

# Operation Manual

## Weir Type Manually Operated Diaphragm Valve

Model : 400NB-15/100

S400NB-15/100

L400NB-15/100

Nippon Daiya Valve Co., Ltd.

## Preface

Thank you very much for choosing this Nippon Daiya Valve product.

This instruction manual will be useful for first-time users and experienced users alike.

First-time users will learn about the many features of this product, and experienced users will have a chance to review and learn more.

To ensure safe and proper operation of your product, please read this instruction manual thoroughly before beginning use.





Once you have read through the manual, keep it nearby for handy access whenever you have questions or need to troubleshoot a problem.

### Safety Advice

This advice will help you use your product safely and correctly.

Adherence to these guidelines will eliminate all risks of property damage and all risks of injury to you and your coworkers.

The instructions in this manual are classified into four levels based on the risk of injury, damage, or operational failure ->“DANGER”, “WARNING”, “CAUTION”, and “REQUEST”.

 <b>DANGER</b>	Indicates the presence of high danger. If a <b>DANGER</b> warning is ignored, death, serious injury, or property damage may result.
 <b>WARNING</b>	Indicates an indirect risk of danger. Danger is not immediate, but it may arise. If a <b>WARNING</b> message is ignored, death, serious injury, or property damage may occur.
 <b>CAUTION</b>	Indicate a risk of moderate danger. If a <b>CAUTION</b> warning is ignored, slight injury may occur.
 <b>REQUEST</b>	A recommendation on the proper use of the product, for the protection of the product itself. While no damage will result if a <b>REQUEST</b> message is ignored, proper use may extend the lifetime of the product.

### Liability waiver

Please understand that Nippon Daiya Valve bears no liability whatsoever for damages resulting from the negligent use of this product or failure of observing the instructions in this manual.

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## 1 . Product Specifications

### Representing Product Specifications by Code Number

Example :

S 4 0 1 NB - NR - 2 5

#### Description of code

##### Option

None : Basic type

S : with an indicator

L : with a lock nut

##### Valve type

4 0 0 : 400 type (weir type )

##### Body material

0 1 : Gray cast iron FC200

0 4 : Ductile cast iron FCD-S

0 5 : Cast steel SCPH2

0 7 : Stainless steel SCS13

1 2 : Stainless steel SCS14

1 3 : Stainless steel SCS16

2 6 : Bronze casting CAC406

3 0 : Hard natural rubber lined ( Base material : FC200 )

3 3 : Soft natural rubber lined ( Base material : FC200 )

3 5 : Chloroprene rubber lined ( Base material : FC200 )

3 6 : Butyl rubber lined ( Base material : FC200 )

4 0 : Glass lined ( Base material : FC200 )

5 0 : Polyethylene lined ( Base material : FC200 )

5 9 : PFA lined ( Base material : FCD-S )

6 0 : ETFE lined ( Base material : FCD-S )

6 1 (M) : New-PFA lined ( Base material : FCD-S )

7 1 : Zinc plated ( Base material : FC200 )

8 0 : Porcelain ( Mulite ) ( Base material : FC200 )

##### Design revision additional No.

##### Diaphragm material

NR : Natural rubber

CR : Chloroprene rubber

BG : Butyl rubber

AB : Nitrile rubber

EP : EPDM

UG : Polyurethane

HP : Hyperon

TX / CE : New-PTFE / EPDM

TX / CX : New-PTFE / EPDM

##### Valve nominal diameter

Shown in (mm) .

