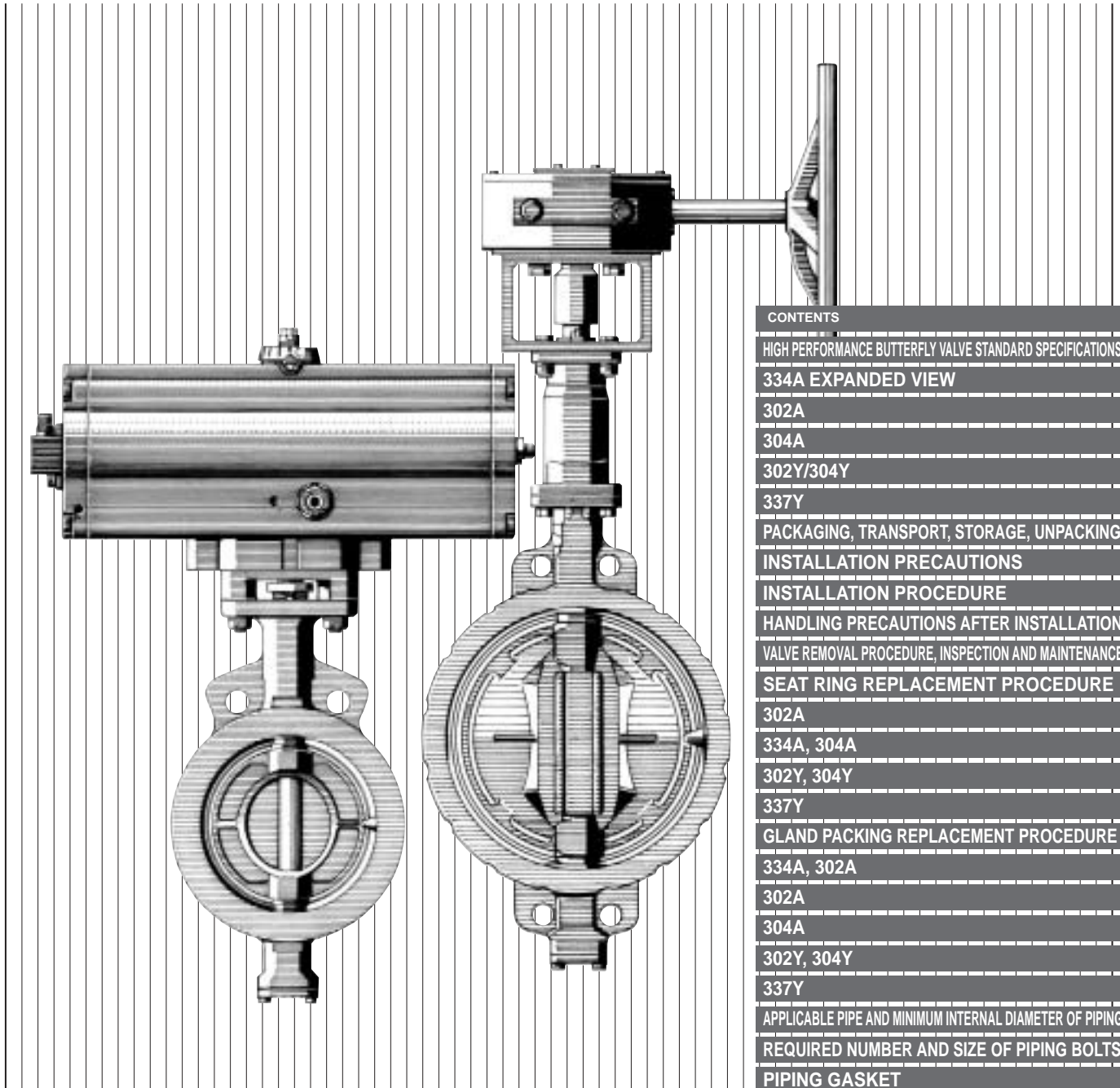


# High Performance Butterfly Valve

334A · 302A · 304A · 302Y/304Y · 337Y

## INSTRUCTION MANUAL



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**This instruction manual explains standard usage of the High Performance Butterfly Valve. This product allows full closure, and features characteristics such as low valve opening and closing torque and the ability to be used over a wide range of pressures and temperatures. Please read this manual thoroughly in order to ensure correct use of the product.**

# HIGH PERFORMANCE BUTTERFLY VALVE STANDARD SPECIFICATIONS

Type	334A		
Body shape	Double offset wafer type and lug type		
Valve nominal size	80, 100, 150, 200, 250, 300, 350, 400, 450, 500, 600mm		
Applicable flange standard	API/JPI class 300, ANSI/ASME class 300, JIS 20K/30K, BS 4504 PN25/40, DIN NP25/40		
Face-to-face dimensions	API609 class 300 categoryB		
Max. working pressure	5.1 MPa (body material: WCB), 4.96 MPa (body material: CF8M)		
Working temperature range	- 29 to 232 degrees C		
Pressure rating	ASME B16.34 class 300 / API609 class 300		
Standard materials	Body	ASTM A216 WCB	ASTM A351 CF8M
	Disc	ASTM A351 CF8M + hardened chrome plating	
	Stem	SUS420J2 <sup>1</sup>	630SS+H1150 <sup>2</sup>
	Seat ring	RPTFE	
	Retainer	S35C <sup>1</sup>	SUS316 <sup>2</sup>
	Gland packing	Exfoliated graphite	

1. When the body material is WCB, the standard materials are SUS420J2 for the stem and S35C for the retainer.

2. When the body material is CF8M, the standard materials are 630SS and H1150 for the stem and SUS316 for the retainer.

Type	302A				304A				
Body shape	Double offset wafer type				Double offset wafer type				
Valve nominal size	80mm to 300mm		350mm to 600mm		80mm to 300mm		350mm to 600mm		
Applicable flange standard	API/JPI class 150, ANSI/ASME class 150, JIS 10K/16K/20K, etc				API/JPI class 150, ANSI/ASME class 150, JIS 10K/16K/20K, etc				
Face-to-face dimensions	API 609(class 150)				API 609(class 150)				
Max. working pressure	2.0MPa				2.0MPa				
Working temperature range	- 29 to 600 degrees C				- 29 to 232 degrees C		- 20 to 232 degrees C		
Seat leakage	API 598-7th Edition				ISO 5208 leakage rate A				
Standard materials	Body	SCPH2	SCS14A	SCPH2	SCS13A	SCPH2	SCS14A	SCPH2	SCS13A
	Disc	SCS16A, SCS14A		SCS13A		SCS13A	SCS16A	SCS13A	
	Stem	SUS420J2	SUS329J1 SUS316	SUS420J2	SUS304 SUS630	SUS420J2	SUS329J1 SUS316	SUS420J2 SUS630	SUS304 SUS630
	Seat ring	SUS316L				RPTFE (carbon reinforced Teflon)			
	Gland packing	Exfoliated graphite				RPTFE		Exfoliated graphite	

Type	302Y		304Y		337Y		
Body shape	Double offset wafer type				Double offset wafer type		
Valve nominal size	40mm to 300mm				50mm to 125mm	150mm to 300mm	
Applicable flange standard	JIS 5K/10K/16K/20K, ANSI/ASME class 150, etc				JIS 10K/16K/20K/30K, ANSI/ASME class 150/300, etc		
Face-to-face dimensions	JIS B2002 (46 series)/ISO 5752 (20 series)				Manufactured standard		
Max. working pressure	2.0MPa(250, 300mm:1.6MPa)				5.0MPa(50mm to 200mm), 3.0MPa(250mm, 300mm)		
Working temperature range	- 20 to 250 degrees C		- 20 to 200 degrees C		- 100 to 600 degrees C		
Seat leakage	ISO 5208 leakage rate C		ISO 5208 leakage rate A		See graph on page 29		
Standard materials	Body	FCD450	SCS13A	FCD450	SCS13A	SCPH2/SCS14	
	Disc	SCS13A				SUSF316/SCS14	
	Stem	SUS420J2	SUS329J1	SUS420J2	SUS329J1	SUS431/SUS329J1 SUS630	
	Seat ring	SUS316		RPTFE (carbon reinforced Teflon)		SUS316L	
	Gland packing	RPTFE (carbon reinforced Teflon)		RPTFE (carbon reinforced Teflon)		Exfoliated graphite	

Remark: If you require the gas sealing property of the bottom cover and gland packing to be less than a few hundred Ppm, special specifications are required. Please inquire.

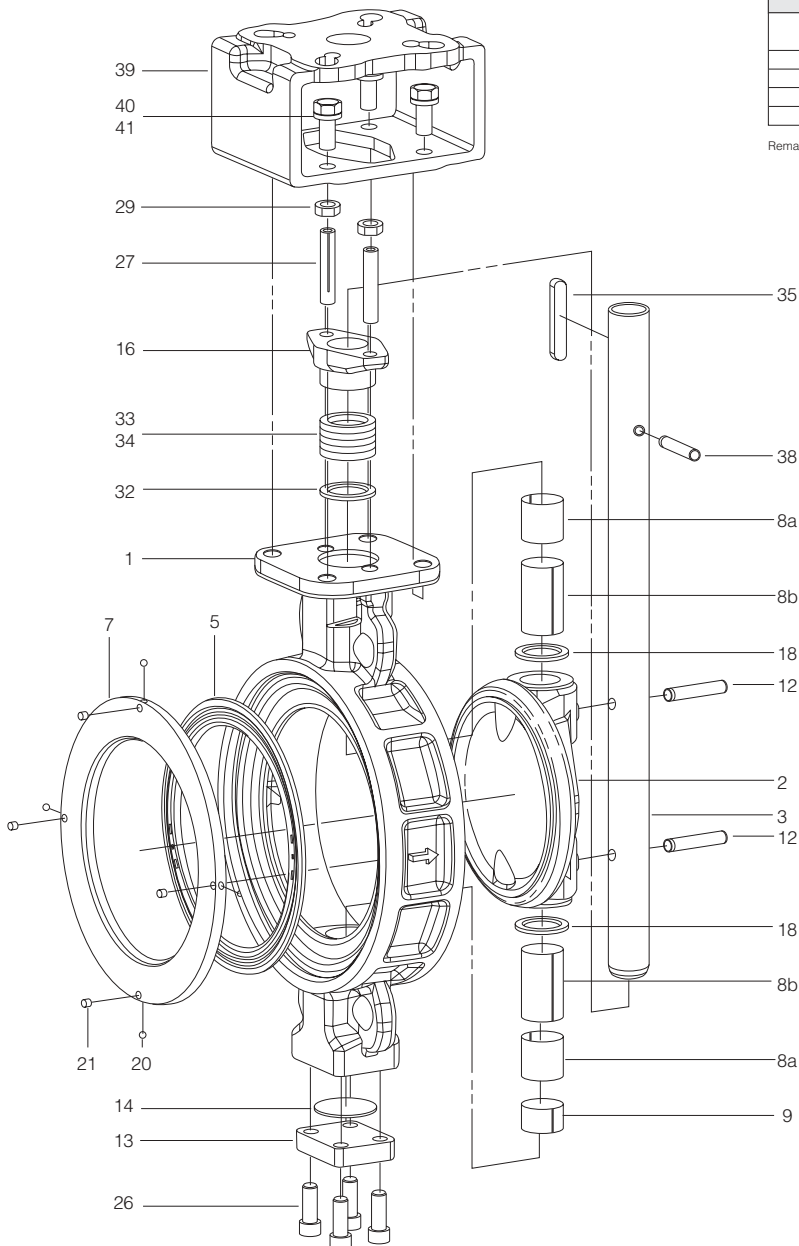
# 334A

## Expanded View

### 334A Parts list

No.	Description	Qty	Remarks
1	Body	1	
2	Disc	1	
3	Stem	1	
5	Seat ring	1	
7	Seat ring retainer	1	
8a	Bearing a	2	
8b	Bearing b	1	80mm to 150mm
		2	200mm to 600mm
9	Bearing spacer	1	
12	Taper pin	2	80mm to 200mm
		3	250mm to 600mm
13	Bottom cover	1	
14	Bottom gasket	1	
16	Gland plate spigot	1	
18	Spacer ring	2	
20	Ball	2	80mm, 100mm
		4	150mm to 600mm
21	Set screw	2	80mm, 100mm
		4	150mm to 600mm
26	Hexagon hole bolt	4	
27	Gland nut	2	
29	Hexagon nut	2	
32	Packing retainer	1	
33	Gland packing a	3	
34	Gland packing b	2	
35	Key	0	80mm to 150mm
		1	200mm to 600mm
38	Spring pin	1	
39	Column	1	
40	Hexagon bolt	4	
41	Spring washer	4	

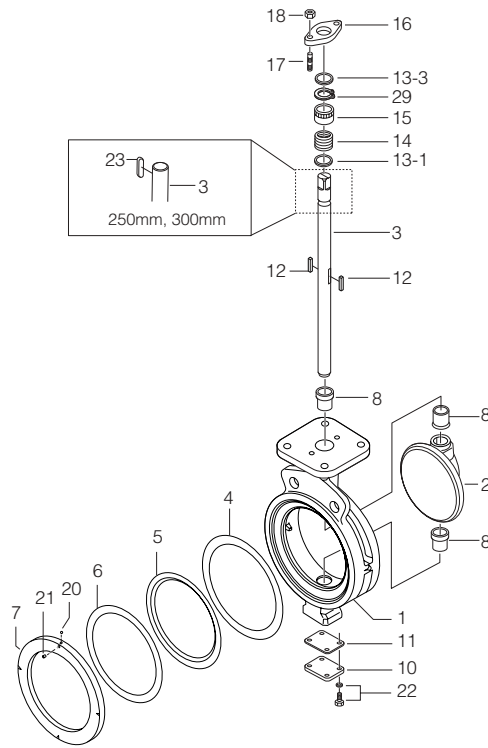
Remark: The indicates recommended spare parts. They are supplied as "Seat ring set" with a small hexagonal spanner to remove set screws (Parts list 21).



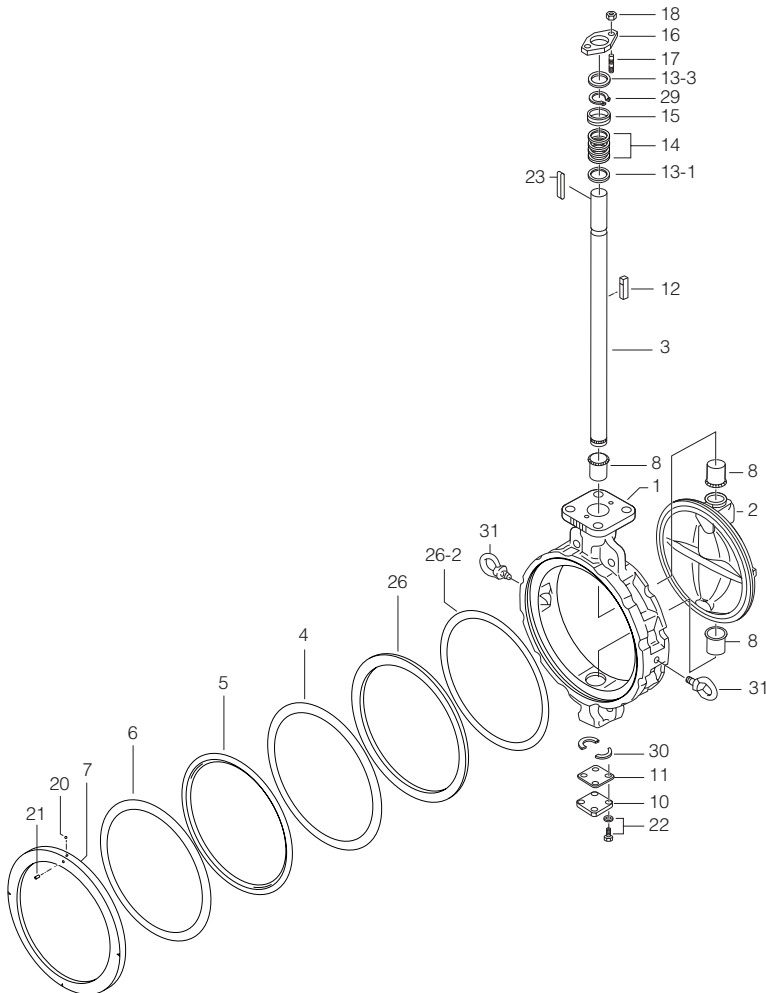
# 302A

## Expanded View

80 to 300mm



350 to 600mm




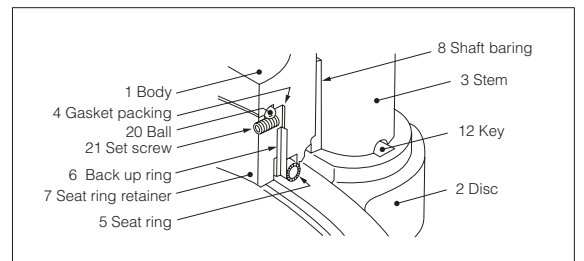
### 302A Parts list (80mm to 300mm: -29 to 400 degrees C)

No.	Description	Q'ty	Remarks
1	Body	1	
2	Disc	1	
3	Stem	1	
4	Seat ring gasket	1	
5	Seat ring	1	
6	Back-up ring	1	
7	Seat ring retainer	1	
8	Shaft bearing	3	
10	Bottom cover	1	
11	Bottom gasket	1	
12	Stem key	2	
13-1	Packing retainer	1	
13-3	Ring	1	
14	Gland packing	1 set	
15	Gland bush	1	
16	Gland flange	1	
17	Gland bolt	2	
18	Gland nut	2	
20	Ball	2	80mm to 125mm
		4	150mm to 300mm
21	Set screw	2	80mm to 125mm
		4	150mm to 300mm
22	Hexagon bolt, Spring washer	4 sets	
23	Key	1	Only 250mm, 300mm
29	C-ring	1	

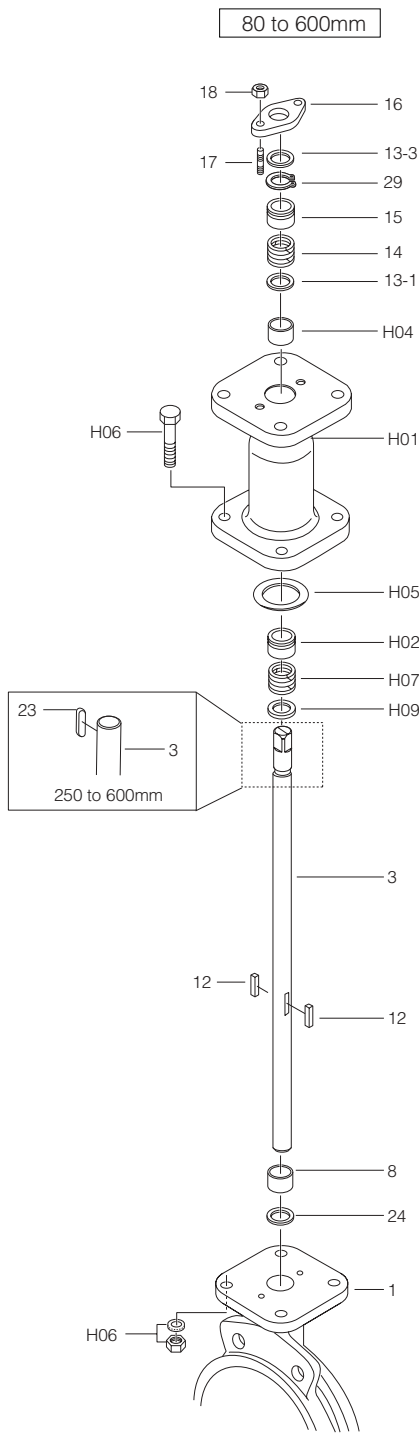
### 302A Parts list (350mm to 600mm: -29 to 400 degrees C)

No.	Description	Q'ty	Remarks
1	Body	1	
2	Disc	1	
3	Stem	1	
4	Seat ring gasket	1	
5	Seat ring	1	
6	Back-up ring	1	
7	Seat ring retainer	1	
8	Shaft bearing	3 sets	
10	Bottom cover	1	
11	Bottom gasket	1	
12	Stem key	1	
13-1	Packing retainer	1	
13-3	Ring	1	
14	Gland packing	1 set	
15	Gland bush	1	
16	Gland flange	1	
17	Gland bolt	2	
18	Gland nut	2	
20	Ball	4	
21	Set screw	4	
22	Hexagon bolt, Spring washer	4 sets	
23	Key	1	
26	Sub-retainer	1	
26-2	Seat spacer	1	Only 350mm
29	C-ring	1	
30	Thrust ring	2	
31	Eye bolt	2	Only 450mm to 600mm

Remark: The  indicates recommended spare parts. They are supplied as "Seat ring set" with a small hexagonal spanner to remove set screws (Parts list 21).



