pcs.) ▶ Protective goggles 	<ul style="list-style-type: none"> ▶ Protective gloves
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[Procedure]

- 1) Remove the gauge cover.
- 2) Fix the stopper and loosen the set nut.
- 3) Loosen the stopper.
- 4) Tighten the handle gradually and stop at a position where the leakage stops.
- 5) Until the lower surface of the stopper is in light contact with the upper surface of the sheet
Fix and tighten with the set nut.
- 6) Return the handle and apply grease to the upper and lower surfaces of the sheet.
- 7) Fit the gauge cover.
(Ensure that the packing does not come off.)



9. How to disassemble/assemble parts for replacement

 Warning	
 Prohibition	<p>Serious injury can result.</p> <ul style="list-style-type: none"> ▶ Be sure to perform safety inspections of the machine tool and power tool beforehand. ▶ Wear appropriate protective equipment for the work details when installing piping. <p>Risk of serious injury and/or valve damage/damage/leakage.</p> <ul style="list-style-type: none"> ▶ 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.

Preparations	▶ Torque Wrench	▶ Spanner (2 pcs.)
	▶ Protective gloves	▶ Protective goggles

[Procedure]



- 1) Completely loosen bolts and nuts [24] between body [1] and bonnet [2].
- 2) Remove the bonnet section.
- 3) Turn handwheel [13] until valve is fully closed. (It may be difficult to work when fully opened)
- 4) Remove the diaphragm [3] by rotating it counterclockwise (to the left).
- 5) Mount the new diaphragm [3] by rotating it clockwise (to the right).
- 6) 1/2 to 1 turn of the diaphragm [3] counterclockwise (left), and the material display of the diaphragm [3] is on the bonnet [2].
 Match with the rib part (valve seat direction).
- 7) Turn handle [13] until valve is fully open.
- 8) Attach the bonnet to the body.
- 9) Tighten body [1] and bonnet [2] diagonally with bolts and nuts [24]. (Refer to the table below for the tightening torque.)

Bonnet tightening torque value

Units: N-m

Diaphragm \ Size	200mm (8")	250mm (10")
Rubber	30.0	30.0
PTFE	30.0	30.0

10. Inspection item

 Caution	
 Forcing	<p>The valve can be damaged, or leak.</p> <ul style="list-style-type: none"> ▶ Maintenance should be performed every 3 to 6 months as a guide in order to keep the valve 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	Pipe flange connection	① Retighten the pipe bolts to the specified torque. ② Remove the valve from the pipe and re-tighten the pipe bolts. (Ref: 5. Piping method)
		Between the body and bonnet	Retighten the mounting bolts with the specified bonnet tightening torque. (Ref: 9. How to disassemble/assemble parts for replacement)
		Surface of the entire valve	Remove the valve from the pipe and replace the valve. (Ref: 9. How to disassemble/assemble parts for 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/assemble parts for 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/assemble parts for replacement)
Abnormal noise (hearing)	No abnormal noise	Valve	Remove the valve from the piping and replace the valve.
		Piping around the valve	Reconfirm the conditions of use (Ref: 2. Safety Instructions)

Periodic inspection

●Guideline for the inspection cycle: 3 months


Inspection items and inspection methods	Guideline of judgment	Check point	Remedy for malfunctions
Vibration (palpation)	No differences from other parts	Valve	Recheck the operating conditions and remove the source of vibration. (Ref: 2. Handling Precautions)
			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. Handling Precautions)

●Guideline of the inspection cycle: 6 months

As inspection items Inspection method	Guideline of judgment	Check point	Remedy for malfunctions
Operability of manual handle (touch)	Rotates smoothly	Manual operation unit	Remove the valve from the pipe and replace the valve.
Looseness of bolts (visual and palpation)	No Loose	Between the body and bonnet	Retighten the mounting bolts with the specified torque value for bonnet tightening. (Ref: 9. How to disassemble/assemble parts for replacement)
		Terminal block	Retighten the screws with the following torques Nominal diameter 15~100mm:1 to 1.5 N-m
		[Flange type] For flange piping	Retighten the pipe bolts to the specified torque. (Ref: 6. Mounting [Flange Type])
Corrosion Or rust ^{※1} (visual inspection)	No corrosion or rust	Appearance of the product	Remove the valve from the pipe and replace the valve. (Ref: 9. How to disassemble/assemble parts for replacement)
Product damage	No scratches, cracks, or deformation	Appearance of the product	Remove the valve from the pipe and replace the valve. (Ref: 9. How to disassemble/assemble parts for replacement)

11. Cause of malfunction and remedy

 **Caution**

 Prohibition	<p>There is a danger of injury.</p> <ul style="list-style-type: none"> ▶ If any malfunction is found, immediately stop using the product and take appropriate action. ▶ When removing the valve from the piping when replacing the valve or parts, completely remove the fluid from the piping before starting work.
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Failure phenomenon	Possible cause	Measures and measures
Fluid leaks even when fully closed (internal leak)	High fluid pressure	Use below the maximum allowable pressure (Ref: 10.How to disassemble for parts replacement)
	The body or diaphragm is damaged.	Remove the valve from the piping and replace the relevant part or replace the valve. (Ref: 10.How to disassemble for parts replacement)
	Foreign matter caught in valve	Remove the valve from the piping, disassemble it, and remove foreign matter. (Ref: 10.How to disassemble for parts replacement)
	Piping stress is applied to the valve.	Remove the piping stress
	The part is damaged.	Remove the valve from the piping, replace the relevant part, or replace the valve. (Ref: 10.How to disassemble for parts replacement)
	Adjustment stopper is running	Adjust the stopper (Ref: 9. How to adjust the stopper)

Cause of malfunction and remedy (continued)

Failure phenomenon	Possible cause	Measures and measures
Fluid leaks from valve (external leak)	Valve is cracked or broken	Stop using the product immediately, remove the valve from the piping, and replace the valve.
	Bonnet tightening bolt is loose	Retighten the mounting bolts with the specified torque value for bonnet tightening. (Ref: 10.How to disassemble for parts replacement)
	The diaphragm is damaged.	Stop using immediately. Remove the valve from the piping and replace the diaphragm or valve. (Ref: 10.How to disassemble for parts replacement)
	O-ring is scratched, worn, melted, or altered	Stop using the product immediately, remove the valve from the piping, replace the relevant part, or replace the valve. (Ref: 10.How to disassemble for parts replacement)
	Scratches or wear are found on the sliding or fixing surfaces of the O-ring.	Stop using the product immediately, remove the valve from the piping, replace the relevant part, or replace the valve. (Ref: 10.How to disassemble for parts replacement)
Handle does not turn (cannot turn)	The valve is already fully open (or fully closed).	Rotate the handle gently (Ref.: 8. Operation method)
	Foreign matter is caught in valve	Remove the valve from the piping, disassemble it, and remove foreign matter. (Ref: 10.How to disassemble for parts replacement)
	Piping stress is applied to the valve.	Remove the piping stress
	The torque of the valve has increased due to the effects of the fluid (temperature, components, pressure, etc.)	Reconfirm the conditions of use (Ref: 2. Handling Precautions)
Idle steering wheel	Damaged diaphragm or stem	Remove the valve from the pipe, disassemble it, replace the relevant part, or replace the valve. (Ref: 10.How to disassemble for parts replacement)

12. Disposal method of residual materials and waste materials

 Warning	
 Forcing	<p>When burnt, toxic gas is generated.</p> <ul style="list-style-type: none">▶ 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]

Diaphragm valve Type 72
(manual operation)



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

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

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