2 . Structure Drawings

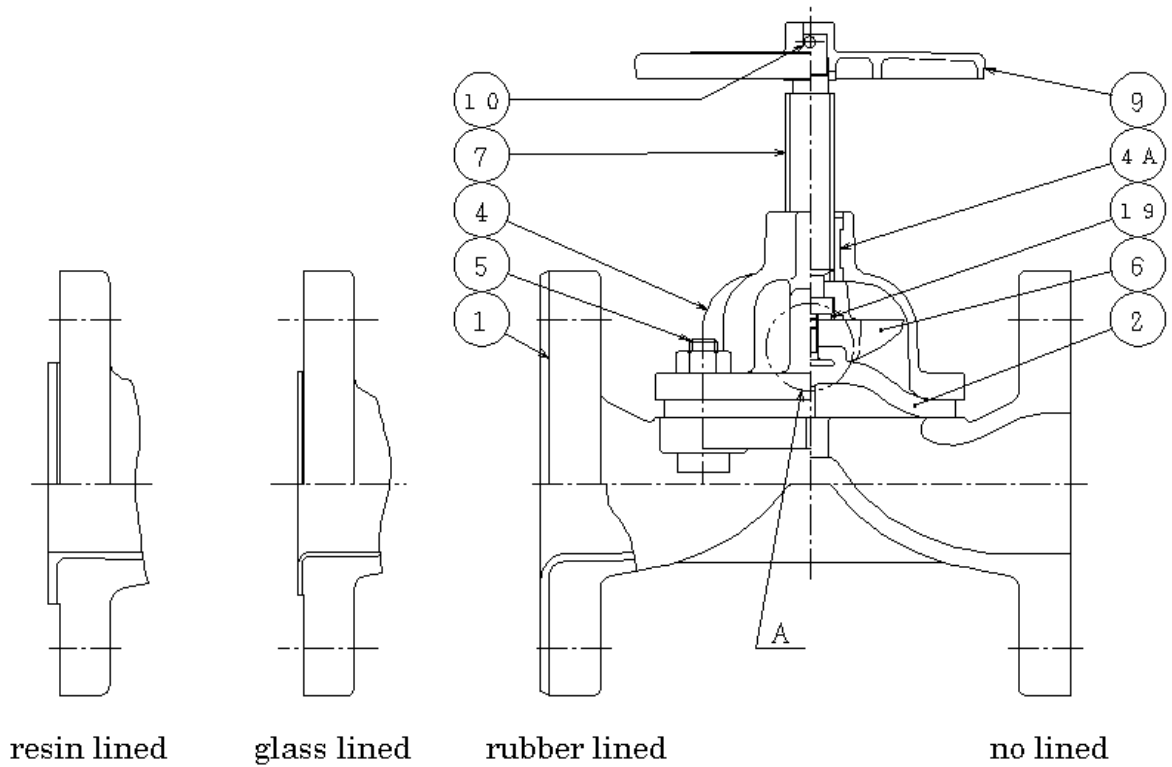


Figure 1 Type : 400NB ( Rubber Diaphragm )

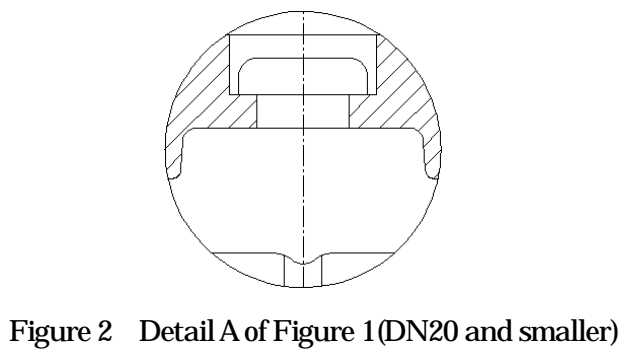


Figure 2 Detail A of Figure 1(DN20 and smaller)

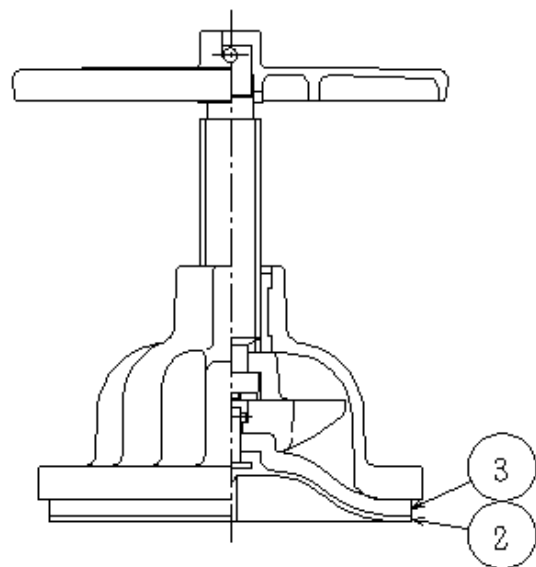


Figure 3 PTFE Diaphragm

		5	Bolt & Nut
1 9	Thrust Washer	4 A	Stem Bush
1 0	Pin	4	Bonnet
9	Hand Wheel	3	Rubber Backing
7	Spindle	2	Diaphragm
6	Compressor	1	Body
No.	Part Name	No.	Part Name

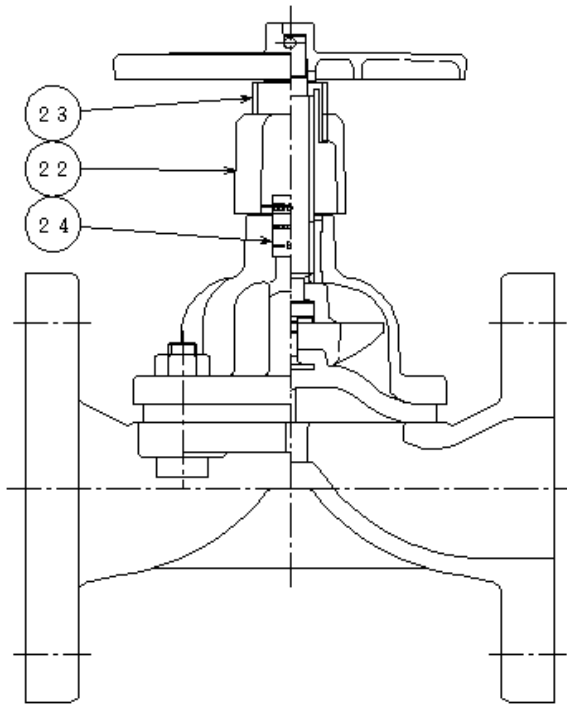


Figure 4 Type : S400NB ( Rubber Diaphragm )

