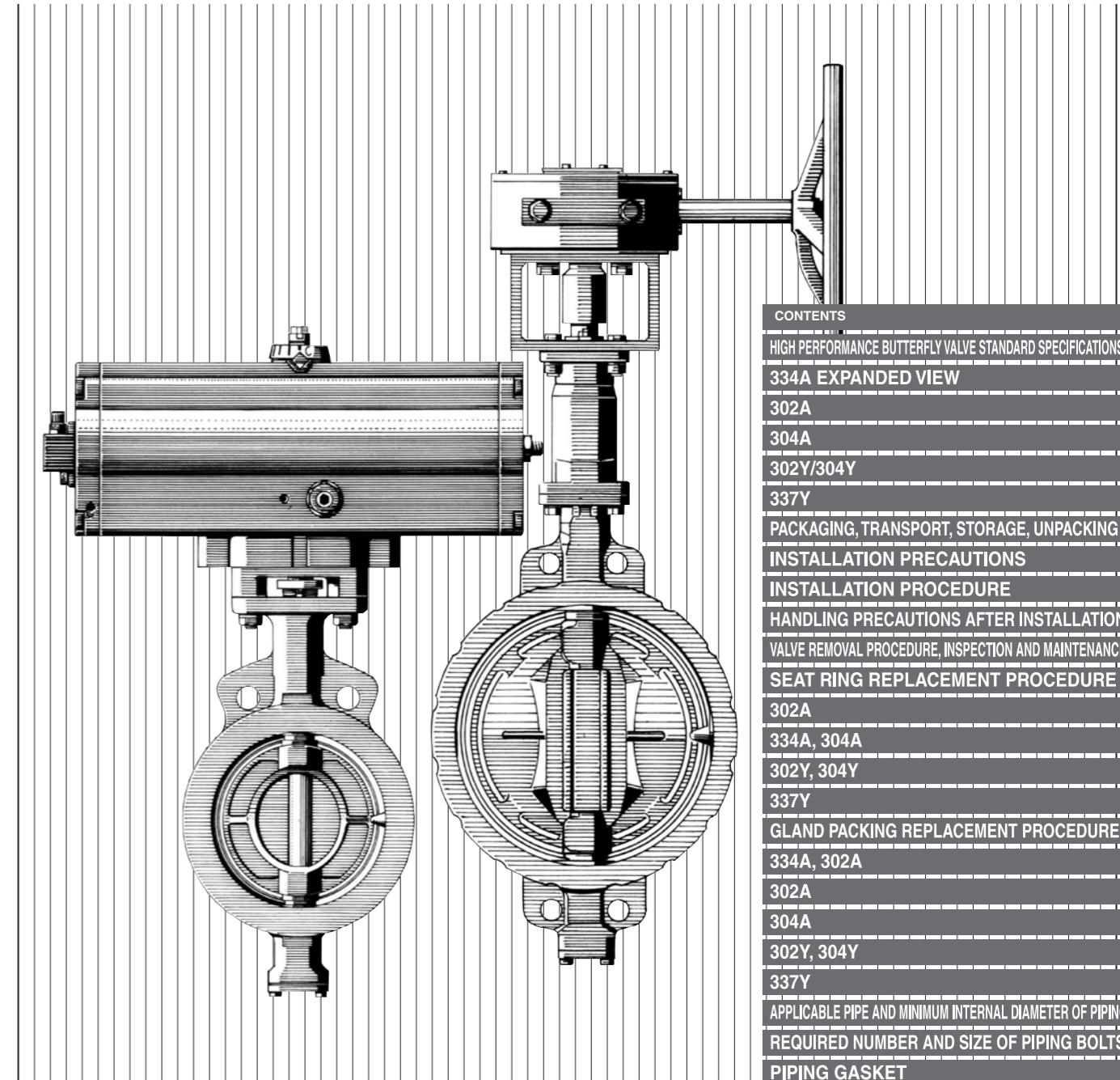


# High Performance Butterfly Valve

334A • 302A • 304A • 302Y/304Y • 337Y

## INSTRUCTION MANUAL



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# HIGH PERFORMANCE BUTTERFLY VALVE STANDARD SPECIFICATIONS

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.

Type	334A		
Body style	Wafer, Lugged, Double flanged *1		
Valve nominal size	80, 100, 150, 200, 250, 300, 350, 400, 450, 500, 600mm		
Applicable flange standard	ASME B 16.5/JPI (API) class 150, 300, JIS10/16/20/30K, BS4504 PN10/16/25/40, DIN NP10/16/25/40		
Face-to-face dimensions	API609 Category B, class 150/300		
Seat leakage	ISO 5208 RATE A (Zero leakage), API598, JPI 7S-39		
Flow direction	Bi-direction (Recommended flow direction: Pressure to shaft side)		
Test pressure	Body Hydrostatic test	1.5 times of rating pressure	
	Seat leakage	7 bar (Air) or 110% of rating pressure (Hydrostatic)	
temperature range	-29 to 232 degrees C		
Standard materials	Body	A216 WCB	A351 CF8M
	Disc	A351 CF8M	
	Stem	SUS420J2	630SS+H1150
	Seat ring	RPTFE	
	Gland packing	Exfoliated graphite	

Type	302A		304A	
Body shape	Double offset wafer type		Double offset wafer type (Option: Flanged, Lugged)	
Valve nominal size	80mm to 300mm *2	350mm to 600mm	80mm to 300mm *3	350mm to 600mm
Applicable flange standard	JIS 10K/16K/20K, ANSI 150Lb API/JPI 150Lb, BS 4504 PN 10/16, DIN NP10/16	JIS 5K/10K/16K/20K, API/JPI 150Lb, ANSI 150Lb, BS 4504 PN 10/16, DIN NP 10/16, BS 10Table E	JIS 10K/16K/20K, ANSI 150Lb, API/JPI 150Lb, BS 4504 PN 10/16, DIN NP 10/16	JIS 5K/10K/16K/20K, API/JPI 150Lb, ANSI 150Lb, BS 4504 PN 10/16, DIN NP 10/16, BS 10Table E
Face-to-face dimensions	API 609 (class 150Lb, category B), JPI-7S-83 (class 150Lb) *125mm is as per JIS B 2002 (series 46) / ISO 5752 (series 20)		API 609 (class 150Lb, category B), JPI-7S-83 (class 150Lb) *125mm is as per JIS B 2002 (2032) (series 46) / ISO 5752 (series 20)	API 609 (class 150Lb, category B), JPI-7S-83 (class 150Lb), ISO 5752 (series 25), JIS B 2002 (series 47)
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 (1996 edition)		ISO 5208 leakage rate A (tight-shut)	
Standard materials	Body	SCPH2, SCS14A	SCPH2, SCS13A	SCPH2, SCS14A, SCPH2, SCS13A
	Disc	80mm to 150mm SCS16A 200mm to 300mm SCS14A	SCS13A	SCS13A, SCS16A, SCS13A
	Stem *8	SUS420J2, SUS329J1, SUS316, SUS329J4L	SUS420J2, SUS304, SUS630	SUS420J2, SUS329J1, SUS316L, SUS329J4L, SUS420J2, SUS630, SUS304, SUS630
	Seat ring	SUS316L		RPTFE*4 (carbon graphite contained) (Special Spec: White PTFE*4)
	Gland packing	Exfoliated graphite		RPTFE(carbon graphite contained) Exfoliated graphite

Type	302Y	304Y	337Y	
Body shape	Double offset wafer type		Double offset wafer type	
Valve nominal size	40mm to 300mm		50mm ~ 300mm*7	
Applicable flange standard	JIS 5K/10K/16K/20K, ANSI 150, Lb, BS10 Table E BS 4504 PN10/16, DIN NP 10/16		JIS 10K/16K/20K/30K, ANSI/ASME class 150/300, etc	
Face-to-face dimensions	JIS B2002 (46 series)/ISO 5752 wafer Butterfly valve (Short)		Manufactured standard	
Max. working pressure	2.0MPa (250, 300mm:1.6MPa)	2.0MPa	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 (tight Shut-off)	See graph on page 29	
Standard materials	Body *5	FCD450, SCS13A	FCD450, SCS13A, SCPH2/SCS14	
	Disc	SCS13A		SUSF316/SCS14
	Stem *6	SUS420J2, SUS329J1	SUS420J2, SUS329J1	SUS431/SUS329J1
	Seat ring	SUS316	*4 RPTFE (carbon graphite contained) (Special Spec: White PTFE)*4	SUS316L
	Gland packing	RPTFE (carbon graphite contained)		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 contact with our sales Dep.

\*1. A double-flange type can also be ordered.

\*2. If using 50A or 65A, 302Y or 337Y is recommended.

\*3. If using 50A or 65A, 304Y is recommended.

\*4. Suits for Food Sanitation Act.

\*5. Body material for 40A : SCS13A only

\*6. Stem material for 40A : SUS329J1 only

\*7. 337Y 80A·100A·150~300A are discontinued products. Please ask any further information to our sales Dep.

\*8. Stem materials are different according to the pressure & temperature. Please ask any further information to our sales Dep.

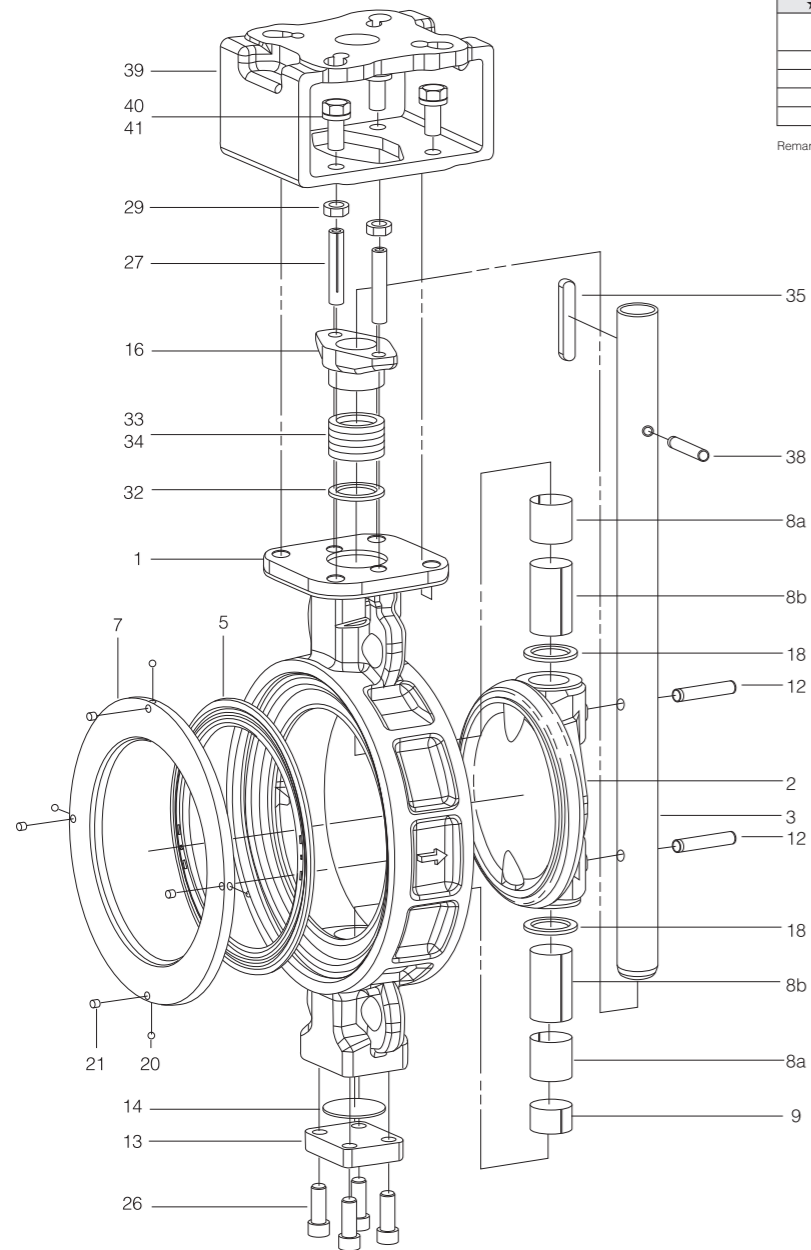
# 334A

## Expanded View

### 334A 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	
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 bolt	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