# 302A High-temperature Extension Expanded View



**302A for high-temperature extension Parts list  
(80mm to 300mm: 400 to 600 degrees C)**

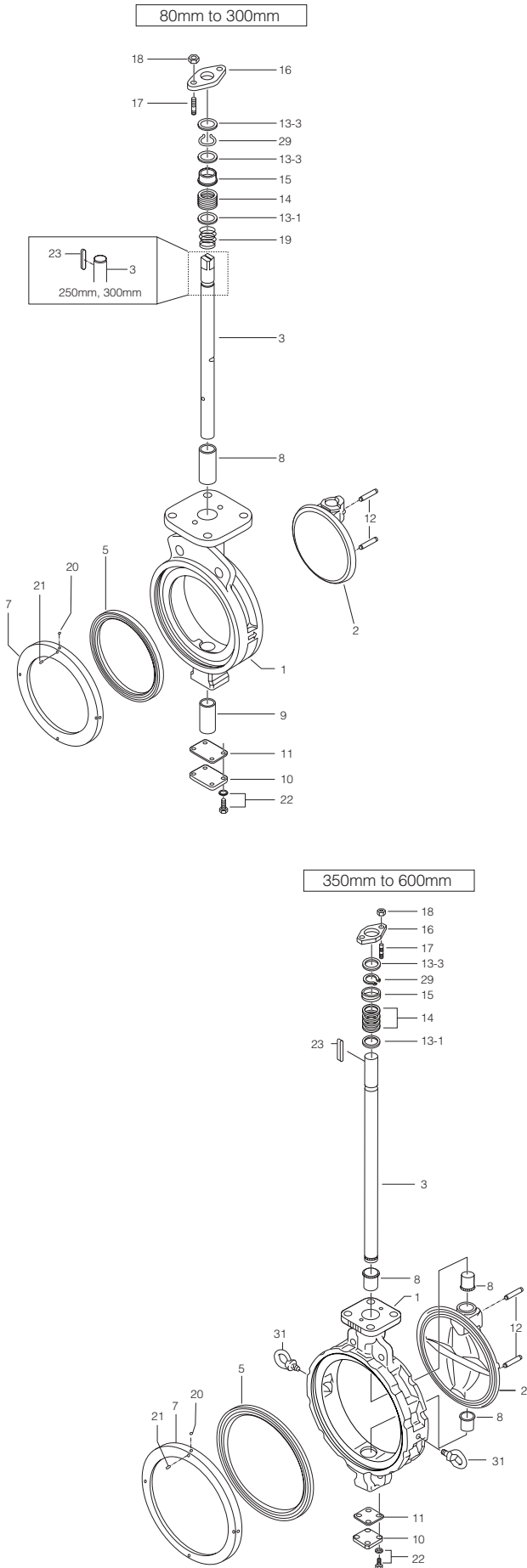
No.	Description	Q'ty	Remarks
1	Body	1	
3	Stem	1	for high-temperature extension
8	Shaft bearing	3	
12	Stem key	2	
13-1	Packing retainer	1	
13-3	Ring	1	
14	Gland packing	1 set	
15	Gland bush	1	
16	Gland flange	1	
17	Gland bolt	2	
18	Gland nut	2	
23	Key	1	Only 250mm, 300mm
24	Spacer ring	2	
29	C-ring	1	
H01	Extension column	1	
H02	Sub-gland bush	1	
H04	Top bearing	1	
H05	Center gasket	1	
H06	Hexagon bolt, Hexagon nut, Spring washer	4 sets	
H07	Sub-gland packing	1 sets	
H09	Packing retainer	1	

**302A for high-temperature extension Parts list  
(350mm to 600mm: 400 to 600 degrees C)**

No.	Description	Q'ty	Remarks
1	Body	1	
3	Stem	1	for high-temperature extension
8	Shaft bearing	3	350mm, 400mm
		4	450mm to 600mm
12	Stem key	2	
13-1	Packing retainer	1	
13-3	Ring	1	
14	Gland packing	1 set	
15	Gland bush	1	
16	Gland flange	1	
17	Gland bolt	2	
18	Gland nut	2	
23	Key	1	
24	Spacer ring	2	
29	C-ring	1	
H01	Extension column	1	
H02	Sub-gland bush	1	
H04	Top bearing	1	
H05	Center gasket	1	
H06	Hexagon bolt, Hexagon nut, Spring washer	4 sets	
H07	Sub-gland packing	1 sets	
H09	Sub- packing retainer	1	

# 304A

## Expanded View



### 304A Parts list ( 80mm to 300mm )

No.	Description	Q'ty	Remarks
1	Body	1	
2	Disc	1	
3	Stem	1	
5	Seat ring	1	
7	Seat ring retainer	1	
8	Top shaft bearing	1	
9	Bottom shaft bearing	1	
10	Bottom cover	1	
11	Bottom gasket	1	
12	Taper pin	2	
13-1	Packing retainer	1	
13-3	Ring	2	
14	Gland packing	1 sets	
15	Gland bush	1	
16	Gland flange	1	
17	Gland bolt	2	
18	Gland nut	2	
19	Gland coil	1	Only 80mm to 150mm
20	Ball	2	80mm to 125mm
		4	150mm to 300mm
21	Set screw	2	80mm to 125mm
		4	150mm to 300mm
22	Hexagon bolt, Spring washer	4 sets	
23	Key	1	Only 250mm, 300mm
29	C-ring	1	

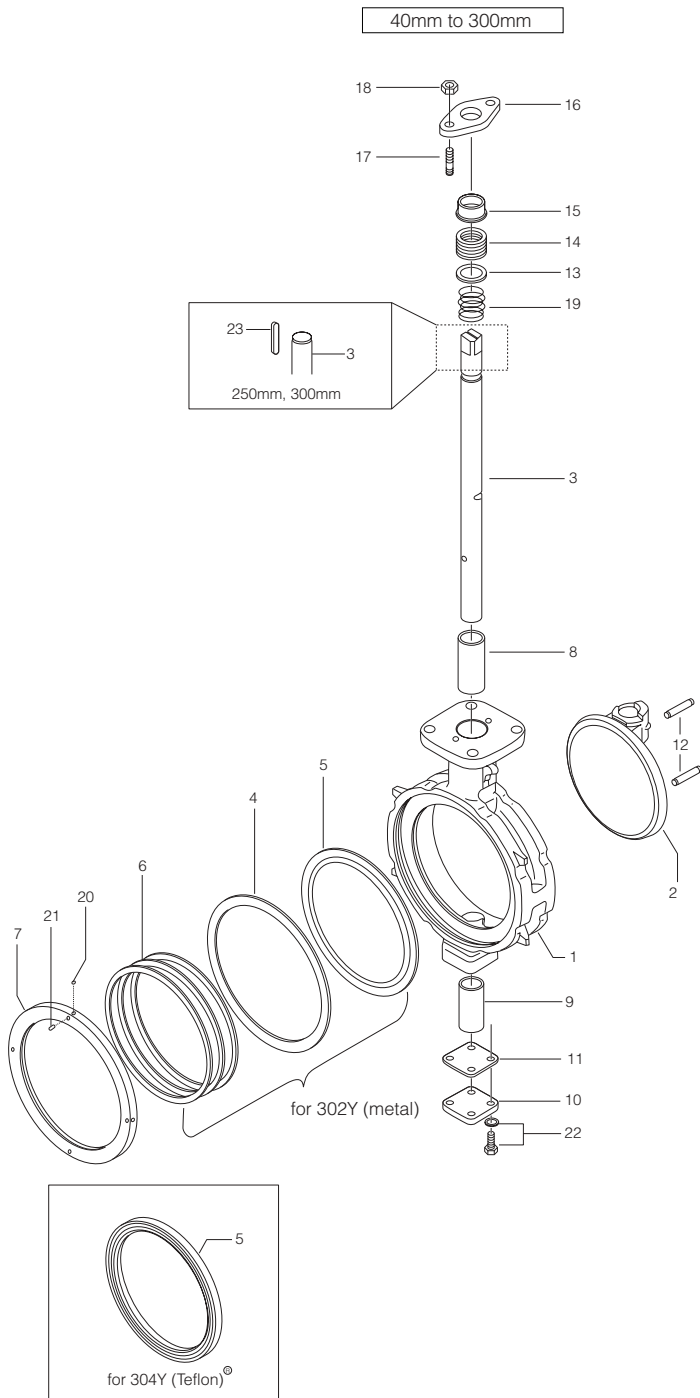
### 304A Parts list( 350mm to 600mm )

No.	Description	Q'ty	Remarks
1	Body	1	
2	Disc	1	
3	Stem	1	
5	Seat ring	1	
7	Seat ring retainer	1	
8	Shaft bearing	3	
10	Bottom cover	1	
11	Bottom gasket	1	
12	Taper pin	1	
13-1	Packing retainer	1	
13-3	Ring	1	
14	Gland packing	1 sets	
15	Gland bush	1	
16	Gland flange	1	
17	Gland bolt	2	
18	Gland nut	2	
20	Ball	4	
21	Set screw	4	
22	Hexagon bolt, Spring washer	4 sets	
23	Key	1	
29	C-ring	1	
31	Eye bolt	2	Only 450mm to 600mm

Remark: The indicates recommended spare parts. They are supplied as "Seat ring set" with a small hexagonal spanner to remove set screws (Parts list 21).

# 302Y/304Y

## Expanded View



### 302Y Parts list

No.	Description	Q'ty	Remarks
1	Body	1	
2	Disc	1	
3	Stem	1	
4	Seat ring gasket	1	
5	Seat ring	1	
6	Back-up spring	2	40mm to 100mm
		3	125mm to 200mm
		4	250mm, 300mm
7	Seat ring retainer	1	
8	Top shaft bearing	1	
9	Bottom shaft bearing	1	
10	Bottom cover	1	
11	Bottom gasket	1	
12	Taper pin	2	
13	Packing retainer	1	
14	Gland packing	1 sets	
15	Gland bush	1	
16	Gland flange	1	
17	Gland bolt	2	
18	Gland nut	2	
19	Gland coil	1	Only 40mm to 150mm
20	Ball	2	40mm to 125mm
		4	150mm to 300mm
21	Set screw	2	40mm to 125mm
		4	150mm to 300mm
22	Hexagon bolt, Spring washer	4 sets	
23	Key	1	Only 250mm, 300mm

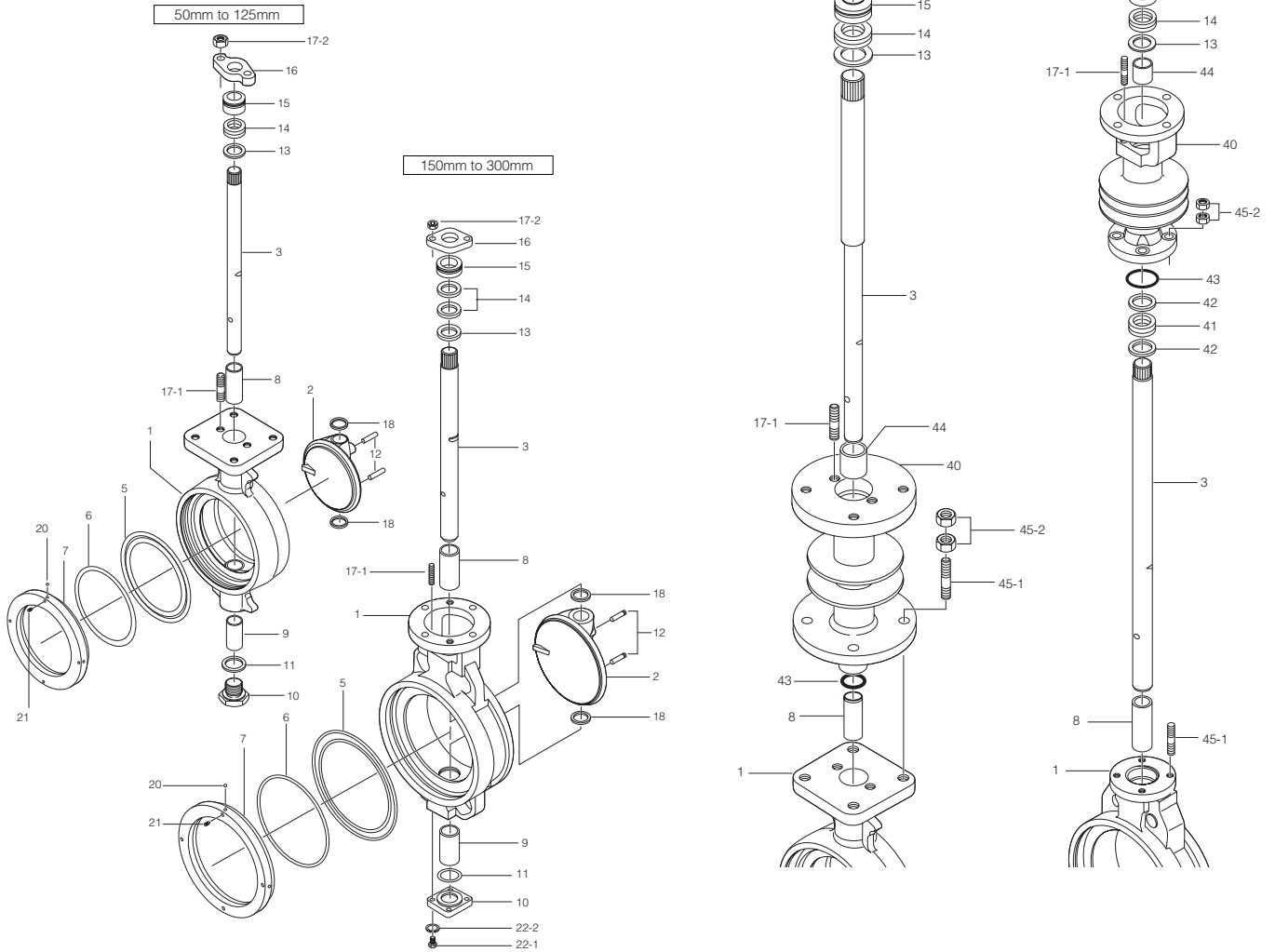
### 304Y Parts list

No.	Description	Q'ty	Remarks
1	Body	1	
2	Disc	1	
3	Stem	1	
5	Seat ring	1	
7	Seat ring retainer	1	
8	Top shaft bearing	1	
9	Bottom shaft bearing	1	
10	Bottom cover	1	
11	Bottom gasket	1	
12	Taper pin	2	
13	Packing retainer	1	
14	Gland packing	1 sets	
15	Gland bush	1	
16	Gland flange	1	
17	Gland bolt	2	
18	Gland nut	2	
19	Gland coil	1	Only 40mm to 150mm
20	Ball	2	40mm to 125mm
		4	150mm to 300mm
21	Set screw	2	40mm to 125mm
		4	150mm to 300mm
22	Hexagon bolt, Spring washer	4 sets	
23	Key	1	Only 250mm, 300mm

Remark: The indicates recommended spare parts. They are supplied as "Seat ring set" with a small hexagonal spanner to remove set screws (Parts list 21).

# 337Y

## Expanded View



**337Y Parts list( 50mm to 125mm: -20 to 350 degrees C )**

No.	Description	Q'ty	Remarks
1	Body	1	
2	Disc	1	
3	Stem	1	
5	Seat ring	1	
6	Outer ring	1	
7	Seat ring retainer	1	
8	Top shaft bearing	1	
9	Bottom shaft bearing	1	
10	Bottom cover	1	
11	Seal ring	1	
12	Taper pin	2	
13	Packing retainer	1	
14	Gland packing	2	
15	Gland bush	1	
16	Gland flange	1	
17-1	Gland bolt	2	
17-2	Gland nut	2	
18	Spacer ring	2	
20	Ball	2	
21	Set screw	2	

**337Y Parts list( 150mm to 300mm: -20 to 400 degrees C )**

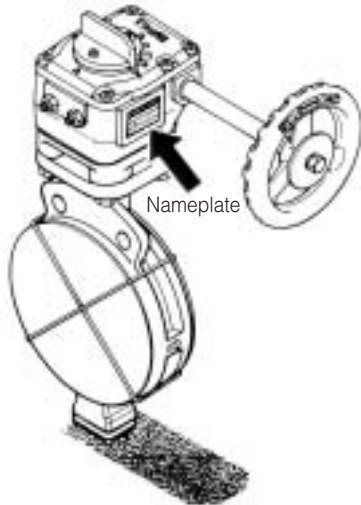
No.	Description	Q'ty	Remarks
1	Body	1	
2	Disc	1	
3	Stem	1	
5	Seat ring	1	
6	Outer ring	1	
7	Seat ring retainer	1	
8	Top shaft bearing	1	
9	Bottom shaft bearing	1	
10	Bottom cover	1	
11	Seal ring	1	
12	Taper pin	2	
13	Packing retainer	1	
14	Gland packing	3	
15	Gland bush	1	
16	Gland flange	1	
17-1	Gland bolt	2	
17-2	Gland nut	2	
18	Spacer ring	2	
20	Ball	4	
21	Set screw	4	
22-1	Hexagon bolt	4	
22-2	Spring washer	4	

**337Y Extension Fin Bonnet Parts list  
(80mm to 125mm: 350 to 600 degrees C /  
150mm to 300mm: 400 to 600 degrees C)**

No.	Description	Q'ty	Remarks
1	Body	1	50mm to 100mm
3	Stem	1	125mm to 300mm
8	Top shaft bearing	1	for high-temperature extension
13	Packing retainer	1	
14	Gland packing	2	
15	Gland bush	1	
16	Gland flange	1	
17-1	Gland bolt	2	
17-2	Gland nut	2	
40	Extension fin bonnet	1	
41	Sub-gland packing	2	150mm, 200mm
		3	250mm, 300mm
		2	150mm
42	Sub-packing retainer	3	200mm, 250mm
		4	300mm
43	Seal ring	1	
44	Top bearing	1	
45-1	Stud bolt	4	
45-2	Hexagon nut	8	

Remark: The 21 indicates recommended spare parts. They are supplied as "Seat ring set" with a small hexagonal spanner to remove set screws (Parts list 21).  
For 50mm to 125mm types in applications 350 degrees C and over as well as 150mm to 300mm types in applications 400 degrees C and over, the design structures are different.

## PACKAGING



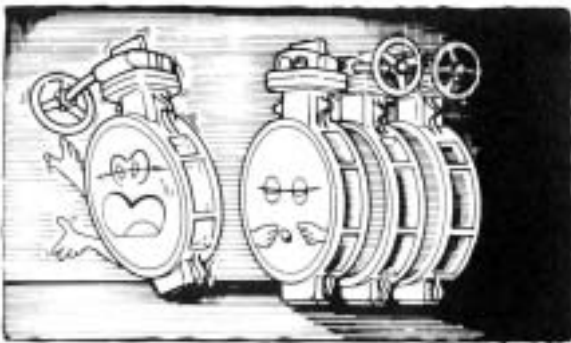
(Fig. 1)

- (1) Standard gear type and lever type off-the-shelf products are packed in cardboard or wooden boxes. For products other than these, a plywood protective plate is attached to the flange face of the valve body (piping flange contact surface) in order to protect the inside of the valve. (Fig. 1)
- (2) The valve disk is shipped in the fully closed position.
- (3) The valve has a nameplate with which you can verify information such as the nominal size and material. (Fig. 1)
- (4) The machined iron surface is protected by the recommended ant-rust coating.