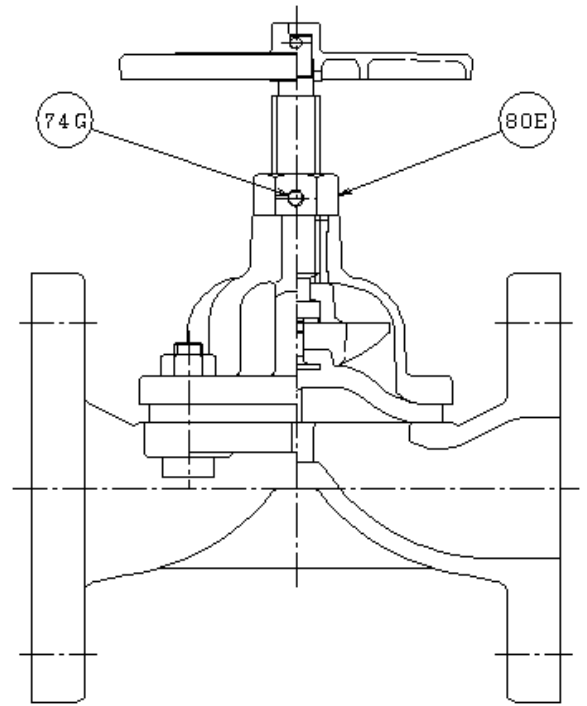


Figure 5 Type : L400NB ( Rubber Diaphragm )

2 4	Indicator Plate		
2 3	Guide	8 0 E	Nut
2 2	Indicator Ring	7 4 G	Set Screw
No.	Part Name	No.	Part Name

### 3 . Maximum Working Pressure and Test Pressure

Table 1

Unit : MPa

Diaphragm		Rubber Diaphragm		PTFE Diaphragm		
Body material	Cast iron	Glass lined	Porcelain	Cast iron	Rubber lined	
	Ductile cast iron			Ductile cast iron		
Nominal diameter	Cast steel	1.0 ( 1.2 )	1.0 ( 1.2 )	Cast steel	Glass lined	
	Stainless steel			Stainless steel		
	Bronze casting			Resin lined	Porcelain	
	Rubber lined				0.7 ( 0.8 5 )	
	Resin lined			1.0 ( 1.2 )	0.5 ( 0.6 )	0.5 ( 0.6 )
	1 5					1.4 ( 1.6 )
2 0	1.0 ( 1.2 )	0.7 ( 0.8 5 )	0.7 ( 0.8 5 )			
2 5				1.0 ( 1.2 )	0.5 ( 0.6 )	0.5 ( 0.6 )
4 0	1.0 ( 1.2 )	0.5 ( 0.6 )	0.5 ( 0.6 )			
5 0				1.0 ( 1.2 )	0.5 ( 0.6 )	0.5 ( 0.6 )
6 5	1.0 ( 1.2 )	0.5 ( 0.6 )	0.5 ( 0.6 )			
8 0				1.0 ( 1.2 )	0.5 ( 0.6 )	0.5 ( 0.6 )
1 0 0	1.0 ( 1.2 )	0.5 ( 0.6 )	0.5 ( 0.6 )			

Note : Values in the table show the maximum working pressure and values in ( ) show the shell test pressure and the seat leakage test pressure (hydraulic pressure).

The diaphragm valve cannot use the hydraulic test pressure indicated in JIS B2238, B 2239 and B 2240 as they are.

## 4 . Reception, transportation and storage

### 4 . 1 Reception and transportation



- ( 1 ) Products with larger nominal diameters are classified as “heavy goods”.  
When lifting these products ,use a hoist machine compliant with the Industrial Health and Safety Law and transport them.  
When products are lifted with hoist machines ,cranes ,etc. , be sure never to operate machinery or place any part of your body under the lifted product(not even your hands or feet) .  
Tumbling or falling products can result in “death and serious injury”.
- ( 2 ) A small sized product contained in a corrugated cardboard package can be deteriorated in its package strength if it gets wet with water.  
Please take enough care when handling the wet corrugated cardboard.  
Tumbling or falling products can result in “physical damage”.
- ( 3 ) Always be sure to wear safety gear and safety protectors when working.
- ( 4 ) Some diaphragm valves consist of materials such as glass lined ,natural hard rubber lined ,etc. , which are sensitive to the impact.  
Please handle gently and carefully.  
If anticorrosion lining materials which contact the fluid are to be damaged ,metal of the base metal will be corroded causing the fluid to leak .  
Contacting a certain kind of fluid can result in a risk of “Death , serious injury , blind”.