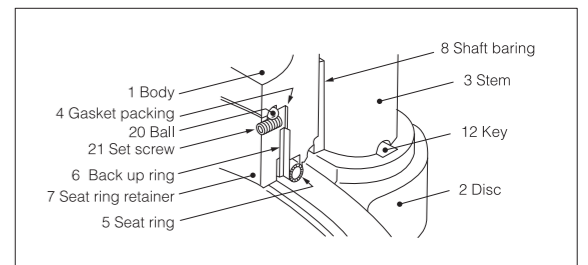
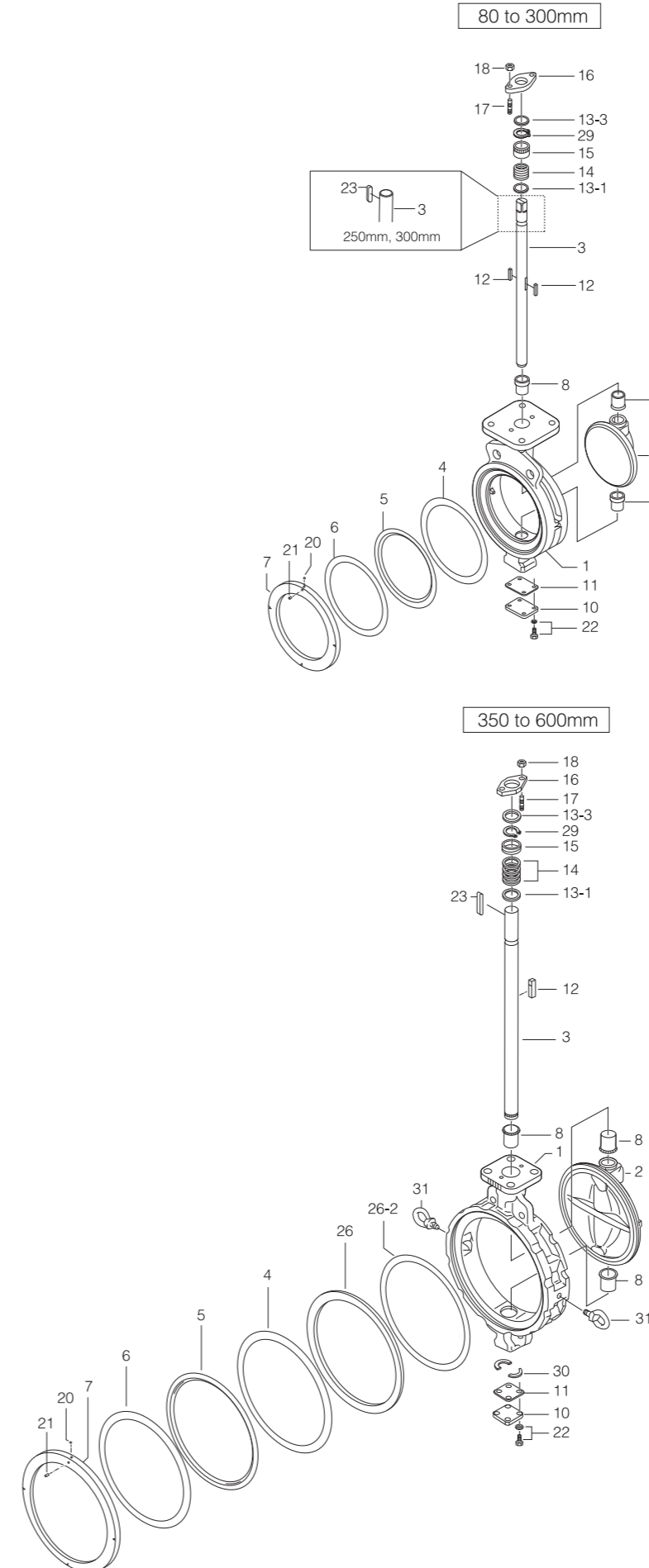
### 302A Parts list (80mm to 300mm: -29 to 400 degrees C)

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)

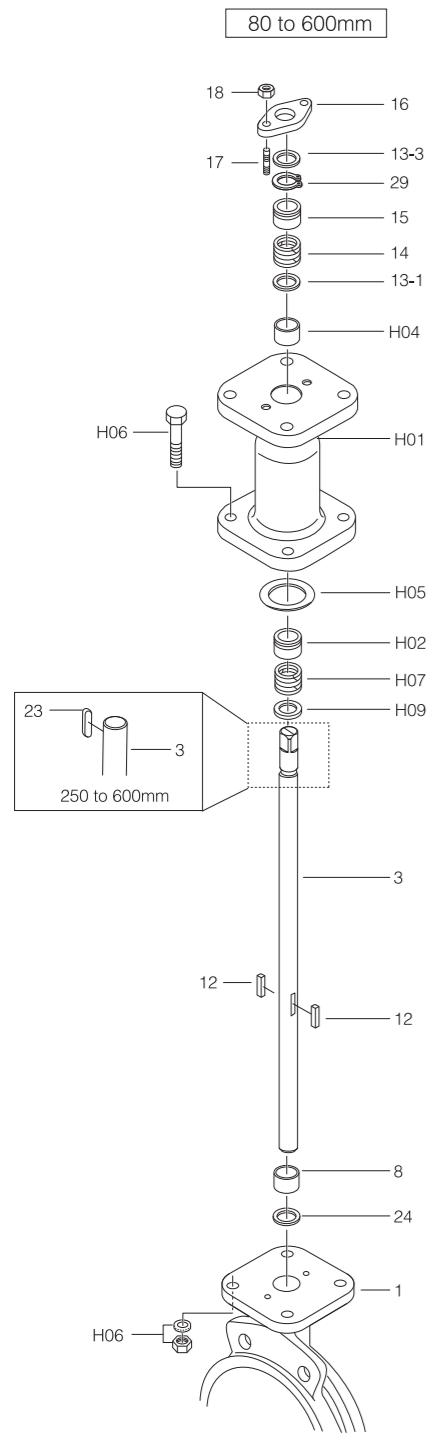
No.	Description	Q'ty	Remarks
1	Body	1	
2	Disc	1	
3	Stem	1	
★ 4	Seat ring gasket	1	
★ 5	Seat ring	1	
★ 6	Back-up ring	1	
7	Seat ring retainer	1	
8	Shaft bearing	3 sets	
10	Bottom cover	1	
★ 11	Bottom gasket	1	
12	Stem key	1	
13-1	Packing retainer	1	
13-3	Ring	1	
★ 14	Gland packing	1 set	
15	Gland bush	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)

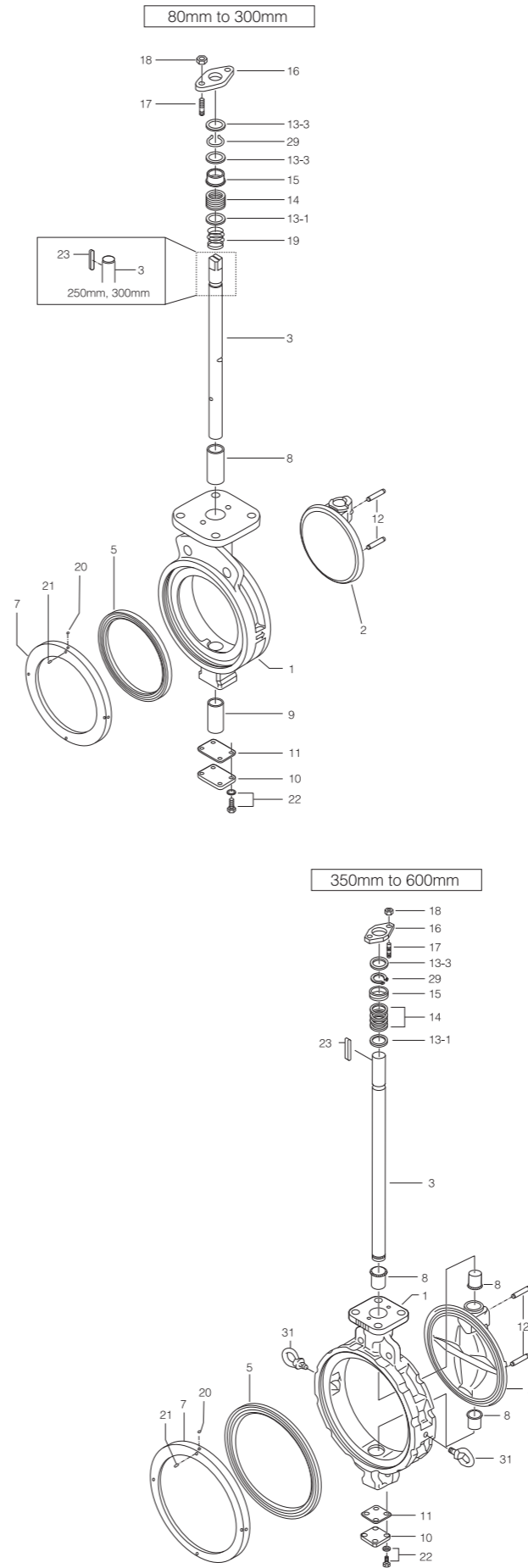
No.	Description	Q'ty	Remarks
1	Body	1	
3	Stem	1	for high-temperature extension
8	Shaft bearing	3	
12	Stem key	2	
13-1	Packing retainer	1	
13-3	Ring	1	
14	Gland packing	1 set	
15	Gland bush	1	
16	Gland flange	1	
17	Gland bolt	2	
18	Gland nut	2	
23	Key	1	Only 250mm, 300mm
24	Spacer ring	2	
29	C-ring	1	
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
12	Stem key	2	450mm to 600mm
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 High-temperature Extension

## 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	

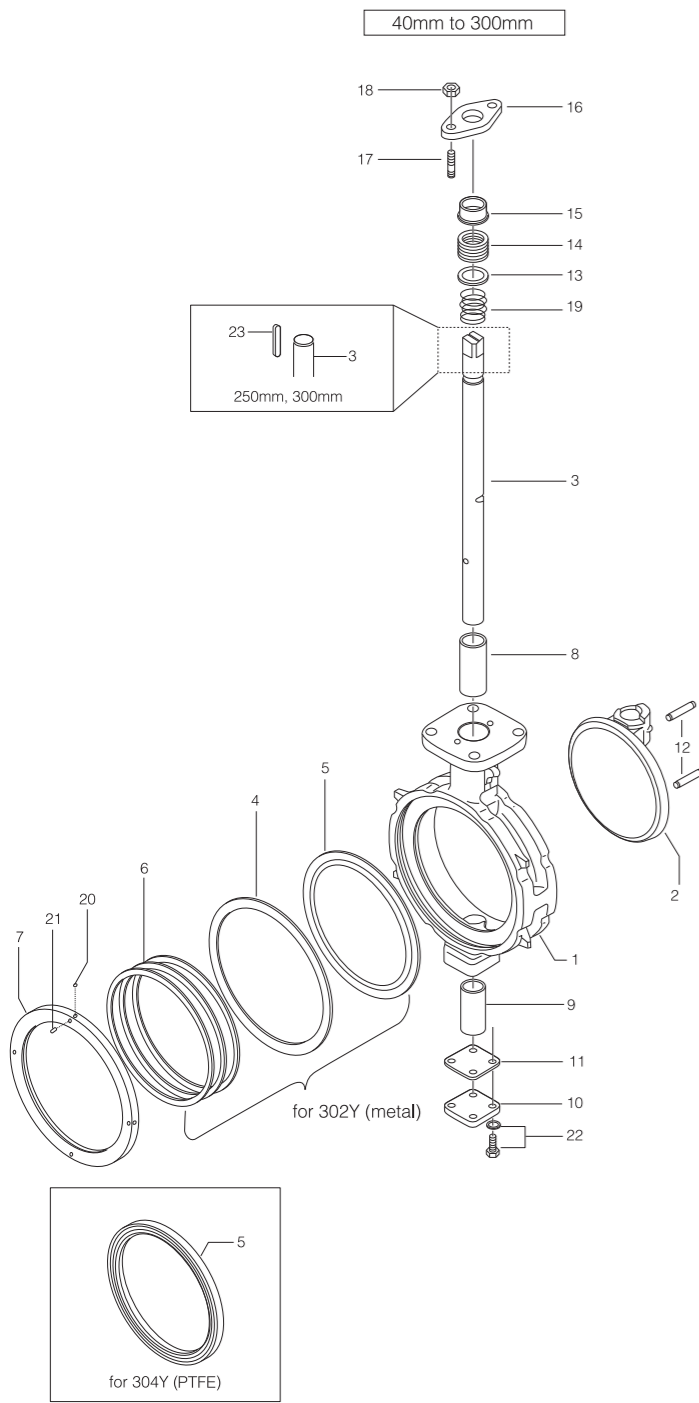
■304A Parts list (350mm to 600mm)

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	
★	Seat ring gasket	1	
★	Seat ring	1	
★	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	
★	Bottom gasket	1	
12	Taper pin	2	
13	Packing retainer	1	
★	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
★	Ball	2	40mm to 125mm
		4	150mm to 300mm
★	Set screw	2	40mm to 125mm
		4	150mm to 300mm
22	Hexagon bolt, Spring washer	4 sets	
23	Key	1	Only 250mm, 300mm