## TRANSPORT

- (1) Use containers for ocean transport.
- (2) Use a covered vehicle for inland transport. If an uncovered vehicle is used, be sure to cover the valves with a protective tarp.

## STORAGE



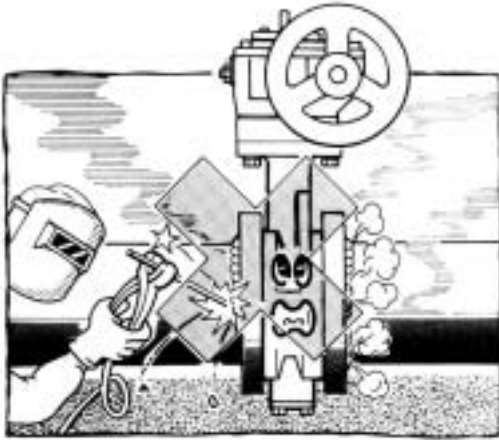
(Fig.2)

- (1) When storing valves, keep them indoors in as cool and dark a place as possible (temperature: -10 to +60 degrees C, humidity: 70% or less) without removing the cardboard packaging or the protective plate attached to the valve.
- (2) For long periods of storage, apply Ferroguard (Ferroguard #1009, US Ronco Laboratories Co.) once per year to the plated parts (indicator, bolts, nuts, and handle shaft, etc.).
- (3) Operate the valve once every three months.
- (4) When storing unpackaged butterfly valves, make sure that no unreasonable load is being applied to the valve body and drive member. (Fig. 2)
- (5) Do not store the valve in an atmosphere that contains corrosive gas.
- (6) Unpack the valve immediately before installing it into the piping. Do not leave the valve unpacked for long periods of time.

## UNPACKING

- (1) Unpack the valve immediately before installing it into the piping. Do not leave the valve unpacked for long periods of time.

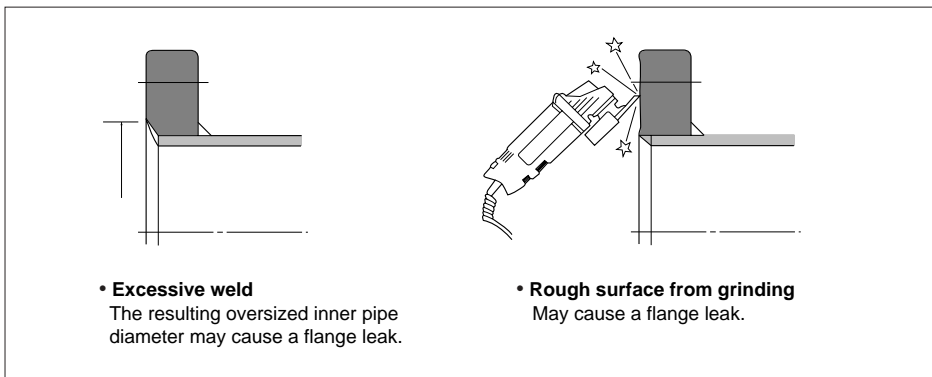
## INSTALLATION PRECAUTIONS



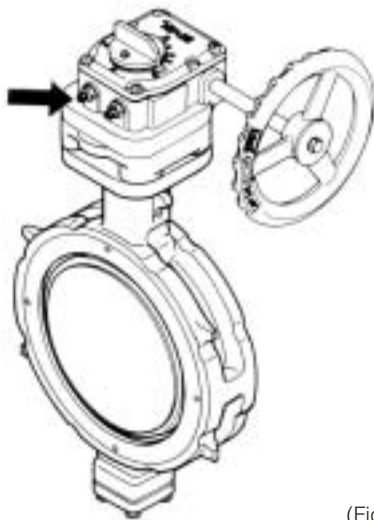
(Fig. 3)

(1) Installation of the valve immediately after welding the pipe flange will lead to adverse consequences, such as damage to the seat ring. Make sure that the temperature has cooled sufficiently and that you have removed weld spatter before installing the valve. Never weld when the valve is in the piping. (Fig. 3)

(2) Please note that flange leakage may occur if the valve flange face is as shown in Fig. 4. Also, please confirm that there is no distortion to the flange and that there is no damage, such as scratches, to the flange face.



(Fig. 4)



(Fig. 5)

(3) Depending on how the flange and pipe are welded, a difference might arise in pipe can be used. Therefore, please refer to page 29 to select the pipe and welding method.

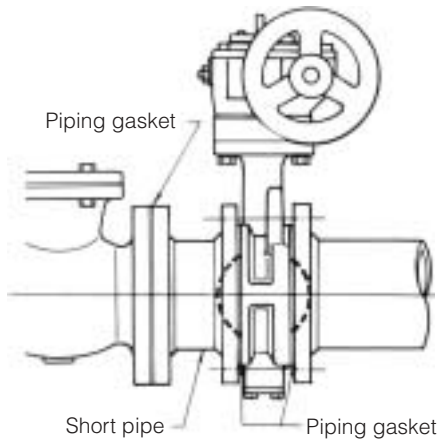
(4) During installation, be sure to use piping gaskets on both sides of the valve. Please refer to the tables starting on page 35 for information on piping gasket types.

(5) Do not apply strong shock such as by throwing the valve and do not put objects or put your weight on the lever or handwheel.

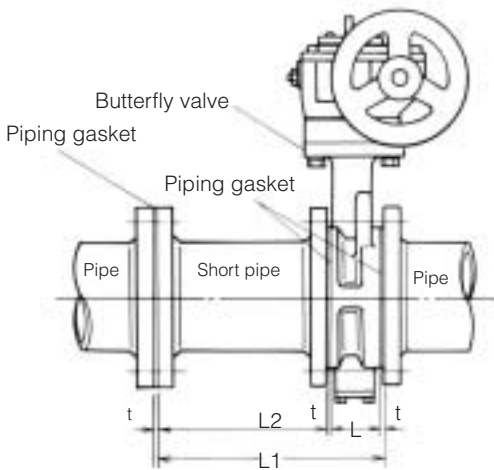
(6) Do not touch the stopper bolts on the gear box. Changing the valve close position will cause valve seat leakage. (Fig. 5)

(7) Alignment of the valve to the flange should be done accurately. In case the set bolt holes are tapped:

Never install the valve to one flange side using the tap holes for the four setting bolts located at the top and bottom of the valve body. The setting bolts are used for piping alignment. Tighten the setting bolts after completely securing the valve with the long bolts.



(Fig. 6)



(Fig. 7)

(8) When installing a non-return valve, pump and butterfly valve, always insert a short pipe in between. Not doing so will cause the disc to hit during operation and lead to faulty operation. (Fig. 6)

(9) Also wind the valve body with insulating material if it will be used with fluids that exceed 60 degrees C.

(10) Do not use plastic or loose flanges for pipe installation, because valve performance cannot be maintained.

(11) When replacing a previously installed regular valve with a butterfly valve, since the face-to-face dimension of the previously installed valve will be greater, you must insert a short pipe and adjust to the face-to-face dimension of the original valve pipe flange. Use the equation below when making the short pipe. (Fig. 7)

<b>Length of short pipe</b>	$L_2 = L_1 - (L + 2t)$	mm
	$L_2$ : Length of short pipe	mm
	$L_1$ : Face-to-face dimension of existing valve	mm
	$L$ : Face-to-face dimension of TOMOE butterfly valve	mm
	$t$ : Thickness of piping gasket	mm

(12) When installing, make the direction of pressure match the direction indicated by the arrow on the valve body. Take note of the following.

- 1 Make sure the drive member does not face downward (relative to horizontal).
- 2 If your application involves pressure being applied in both directions, please inquire with one of our sales personnel.
- 3 Be careful of the stem direction when piping conditions are as shown in Fig. 8.

(Fig. 8)

### Installing a valve at a pump outlet

**Incorrect installation orientation**

**Correct installation orientation**

### Installing at an elbow or a reducer

**Incorrect installation orientation**

**Correct installation orientation**

### Combination of a control valve and stop valve

**Incorrect installation orientation**

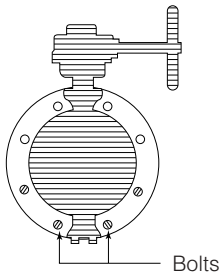
All the valve stems have the same orientation.

**Correct installation orientation**

The orientation of the valve stems is alternating.

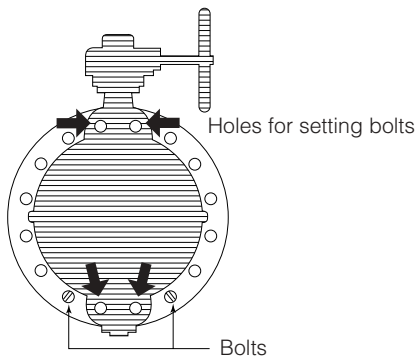
# INSTALLATION PROCEDURE

Without setting bolts holes

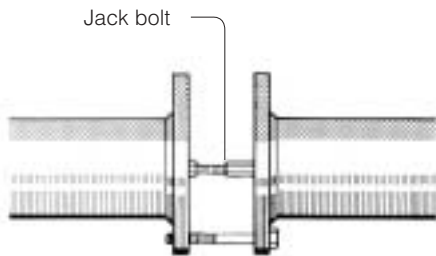


(Fig. 10)

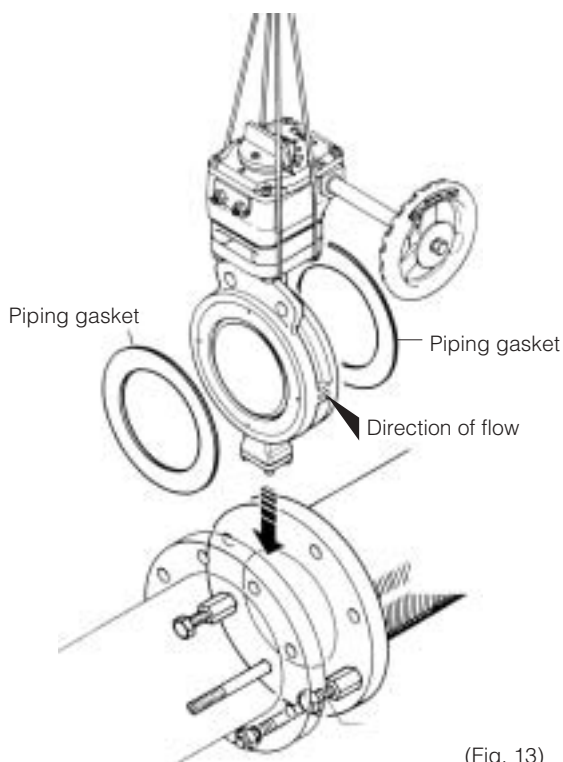
With setting bolt holes



(Fig. 11)

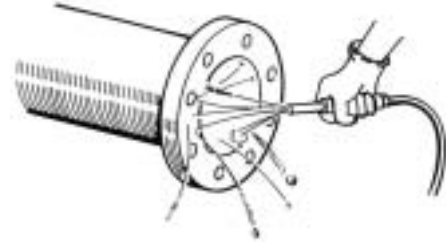


(Fig. 12)



(Fig. 13)

- (1) Use air purging to clean the flange faces that will contact the valve. If there is rust or some other foreign material sticking to a flange face, clean it with a suitable cleaning fluid (alcohol or neutral detergent, etc.). (Fig. 9)  
If possible, install in the piping a short pipe with a face-to-face dimension identical to the butterfly valve and blow into the pipe to completely remove foreign substances.



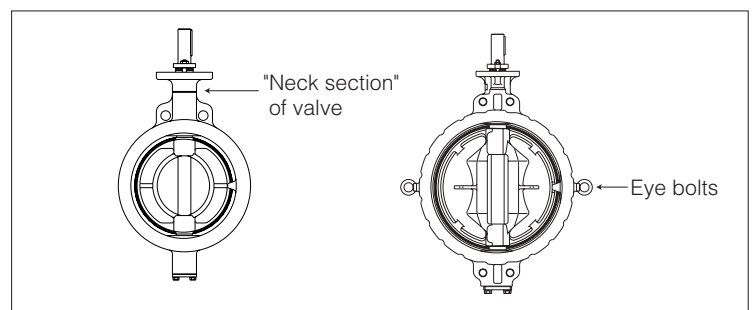
(Fig. 9)

- (2) During installation or removal operations, keep the valve disc in the completely closed position.
- (3) After aligning the piping, insert a piping bolt into the position in the figure and secure the valve to prevent it from dropping. (Fig. 10) (Fig. 11)
- (4) Place a jack bolt in the position shown in the figure to widen the face-to-face dimension. (If you require, we can supply jack bolts.) Push and widen to make the face-to-face dimension 3 to 5 mm greater than the valve width on each side. (Fig. 12)

- (5) Match the direction of valve pressure to the direction of the arrow indicated on the valve body and insert the valve taking care not to damage the valve gasket face. (Fig. 13)

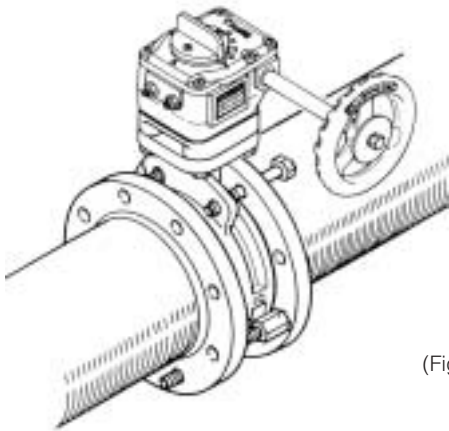
\*To facilitate installation, suspend the valve with a crane or similar while working.

When suspending the valve, use nylon string and suspend it from its "neck section" if the valve has no eye bolts. (Do not suspend the valve from drive member parts such as the gear handle.) (Fig. 14)



(Fig. 14)

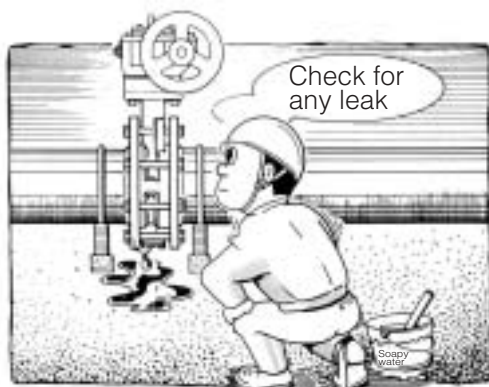
- (6) Insert piping gaskets between the pipe flange faces and the end faces of the valve. (Fig. 13)



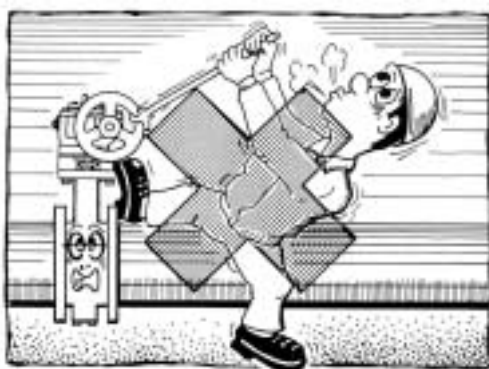
(Fig. 15)

- (7) Insert piping bolts into the piping bolt holes and then insert piping bolts into the remaining flange bolt holes. After removing the jack bolt, align the piping flanges with the valve and the piping gaskets and then tighten the nuts. (Fig. 15)
- (8) When tightening the nuts, alternate diagonally, applying equal strength as you gradually tighten each nut. Be careful not to tighten the nuts on one side too much or too little in order to prevent lopsided tightening. The right amount of seat ring compression is maintained by the flange tightening force and this construction prevents valve seat leakage. Therefore, piping bolts should be tightened with care.
- (9) After installing, open and close the valve to verify that the disc does not hit the piping or gaskets.

## HANDLING PRECAUTIONS AFTER INSTALLATION



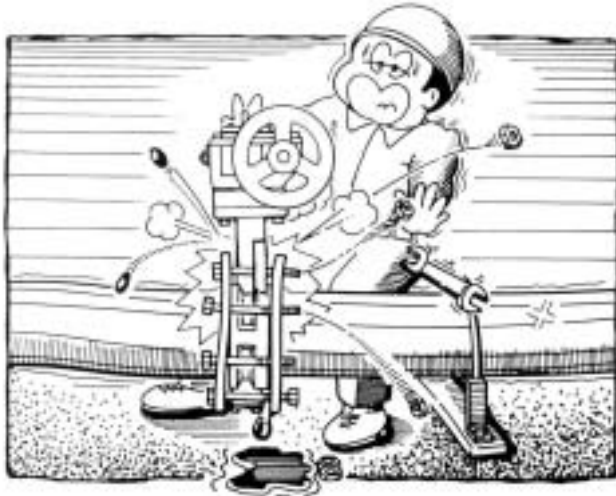
(Fig. 16)



(Fig. 17)

- (1) Never loosen the piping bolts, bottom cover bolts, gland nuts or drive member installation bolts when the inside of the piping is under pressure.
- (2) After installation and before operation be sure to open and close the valve once or twice.
- (3) Completely open the valve when performing a pressure test. Never use a fully closed valve in place of a blind flange.
- (4) Prior to operating, increase the internal pressure of the piping and check for possible leakage from the flanges, glands, and bottom cover by employing soapy water or similar. When doing so, make sure the internal pressure does not exceed the rated pressure of the valve. (Fig. 16)
- (5) If leakage is observed from the glands or bottom cover, immediately retighten the gland nuts and the bottom cover installation bolts. Alternate and tighten gradually with equal strength to avoid lopsided tightening. If leakage is observed from the flanges, release the internal pressure and remove the valve from the piping. Check that there is nothing wrong with the pipe gaskets or flange faces.
- (6) Opening and closing operation of the lock lever type and worm gear type must be done by hand. Do not use a pipe on the lever or a Wilky key on the gear handle. Doing so can damage the lever and handle, or break the valve. (Fig. 17)
- (7) After trial operation or operation over a fixed period, retighten the piping bolts and nuts. In particular, in applications involving high-temperature liquids, the piping bolts elongate which causes the tightening force on the flange faces to weaken and possibly cause leaking from the flanges.

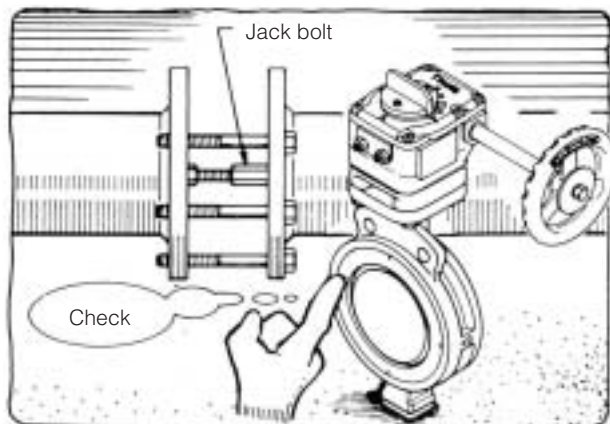
## VALVE REMOVAL PROCEDURE



(Fig. 18)

- (1) When removing the valve from the piping, make sure that the pressure inside the piping and the temperature have dropped completely.
- (2) It is very dangerous to loosen any piping bolts while the piping is under pressure. Be very careful. Also, drain off any residual fluid from the piping. (Fig. 18)
- (3) With the disc closed, loosen the piping bolts and nuts. Remove them all except those on the lower side. Remove the valve. Use of a jack bolt in between the flanges will assist in removing the valve more easily.