### 4 . 2 Storage

- ( 1 ) It is recommended to keep the product in a package until piping work starts.
- ( 2 ) To store the product for a certain period, which has been unpacked, it is recommended to store it indoors to prevent it from rust.
- ( 3 ) Avoid the following places to store the products.
  - A place where rain drops come in
  - A place with atmosphere with temperature of more than 60 degrees Celsius
  - A place with atmosphere with high humidity
  - A place with dusty atmosphere
- ( 4 ) A dust-tight seal is provided on a connection flange surface of the product to prevent dust from coming into the inside of the valve body.  
Do not remove the dust-tight seal before piping even after the valve has been unpacked.  
If foreign material coming into the inside of the valve is caught between the diaphragm and seat, leakage may occur.
- ( 5 ) Also, when the valve is unpacked for the acceptance inspection, it is recommended to pack it again and store until the installation work starts.
- ( 6 ) When handling the glass lined body or porcelain body, take enough care not to give impact upon them.
- ( 7 ) Place the product on the rubber sheet, taking care not to scratch the connection flange surface of the valve body.
- ( 8 ) To store the product after use, follow the steps described below.
  - Thoroughly clean the inside of the valve and dry it sufficiently.
  - Protect the connection flange surface of the valve body to prevent from being scratched.
  - Perform rust prevention treatment to the location where rust may occur.

## 5 . Installation of the valve



- ( 1 ) Products with larger nominal diameters are classified as “heavy goods”.  
When attaching these products to piping, use a hoist machine compliant with the Industrial Health and Safety Law.  
When products are lifted with hoist machines, cranes, etc., be sure never to operate machinery or place any part of your body under the lifted product (not even your hands or feet).  
Tumbling or falling products can result in “death and serious injury”.
- ( 2 ) When attaching a valve to piping, never insert a hand or foot into a connection flange surface of the valve and pipe.  
The risk of “physical damage” is high.
- ( 3 ) Always be sure to wear safety gear and safety protectors when working.
- ( 4 ) Some diaphragm valves consist of materials such as glass lined, natural hard rubber lined, etc., which are sensitive to the impact.  
Please handle gently and carefully.  
If anticorrosion lining materials which contact the fluid are to be damaged, metal of the base metal will be corroded causing the fluid to leak.  
Contacting a certain kind of fluid can result in a risk of “Death, serious injury, blind”.



- ( 1 ) Before starting work, please confirm that there are no safety hazards in the working environment.
- ( 2 ) When removing the product from the package and lifting it, use a standardized lifting device to safeguard against product damage.
- ( 3 ) During piping work, never drop the product or allow it to slip or tumble.  
Strong impacts due to tumbles and falls pose a risk of “damage or failure.”

### Attaching the valve

- ( 1 ) Remove the dust-tight seal covering the connection flange surface of the body and confirm that the inside is free of dirt or adhering foreign materials.  
Also confirm the absence of dirt and foreign materials in the piping to be attached to the valve.
- ( 2 ) The diaphragm valve can flow in either direction.  
For the valve with an indicator, attach it so as the indicator can be easily seen.
- ( 3 ) Replacement of the diaphragm will be easier if installed vertically to the horizontal piping.
- ( 4 ) For horizontal piping, to prevent the fluid from remaining inside the piping, the valve can be installed by tilting the valve.  
Tilting angle varies with nominal sizes and body materials, so please check with us for the angle.
- ( 5 ) Be sure to secure enough space for disassembly inspection.  
The space must be wide enough to replace the diaphragm with the body attached to the piping.  
Especially, secure the space wide enough to lift the bonnet.
- ( 6 ) When installing the valve to the piping, be sure never to apply abnormal tensile compression or bending stress.
- ( 7 ) When installing the valve, use a full-face gasket for the full-face seat flange type.  
Especially, use soft rubber full-face gasket for the soft rubber lined body (natural soft rubber lined, chloroprene rubber lined, etc.).



- ( 8 ) When installing the valve to the piping, tighten the piping bolts diagonally in alternate steps in equal turning increments.  
If only one piping bolt is tightened, leakage may occur from a connection flange surface and damage the lining.
- ( 9 ) For the bolts used when installing the valve to the piping, select the bolts with proper length whose end may not contact the bonnet. Use double-end studs if necessary.
- ( 10 ) When attaching the glass lined body or porcelain body, be sure to tighten one flange after securing the adjacent valve or piping, and then the other flange.
- ( 11 ) For the valves to be connected by weld joint, carry out welding after removing a set of the bonnet including the diaphragm, and attach a set of the bonnet including the diaphragm after cooling.
- ( 12 ) Confirm that the tightening bolts and nuts of the body and diaphragm are fully tightened.  
If any of them are loose, tighten them securely, according to torque listed in Table 2.
- ( 13 ) After installing the valve to the body, flush or flow out the piping with gas or liquid with the valve in the full open position to remove any foreign materials remaining inside.  
Be sure to use the fluid, which does not corrode the body or diaphragm for cleansing.