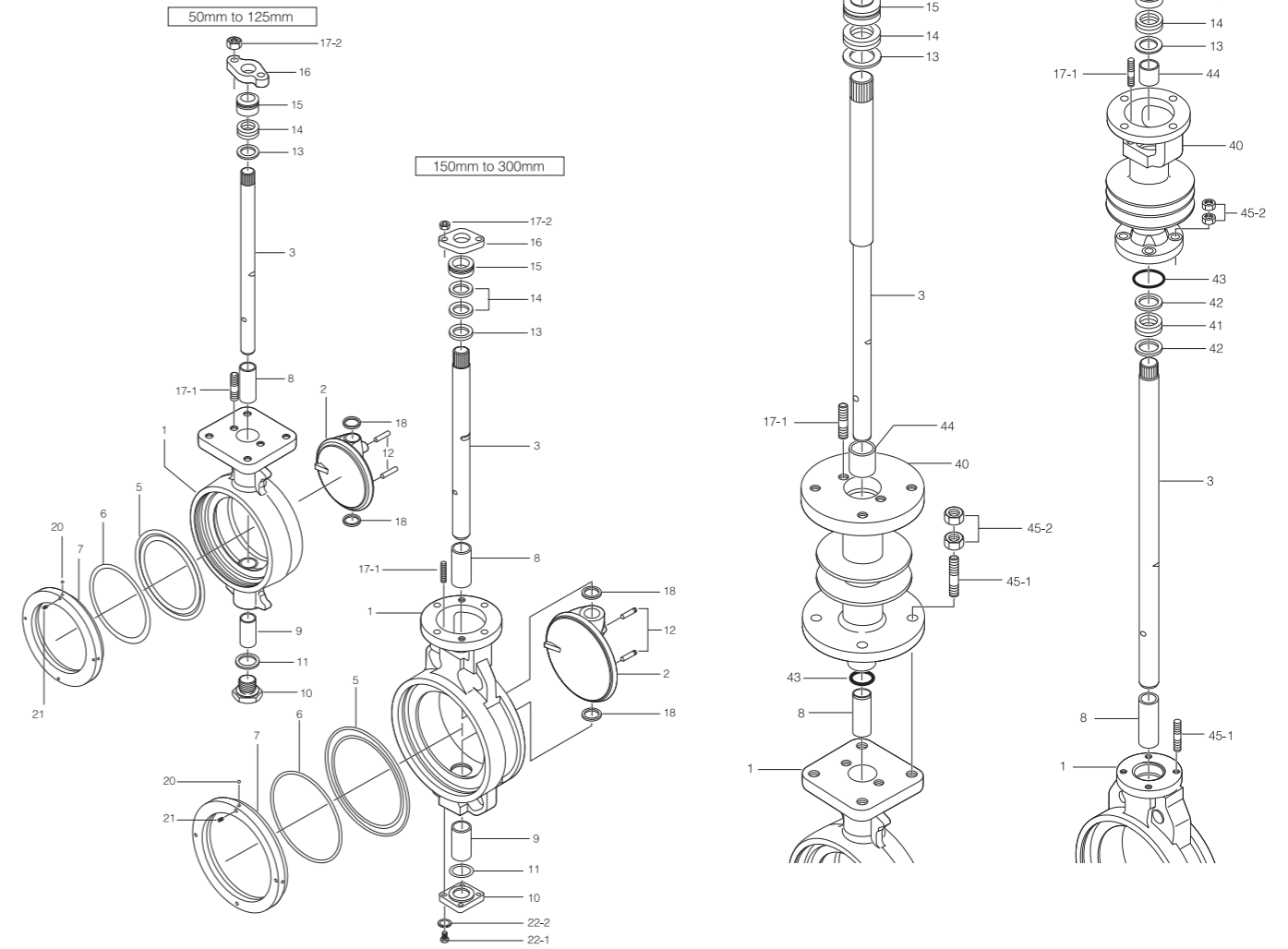
### 304Y Parts list

No.	Description	Q'ty	Remarks
1	Body	1	
2	Disc	1	
3	Stem	1	
★	Seat ring	1	
7	Seat ring retainer	1	
8	Top shaft bearing	1	
9	Bottom shaft bearing	1	
10	Bottom cover	1	
★	Bottom gasket	1	
12	Taper pin	2	
13	Packing retainer	1	
★	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
★	Ball	2	40mm to 125mm
		4	150mm to 300mm
★	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	
★	Seat ring	1	
★	Outer ring	1	
7	Seat ring retainer	1	
8	Top shaft bearing	1	
9	Bottom shaft bearing	1	
10	Bottom cover	1	
★	Seal ring	1	
12	Taper pin	2	
13	Packing retainer	1	
★	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	
★	Ball	2	
★	Set screw	2	

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

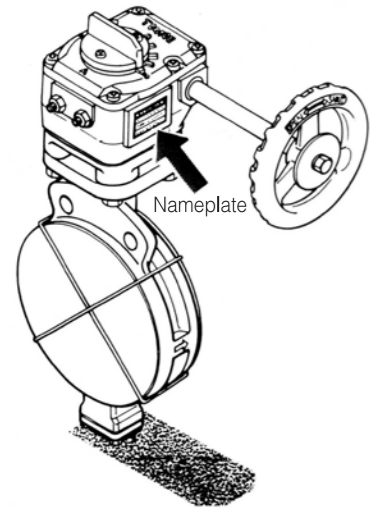
No.	Description	Q'ty	Remarks
1	Body	1	
2	Disc	1	
3	Stem	1	
★	Seat ring	1	
★	Outer ring	1	
7	Seat ring retainer	1	
8	Top shaft bearing	1	
9	Bottom shaft bearing	1	
10	Bottom cover	1	
★	Seal ring	1	
12	Taper pin	2	
13	Packing retainer	1	
★	Gland packing	3	
15	Gland bush	1	
16	Gland flange	1	
17-1	Gland bolt	2	
17-2	Gland nut	2	
18	Spacer ring	2	
★	Ball	4	
★	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
			125mm to 300mm
3	Stem	1	for high-temperature extension
8	Top shaft bearing	1	
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
42	Sub-packing retainer	2	150mm
		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 ★ 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.  
337Y 80A·100A·150-300A are discontinued products. Please ask any further information to our sales Dep.

## PACKAGING



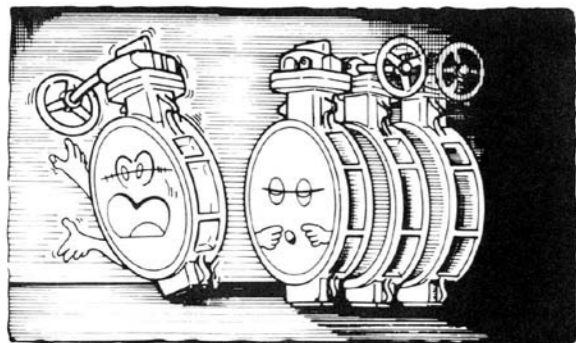
(Fig. 1)

- (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

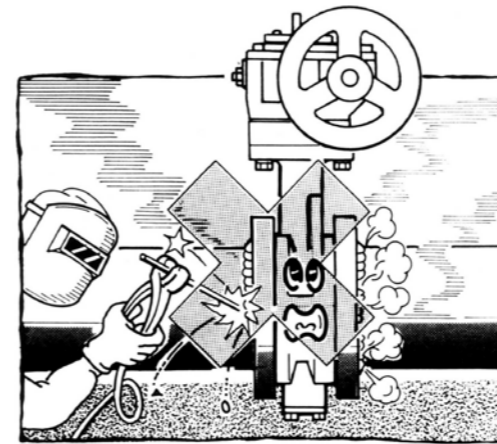


(Fig.2)

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

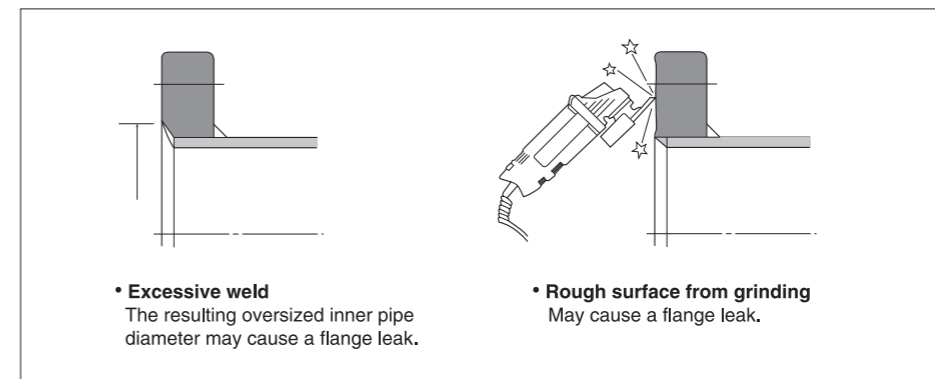
## UNPACKING

## INSTALLATION PRECAUTIONS

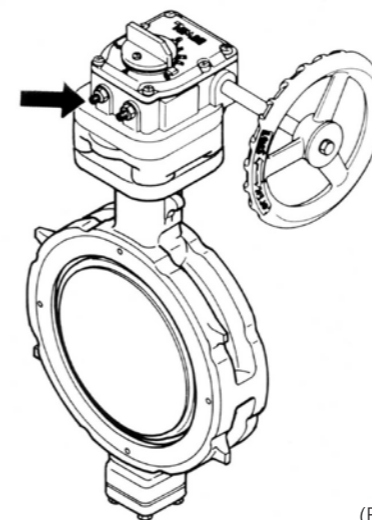


(Fig. 3)

- (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.

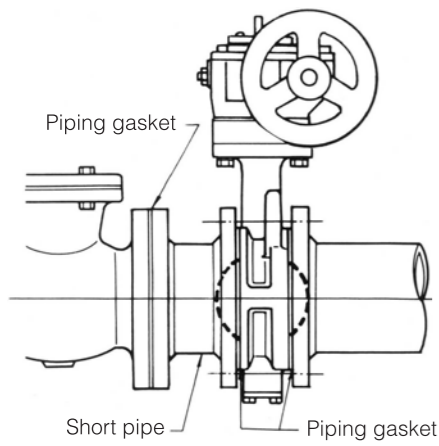


(Fig. 4)



(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)

(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.

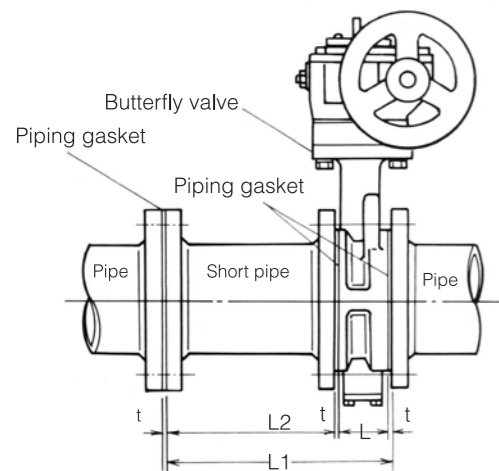
(10) Do not use plastic or loose flanges for pipe installation, because valve performance cannot be maintained.

(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

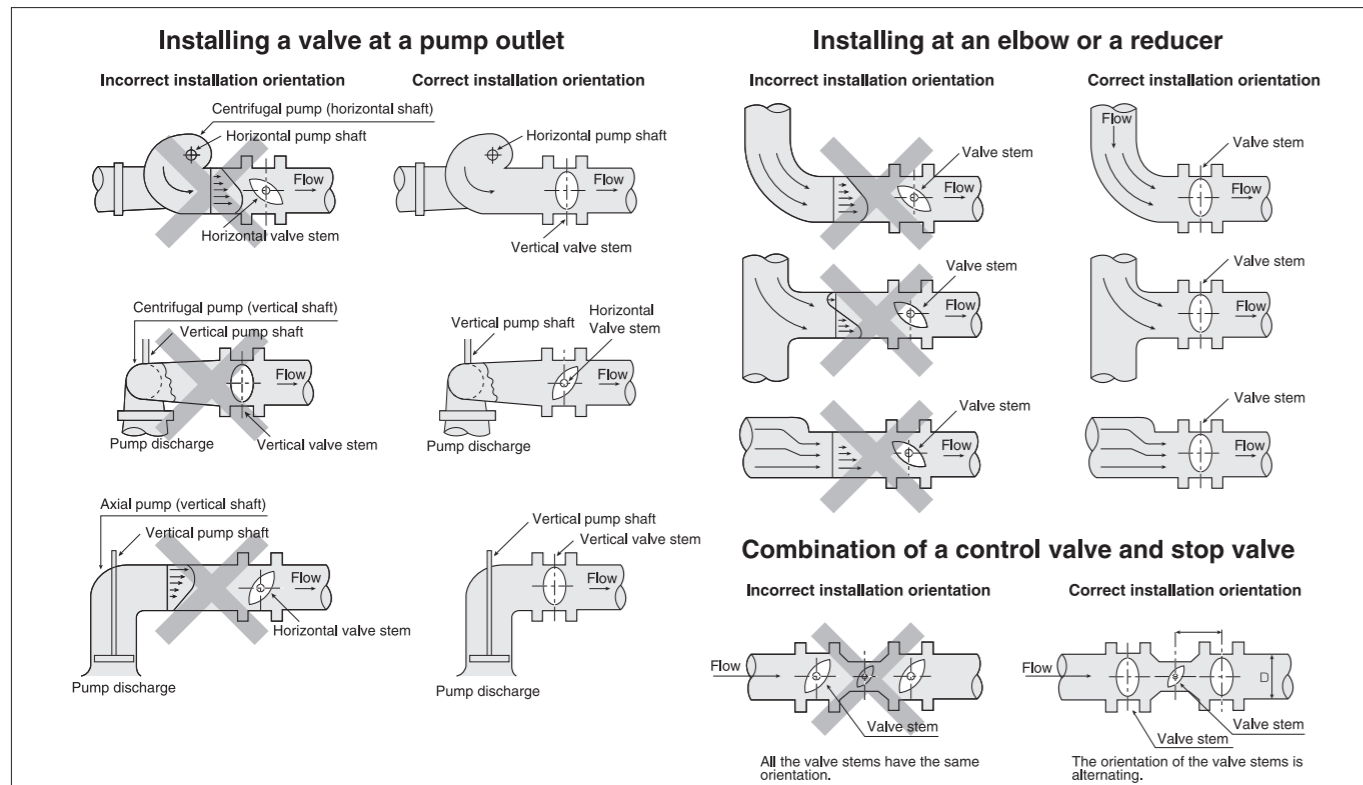
(12) When installing, make the direction of pressure match the direction indicated by the arrow on the valve body. Take note of the following.