## INSPECTION AND MAINTENANCE



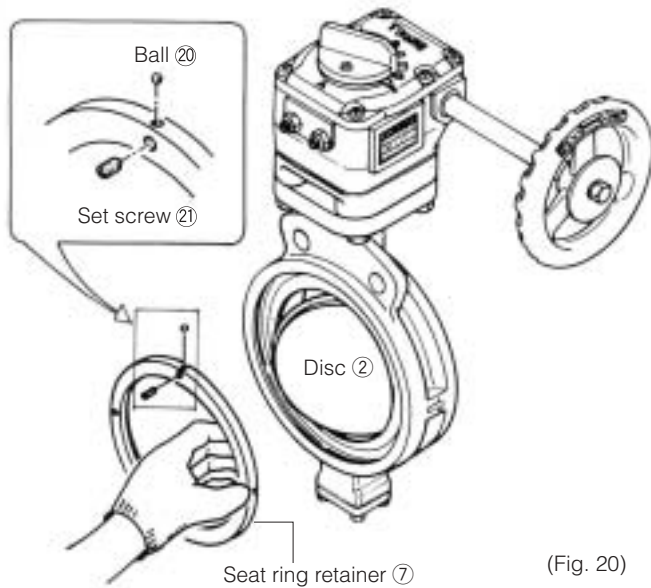
(Fig. 19)

- (1) **Periodic inspection**  
Perform an inspection once per year and check for disc corrosion and wear of the seat ring. The gear box and lever unit have been designed to be maintenance-free.
- (2) **Abnormal operation**  
Abnormal operation is usually caused by accumulation of foreign material or damage to the seat. If foreign material has accumulated and the disc is in the fully open position, it can be removed by maintaining the fully open position and flushing it out. If that does not work and if you think the seat might be damaged, remove the valve from the piping and inspect it. (Fig. 19)
- (3) **Lubricants**  
To lubricate the cylinder use lithium-base grease. To lubricate the gear box use grease. Be sure to use the ones recommended below.

Rust preventive agents and Lubricants	Product name (manufacturers)	To be applied to:
FELLOW GUARD	FELLOW GUARD #1009	Plated parts (Indicator, bolts, nuts and handle shaft)
Lithium-base grease	Multinoc grease No.2 (Nippon Oil Corporation)	Pneumatic Actuator T-matic
Grease	M ystik JI-6 (Kyodo yushi)	Gear box

## SEAT RING REPLACEMENT PROCEDURE

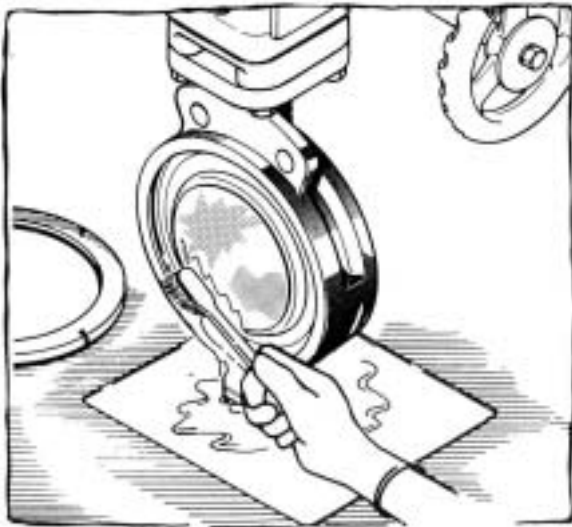
When performing periodic inspection or replacing the seat rings after they have become worn and damaged, remove the valve from the piping and proceed according to the following procedure while referring to the "Expanded View".



### Disassembly Procedure

302A

- (1) Open the disc ② approximately 30 °
- (2) Remove the set screw ㉑ located in the face of the seat ring retainer ⑦.
- (3) Carefully grasp the inner side of the seat ring retainer ⑦ and pull it out by hand. The ball ⑳ inserted on the outer side of the retainer may pop out during removal, so care must be taken not to lose it. (Fig. 20)
- (4) Remove the back-up ring ⑥, the seat ring ⑤, and the seat ring gasket ④.
- (5) Thoroughly clean the seat ring mounting faces of the body and the seat ring retainer ⑦, using a suitable cleaning fluid such as alcohol or a neutral detergent. (Fig. 21)
- (6) Put the disc ② into the fully closed position.

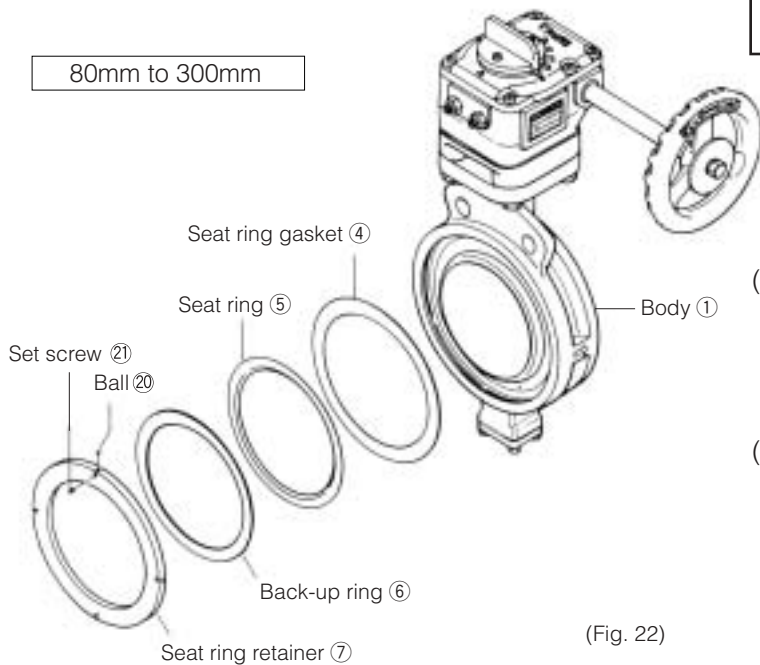


(Fig. 21)

## Assembly Procedure

302A

80mm to 300mm



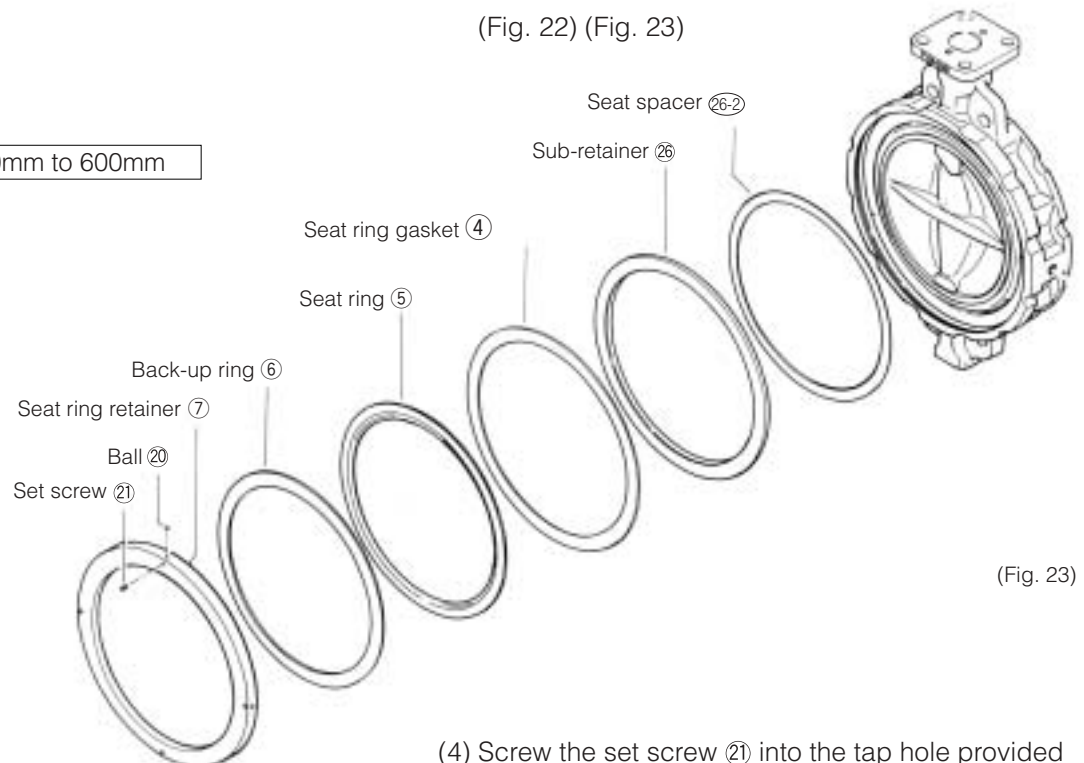
(Fig. 22)

- (1) Assemble the new seat ring (5), the seat ring gasket (4), the back-up ring (6) and the removed parts according to the procedure below.
- (2) Install the seat ring (5) on the body. Set the ball (20) on the periphery of the seat ring retainer (7) and install it on the body (1). (Fig. 22) (Fig. 23)
- (3) Set the seat ring gasket (4) on the body (1), then set the inner circumference of the seat ring (5) so that it makes tight contact with the outside perimeter of the disc, and set the back-up ring (6) on the top surface of the seat ring (5) collar. Next, insert the ball (20) into the seat ring retainer (7) and attach it to the body (1).

\*350 mm to 600 mm type valves have a sub-retainer (26) and seat spacer (26-2).

(Fig. 22) (Fig. 23)

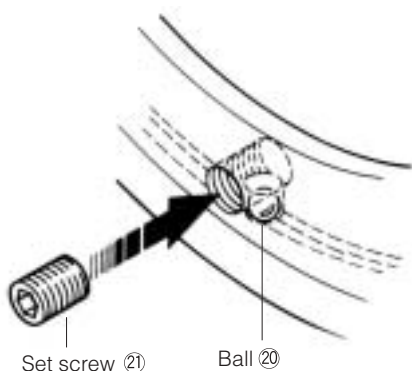
350mm to 600mm



(Fig. 23)

- (4) Screw the set screw (21) into the tap hole provided on the front face of the seat ring retainer (7). Make sure the set screw (21) is completely screwed in so that it does not protrude from the front face of the seat ring retainer (7).

(Fig. 24)

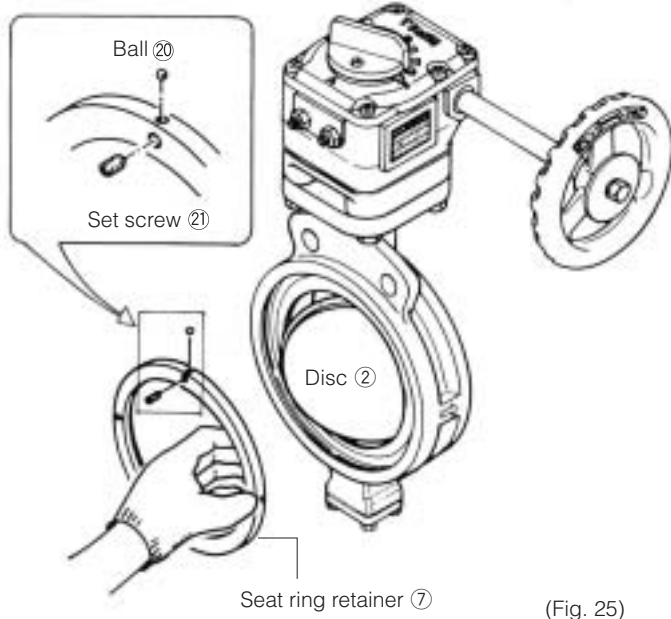


(Fig. 24)

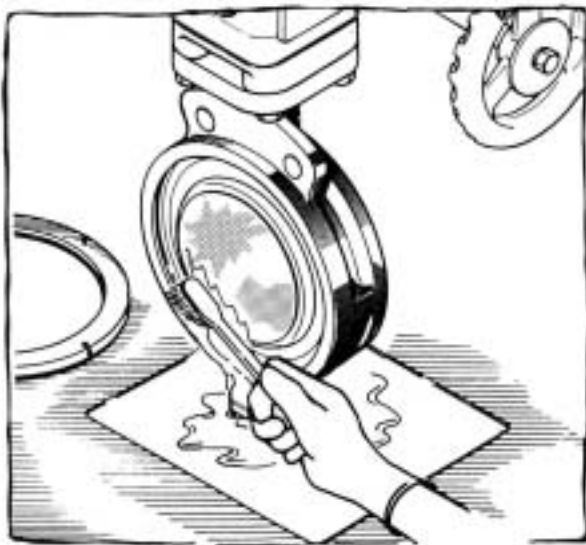
- (5) Open and close the valve to ensure that the retainer is properly secured to the body.

## Disassembly Procedure

334A • 304A



- (1) Open the disc ② approximately 30°.
- (2) Remove the set screw ㉑ located in the face of the seat ring retainer ㉑.
- (3) Carefully grasp the inner side of the seat ring retainer ㉑ and pull it out by hand. The ball ㉑ inserted on the outer side of the retainer may pop out during removal, so care must be taken not to lose it. (Fig. 25)
- (4) Remove the seat ring ⑤ from the seat ring retainer ㉑.
- (5) Thoroughly clean the seat ring mounting faces of the body and the seat ring retainer ㉑, using a suitable cleaning fluid such as alcohol or a neutral detergent. (Fig. 26)
- (6) Put the disc ② into the fully closed position.



(Fig. 26)

## Assembly Procedure

334A • 304A

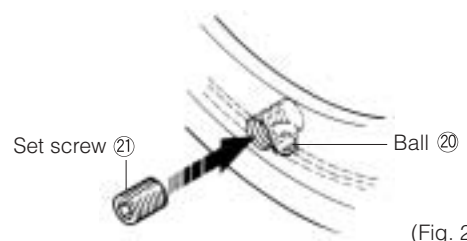
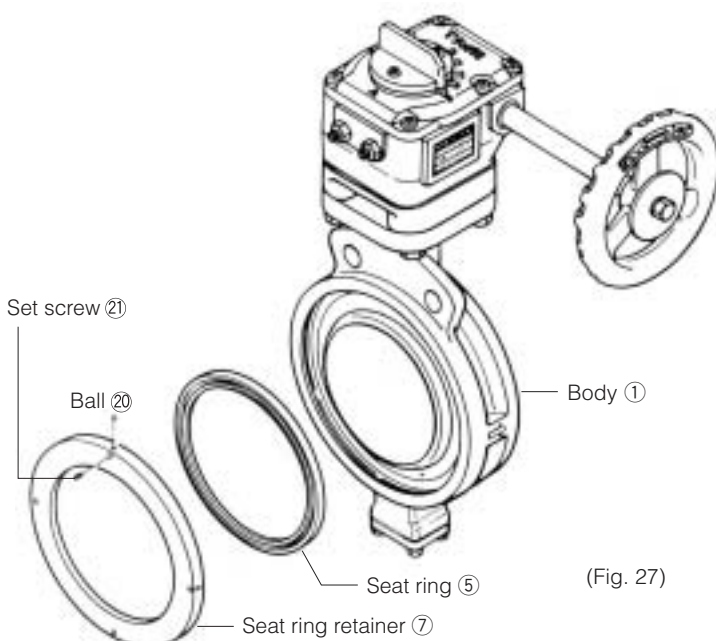
- (1) Assemble the new seat ring ⑤ and the removed parts according to the procedure below.

### 334A

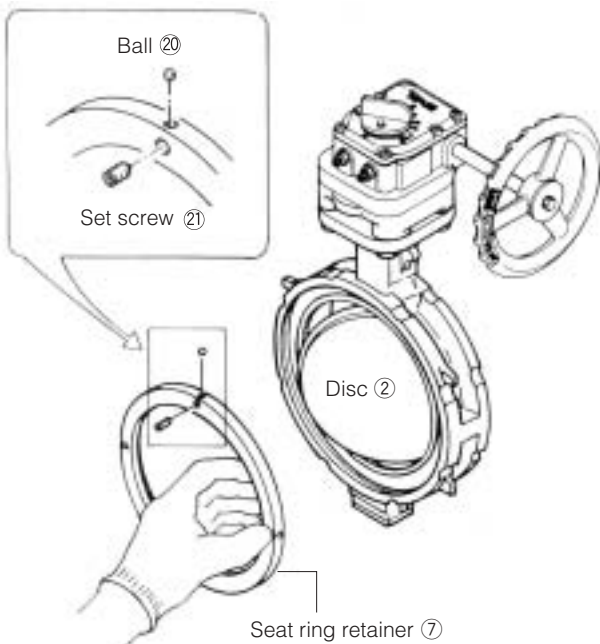
- (2) Attach the seal ring to the body ①. Next, set the ball ㉑ into the outer periphery of the seat ring retainer ㉑ and attach this assembly to the body ①. (Fig. 27)

### 304A

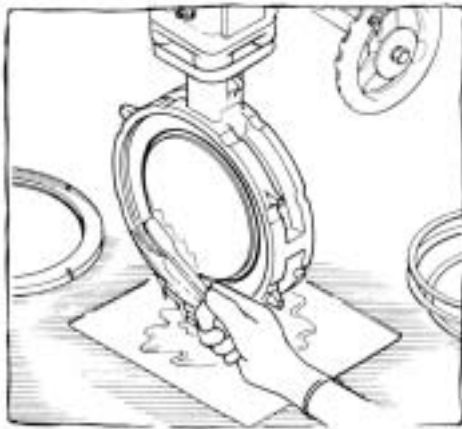
- (2) Attach the seat ring ⑤ to the seat ring retainer ㉑ and set the ball ㉑ into the outer periphery of the seat ring retainer ㉑, and then attach this assembly to the valve ①. (Fig. 27)
- (3) Screw the set screw ㉑ into the tap hole provided on the front face of the seat ring retainer ㉑. Make sure the set screw ㉑ is completely screwed in so that it does not protrude from the front face of the seat ring retainer ㉑. (Fig. 28)



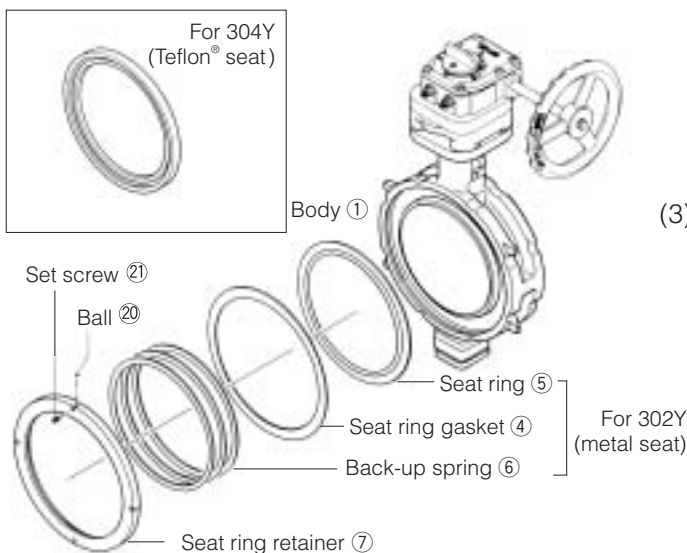
- (4) Open and close the valve to ensure that the seat ring retainer ㉑ is properly secured to the body.



(Fig. 29)



(Fig. 30)



(Fig. 31)

## Disassembly Procedure

302Y • 304Y

- (1) Open the disc ② approximately 30 °
- (2) Remove the set screw ⑳ located in the face of the seat ring retainer ㉑.
- (3) Carefully grasp the inner side of the seat ring retainer ㉑ and pull it out by hand. The ball ㉒ inserted on the outer side of the retainer may pop out during removal, so care must be taken not to lose it. (Fig. 29)
- (4) For the **304Y** Teflon® seat type, remove the seat ring ⑤ from the seat ring retainer ㉑.

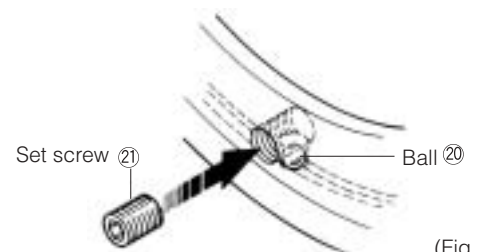
For the **302Y** metal seat type, remove the seat ring ⑤ and seat ring gasket ④ from the body, and the back-up spring ⑥ from the seat ring retainer ㉑.

- (5) Thoroughly clean the seat ring mounting faces of the body and the seat ring retainer ㉑, using a suitable cleaning fluid such as alcohol or a neutral detergent. (Fig. 30)
- (6) Put the disc ② into the fully closed position.