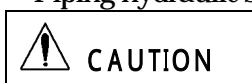
## 6 . Operation



- ( 1 ) The hand wheel diameter is designed to produce an optimum tightening thrust by a normal human power. Avoid the following actions .  
Using an auxiliary handle on the hand wheel .  
Operating the hand wheel by multiple people .  
If you take any of the above actions ,the valve may be damaged .  
Also , a risk of physical damage is high .  
If the valve does not work with a designated hand wheel ,disassemble it for inspection .
  - ( 2 ) In case the fluid is incompressible liquid and the valves in the downstream and upstream of the valve to be operated are closed ,do not operate the valve to be operated .  
The valve may be damaged due to pressure change caused by volume change of the fluid .Also , a risk of physical damage is high .
  - ( 3 ) When retightening the hand wheel for closing ,tighten it until it comes to between 15 degree and 20 degree from where closing resistance is felt and do not tighten further by force .  
Over tightening may shorten the lifetime of the diaphragm .  
Special care should be taken for the high temperature fluid .
- ( 1 ) The valve is opened by turning the hand wheel to counterclockwise and closed by turning it to clockwise.
  - ( 2 ) If the handle torque sharply rises during closing operation, foreign matter can be caught in the weir (seat section). Fully open the valve to remove it and restart closing operation.

## 7 . Piping hydraulic shell test

Piping hydraulic shell test pressures shall be in accordance with Table 1 (Page 6).



The diaphragm valve cannot use the hydraulic test pressure indicated in JIS B2238 , B2239 and B2240 as they are .  
If tested with pressure exceeding the values in Table 1 , external leakage may occur from between the body and the diaphragm .

## 8 . Maintenance and Management

Maintenance and management is basically to keep the valve in a state that enables smooth operation without leakage from a pressure retaining part of the valve after starting operation.

To attain this, it is necessary to monitor an everyday operation and continue to keep it.

Perform daily inspection and periodic inspection, referring to the following items.

### 8 . 1 Daily Inspection

- ( 1 ) Is there any fluid leakage between **the body (1)** and **the bonnet (4)** and the connection area of the piping?

If leakage is found, tighten the bolt further after releasing fluid pressure.

- ( 2 ) Is there any fluid leakage from the crack or corrosion hole in **the body (1)**?

- ( 3 ) Is it possible to operate smoothly?

- ( 4 ) If any abnormality occurs, refer to Chapter 10 "Troubleshooting".

### 8 . 2 Periodic inspection

- ( 1 ) Intervals of inspection vary with the conditions and frequency of use.

Normally, perform the inspection once every 6 through 12 months.

- ( 2 ) Periodically check that the tightening bolts securing the body and diaphragm are not loose. If the bolts are loose, retighten them according to the torque value listed in Table 2. Retightening must be done especially for PTFE diaphragm.

Table 2 Tightening torque for diaphragm

Unit: N·m

Nominal diameter DN		15	20	25	40	50	65	80	100
PTFE Diaphragm	Other than hard rubber lined body	3	4	6.5	12	20	35	60	30
	Hard rubber lined body	4	5.5	9	17	30	55	90	45
Rubber diaphragm		2	3	4	9	13	20	35	14

- ( 3 ) Inspection of flow passage section

Check for any adhesion of foreign material or adherence in the main body.

Check for the state of corrosion of liquid-contacting section and the degree of wear.

Check for the state of the lining surface of the body (existence and degree of swelling, crack, chipping, etc.).

For the diaphragm, carefully check the liquid-contacting surfaces and the rear side for the condition of appearance (degree of deterioration, existence of cracks and wear).

## 9 . Replacement of Parts

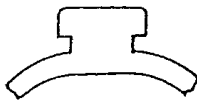

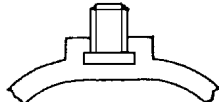
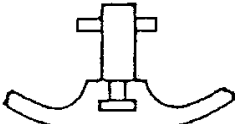



If you carry out replacement of parts when is fluid remaining, the fluid can cause a risk of “physical damage, blind”.

Before replacing the parts, make sure that there is no fluid, gas, or steam remaining inside the valve.

### 9 . 1 Connecting method of the Diaphragm and its shape

Table 3

Diaphragm	Valve nominal diameter	Connecting method	Shape	
Rubber diaphragm	15 ~ 20	 Inserted type	 Normal open type	
	25 or more	 Screwed type		
PTFE diaphragm	15 ~ 20	 Bayonet type		 Normal close type
	25 or more			

### 9 . 2 Bolts and nuts fastening the Diaphragm

Table 4

Nominal diameter of valve	15	20	25	40	50	65	80	100
Nominal size of hexagon gut	M6		M8	M10	M12		M16	M12
Nominal size of spanner	10		13	17	19		24	19

### 9.3 Replacement procedures for the Diaphragm

The diaphragm can be replaced with the valve body connected to the piping.

( 1 ) Remove **the bolt and nut (5)** securing **the body (1)** and **the bonnet (4)**.