- 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.



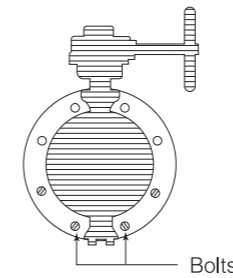
(Fig. 7)

(Fig. 8)



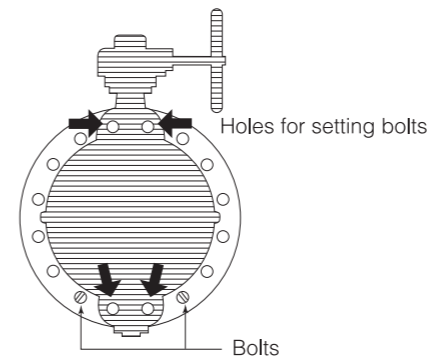
## INSTALLATION PROCEDURE

Without setting bolts holes

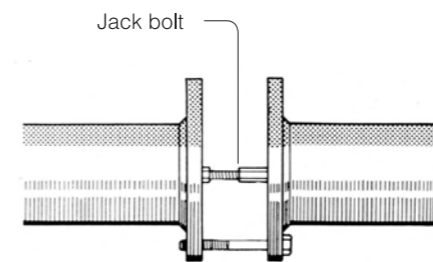


(Fig. 10)

With setting bolt holes



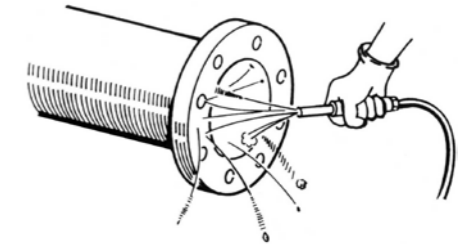
(Fig. 11)



(Fig. 12)

(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.

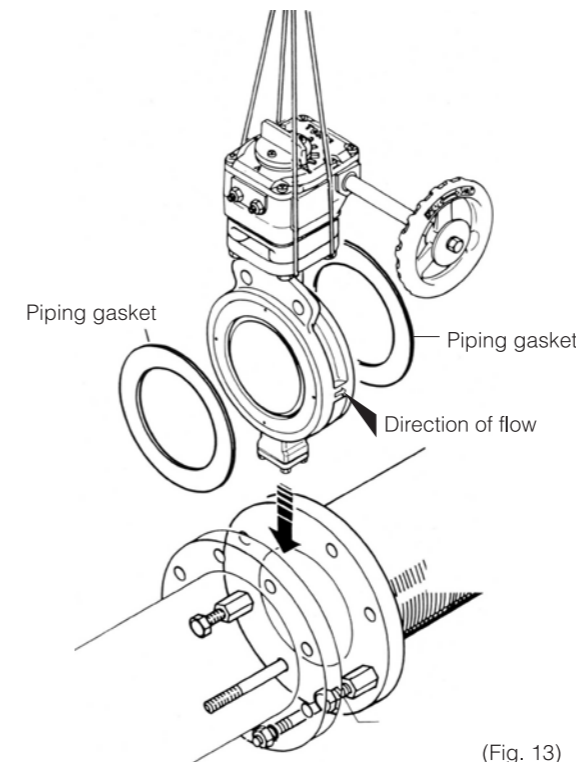
(3) After aligning the piping, insert a piping bolt into the position in the figure and secure the valve to prevent it from dropping. (Fig. 10) (Fig. 11)

(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)

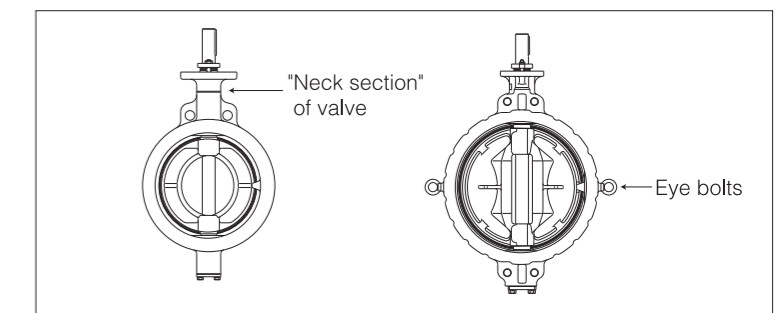
(5) Match the direction of valve pressure to the direction of the arrow indicated on the valve body and insert the valve taking care not to damage the valve gasket face. (Fig. 13)

\*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)

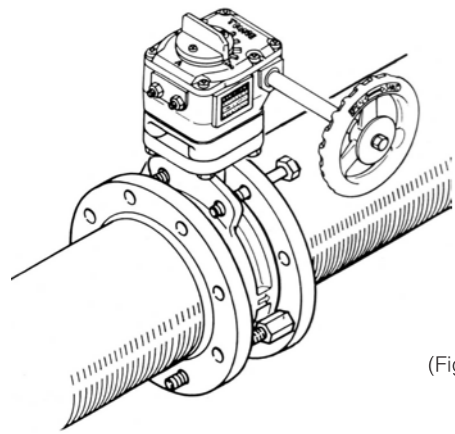


(Fig. 13)



(Fig. 14)

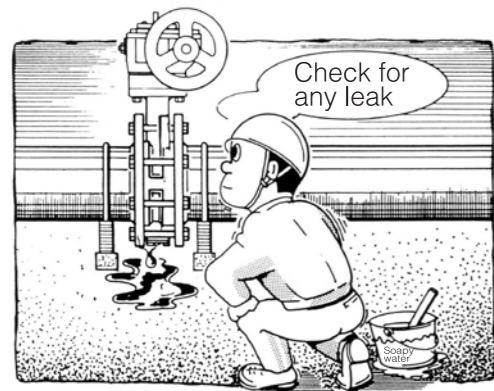
(6) Insert piping gaskets between the pipe flange faces and the end faces of the valve. (Fig. 13)



(Fig. 15)

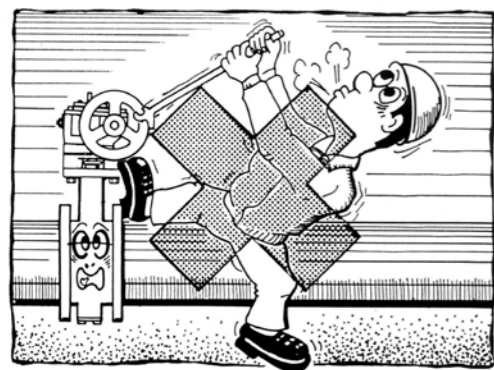
- (7) Insert piping bolts into the piping bolt holes and then insert piping bolts into the remaining flange bolt holes. After removing the jack bolt, align the piping flanges with the valve and the piping gaskets and then tighten the nuts. (Fig. 15)
- (8) When tightening the nuts, alternate diagonally, 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)

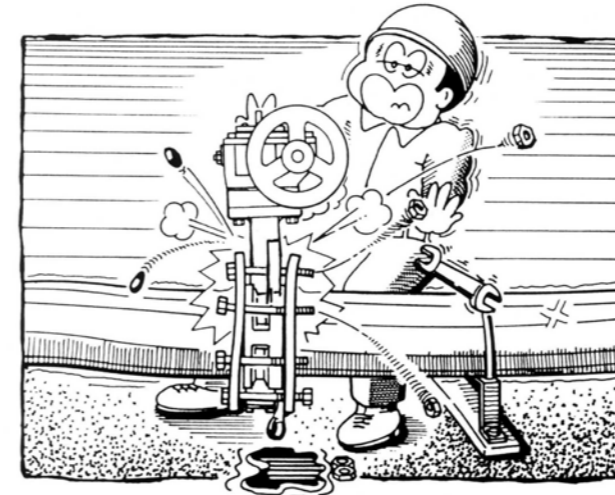
- (1) Never loosen the piping bolts, bottom cover bolts, gland nuts or drive member installation bolts when the inside of the piping is under pressure.
- (2) After installation and before operation be sure to open and close the valve once or twice.
- (3) Completely open the valve when performing a pressure 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)



(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.

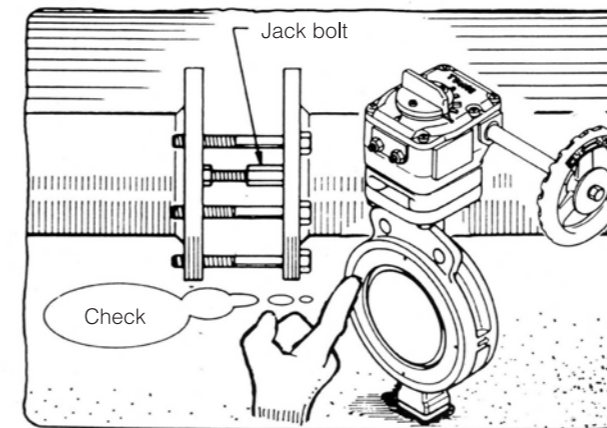
## VALVE REMOVAL PROCEDURE



(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-DYNAMO
Grease	M ystik JI-6 (Kyodo yushi)	Gear box



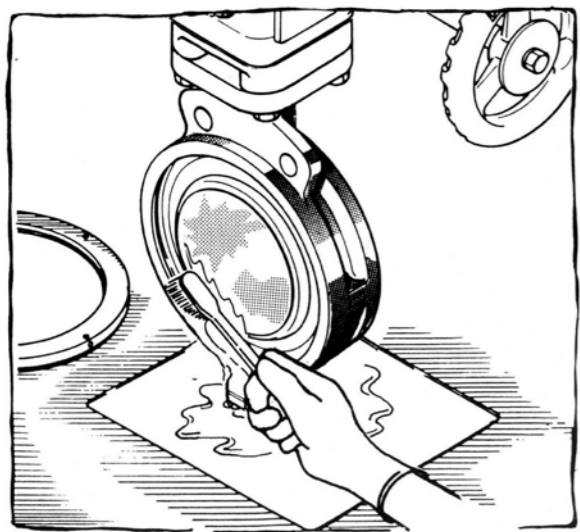
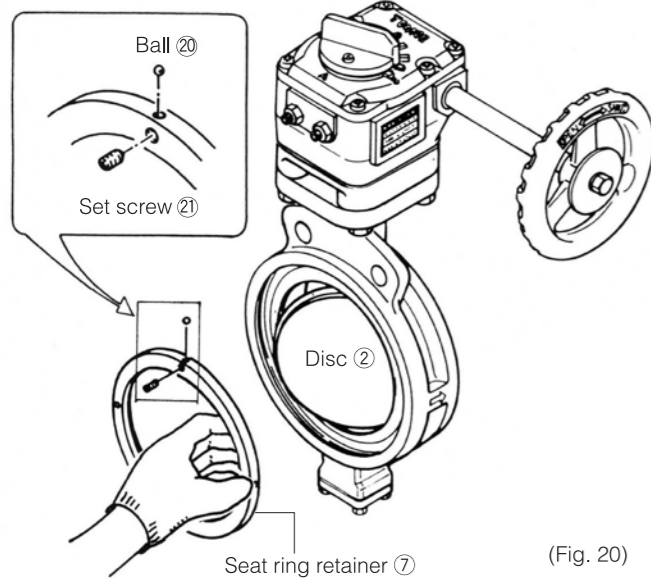
## SEAT RING REPLACEMENT PROCEDURE

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 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. 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 ㉑, using a suitable cleaning fluid such as alcohol or a neutral detergent. (Fig. 21)
- (6) Put the disc ② into the fully closed position.