## Assembly Procedure

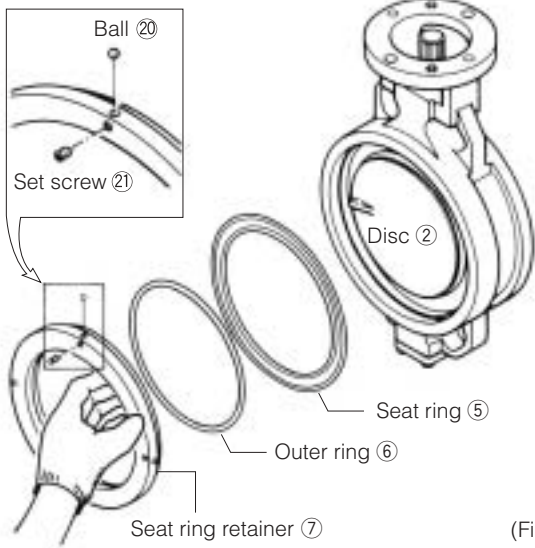
302Y • 304Y

- (1) Assemble the new seat ring ⑤ and the removed parts according to the procedure below.
- (2) For the **304Y** Teflon® seat type, attach the seat ring ⑤ to the seat ring retainer ㉑ and set the ball ㉒ into the outer periphery of the seat ring retainer ㉑, and then attach this assembly to the body ①.  
For the **302Y** metal seat type, set the seat ring ⑤ on the body ① so that its inner circumference makes tight contact with the outside perimeter of the disc and then attach the seat ring gasket ④ to the upper face of the seat ring ⑤ collar. Next, insert the ball ㉒ and back-up spring ⑥ into the seat ring retainer ㉑ and attach it to the body. (Fig. 31)
- (3) Screw the set screw ㉑ into the tap hole provided on the front face of the seat ring retainer ㉑. Make sure the set screw ㉑ is completely screwed in so that it does not protrude from the front face of the seat ring retainer ㉑. (Fig. 32)

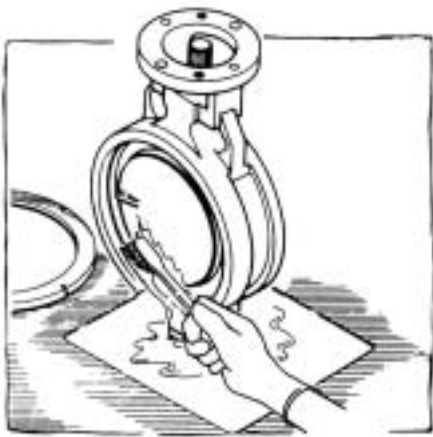


(Fig. 32)

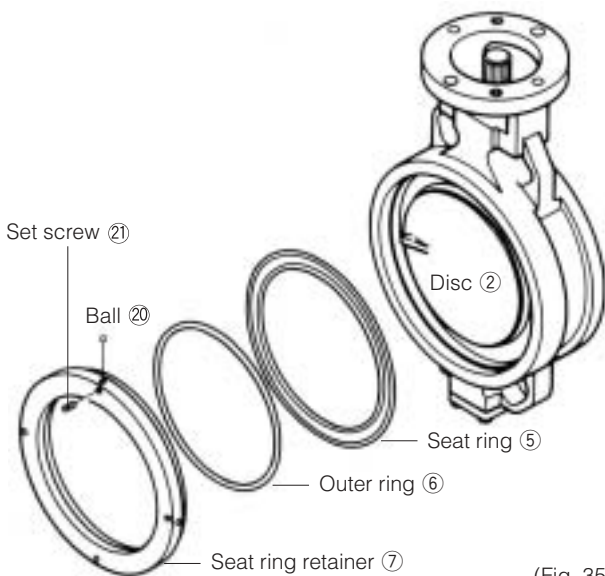
- (4) Open and close the valve to ensure that the seat ring retainer ㉑ is properly secured to the body.



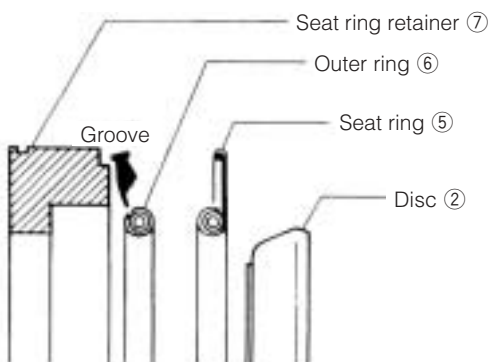
(Fig. 33)



(Fig. 34)



(Fig. 35)



(Fig. 36)

## Disassembly Procedure

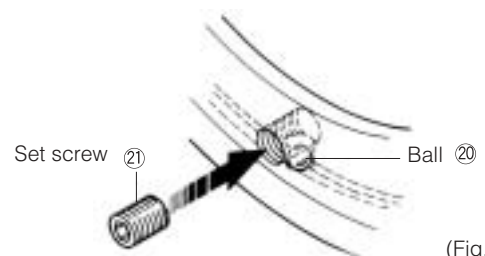
337Y

- (1) Open the disc ② approximately 30 °
- (2) Remove the set screw ⑳ located in the face of the seat ring retainer ㉟.
- (3) Carefully grasp the inner side of the seat ring retainer ㉟ and pull it out by hand. The ball ㉟ inserted on the outer side of the retainer may pop out during removal, so care must be taken not to lose it. (Fig. 33)
- (4) Remove the seat ring ⑤ and outer ring ⑥ from the seat ring retainer ㉟.
- (5) Thoroughly clean the seat ring mounting faces of the body and the seat ring retainer ㉟, using a suitable cleaning fluid such as alcohol or a neutral detergent. (Fig. 34)
- (6) Put the disc ② into the fully closed position.

## Assembly Procedure

337Y

- (1) Assemble the new seat ring ⑤ and the removed parts according to the procedure below.
- (2) Attach the seat ring ⑤ and the outer ring ⑥ to the seat ring retainer ㉟ and set the ball ㉟ into the outer periphery of the seat ring retainer ㉟, and then attach this assembly to the body ①. Make sure that the correct side of the outer ring ⑥ is facing the seat ring retainer. (Fig. 35) (Fig. 36)
- (3) Screw the set screw ㉟ into the tap hole provided on the front face of the seat ring retainer ㉟. Make sure the set screw ㉟ is completely screwed in so that it does not protrude from the front face of the seat ring retainer ㉟. (Fig. 37)



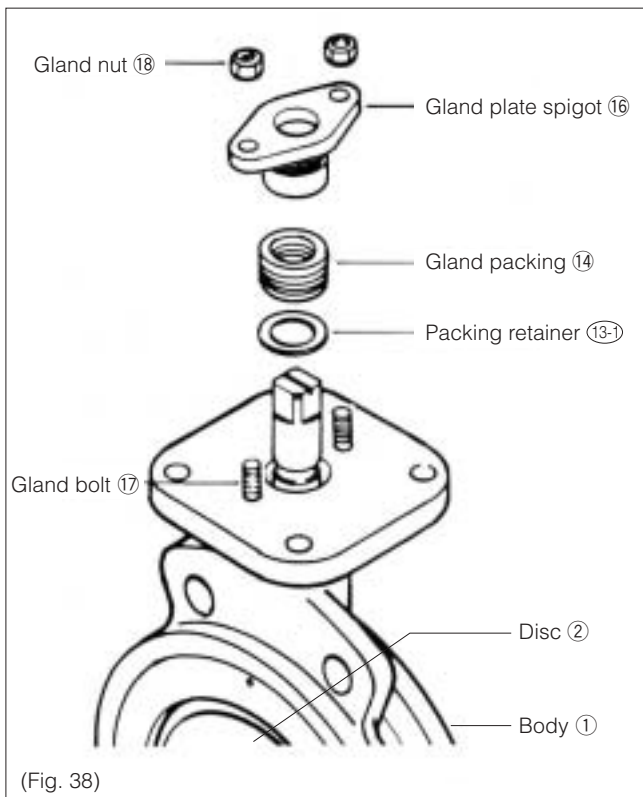
(Fig. 37)

- (4) Open and close the valve to ensure that the seat ring retainer ㉟ is properly secured to the body

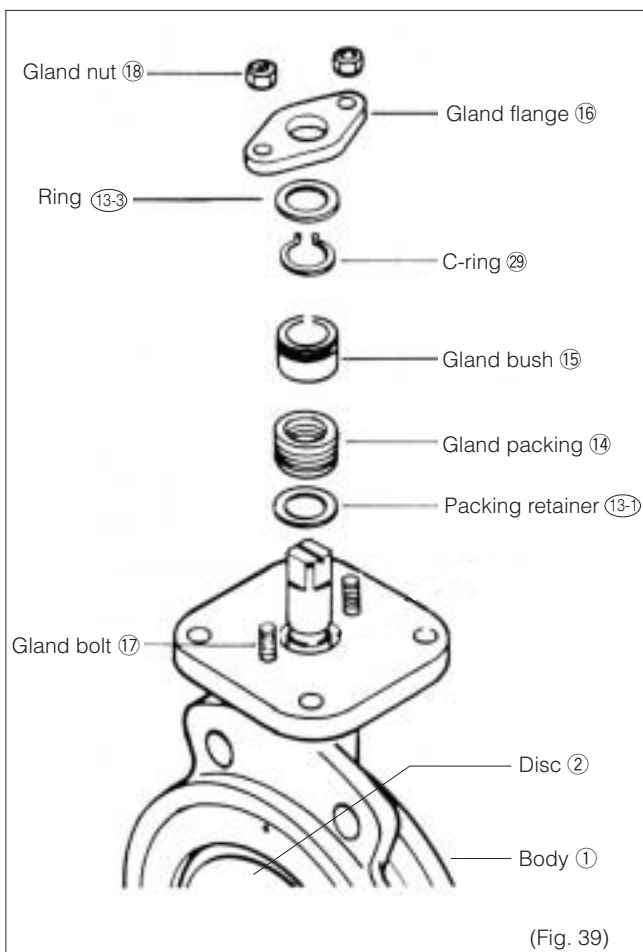
# GLAND PACKING REPLACEMENT PROCEDURE

334A Disassembly Procedure  
 302A Disassembly Procedure (when fluid temperature is between -29 and 400 degrees C)

## 334A



## 302A



# Disassembly Procedure

334A  
 302A (-29 to 400 degrees C)

### Caution:

Material may differ even though dimensions are the same. When disassembling (SUS304 and SUS316, etc.), please keep track of where the parts were located before they were disassembled.

- (1) Put the disc (2) into the fully closed position. Prior to disassembly, make an alignment mark using an oil based pen or chisel on the bonnet (bracket) that connects the actuator and body in order to clarify the position and direction in which the actuator and body are assembled.
- (2) Remove the actuator and bonnet (bracket and joint).

### 334A

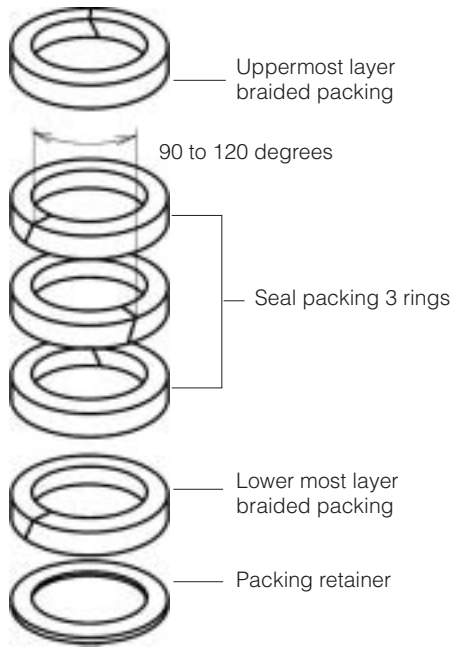
- (3) For 200 mm or higher type, remove the key (23).
- (4) Remove the lock pin.
- (5) Remove the gland nut (18) and remove the gland plate spigot (16).

### 302A

- (3) For 250 mm or higher type, remove the key (23).
- (4) Loosen the gland nut (18) and remove the gland flange (16).
- (5) Remove the ring (13-3) and C-ring (29).
- (6) Remove the gland bush (15) from the body (1).

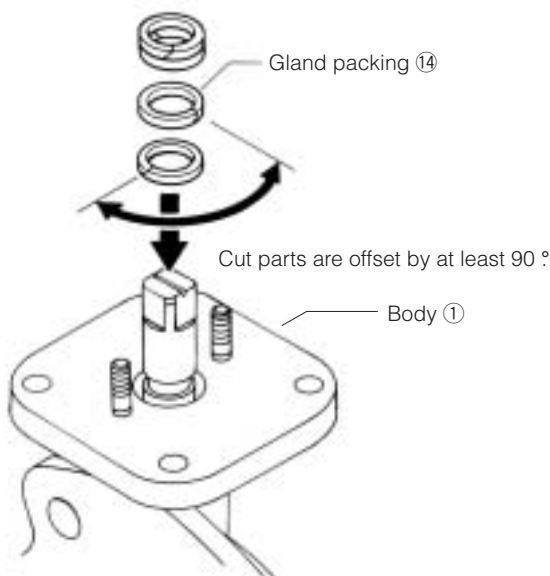
- (7) Remove the gland packing (14) from the body (1) using a packing tool, scriber or similar implement. If the packing retainer (13-1) can also be removed, remove it.

### 334A



Nominal size		Gland nut	
mm	Inch	Specified torque (Nm)	Nominal size (Bolt)
80	3	8.3	M6
100	4	20.2	M8
150	6	20.2	M8
200	8	40	M10
250	10	69.7	M12
300	12	173	M16
350	14	173	M16
400	16	173	M16
450	18	173	M16
500	20	173	M16
600	24	173	M16

(Fig. 40)



(Fig. 41)

## Assembly Procedure

### 334A

### 302A (-29 to 400 degrees C)

- (1) Thoroughly clean the gland packing hole on the body (1) of all waste and other foreign particles.
- (2) Clean each component before assembling.
- (3) If the packing retainer (13-1) was removed, install it in the gland packing hole on the body (1).

### 334A

- (4) Insert the new gland packing being careful not to scratch it with the stem key groove. Insert the gland packing one layer at a time. While compressing, insert in the order of braided packing (1 layer), seal packing (3 layers) and braided packing (1 layer).
- (5) The gland packing should be stacked so that the cut parts do not align in the same direction. Make sure cut parts are offset from each other by 90 to 120 degrees. (Fig. 40)
- (6) Install the gland plate spigot and tighten the gland nuts in accordance with the torque specified in Table 3. Alternating left and right, tighten them first 20%, 50%, 75% and then 100% of the specified torque.

### 302A

- (4) Insert the gland packing (14) into the gland packing hole on the body (1) and attach the gland bush (15) onto it.
 

Be sure to install the gland packing (14) so that the cut parts are offset by at least 90° so that they are not facing in the same direction. (Fig. 41)
- (5) Install the C-ring (29) and the ring (13-3).
- (6) Attach the gland flange (16) and tighten the gland nuts (18) equally on the left and right sides.
- (7) For 250 mm or higher type, install the key (23).

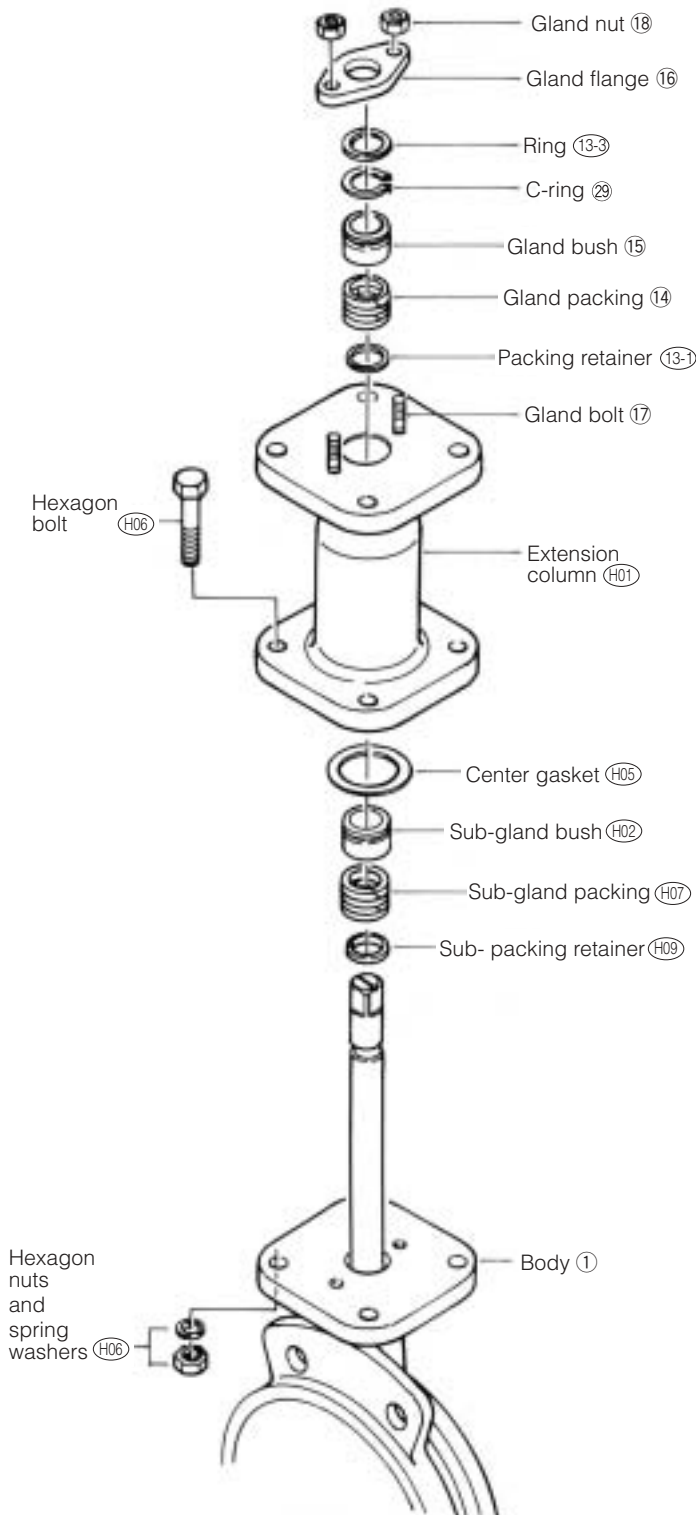
- (8) Put the disc (2) into the fully closed position.
- (9) Install the bracket, joint, and actuator. When assembling, align and position each part using the alignment mark you made prior to disassembly.
- (10) Open and close the valve to verify that operation is smooth.

## Disassembly Procedure

### 3 0 2 A High-temperature Extension (400 to 600 degrees C)

#### Caution:

Material may differ even though dimensions are the same. When disassembling (SUS304 and SUS316, etc.), please keep track of where the parts were located before they were disassembled.

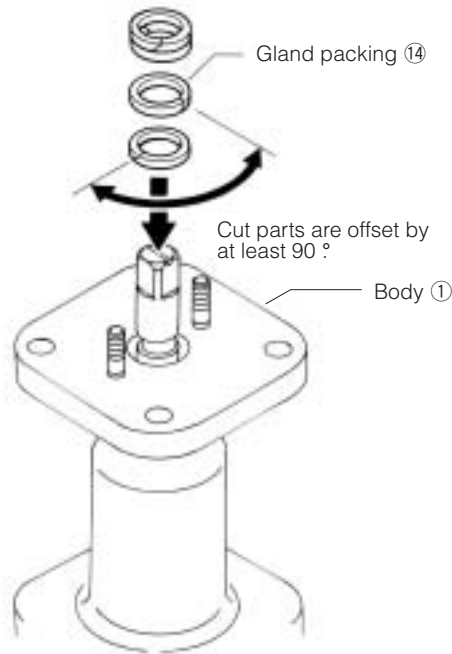


(Fig. 42)

- (1) Put the disc (2) into the fully closed position. Prior to disassembly, make an alignment mark using an oil based pen or chisel on the bracket that connects the actuator and extension column, and on the extension column and body, in order to clarify the respective positions and directions that they were assembled.
- (2) Remove the actuator, bracket and joint.
- (3) For 250 mm or higher type, remove the key (23).
- (4) Loosen the gland nut (18) and remove the gland flange (16).
- (5) Remove the ring (13-3) and C-ring (29).
- (6) Remove the gland bush (15) from the extension column (H01).
- (7) Remove the gland packing (14) from the extension column (H01) using a scribe or similar implement. If the packing retainer (13-1) can also be removed, remove it.
- (8) To replace the sub-gland packing (H07), remove the hexagon bolts, hexagon nuts, spring washers (H06) and slide the extension column (H01) up and take it off.
- (9) Remove the center gasket (H05) located between the body (1) and the extension column (H01).
- (10) Remove the sub-gland bush (H02).
- (11) Remove the sub-gland packing (H07) from the body (1) using packing tool, scribe or similar implement. If the sub-packing retainer (H09) can also be removed, remove it.