( 2 ) Lift the bonnet out from the body.

If the diaphragm, the body and the bonnet stick each other, move the bonnet to left and right to loosen them.

If they still stick tightly, insert a minus driver, but take care not to damage the sealing surface of the body.

( 3 ) Replacement of the diaphragm



If the diaphragm (2) contacts acid or other poisonous chemicals, a risk of “death, serious injury, blind” is high due to the fluid.

Be sure to take appropriate prevention measures such as wearing rubber gloves when handling.

( a ) Removing

Remove **the diaphragm (2)** from **the compressor (6)** as follows :

For the inserted type, **the diaphragm (2)** can be removed by pulling while twisting it.

For the screwed type, **the diaphragm (2)** can be removed by turning it counterclockwise twice.

For the bayonet type, **the diaphragm (2)** can be removed by pulling it after turning it to clockwise or counterclockwise by 90 degree.

( b ) Confirmation

Confirm **that new diaphragm (2)** conforms to its nominal diameter and kind of material.

Check **the new diaphragm (2)** for any scratch.

( c ) Installation

Install **the new diaphragm (2)** to **the compressor (6)** using the steps below.

Inserted type (Figure 6)

Apply a small amount of water onto the head of **the diaphragm (2)** and screw into the hole of **the compressor (6)**.

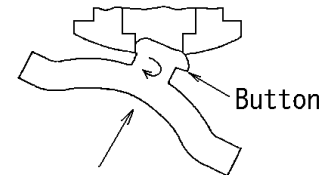


Figure 6

Screwed type (Figure 7)

Screw down the machine screw until the boss upper surface of **the diaphragm (2)** comes into contact with the dent of **the compressor (6)**.

Then, return **the diaphragm (2)** by “ ° ” until hole “ a ’ ” of **the diaphragm (2)** coincides with bonnet flange hole “ a ”.

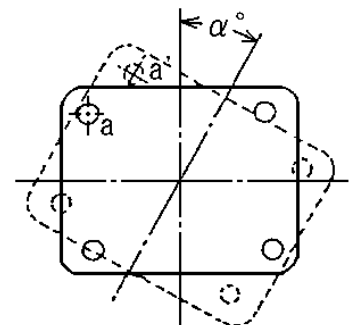
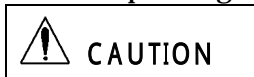


Figure 7

Bayonet type (Figure 8)

Insert the cross pin into the groove of **the compressor (6)**, and turn to the right while securely pressing the center of **the diaphragm (2)** with a finger.



If the center is not pressed securely, the cross pin is caught in the groove of the compressor causing resistance. If the diaphragm is turned under this state, the cross pin idles.

This may cause the diaphragm (2) to be unusable. Enough care should be taken to avoid this problem.

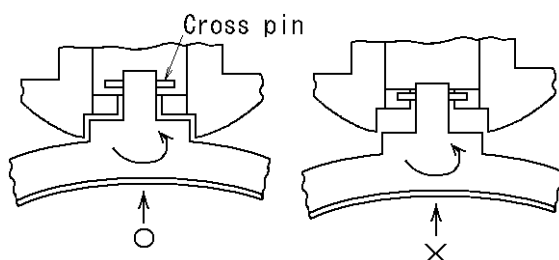


Figure 8

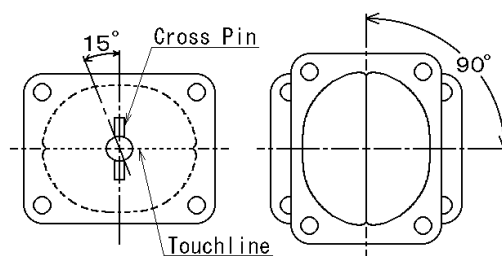
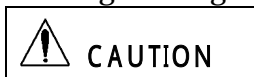


Figure 9

It is normal that the cross pin intersects the touchline by 90 degree, however, fluctuation within 15 degree is regarded normal (Figure 9).



When installing the normal close type diaphragm, use the above-mentioned procedure after inserting it into the compressor groove with the diaphragm reversed as shown in Figure 10.



Figure 10

#### ( 4 ) Assembly

Clean the weir and sealing surfaces of **the body (1)** with a cloth.

After confirming that **the diaphragm (2)** has been properly installed onto **the compressor (6)**, operate the hand wheel to set the valve to the open position.

Put the bonnet on **the body (1)**, and temporarily tighten with **the bolt and nut (5)**.

Open and close the valve several times for centering, then fully close the valve.

Tighten **the bolt and nut (5)** diagonally in alternate steps in equal turning increments while the valve closed, taking care that only one bolt may not be tightened. Confirming that the bonnet and the valve body are secured, open the valve more than 10% and tighten all **the bolt and nut (5)** evenly. In case of rubber diaphragm is to be used, tightening by hand are sufficient. If you need the tightening torque as a reference, the torque listed in Table 2 is to be used.