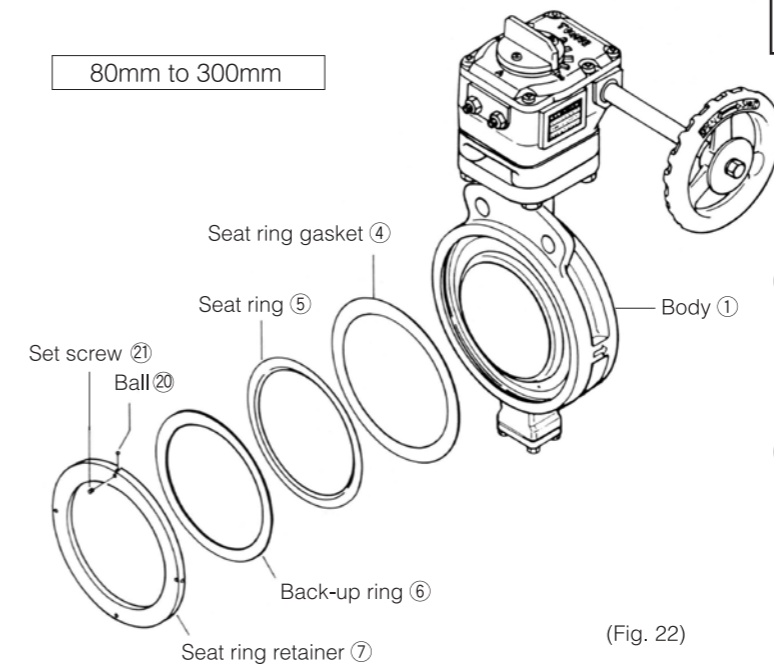


(Fig. 21)

### Assembly Procedure

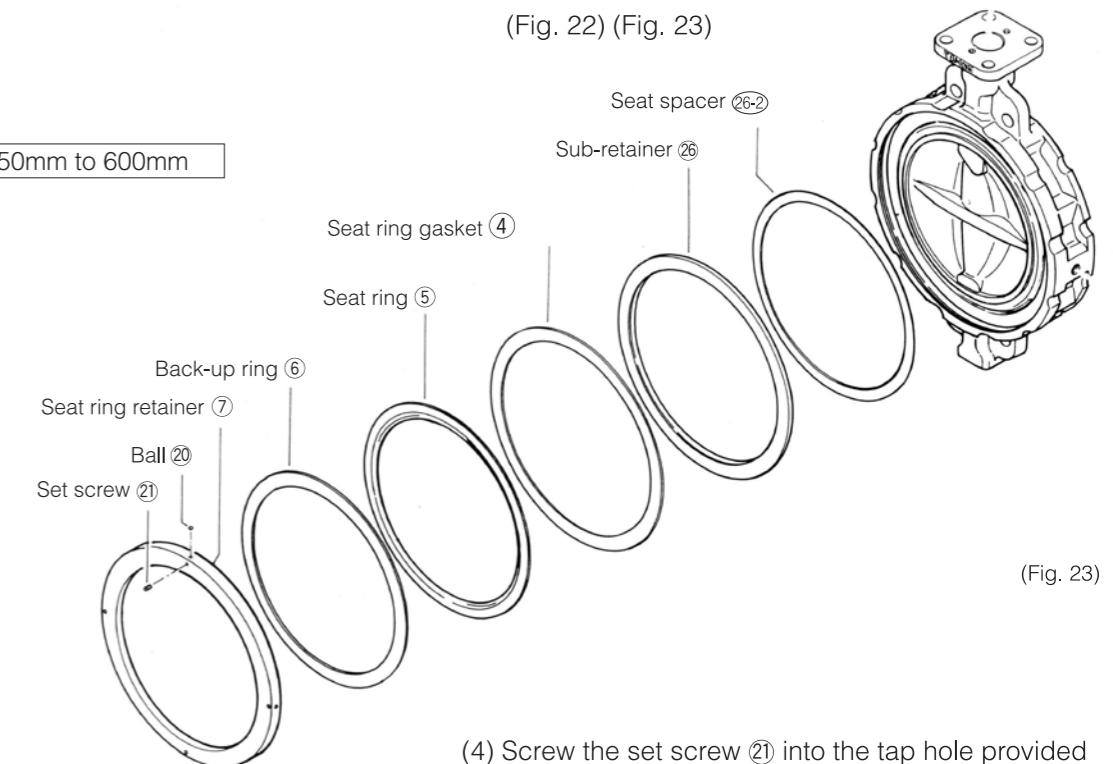
#### 302A

- (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 ㉒ on the periphery of the seat ring retainer ㉑ 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 ㉒ into the seat ring retainer ㉑ and attach it to the body ①.  
\*350 mm to 600 mm type valves have a sub-retainer ㉒ and seat spacer ㉒-2. (Fig. 22) (Fig. 23)

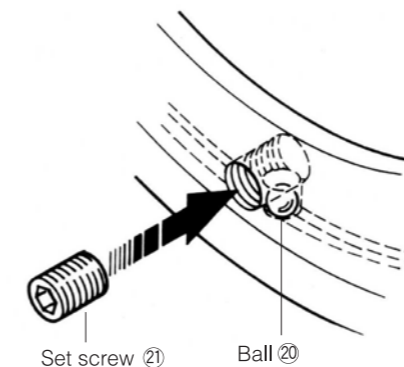


(Fig. 22)

350mm to 600mm

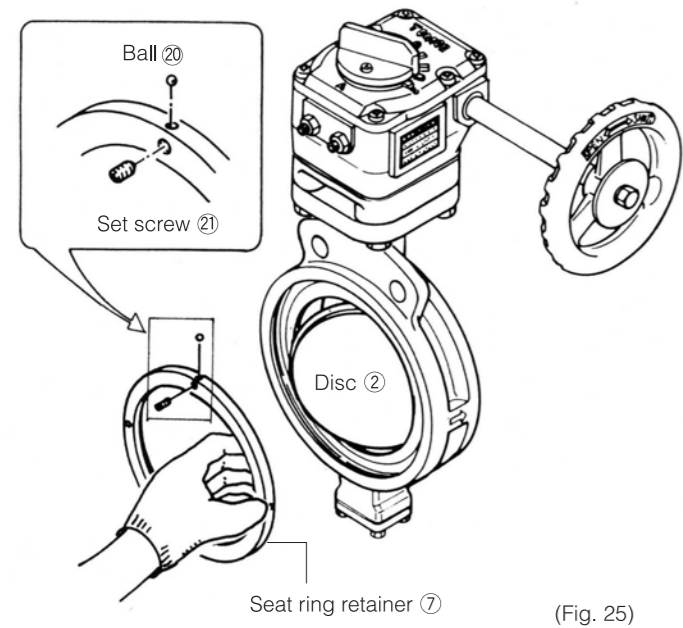


(Fig. 23)

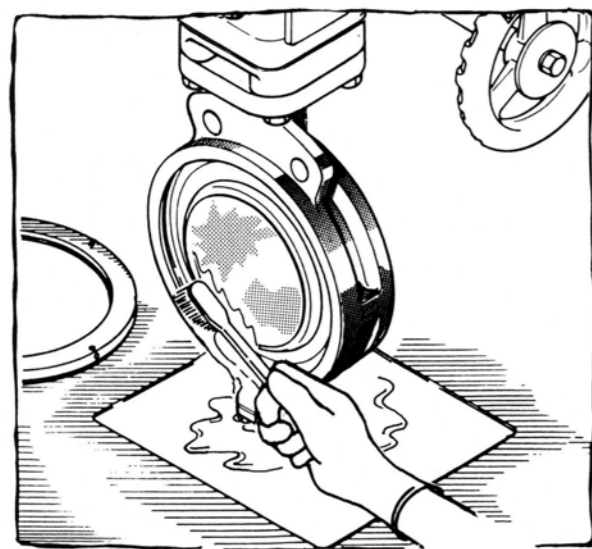


(Fig. 24)

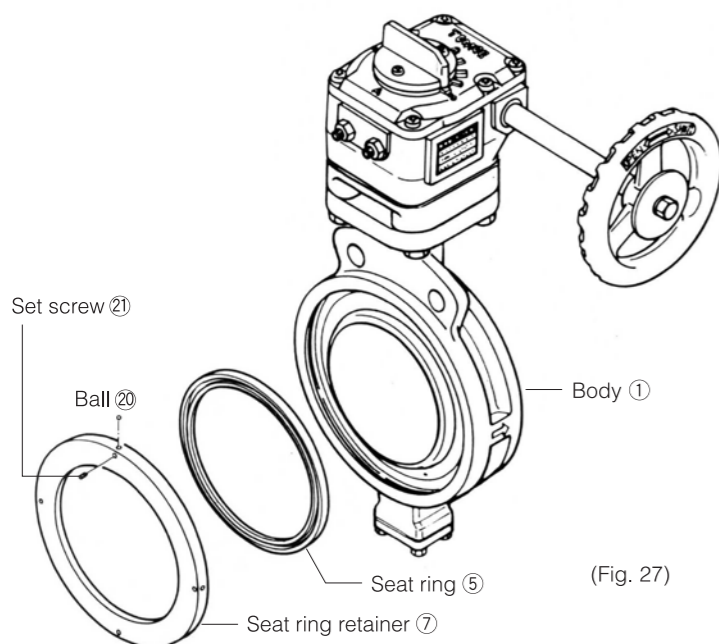
- (4) Screw the set screw ⑳ into the tap hole provided on the front face of the seat ring retainer ㉑. Make sure the set screw ⑳ is completely screwed in so that it does not protrude from the front face of the seat ring retainer ㉑. (Fig. 24)
- (5) Open and close the valve to ensure that the retainer is properly secured to the body.



(Fig. 25)



(Fig. 26)



(Fig. 27)

## Disassembly Procedure

### 334A • 304A

- (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. 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.

## Assembly Procedure

### 334A • 304A

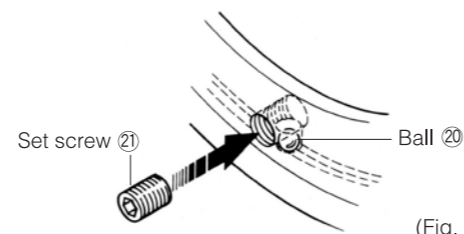
- (1) Assemble the new seat ring ⑤ and the removed parts according to the procedure below.

#### 334A

- (2) Attach the seal ring to the body ①. Next, set the ball ㉒ into the outer periphery of the seat ring retainer ㉑ and attach this assembly to the body ①. (Fig. 27)

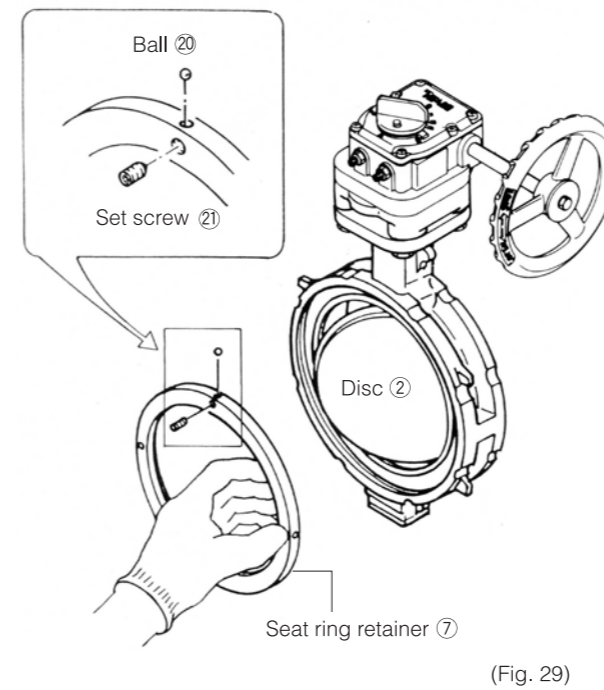
#### 304A

- (2) Attach the seat ring ⑤ to the seat ring retainer ㉑ and set the ball ㉒ 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)

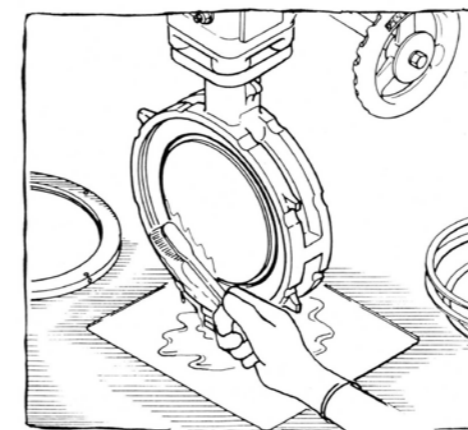


(Fig. 28)

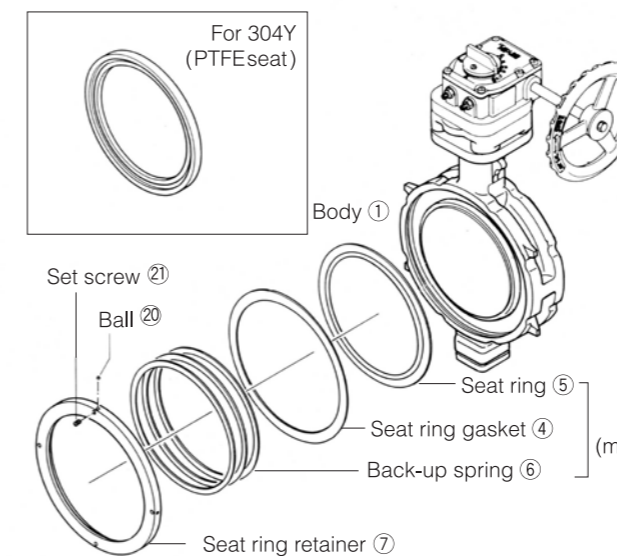
- (4) Open and close the valve to ensure that the seat ring retainer ㉑ is properly secured to the body.