## Assembly Procedure

### 3 0 2 A High-temperature Extension (400 to 600 degrees C)



(Fig. 43)

- (1) Thoroughly clean the gland packing hole on the body (1) and extension column (H01) of all waste and other foreign particles.
- (2) Clean each component before assembling.
- (3) If the sub-packing retainer (H09) was removed, install it in the gland packing hole on the body (1). (Fig. 24)
- (4) Insert the sub-gland packing (H07) into the gland packing hole on the body (1) and attach the sub-gland bush (H02) onto it.

Be sure to install the sub-gland packing (H07) so that the cut parts are offset by at least 90 °so that they are not facing in the same direction. (Fig. 41)

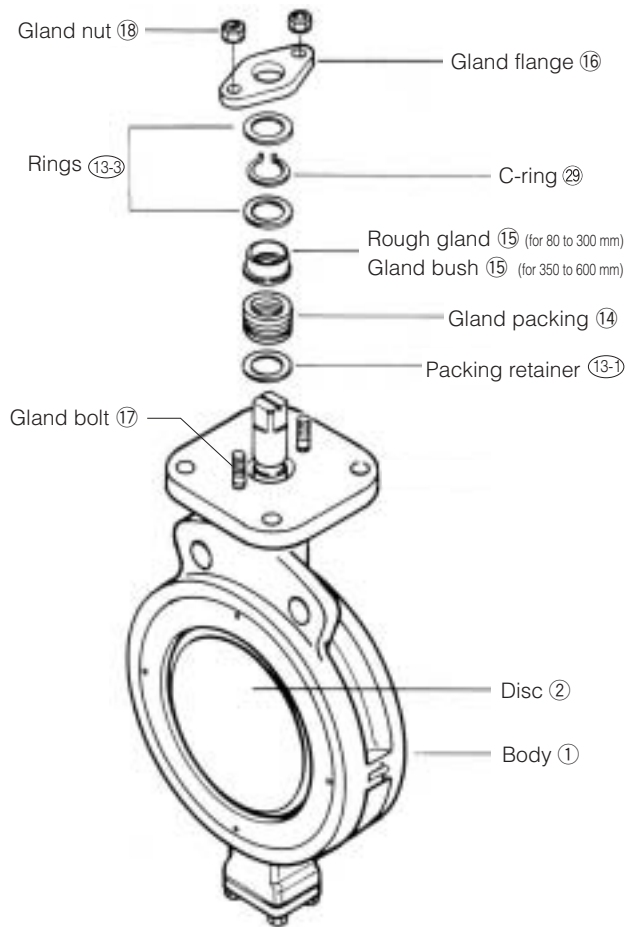
- (5) Place the center gasket (H05) and extension column (H01) onto the body (1) and tighten the hexagon bolts, hexagon nuts, and spring washers (H06).
- (6) If the packing retainer (13-1) was removed, install it in the gland packing hole on the extension column (H01).
- (7) Insert the gland packing (14) into the gland packing hole on the extension column (H01) and attach the gland bush (15) onto it.

Be sure to install the gland packing (14) so that the cut parts are offset by at least 90 °so that they are not facing in the same direction. (Fig. 43)

- (8) Install the C-ring (29) and the ring (13-3).
- (9) Attach the gland flange (16) and tighten the gland nuts (18) equally on the left and right sides.
- (10) For 250 mm or higher type, install the key (23).
- (11) Put the disc (2) into the fully closed position.
- (12) Install the bracket, joint, and actuator. When assembling, align and position each part using the alignment mark you made prior to disassembly.
- (13) Open and close the valve to verify that operation is smooth.

## Disassembly Procedure

304A

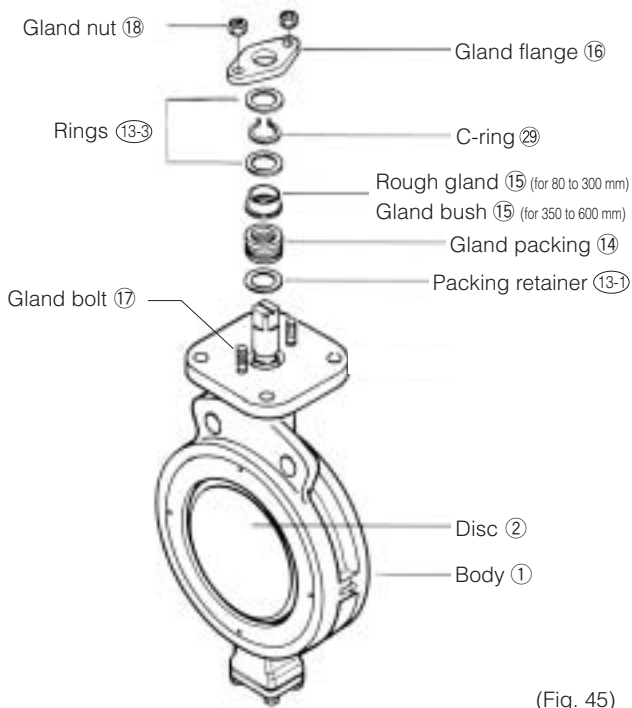


(Fig. 44)

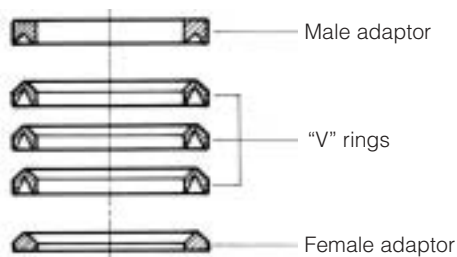
- (1) Put the disc ② into the fully closed position. Prior to disassembly, make an alignment mark using an oil based pen or chisel on the bonnet (bracket) that connects the actuator and body in order to clarify the position and direction in which the actuator and body are assembled.
- (2) Remove the actuator and bonnet (bracket and joint).
- (3) For 250 mm or higher type, remove the key ⑳.
- (4) Loosen the gland nut ⑱ and remove the gland flange ⑲.
- (5) Remove the C-rings ⑳ and ring ⑬-③ .
- (6) Remove the rough gland ⑮ (for 80 to 300 mm) / gland bush ⑮ (for 350 to 600 mm) from the body ①.
- (7) Remove the gland packing ⑭ from the body ① using a packing tool, scriber or similar implement. If the packing retainer ⑬-① can also be removed, remove it.(Fig. 44)

## Assembly Procedure

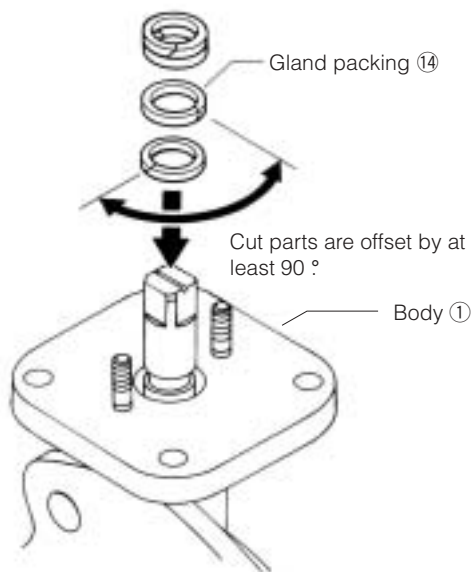
### 304 A



(Fig. 45)



(Fig. 46)



(Fig. 47)

- (1) Thoroughly clean the gland packing hole on the body ① of all waste and other foreign particles.
- (2) Clean each component before assembling.
- (3) If the packing retainer ⑬-① was removed, install it in the gland packing hole on the body ①.
- (4) Insert the gland packing ⑭ into the gland packing hole on the body ① and attach the rough gland ⑮ (for 80 to 300 mm) / gland bush ⑮ (for 350 to 600 mm) onto it.

For 80 mm to 300 mm type:

When inserting the gland packing ⑭, lubricate the inner and outer sides of the packing lightly with grease. Insert the male adaptor, "V" rings (3 pieces), and the female adaptor in that order, one by one. (Fig. 46)

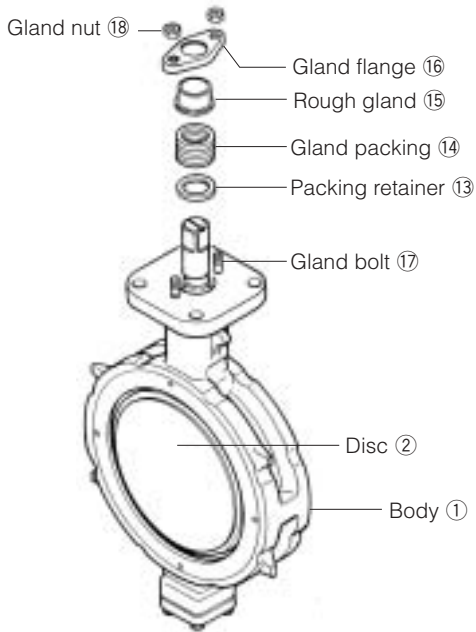
For 350 mm to 600 mm type:

Be sure to install the gland packing ⑭ so that the cut parts are offset by at least 90 °so that they are not facing in the same direction. (Fig. 47)

- (5) For 80 mm to 300 mm type, after placing one ring ⑬-③ install the C-ring ⑲ and then the remaining the ring ⑬-③ .  
For 350mm to 600mm type, install the C-ring ⑲ and then ring ⑬-③.
- (6) Attach the gland flange ⑯ and tighten the gland nuts ⑱ equally on the left and right sides. ⑳
- (7) For 250 mm or higher type, install the key .
- (8) Put the disc ② into the fully closed position.
- (9) Install the bracket, joint, and actuator. When assembling, align and position each part using the alignment mark you made prior to disassembly.
- (10) Open and close the valve to verify that operation is smooth.

## Disassembly Procedure

302Y • 304Y

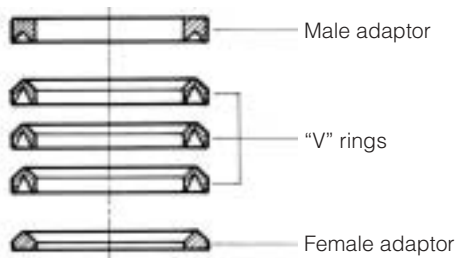


(Fig. 48)

- (1) Put the disc (2) into the fully closed position. Prior to disassembly, make an alignment mark using an oil based pen or chisel on the bonnet (bracket) that connects the actuator and body in order to clarify the position and direction in which the actuator and body are assembled.
- (2) Remove the actuator, bracket and joint.
- (3) For 250 mm or higher type, remove the key (23).
- (4) Loosen the gland nut (18) and remove the gland flange (16).
- (5) Remove the rough gland (15) from the body (1).
- (6) Remove the gland packing (14) from the body (1) using a packing tool, scriber or similar implement. If the packing retainer (13) can also be removed, remove it.

## Assembly Procedure

302Y • 304Y

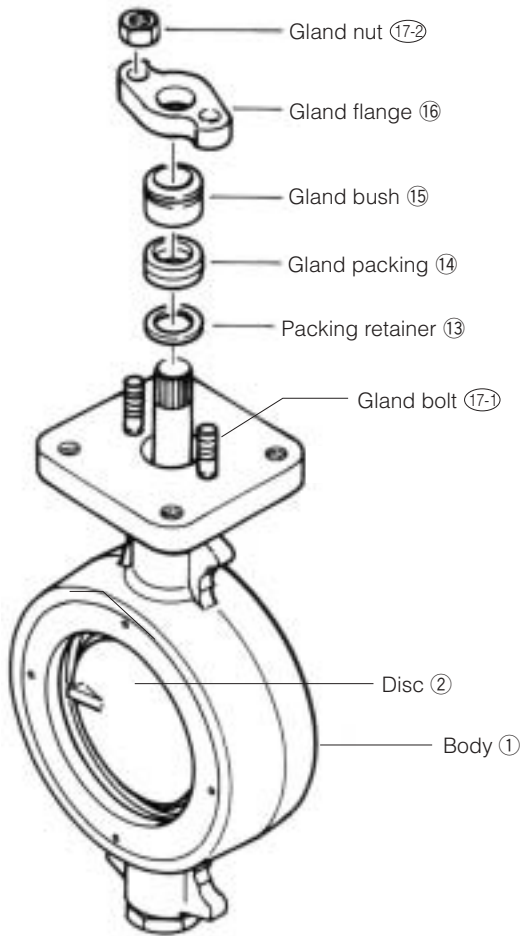


(Fig. 49)

- (1) Thoroughly clean the gland packing hole on the body (1) of all waste and other foreign particles.
- (2) Clean each component before assembling.
- (3) If the packing retainer (13) was removed, install it in the gland packing hole on the body (1).
- (4) Insert the gland packing (14) into the gland packing hole on the body (1) and attach the rough gland (15) onto it.

When inserting the gland packing (14), lubricate the inner and outer sides of the packing lightly with grease. Insert the male adaptor, "V" rings (3 pieces), and the female adaptor in that order, one by one. (Fig. 49)

- (5) Attach the gland flange (16) and tighten the gland nuts (18) equally on the left and right sides.
- (6) For 250 mm or higher type, install the key (23).
- (7) Put the disc (2) into the fully closed position.
- (8) Install the bracket, joint, and actuator. When assembling, align and position each part using the alignment mark you made prior to disassembly.
- (9) Open and close the valve to verify that operation is smooth.



(Fig. 50)

## Disassembly Procedure

**337Y** 50 mm to 125 mm: -20 to 350 degrees C  
150 mm to 300 mm: -20 to 400 degrees C

- (1) Put the disc ② into the fully closed position. Prior to disassembly, make an alignment mark using an oil based pen or chisel on the bonnet (bracket) that connects the actuator and body in order to clarify the position and direction in which the actuator and body are assembled.
- (2) Remove the actuator and bonnet (bracket and joint).
- (3) Loosen the gland nut ⑰-② and remove the gland flange ⑰.
- (4) Remove the gland bush ⑮ from the body ①.
- (5) Remove the gland packing ⑭ from the body ① using a packing tool, scribe or similar implement. If the packing retainer ⑬ can also be removed, remove it.

## Assembly Procedure

**337Y** 50 mm to 125 mm: -20 to 350 degrees C  
150 mm to 300 mm: -20 to 400 degrees C

- (1) Thoroughly clean the gland packing hole on the body ① of all waste and other foreign particles.
- (2) Clean each component before assembling.
- (3) If the packing retainer ⑬ was removed, install it in the gland packing hole on the body ①.

- (4) Insert the gland packing ⑭ into the gland packing hole on the body ① and attach the gland bush ⑮ onto it.

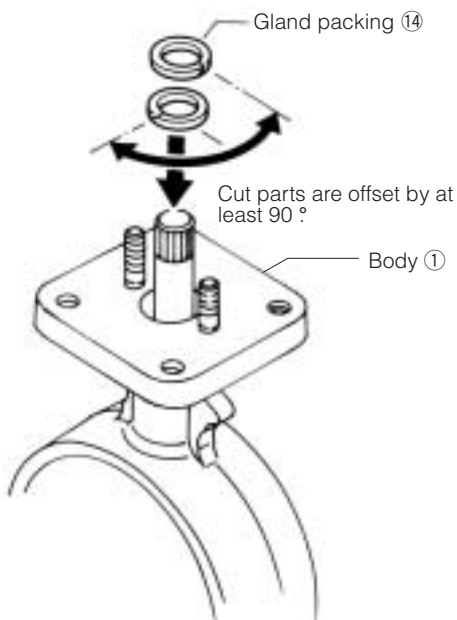
Be sure to install the gland packing ⑭ so that the cut parts are offset by at least 90 °so that they are not facing in the same direction. (Fig. 51)

- (5) Attach the gland flange ⑰ and tighten the gland nuts ⑰-② equally on the left and right sides.

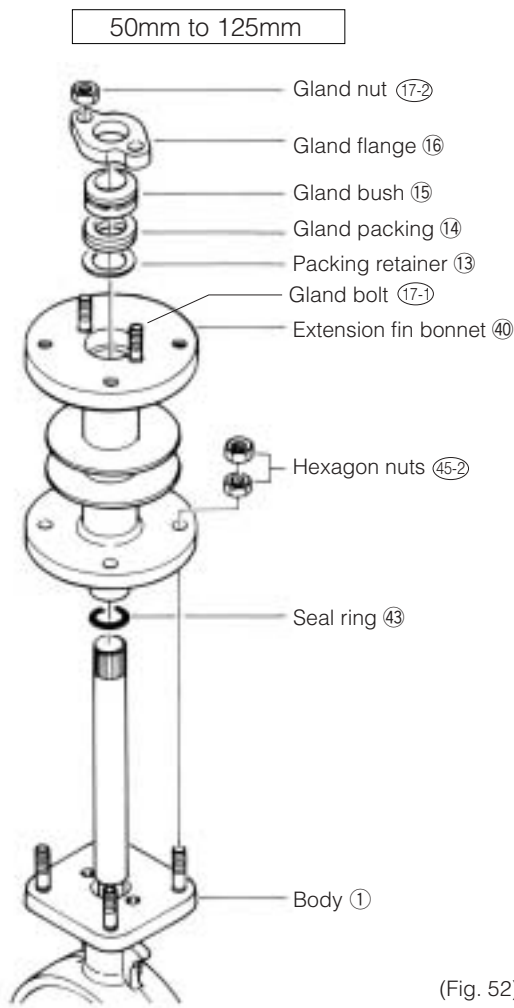
- (6) Put the disc ② into the fully closed position.

- (7) Install the bracket, joint, and actuator. When assembling, align and position each part using the alignment mark you made prior to disassembly.

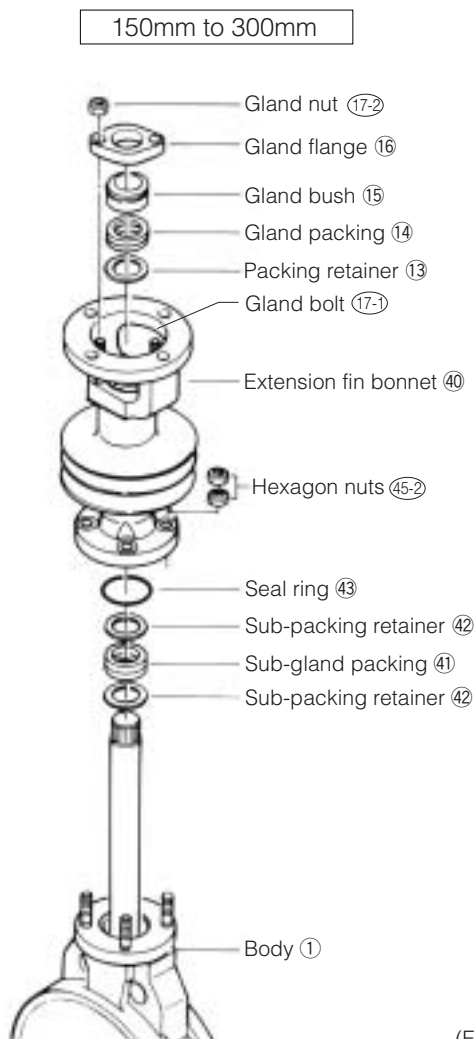
- (8) Open and close the valve to verify that operation is smooth.