In case of PTFE diaphragm, tighten all **the bolt and nut (5)** evenly according to the torque listed in Table 2, and retighten with proper torque 4 hours or more after the first tightening to increase reliability of the seal between diaphragm and the valve body.



If there are scratches on the screw of the bolts and nuts due to repeated maintenance, specified tightening torque sometimes cannot be obtained even if tightened by the torque listed in Table 2.

Be sure to confirm that there is no leakage by conducting resistance test after replacing the diaphragm. If the leakage is to be found at the resistance test, retighten after releasing the fluid pressure.

#### 9. 4 Disassembly and assembly procedures for the bonnet

##### 9. 4. 1 Type:400NB ( Refer to Figure 11 )

- ( 1 ) Tap out **the pin (10)** from **the spindle (7)** using a pin punch and a hammer.
- ( 2 ) Remove **the hand wheel (9)** from **the spindle (7)**.
- ( 3 ) Turn **the spindle (7)** clockwise and extrude **the compressor (6)** from **the bonnet (4)**.
- ( 4 ) Remove **the compressor (6)** and **the thrust washer (19)** from **the spindle (7)**.
- ( 5 ) Turn **the spindle (7)** clockwise further and pull out **the compressor (6)** from **the bonnet (4)**.
- ( 6 ) Since **the stem bush (4A)** is fabricated with being inserted into **the bonnet (4)**, it cannot be disassembled.
- ( 7 ) Wipe the parts with a soft cloth, and clean them.
- ( 8 ) When the parts are damaged due to corrosion or wear, replace them new ones.
- ( 9 ) Apply proper amount of grease to the screw of **the spindle (7)** and **the thrust washer (19)**.
- ( 10 ) For reassembling, use the steps (1) ~ (5) in reverse.

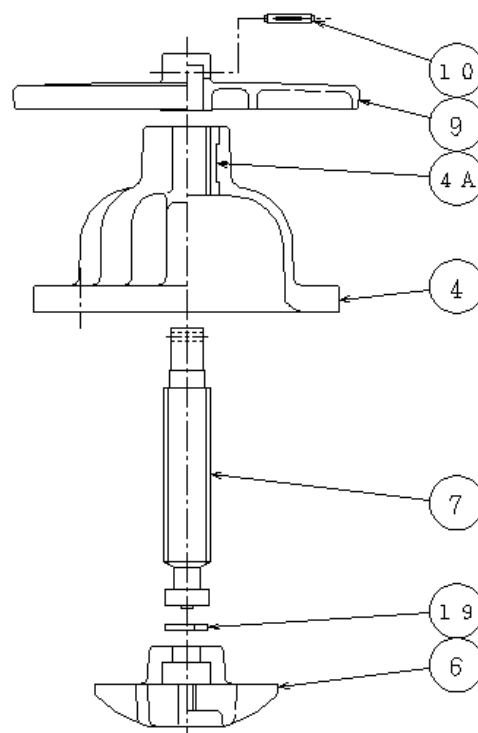


Figure 11

##### 9. 4. 2 Type:S400NB ( Refer to Figure 12 )

- ( 1 ) Tap out **the pin (10)** from **the spindle (7)** using a pin punch and a hammer.
- ( 2 ) Remove **the hand wheel (9)** from **the spindle (7)**.
- ( 3 ) Remove **the indicator ring (22)** and **the guide (23)** from **the spindle (7)**.
- ( 4 ) Remove **the indicator plate (24)** from **the bonnet (4)**.
- ( 5 ) Turn **the spindle (7)** clockwise and extrude **the compressor (6)** from **the bonnet (4)**.
- ( 6 ) Remove **the compressor (6)** and **the thrust washer (19)** from **the spindle (7)**.
- ( 7 ) Turn **the spindle (7)** clockwise further and pull out **the compressor (6)** from **the bonnet (4)**.
- ( 8 ) Since **the stem bush (4A)** is fabricated with being inserted into **the bonnet (4)**, it cannot be disassembled.
- ( 9 ) Wipe the parts with a soft cloth, and clean them.
- ( 10 ) When the parts are damaged due to corrosion or wear, replace them new ones.
- ( 11 ) Apply proper amount of grease to the screw of **the spindle (7)** and **the thrust washer (19)**.
- ( 12 ) For reassembling, use the steps (1) ~ (7) in reverse.