(Fig. 29)



(Fig. 30)



(Fig. 31)

## Disassembly Procedure

### 302Y • 304Y

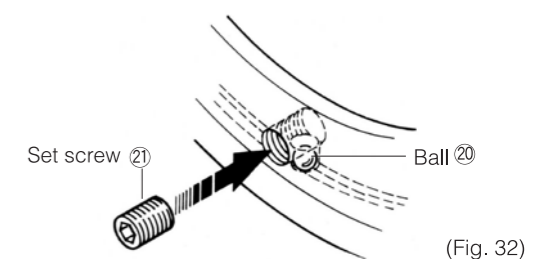
- (1) Open the disc ② approximately 30°.
- (2) Remove the set screw ㉑ located in the face of the seat ring retainer ㉑.
- (3) Carefully grasp the inner side of the seat ring retainer ㉑ and pull it out by hand. The ball ㉒ inserted on the outer side of the retainer may pop out during removal, so care must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

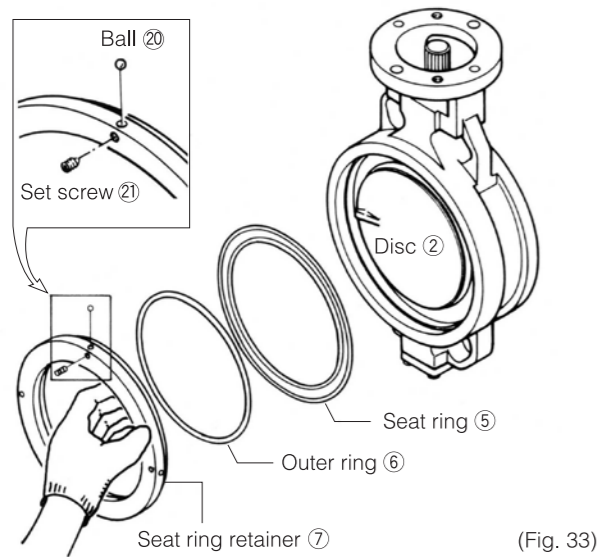
### 302Y • 304Y

- (1) Assemble the new seat ring ⑤ and the removed parts according to the procedure below.
- (2) For the 304Y PTFE 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)

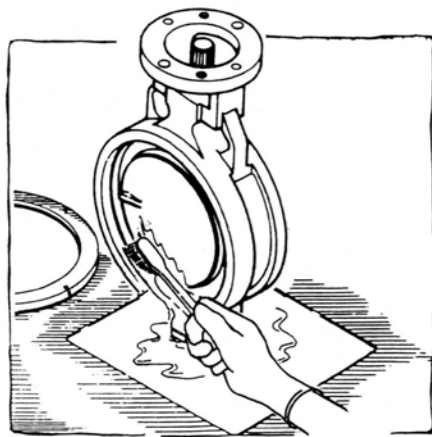


(Fig. 32)

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



(Fig. 33)



(Fig. 34)

## Disassembly Procedure

### 337Y

337Y 80A·100A·150~300A are discontinued products. Please ask any further information to our sales Dep.

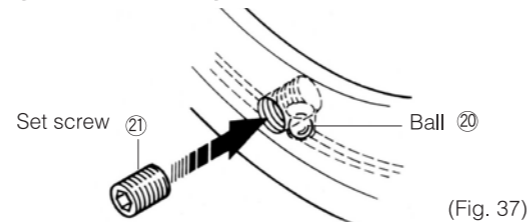
- (1) Open the disc (2) approximately 30°.
- (2) Remove the set screw (21) located in the face of the seat ring retainer (7).
- (3) Carefully grasp the inner side of the seat ring retainer (7) and pull it out by hand. The ball (20) inserted on the outer side of the retainer may pop out during removal, so care must be taken not to lose it. (Fig. 33)
- (4) Remove the seat ring (5) and outer ring (6) from the seat ring retainer (7).
- (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. 34)
- (6) Put the disc (2) into the fully closed position.

## Assembly Procedure

### 337Y

337Y 80A·100A·150~300A are discontinued products. Please ask any further information to our sales Dep.

- (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 (7) and set the ball (20) into the outer periphery of the seat ring retainer (7), 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 (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. 37)



(Fig. 37)

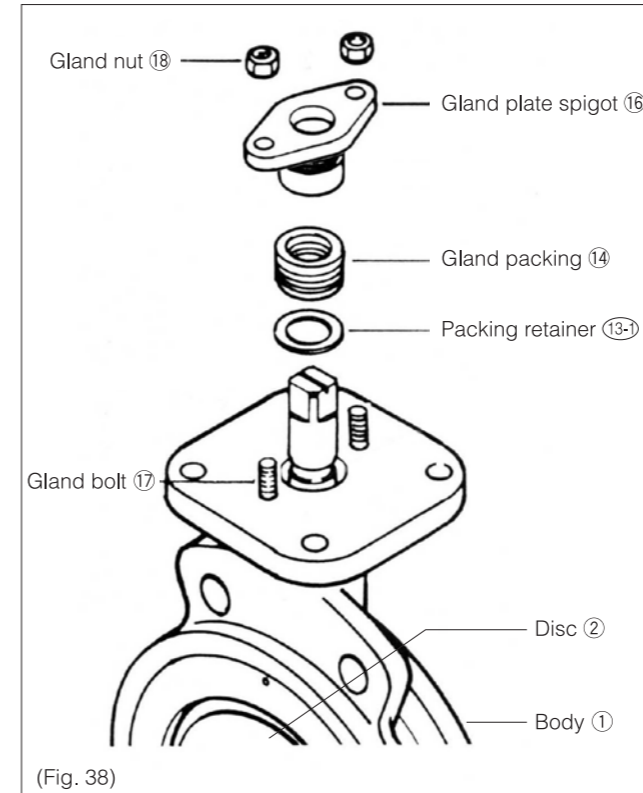
- (4) Open and close the valve to ensure that the seat ring retainer (7) is properly secured to the body.

## GLAND PACKING REPLACEMENT PROCEDURE

334ADisassembly Procedure

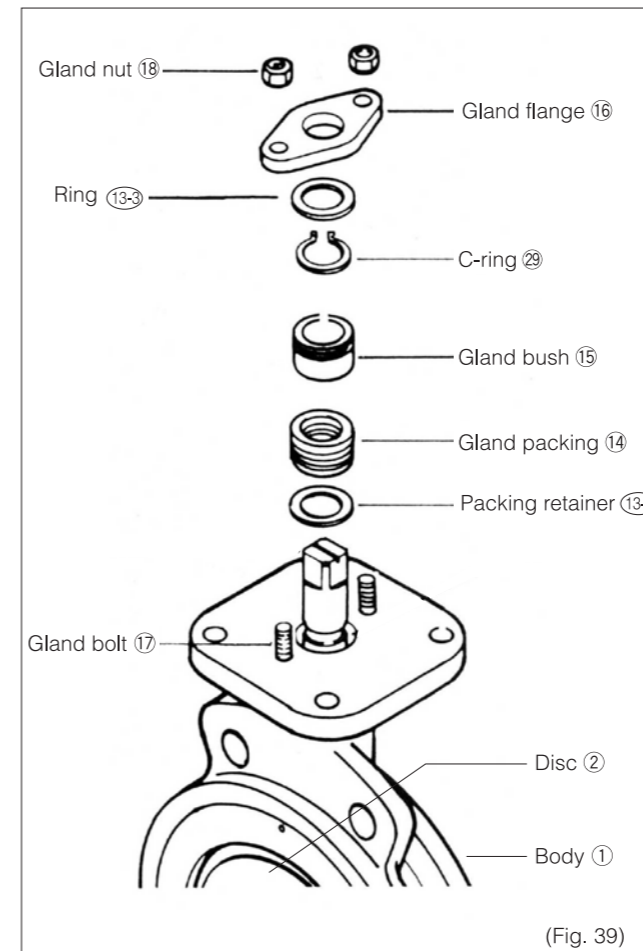
302ADisassembly Procedure (when fluid temperature is between -29 and 400 degrees C)

### 334A



(Fig. 38)

### 302A



(Fig. 39)

## 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

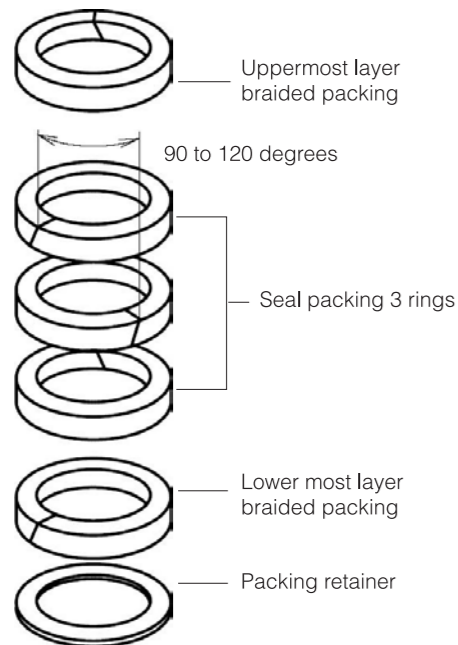
- (3) For 200 mm or higher type, remove the key (23).
- (4) Remove the lock pin.
- (5) Remove the gland nut (18) and remove the gland plate spigot (16).

### 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).

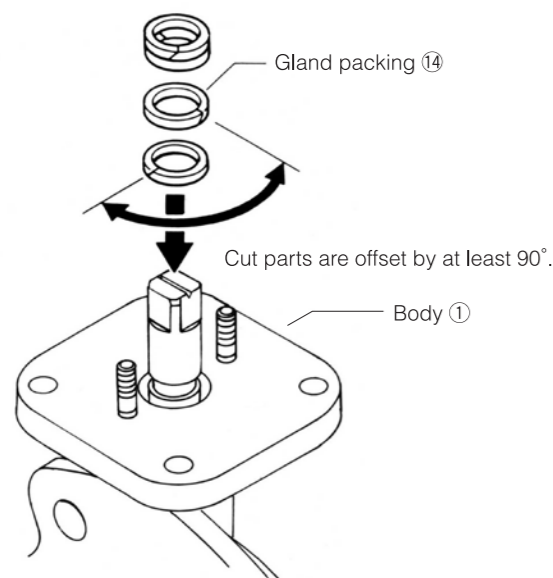
- (7) Remove the gland packing (14) from the body (1) using a packing tool, scriber or similar implement. If the packing retainer (13-1) can also be removed, remove it.

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 ⑲ and the ring ⑬-3.
- (6) Attach the gland flange ⑰ 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

### 302A 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.

- (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 ⑰.

- (5) Remove the ring ⑬-3 and C-ring ⑲.

- (6) Remove the gland bush ⑮ from the extension column ⑩1.