(Fig. 51)



(Fig. 52)



(Fig. 53)

## Disassembly Procedure

**3 3 7 Y** 50 mm to 125 mm: 350 to 600 degrees C  
150 mm to 300 mm: 400 to 600 degrees C

- (1) Put the disc (2) into the fully closed position. Prior to disassembly, make an alignment mark using an oil based pen or chisel on the bracket and extension fin bonnet that connects the actuator and extension fin bonnet in order to clarify the position and direction in which the actuator and extension fin bonnet are assembled.
- (2) Remove the actuator, bracket and joint.
- (3) Loosen the gland nut (17-2) and remove the gland flange (16).
- (4) Remove the gland bush (15) from the extension fin bonnet (40).
- (5) Remove the gland packing (14) from the extension fin bonnet (40) using a packing tool, scriber or similar implement. If the packing retainer (13) can also be removed, remove it.
- (6) To replace the seal ring (43), remove the hexagon nuts (45-2) and slide the extension fin bonnet (40) up and take it off.

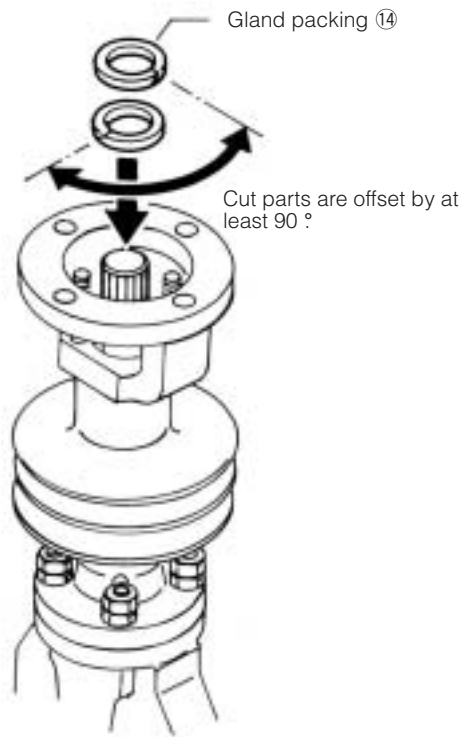
\*For 150 mm to 300 mm, 400 to 600 degrees C types, since the sub-packing retainer (42), sub-gland packing (41) and sub-packing retainer (42) are mounted on the valve body (1) in that order, remove them with a scriber or similar implement.

## Assembly Procedure

**3 3 7 Y** 50 mm to 125 mm: 350 to 600 degrees C  
150 mm to 300 mm: 400 to 600 degrees C

- (1) Thoroughly clean the gland packing hole on the body (1) and extension fin bonnet (40) of all waste and other foreign particles.
- (2) Clean each component before assembling.
- (3) Add the seal ring (43) to the valve body (1).  
\*For 150 mm to 300 mm, 400 to 600 degrees C types, mount the sub-packing retainer (42), sub-gland packing (41) and sub-packing retainer (42) on the valve body (1) in that order and then mount the seal ring (43).

Be sure to install the gland packing (14) so that the cut parts are offset by at least 90° so that they are not facing in the same direction.



(Fig. 54)

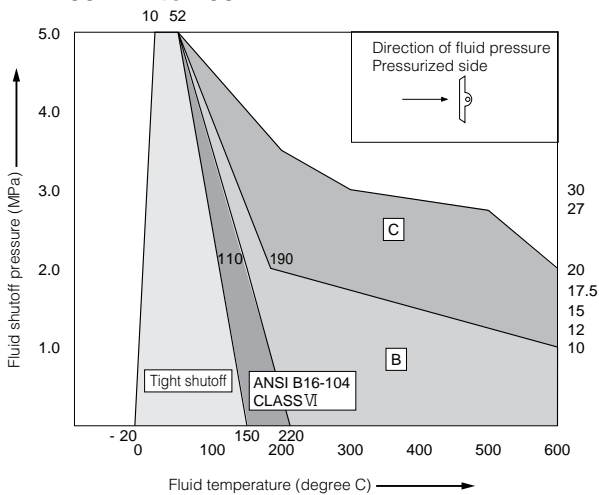
- (4) Install the extension fin bonnet ④⑩ to the valve body ① with the hexagon nuts ④⑤-②. Alternate diagonally, tightening the hexagon nuts evenly. (There are 2 nuts per bolt for a total of 8 nuts.)
- (5) If the packing retainer ⑬ was removed, install it in the gland packing hole on the extension fin bonnet ④⑩.
- (6) Insert the gland packing ⑭ into the gland packing hole on the extension fin bonnet ④⑩ and attach the gland bush ⑮ onto it.

Be sure to install the gland packing ⑭ so that the cut parts are offset by at least 90° so that they are not facing in the same direction. (Fig. 54)

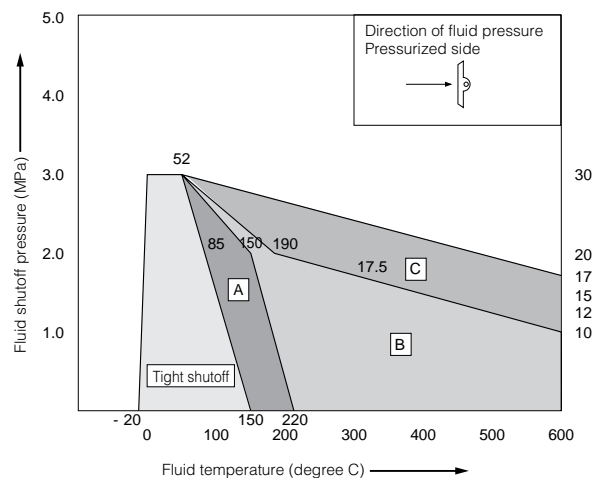
- (7) Attach the gland flange ⑯ and tighten the gland nuts ⑰-② equally on the left and right sides.
- (8) Put the disc ② into the fully closed position.
- (9) Install the bracket, joint, and actuator. When assembling, align and position each part using the alignment mark you made prior to disassembly.
- (10) Open and close the valve to verify that operation is smooth.

### 337Y allowable seat leakage

#### 50 mm to 200 mm



#### 250 mm to 300 mm



Remarks:

1. Allowable leakage: 50 Ncm<sup>3</sup>/min/inch for range A, 1 × 10<sup>-4</sup> Cv for range B, and 2 × 10<sup>-4</sup> Cv for range C.
2. These graphs apply only to standard products. For other specifications, please inquire.
3. These graphs are based on standard values at the time of inspection before shipping.
4. The data indicated in these graphs may differ depending on the liquid used. For more information please inquire with one of our sales personnel.

# 334A APPLICABLE PIPE AND MINIMUM INTERNAL DIAMETER OF PIPING

Applicable pipe

Nominal size		JIS (STPG)			ANSI B36.1		
mm	inch	Sch#40	Sch#60	Sch#80	Sch#40	Sch#60	Sch#80
80	3						
100	4						
150	6						
200	8						
250	10						
300	12						
350	14						
400	16						
450	18						
500	20						
600	24						

Min. internal diameter of piping

Nominal size		Min. internal diameter of piping [mm]
mm	inch	
80	3	73
100	4	93
150	6	138
200	8	185
250	10	225
300	12	267
350	14	306
400	16	347
450	18	394
500	20	438
600	24	533

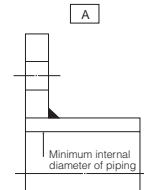
Remark 1: : Installation possible.

# APPLICABLE PIPE AND MINIMUM INTERNAL DIAMETER OF PIPING

## Applicable pipe list in case of A

Nominal size (mm)	SGP						Sch20						Sch40					
	302Y/304Y		302A/304A		337Y		302Y/304Y		302A/304A		337Y		302Y/304Y		302A/304A		337Y	
	Retainer side (up stream)	Stem side (down stream)	Retainer side (up stream)	Stem side (down stream)	Retainer side (up stream)	Stem side (down stream)	Retainer side (up stream)	Stem side (down stream)	Retainer side (up stream)	Stem side (down stream)	Retainer side (up stream)	Stem side (down stream)	Retainer side (up stream)	Stem side (down stream)	Retainer side (up stream)	Stem side (down stream)	Retainer side (up stream)	Stem side (down stream)
40																		
50																		
65																		
80																		
100																		
125																		
150																		
200																		
250																		
300																		
350	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
400	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
450	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
500	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
600	/	/	-	-	/	/	/	/	/	/	/	/	/	/	/	/	/	/

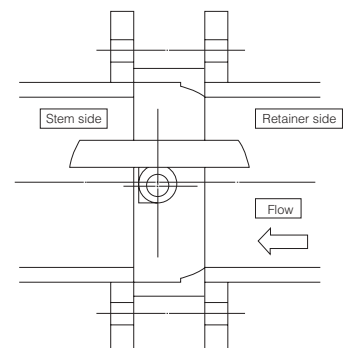
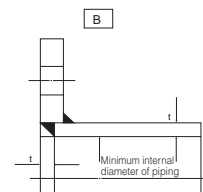
Nominal size (mm)	Sch60						Sch80						Minimum internal diameter of piping (mm)		
	302Y/304Y		302A/304A		337Y		302Y/304Y		302A/304A		337Y		302Y/304Y	302A/304A	337Y
	Retainer side (up stream)	Stem side (down stream)	Retainer side (up stream)	Stem side (down stream)	Retainer side (up stream)	Stem side (down stream)	Retainer side (up stream)	Stem side (down stream)	Retainer side (up stream)	Stem side (down stream)	Retainer side (up stream)	Stem side (down stream)	302Y/304Y	302A/304A	337Y
40													32.7		
50											x	34.6		48.5	
65											x	53.6		62.6	
80											x	72.5	72.5	73.5	
100											x	93.8	93.8	97.4	
125						x					x	119.4	119.4	123.7	
150	x		x		x		x		x		x	147.5	147.5	149.1	
200	x		x		x		x		x		x	197.5	197.5	199.6	
250	x		x		x		x		x		x	248.1	248.1	247.9	
300	x		x		x	x	x		x	x	x	297.6	297.6	297.7	
350	/	/	/	/	/	/	/	/	/	/	/	/	/	/	
400	/	/	x		/	/	/	x	x	/	/	/	330.0		
450	/	/	x		/	/	/	x	x	/	/	/	377.0		
500	/	/	x		/	/	/	x	x	/	/	/	424.0		
600	/	/	x		/	/	/	x	x	/	/	/	470.0		
													564.0		



## Applicable pipe list in case of B

Nominal size (mm)	SGP						Sch20						Sch40					
	302Y/304Y		302A/304A		337Y		302Y/304Y		302A/304A		337Y		302Y/304Y		302A/304A		337Y	
	Retainer side (up stream)	Stem side (down stream)	Retainer side (up stream)	Stem side (down stream)	Retainer side (up stream)	Stem side (down stream)	Retainer side (up stream)	Stem side (down stream)	Retainer side (up stream)	Stem side (down stream)	Retainer side (up stream)	Stem side (down stream)	Retainer side (up stream)	Stem side (down stream)	Retainer side (up stream)	Stem side (down stream)	Retainer side (up stream)	Stem side (down stream)
40																		
50																		
65																		
80																		
100																		
125																		
150																		
200																		
250																		
300																		
350	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
400	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
450	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
500	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
600	/	/	-	-	/	/	/	/	/	/	/	/	/	/	/	/	/	/

Nominal size (mm)	Sch60						Sch80					
	302Y/304Y		302A/304A		337Y		302Y/304Y		302A/304A		337Y	
	Retainer side (up stream)	Stem side (down stream)	Retainer side (up stream)	Stem side (down stream)	Retainer side (up stream)	Stem side (down stream)	Retainer side (up stream)	Stem side (down stream)	Retainer side (up stream)	Stem side (down stream)	Retainer side (up stream)	Stem side (down stream)
40												
50												
65												
80												
100												
125												
150												x
200	x		x		x		x		x		x	x
250	x		x		x		x		x		x	x
300	x		x		x		x		x		x	x
350	/	/	/	/	/	/	/	/	/	/	/	/
400	/	/	x		/	/	/	x	x	/	/	/
450	/	/	x		/	/	/	x	x	/	/	/
500	/	/	x		/	/	/	x	x	/	/	/
600	/	/	x		/	/	/	x	x	/	/	/



Remark 1: /: Installation possible, x: Installation not possible, -: No standard, f: No supported nominal size  
 Remark 2: The clearance between the disc and the pipe is based on API 609 and MSS SP-67.  
 80mm to 150mm: 1.5mm; 200mm to 500mm: 3.0mm, and 600mm: 6.4mm  
 Remark 3: Butterfly valves are inserted into a pipe that was fitted with the disc when fully open.  
 In cases where there is an "X" in the chart above or you are using a pipe or flange that is less than the minimum inner pipe diameter, use is still possible if means are taken such as inserting a spacer between the valve and flange. For details, please consult us.

# REQUIRED NUMBER AND SIZE OF PIPING BOLTS

## 334A Piping bolts and nuts sizes

Nominal size		ANSI / JPI class 300			
mm	inch	Long bolts and nuts	Hexagon bolts	b	L <sub>1</sub>
80	3	8- 3/4-10UNC×175	-	-	-
100	4	8- 3/4-10UNC×185	-	-	-
150	6	12- 3/4-10UNC×200	-	-	-
200	8	12- 7/8-9UNC×235	-	-	-
250	10	12- 1-8UNC×260	8- 1-8UNC×125	21	14
300	12	12-1 1/8-8UN ×285	8-1 1/8-8UN ×135	24	16
350	14	16-1 1/8-8UN ×315	8-1 1/8-8UN ×145	24	16
400	16	16-1 1/4-8UN ×345	8-1 1/4-8UN ×155	24	16
450	18	20-1 1/4-8UN ×365	8-1 1/4-8UN ×155	24	16
500	20	20-1 1/4-8UN ×380	8-1 1/4-8UN ×160	24	16
600	24	20-1 1/2-8UN ×430	8-1 1/2-8UN ×190	30	20

Nominal size		JIS20K				JIS30K			
mm	inch	Long bolts and nuts	Hexagon bolts	b	L <sub>1</sub>	Long bolts and nuts	Hexagon bolts	b	L <sub>1</sub>
80	3	8-M20 ×160	-	-	-	8-M20 ×170	-	-	-
100	4	8-M20 ×170	-	-	-	8-M22 ×190	-	-	-
150	6	12-M22 ×190	-	-	-	12-M24 ×210	-	-	-
200	8	12-M22 ×200	-	-	-	12-M24 ×240	-	-	-
250	10	8( 12 )-M24 ×230	8( 0 )-M24 ×110	21	14	8( 12 )-M30(P3)×275	8( 0 )-M30(P3)×135	24	16
300	12	12-M24 ×240	8-M24 ×120	21	14	12-M30(P3)×285	8-M30(P3)×145	24	16
350	14	12-M30(P3)×285	8-M30(P3)×140	24	16	12-M30(P3)×315	8-M30(P3)×155	24	16
400	16	12-M30(P3)×315	8-M30(P3)×140	24	16	12-M36(P3)×355	8-M36(P3)×170	30	20
450	18	16-M30(P3)×335	8-M30(P3)×145	24	16	-	-	-	-
500	20	16-M30(P3)×350	8-M30(P3)×150	24	16	-	-	-	-
600	24	20-M36(P3)×385	8-M36(P3)×175	30	20	-	-	-	-

Remark: Bolt material: SNB7

Nut material: S45C

Please use heavy nut.

The bolt length calculation is based on use of a 4.5 mm thick spiral gasket.

The flange thickness calculation is based on the standard steel flange thickness.

Quantities shown are for one valve.

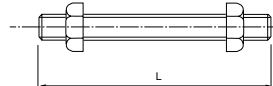
250mm bolt quantities are indicated as follows: The quantity outside the brackets applies when the setting bolt holes are tapped and the values inside the brackets applies when bolt holes are drilled.

### Examples

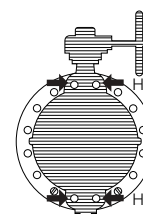
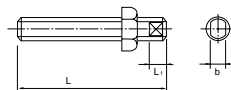
Long bolts: 8 - M20 × 160  
 Quantity      Nominal size (M)      Length of bolt (L)

Hexagon bolts: 8 - M30 × 140  
 (set bolts)      Quantity      Nominal size (M)      Length of bolt (L)

Long bolts and nuts (full thread)



Hexagon bolts (set bolts)



Hexagon bolt holes

Hexagon bolt holes

# REQUIRED NUMBER AND SIZE OF PIPING BOLTS

## 302A/304A Piping bolts and nuts sizes

Nominal size		JIS5K		JIS10K		JIS16K	
mm	inch	Long bolts and nuts	Hexagon bolts	Long bolts and nuts	Hexagon bolts	Long bolts and nuts	Hexagon bolts
80	3	—	—	8-M16×145	—	8-M20×170	—
100	4	—	—	8-M16×145	—	8-M20×170	—
125	5	—	—	8-M20×170	—	8-M22×190	—
150	6	—	—	8-M20×170	—	12-M22×190	—
200	8	—	—	12-M20×170	—	12-M22×190	—
250	10	—	—	12-M22×190	—	12-M24×210	—
300	12	—	—	16-M22×190	—	16-M24×225	—
350	14	12-M22×210	—	16-M22×210	—	16-M30(P3)×245	—
400	16	16-M22×220	—	16-M24×235	—	16-M30(P3)×265	—
450	18	16-M22×230	—	16-M24×250	4-M24×84×60	16-M30(P3)×280	4-M30(P3)×95×65
					4-M24×58×50		4-M30(P3)×73×50
500	20	16-M22×245	4-M22×80×50	16-M24×260	4-M24×90×60	16-M30(P3)×300	4-M30(P3)×105×65
			4-M22×60×50		4-M24×70×60		4-M30(P3)×81×50
600	24	16-M24×280	4-M24×84×60	20-M30(P3)×300	4-M30(P3)×81×50	20-M36(P3)×345	4-M36(P3)×100×60
			4-M24×65×50		4-M30(P3)×65×50		4-M36(P3)×82×50

Nominal size		JIS20K		ANSI150Lb, API/JPI150Lb	
mm	inch	Long bolts and nuts	Hexagon bolts	Long bolts and nuts	Hexagon bolts
80	3	8-M20×170	—	4-U5/8-11UNC×155	—
100	4	8-M20×170	—	8-U5/8-11UNC×155	—
125	5	8-M22×190	—	8-U3/4-10UNC×175	—
150	6	12-M22×190	—	8-U3/4-10UNC×175	—
200	8	12-M22×190	—	8-U3/4-10UNC×205	—
250	10	12-M24×210	—	12-U7/8-9UNC×215	—
300	12	16-M24×225	—	12-U7/8-9UNC×215	—
350	14	16-M30(P3)×260	—	12-U1-8UNC×240	—
400	16	16-M30(P3)×280	—	16-U1-8UNC×255	—
450	18	16-M30(P3)×300	4-M30(P3)×105×65	16-U1 1/8-8UN×280	—
			4-M30(P3)×81×50		
500	20	16-M30(P3)×315	4-M30(P3)×110×60	16-U1 1/8-8UN×295	4-U1 1/8-8UN×105×50
			4-M30(P3)×90×65		4-U1 1/8-8UN×80×50
600	24	20-M36(P3)×360	4-M36(P3)×108×60	16-U1 1/4-8UN×340	4-U1 1/4-8UN×100×50
			4-M36(P3)×90×50		4-U1 1/4-8UN×90×50

Remark: Use SNB 7/S45C (A193 B7/A, 194 2H) SUS304/SUS304

For long bolt, use full thread bolt.

For hexagon nut, use heavy nut.

A metric screw should have 3 pitches if its nominal diameter exceeds M30.

A unified screw should have 8 threads per inch if its nominal diameter exceeds 1 inch.

Hexagon bolts (set bolts) are indicated with the retainer side on the up side and the stem side on down side.