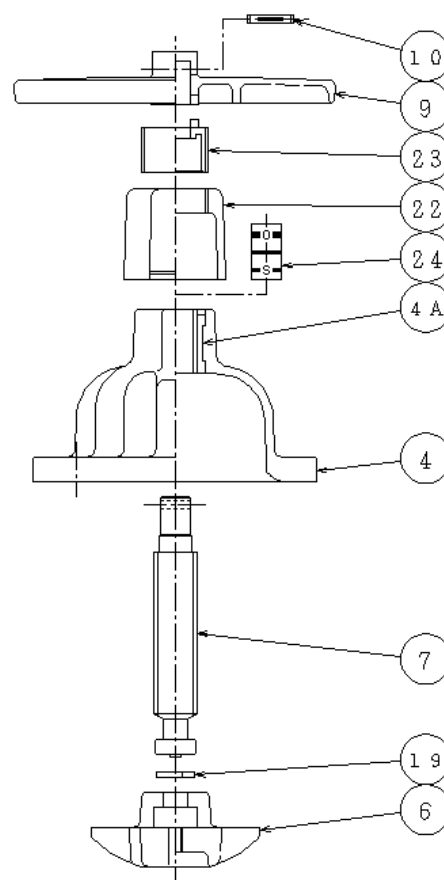


Figure 12

9. 4. 3 Type:L400NB ( Refer to Figure 13 )

- ( 1 ) Tap out **the pin (10)** from **the spindle (7)** using a pin punch and a hammer.
- ( 2 ) Remove **the hand wheel (9)** from **the spindle (7)**.
- ( 3 ) Loosen **the set screw (74G)**, turn **the nut (80E)** counterclockwise and pull out from **the spindle (7)**.
- ( 4 ) Turn **the spindle (7)** clockwise and extrude **the compressor (6)** from **the bonnet (4)**.
- ( 5 ) Remove **the compressor (6)** and **the thrust washer (19)** from **the spindle (7)**.
- ( 6 ) Turn **the spindle (7)** clockwise further and pull out **the compressor (6)** from **the bonnet (4)**.
- ( 7 ) Since **the stem bush (4A)** is fabricated with being inserted into **the bonnet (4)**, it cannot be disassembled.
- ( 8 ) Wipe the parts with a soft cloth, and clean them.
- ( 9 ) When the parts are damaged due to corrosion or wear, replace them new ones.
- ( 10 ) Apply proper amount of grease to the screw of **the spindle (7)** and **the thrust washer (19)**.
- ( 11 ) For reassembling, use the steps (1) ~ (6) in reverse.

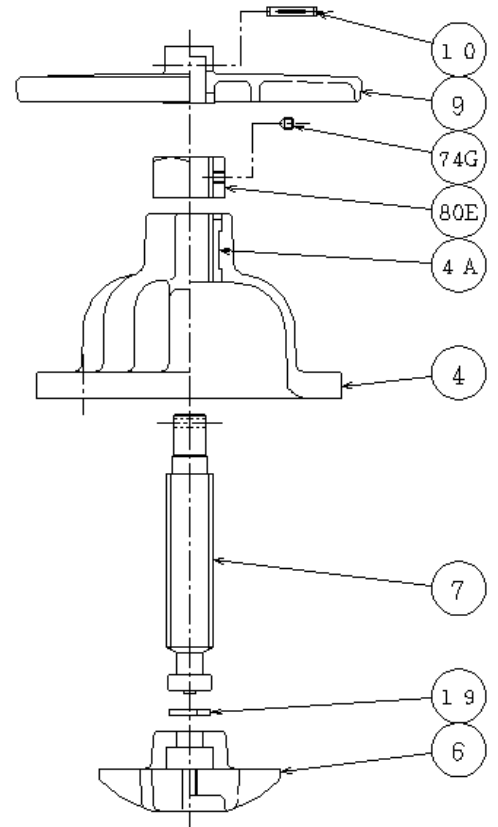


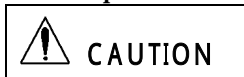
Figure 13

## 1 0 . Troubleshooting

Refer to the list below to solve problems such as fluid leakage, operation, etc.

Failure		Causes	Countermeasures
Leakage from the body.		When leakage is found, following problems can exist : Hole in the body due to corrosion. Crack on the body due to stress. Weld cracking caused due to leakage from the welded portion.	Replace the body.
Leakage from the connecting area of the body.	Piping connecting area.	The bolt is loose.	Retighten the bolt.
		Unsuitable gasket.	Replace the gasket.
	Connecting area of the body and the diaphragm.	Bolts and nuts are not securely tightened or unevenly tightened..	Retighten the bolts and nuts with appropriate torque. Adjustment of unbalanced tightened bolts and nuts.
Leakage from the connecting area of the bonnet and the diaphragm .		Diaphragm is damaged.	Replace the diaphragm.
Leakage from the seat.		Foreign material is caught.	Remove foreign material.
		Fluid pressure is high.	Adjust the pressure.
		Wear of the body.	Check and replace.
		Diaphragm is damaged.	Replace the diaphragm.
During closing and opening operation, the torque of the hand wheel is too high or the hand wheel does not move.		Grease is run out of the screw of the spindle and the bonnet.	Apply proper amount of grease to the screw of the spindle and the bonnet.
		Galling of the screw of the spindle and the bonnet.	Correction of the screw. If the thread cannot be corrected, replace the bonnet and the spindle.

## 1 1 . Disposal



Used parts produced from maintenance of valves should be adequately disposed of as industrial waste.

In adequate disposal or burning of waste will cause environmental pollution.