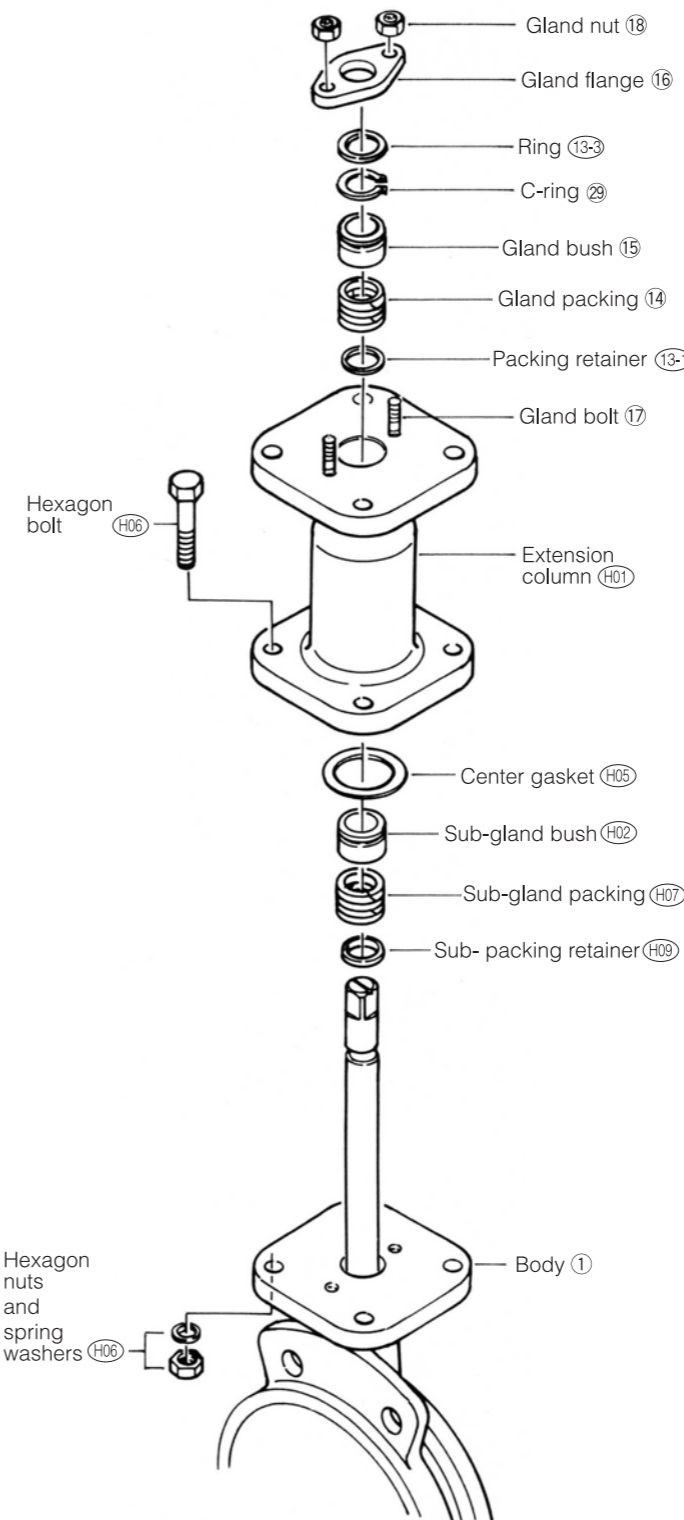
- (7) Remove the gland packing ⑭ from the extension column ⑩1 using a scriber or similar implement. If the packing retainer ⑬-1 can also be removed, remove it.

- (8) To replace the sub-gland packing ⑩7, remove the hexagon bolts, hexagon nuts, spring washers ⑩6 and slide the extension column ⑩1 up and take it off.

- (9) Remove the center gasket ⑩5 located between the body ① and the extension column ⑩1.

- (10) Remove the sub-gland bush ⑩2.

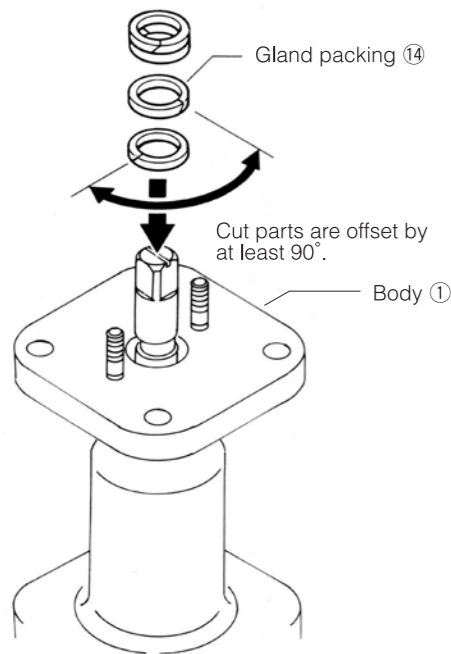
- (11) Remove the sub-gland packing ⑩7 from the body ① using packing tool, scriber or similar implement. If the sub-packing retainer ⑩9 can also be removed, remove it.



(Fig. 42)

## Assembly Procedure

### 302A High-temperature Extension (400 to 600 degrees C)

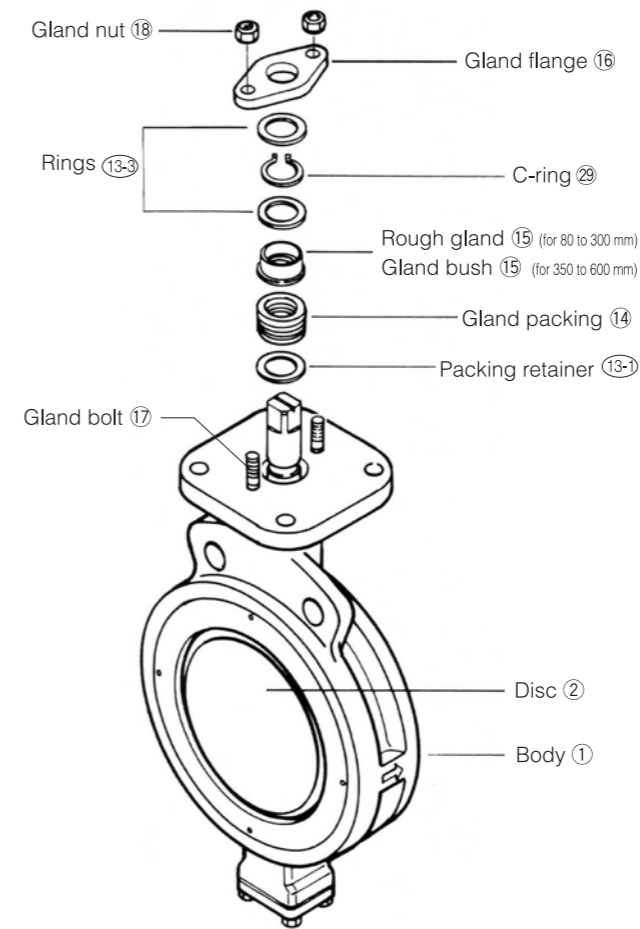


(Fig. 43)

- (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.

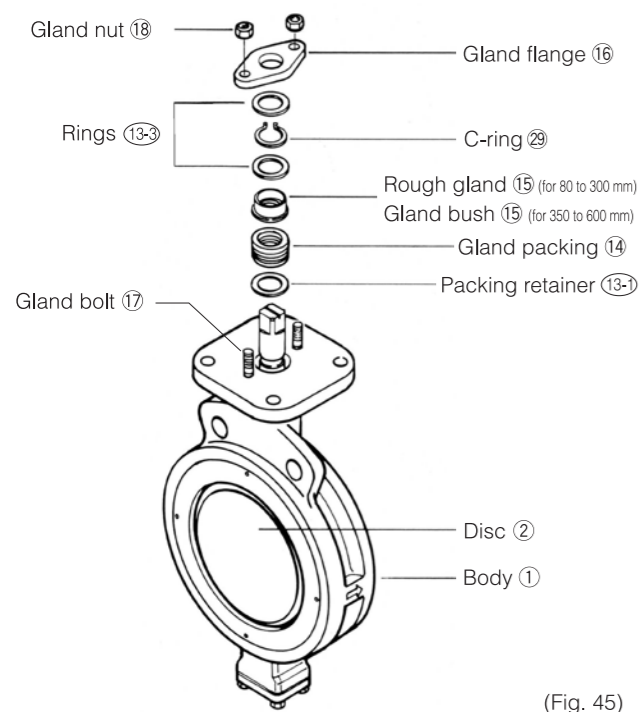


(Fig. 44)

## Disassembly Procedure

### 304A

- (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 (23).
- (4) Loosen the gland nut (18) and remove the gland flange (16).
- (5) Remove the C-rings (29) 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)



(Fig. 45)

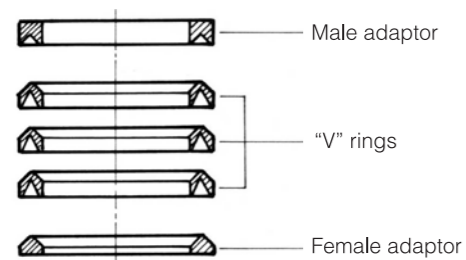
## Assembly Procedure

### 304A

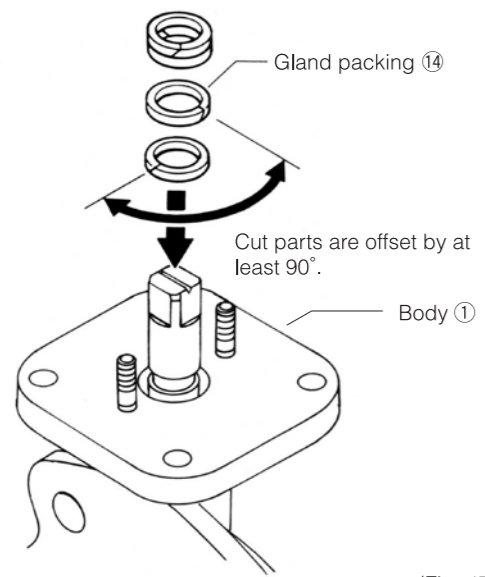
- (1) Thoroughly clean the gland packing hole on the body ① of all waste and other foreign particles.
- (2) Clean each component before assembling.
- (3) If the packing retainer ⑬-① was removed, install it in the gland packing hole on the body ①.
- (4) Insert the gland packing ⑭ into the gland packing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

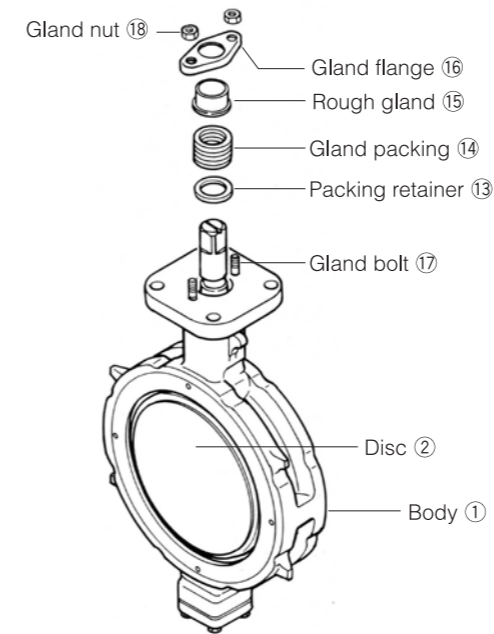


(Fig. 46)



(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.



(Fig. 48)

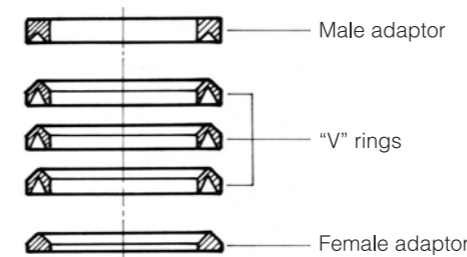
## Disassembly Procedure

### 302Y•304Y

- (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 ⑳.
- (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.

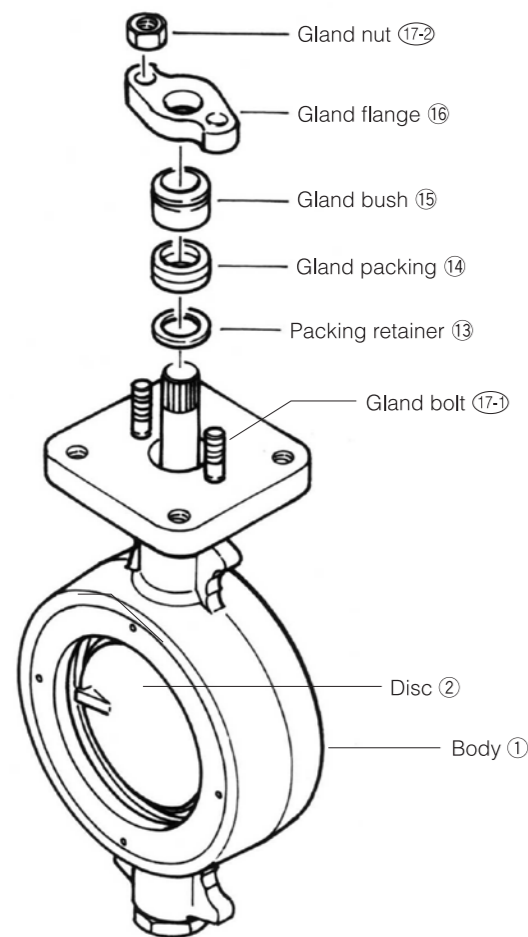
## Assembly Procedure

### 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 ⑳.
  - (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

337Y 80A·100A·150~300A are discontinued products. Please ask any further information to our sales Dep.