### Examples

Long bolts: 12 - M22 × 185 × 45

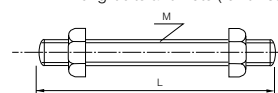
Quantity      Nominal size (M)      Length of bolt (L)      Effective screw length (S)

Hexagon bolts: 4 - M30 × 95 × 65

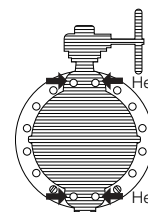
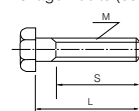
(set bolts)

Quantity      Nominal size (M)      Length of bolt (L)      Effective screw length (S)

Long bolts and nuts (full thread)



Hexagon bolts (set bolts)



Hexagon bolt holes

Hexagon bolt holes

### 302Y/304Y Piping bolts and nuts sizes

Nominal size		JIS5K	JIS10K	JIS16K/20K	ANSI150Lb
mm	inch	Long bolts and nuts	Long bolts and nuts	Long bolts and nuts	Long bolts and nuts
40	1 1/2	4-M12×100	4-M16×120	4-M16×120	4-U1/2-13UNC×115
50	2	4-M12×120	4-M16×130	8-M16×130	4-U5/8-11UNC×140
65	2 1/2	4-M12×120	4-M16×145	8-M16×145	4-U5/8-11UNC×155
80	3	4-M16×130	8-M16×145	8-M20×170	4-U5/8-11UNC×155
100	4	8-M16×145	8-M16×145	8-M20×170	8-U5/8-11UNC×155
125	5	8-M16×145	8-M20×170	8-M22×190	8-U3/4-10UNC×175
150	6	8-M16×145	8-M20×170	12-M22×190	8-U3/4-10UNC×175
200	8	8-M20×170	12-M20×170	12-M22×190	8-U3/4-10UNC×205
250	10	12-M20×190	12-M22×190	12-M24×210	12-U7/8- 9UNC×215
300	12	12-M20×190	16-M22×190	16-M24×225	12-U7/8- 9UNC×215

Remark: Use SNB7/S45C (A193 B7/A194 2H) SS400/SS400, SUS304/SUS304.  
 SS400 can be used with JIS5K/10K flanges 220 degrees C and below.  
 Long bolt uses full threaded bolt.  
 Hexagon nut uses heavy nut.

### 337Y Piping bolts and nuts sizes

Nominal size		JIS10K		JIS16K		JIS20K	
mm	inch	Long bolts and nuts	Hexagon bolts	Long bolts and nuts	Hexagon bolts	Long bolts and nuts	Hexagon bolts
50	2	4-M16×130	-	8-M16×130	-	8-M16×130	-
65	2 1/2	4-M16×145	-	8-M16×145	-	8-M16×145	-
80	3	8-M16×145	-	8-M20×170	-	8-M20×170	-
100	4	8-M16×145	-	8-M20×170	-	8-M20×170	-
125	5	8-M20×170	-	8-M22×190	-	8-M22×190	-
150	6	8-M20×190	-	12-M22×190	-	12-M22×210	-
200	8	12-M20×190	-	12-M22×210	-	12-M22×210	-
250	10	12-M22×235	-	12-M24×250	-	12-M24×250	-
300	12	12-M22×235	4-M22×80×50	16-M24×250	-	16-M24×269	-
			4-M22×70×50				

Nominal size		ANSI150Lb		ANSI300Lb	
mm	inch	Long bolts and nuts	Hexagon bolts	Long bolts and nuts	Hexagon bolts
50	2	4-U5/8-11UNC×140	-	8-U5/8-11UNC×140	-
65	2 1/2	4-U5/8-11UNC×140	-	8-U3/4-10UNC×175	-
80	3	4-U5/8-11UNC×155	-	8-U3/4-10UNC×175	-
100	4	8-U5/8-11UNC×155	-	8-U3/4-10UNC×175	-
125	5	8-U3/4-10UNC×175	-	8-U3/4-10UNC×205	-
150	6	8-U3/4-10UNC×205	-	12-U3/4-10UNC×205	-
200	8	8-U3/4-10UNC×205	-	12-U7/8- 9UNC×245	-
250	10	12-U7/8- 9UNC×245	-	12-U1 - 8UN ×260	4-U1-8UN×100×40
					4-U1-8UN× 85×40
300	12	12-U7/8- 9UNC×245	-	16-U1 1/8-8UN ×295	-

Remark: Use SNB 7/S45C  
 For long bolt, use full thread bolt.  
 For hexagon nut, use heavy nut.  
 A unified screw should have 8 threads per inch if its nominal diameter exceeds 1 inch.  
 Hexagon bolts (set bolts) are indicated with the retainer side on the up side and the stem side on down side.

# PIPING GASKET

## 334A Piping gasket

In case of sheet gasket ..... Any standard can be used.

In case of spiral gasket

ASME/JPI Clase300 ..... Any standard spiral gasket with inner/outer ring can be used.

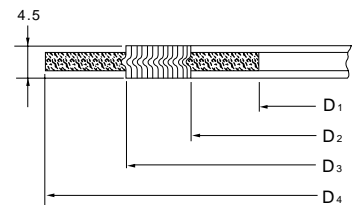
For JIS flange ..... Commercially available spiral gasket cannot be used with some bore diameters.

Compatibility is possible using the spiral gasket for the TOMOE334A.

### Spiral gasket dimensions for use with 334A

Nominal size		D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>				
					ANSI	JIS		BS4504	
mm	inch				JPI				
					Class 300	20K	30K	PN25	PN40
80	3	89	97	120	149	140	150	144	144
100	4	115	124	146	181	165	172	170	170
150	6	166	178	207	250	237	249	226	226
200	8	217	227	257	308	282	294	286	293
250	10	268	282	318	362	354	360	343	355
300	12	319	339	370	422	404	418	403	420
350	14	356	369	403	485	450	463	460	477
400	16	406	420	457	539	508	524	517	549
450	18	458	472	517	596	573	-	567	574
500	20	508	523	567	654	628	-	627	631
600	24	610	626	672	774	734	-	734	750

\*Except for 300 mm and 350 mm sizes, the dimensions of the gasket designed for the TomDisco (TOMOE300 Series) and D<sub>1</sub>, D<sub>2</sub> and D<sub>3</sub> are the same. If the flange standard is the same, D<sub>4</sub> will also be the same so the same gasket can be used.



### Commercially available spiral gasket with inner/outer ring

Nominal size		ASME/JPI	JIS		BS4504	
mm	inch	Class 300	20K	30K	PN25	PN40
80	3			x		
100	4			x		
150	6		x	x	x	x
200	8		x	x	x	x
250	10		x	x		x
300	12			x	x	x
350	14		x	x		
400	16		x			
450	18		x	-		
500	20		x	-		
600	24		x	-		

Remark; : Applicable, x: Not applicable

### Special spiral gasket for the TOMOE 334A

Nominal size		ASME/JPI	JIS		BS4504	
mm	inch	Class 300	20K	30K	PN25	PN40
80	3					
100	4					
150	6					
200	8					
250	10					
300	12					
350	14					
400	16					
450	18			-		
500	20			-		
600	24			-		

Remark; : Applicable, x: Not applicable

334A Applicable standard for standard piping gasket

Nominal size		Joint sheet or PTFE solid gasket ( t 2mm )					PTFE mold type gasket	
		ANSI/JPI	JIS		BS4504		ANSI/JPI	JIS
mm	inch	Class 300	JIS 20K	JIS 30K	PN25	PN40	Class 300	20K
80	3							
100	4							
150	6							
200	8							
250	10							
300	12							
350	14							
400	16							
450	18			-				
500	20			-				
600	24			-				

All standard joint seats and PTFE (Teflon®) solid gaskets can be used.

302A/304A Piping gasket

In case of sheet gasket ..... Any standard can be used.

In case of spiral gasket

For API, JPI, ANSI flange ..... Any standard spiral gasket with inner/outer ring can be used.

For JIS flange ..... Use special spiral gasket shown below.

Special spiral gasket for JIS flange size

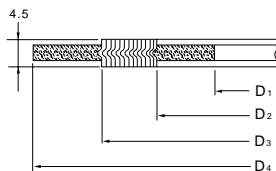
Nominal size		JIS flange					
		5K, 10K, 16K, 20K			5K	10K	16K, 20K
mm	inch	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>4</sub>	D <sub>4</sub>
80	3	89	97	120	x	134	140
100	4	115	124	146	x	159	165
125	5	140	151	177	x	190	202
150	6	166	178	207	x	220	237
200	8	217	227	257	x	270	282
250	10	268	282	318	x	332	354
300	12	319	331	362	x	377	404
350	14	356	369	399	412	422	450
400	16	406	420	457	472	484	508
450	18	458	472	517	532	539	573
500	20	508	532	567	582	594	628
600	24	610	626	672	689	700	734

Remark; x: Not applicable

Applicable standard for spiral gasket

Nominal size		Tomoe special			Standard gasket		
		JIS 10K	JIS 16K JIS 20K	ANSI 125/150Lb	JIS 10K	JIS 16K JIS 20K	ANSI 125/150Lb
mm	inch						
80	3				x	x	
100	4				x	x	
125	5				x	x	
150	6				x	x	
200	8				x	x	
250	10				x	x	
300	12				x	x	
350	14				x	x	
400	16				x	x	
450	18				x	x	
500	20				x	x	
600	24				x	x	

Remark; : Applicable, x: Not applicable



## PIPING GASKET

### 302A/304A Applicable standard for standard piping gasket

Nominal size		Max. allowable inside diameter ( D )	Joint sheet or PTFE solid gasket ( t 2mm )					PTFE mold type gasket VALQUA or NICHIASU				
			JIS 5K	JIS 10K	JIS 16K JIS 20K	ANSI 125/150Lb	JPI 150Lb	JIS 5K	JIS 10K	JIS 16K JIS 20K	ANSI 125/150Lb	JPI 150Lb
80	3	97	x					x				
100	4	124	x					x				
125	5	151	x					x				
150	6	178	x					x				
200	8	227	x					x				
250	10	282	x					x				
300	12	331	x					x				
350	14	362										
400	16	414										
450	18	468										
500	20	518										
600	24	619										

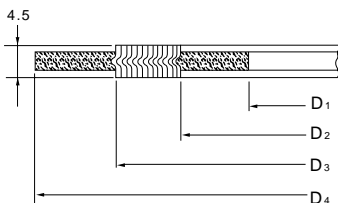
Remark; : Applicable, x: Not applicable

### 302Y/304Y Piping gasket

In case of sheet gasket ..... Any standard can be used.  
 In case of spiral gasket ..... Use special spiral gasket shown below.

#### Special spiral gasketsize

Nominal size		JIS flange					ANSI flange				
		10K, 16K, 20K			10K	16K, 20K	150•300Lb			150Lb	300Lb
mm	inch	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>4</sub>	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>4</sub>
40	1 1/2	48	54	73	89	89	48	54	73	85	95
50	2	61	69	88	104	104	61	69	88	104	111
65	2 1/2	73	81	100	124	124	73	81	100	123	129
80	3	89	96	120	134	140	89	97	120	136	148
100	4	115	124	142	159	165	115	124	146	174	180
125	5	140	152	175	190	203	140	151	177	196	215
150	6	166	180	199	220	238	166	178	207	222	250
200	8	217	232	252	270	283	217	229	257	279	307
250	10	268	282	310	333	356	268	285	318	339	362
300	12	319	336	361	378	406	319	335	362	409	422



302Y/304Y Applicable standard for standard piping gasket

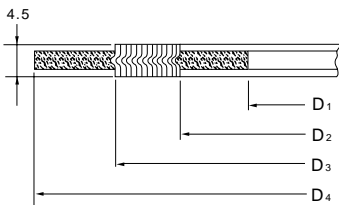
Nominal size		Max. allowable inside diameter (D)	Asbestos joint sheet or PTFE solid gasket (t = 2mm)					PTFE mold type gasket				
mm	inch		JIS 5K	JIS 10K	JIS 16K JIS 20K	ANSI 150• 300Lb	JPI 150• 300Lb	Valqua: 7030, 7031 or 7035				
							JIS 5K	JIS 10K	JIS 16K JIS 20K	ANSI 150• 300Lb	JPI 150• 300Lb	
40	1 1/2	55										
50	2	69										
65	2 1/2	81					x	x	x			
80	3	97										
100	4	124										
125	5	151										
150	6	178										
200	8	227										
250	10	282										
300	12	331										

Remark; : Applicable, x: Not applicable

337Y Piping gasket

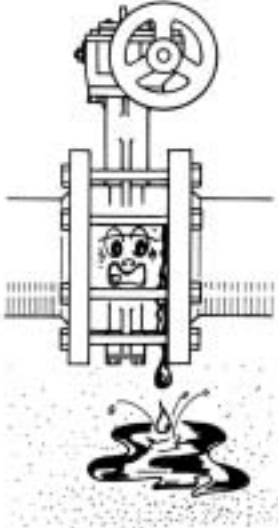
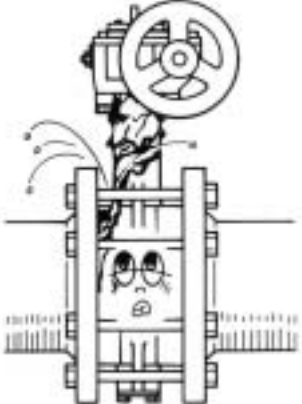
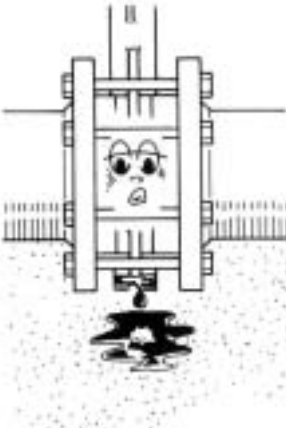
337Y Special spiral gasket size

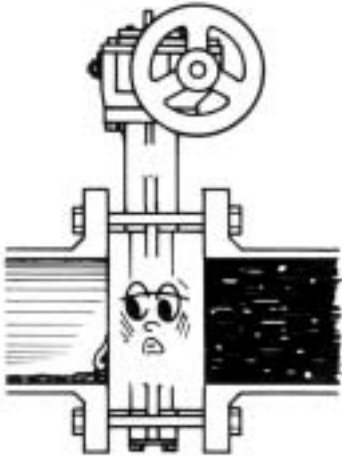
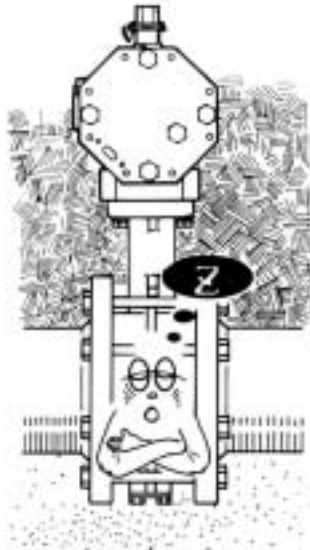
Nominal size		JIS flange					ANSI flange				
mm	inch	10K, 16K, 20K			10K	16K, 20K	150•300Lb			150Lb	300Lb
		D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>4</sub>	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>4</sub>
50	2	61	69	88	104	104	61	69	88	104	111
65	2 1/2	73	81	100	124	124	73	81	100	123	129
80	3	89	97	120	134	140	89	97	120	136	148
100	4	115	124	146	159	165	115	124	146	174	180
125	5	140	151	177	190	202	140	151	177	196	215
150	6	166	178	207	220	237	166	178	207	222	250
200	8	217	227	257	270	282	217	229	257	279	307
250	10	268	282	318	332	354	268	285	318	339	362
300	12	319	331	362	377	404	319	335	362	409	422



# TROUBLESHOOTING

Please refer to the following when there is a problem with a valve.

Problem	Cause	Countermeasure
<p data-bbox="105 353 507 423">There is a leak between the body and pipe flange faces.</p> 	<p data-bbox="560 353 962 423">The piping bolts are loose or they were not tightened evenly.</p>	<p data-bbox="1018 353 1334 423">Loosen the bolts and then retighten them.</p>
	<p data-bbox="560 465 933 607">The flange gasket face is scratched or there is waste material or other foreign matter adhering.</p>	<p data-bbox="1018 465 1404 607">Remove the body and clean the flange gasket face. Clean the piping flange gasket face and re-install the valve.</p>
	<p data-bbox="560 654 850 683">The valve is misaligned.</p>	<p data-bbox="1018 654 1404 723">Loosen the bolts and realign the valve correctly.</p>
<p data-bbox="105 1025 469 1055">There is a leak from the gland.</p> 	<p data-bbox="560 1025 866 1055">The gland nuts are loose.</p>	<p data-bbox="1018 1025 1329 1055">Retighten the gland nuts.</p>
	<p data-bbox="560 1137 940 1207">The gland packing is damaged or has deteriorated.</p>	<p data-bbox="1018 1137 1353 1243">Replace the gland packing. (Refer to "Gland Packing Replacement Procedure".)</p>
<p data-bbox="105 1585 480 1655">There is a leak from the bottom cover.</p> 	<p data-bbox="560 1585 908 1655">The bottom cover installation bolts are loose.</p>	<p data-bbox="1018 1585 1356 1655">Re-tighten the bottom cover installation bolts.</p>
	<p data-bbox="560 1697 956 1767">The seat packing is damaged or has deteriorated.</p>	<p data-bbox="1018 1697 1404 1767">Replace the seat packing with a new one.</p>

Problem	Cause	Countermeasure
<p data-bbox="180 141 584 203">There is leaking from the valve seat.</p> 	<p data-bbox="632 136 1042 230">The wrong material was selected for the fluid application. (Parts are being corroded.)</p>	<p data-bbox="1090 136 1433 230">Change the material. Please inquire with us regarding selection.</p>
	<p data-bbox="632 291 1042 385">There is damage to the disc seal or seat ring due to the presence of foreign matter inside the piping.</p>	<p data-bbox="1090 291 1477 353">Replace the disc seal wrapping and the seat ring.</p>
	<p data-bbox="632 445 975 508">Movement of disc in the fully closed position.</p>	<p data-bbox="1090 445 1493 508">Adjust the fully closed position of the disc.</p>
	<p data-bbox="632 555 1058 618">The disc cannot fully close due to insufficient output from the actuator.</p>	<p data-bbox="1090 555 1453 618">Refer to the actuator selection table for correction.</p>
	<p data-bbox="632 701 1054 795">Fluid specification is not compatible with valve specification. (Specifications have been exceeded.)</p>	<p data-bbox="1090 701 1433 732">Re-check the specifications.</p>
	<p data-bbox="632 810 1034 904">There is torsion of stem due to an unusual increase in opening/closing torque.</p>	<p data-bbox="1090 810 1385 842">Replace the valve body.</p>
	<p data-bbox="632 920 1018 1014">Movement of disc in fully closed position due to loose actuator installation bolts.</p>	<p data-bbox="1090 920 1453 1014">Re-adjust the fully closed disc position by re-tightening the installation bolts.</p>
	<p data-bbox="632 1030 1034 1124">Uneven connection between seat ring and disc due to unequal tightening of piping bolts.</p>	<p data-bbox="1090 1030 1493 1115">Loosen the piping bolts and then re-tighten them.</p>
	<p data-bbox="632 1184 1018 1247">Wearing of seat ring due to long period of use.</p>	<p data-bbox="1090 1184 1358 1216">Replace the seat ring.</p>
<p data-bbox="180 1294 584 1357">Faulty operation (The valve does not work.)</p> 	<p data-bbox="632 1294 1050 1357">Prescribed actuator air pressure or voltage not being supplied.</p>	<p data-bbox="1090 1294 1417 1357">Check by using a pressure gauge, tester, or similar.</p>
	<p data-bbox="632 1404 1023 1532">For pneumatic pressure cylinder types, diaphragm of speed controller is stuck in the fully closed position.</p>	<p data-bbox="1090 1404 1422 1467">Open the diaphragm of the speed controller.</p>
	<p data-bbox="632 1550 970 1612">By-pass valve is in the open position.</p>	<p data-bbox="1090 1550 1390 1581">Close the by-pass valve.</p>
	<p data-bbox="632 1630 1050 1693">Insufficient output due to damaged cylinder parts.</p>	<p data-bbox="1090 1630 1461 1758">Apply the prescribed pressure and observe functioning. If defective parts are suspected, replace them with new parts.</p>
	<p data-bbox="632 1785 983 1816">Erroneous actuator selection.</p>	<p data-bbox="1090 1785 1453 1848">Refer to the actuator selection table for correction.</p>
	<p data-bbox="632 1888 1042 1951">Increased torque due to presence of foreign matter in the piping.</p>	<p data-bbox="1090 1888 1485 1982">Keep valve in the fully opened position and flush out the foreign material.</p>





The specifications are subject to change without notice. Please consult us for the latest specifications.  
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Cat.No.EG058-2	06.01.049
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