- (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 (16).
- (4) Remove the gland bush (15) from the body (1).
- (5) 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.

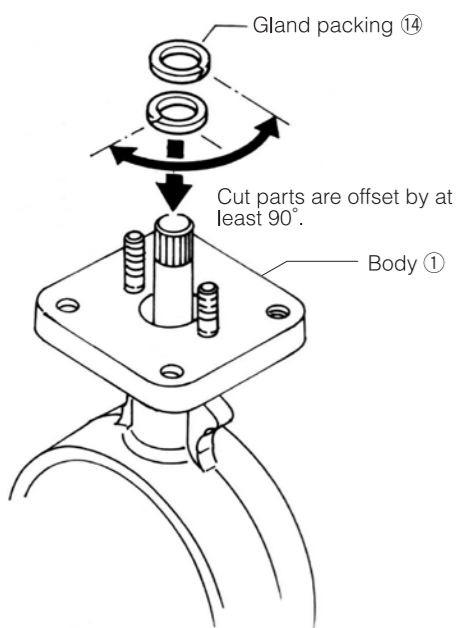
### Assembly Procedure

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

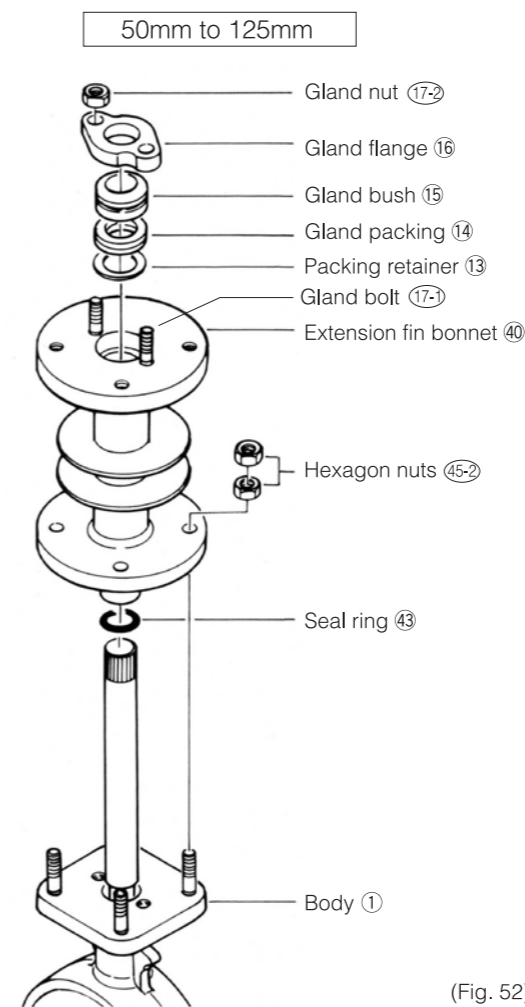
337Y 80A·100A·150~300A are discontinued products. Please ask any further information to our sales Dep.

- (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 (16) 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)

### Disassembly Procedure

**337Y** 50 mm to 125 mm: 350 to 600 degrees C  
150 mm to 300 mm: 400 to 600 degrees C

337Y 80A·100A·150~300A are discontinued products. Please ask any further information to our sales Dep.

- (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

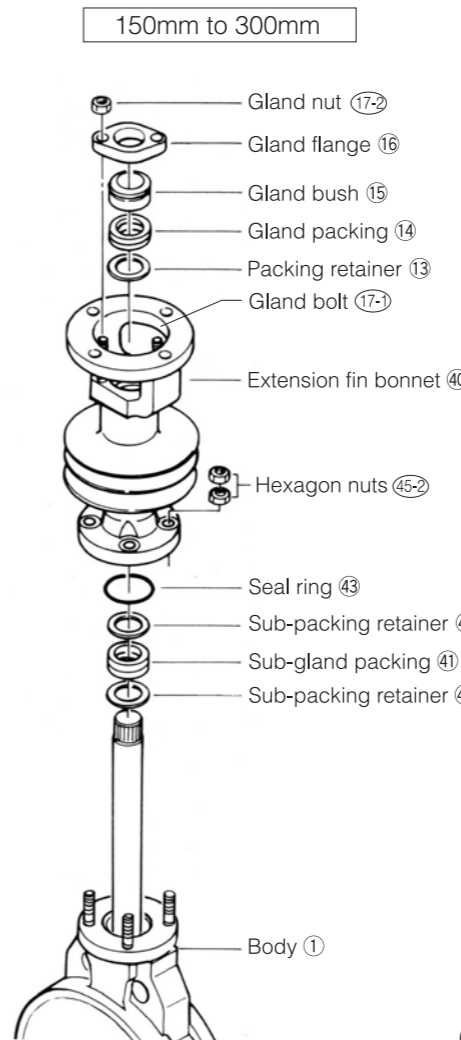
**337Y** 50 mm to 125 mm: 350 to 600 degrees C  
150 mm to 300 mm: 400 to 600 degrees C

337Y 80A·100A·150~300A are discontinued products. Please ask any further information to our sales Dep.

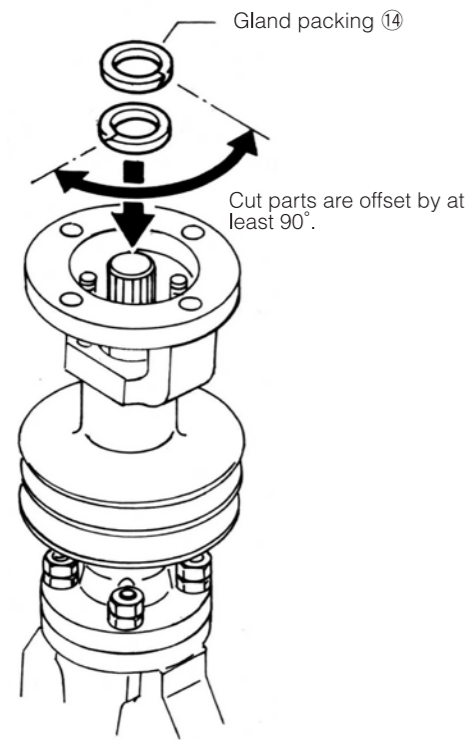
- (1) Thoroughly clean the gland packing hole on the body (1) and extension fin bonnet (40) of all waste and other foreign particles.
- (2) Clean each component before assembling.
- (3) Add the seal ring (43) to the valve body (1).
 

\*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. 53)



(Fig. 54)

(4) Install the extension fin bonnet (40) 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 (40).

(6) Insert the gland packing (14) into the gland packing hole on the extension fin bonnet (40) 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.

## 334A APPLICABLE PIPE AND MINIMUM INTERNAL DIAMETER OF PIPING

### ■ Applicable pipe

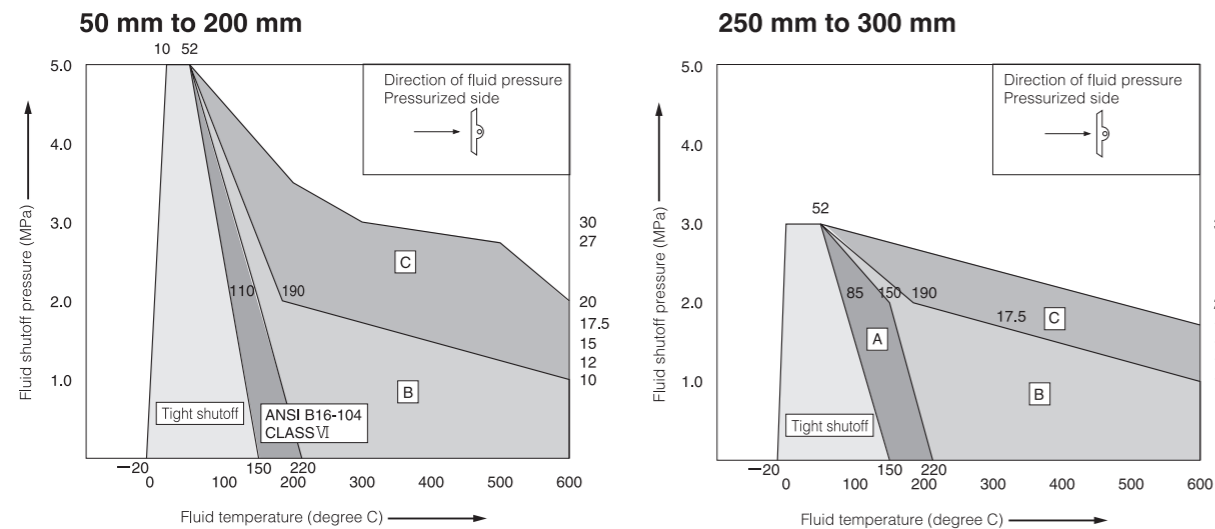
Nominal size		JIS (STPG)			ANSI B36.1		
mm	inch	Sch#40	Sch#60	Sch#80	Sch#40	Sch#60	Sch#80
80	3	○	○	○	○	○	○
100	4	○	○	○	○	○	○
150	6	○	○	○	○	○	○
200	8	○	○	○	○	○	○
250	10	○	○	○	○	○	○
300	12	○	○	○	○	○	○
350	14	○	○	○	○	○	○
400	16	○	○	○	○	○	○
450	18	○	○	○	○	○	○
500	20	○	○	○	○	○	○
600	24	○	○	○	○	○	○

Remark 1: ○: Installation possible.

### ■ 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

### 337Y allowable seat leakage



#### 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.

337Y 80A·100A·150~300A are discontinued products. Please ask any further information to our sales Dep.





# 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	Setting bolts	Long bolts and nuts	Setting bolts	Long bolts and nuts	Setting 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 4-M24×58×50	16-M30(P3)×280	4-M30(P3)× 95×65 4-M30(P3)× 73×50
500	20	16-M22×245	4-M22×80×50 4-M22×60×50	16-M24×260	4-M24×90×60 4-M24×70×60	16-M30(P3)×300	4-M30(P3)×105×65 4-M30(P3)× 81×50
600	24	16-M24×280	4-M24×84×60 4-M24×65×50	20-M30(P3)×300	4-M30(P3)×81×50 4-M30(P3)×65×50	20-M36(P3)×345	4-M36(P3)×100×60 4-M36(P3)× 82×50

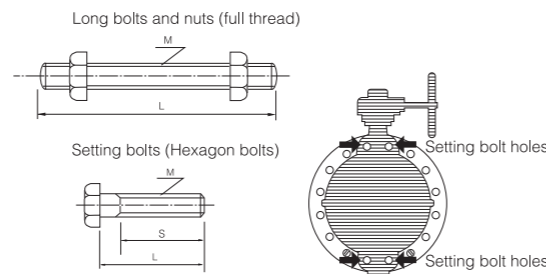
Nominal size		JIS20K		ANSI150Lb, API/JPI150Lb	
mm	inch	Long bolts and nuts	Setting bolts	Long bolts and nuts	Setting bolts
80	3	8-M20×170	—	4-U5/8-11UNC×155	—
100	4	8-M20×170	—	8-U5/8-11UNC×155	—
125	5	8-M22×190	—	8-U3/4-10UNC×175	—
150	6	12-M22×190	—	8-U3/4-10UNC×175	—
200	8	12-M22×190	—	8-U3/4-10UNC×205	—
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 4-M30(P3)× 81×50	16-U1 1/8- 8UN×280	—
500	20	16-M30(P3)×315	4-M30(P3)×110×60 4-M30(P3)× 90×65	16-U1 1/8- 8UN×295	4-U1 1/8- 8UN×105×50 4-U1 1/8- 8UN× 80×50
600	24	20-M36(P3)×360	4-M36(P3)×108×60 4-M36(P3)× 90×50	16-U1 1/4- 8UN×340	4-U1 1/4- 8UN×100×50 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:  $\frac{12}{N} - \frac{M22}{M} \times \frac{185}{L}$

Setting bolts:  $\frac{4}{N} - \frac{M30}{M} \times \frac{95}{L} \times \frac{65}{S}$   
 (Hexagon bolts)



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 4-M22×70×50	16-M24×250	—	16-M24×269	—

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

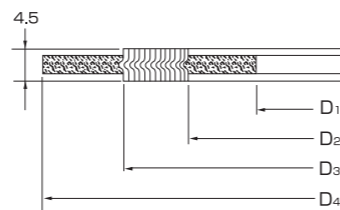
## 334A Piping gasket

- In case of sheet gasket ..... Any standard can be used.
  - In case of spiral gasket
    - ASME/JPI Class300 ..... 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	
					JPI	20K	30K	PN25	PN40
mm	inch	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	○	○	×	○	○	
100	4	○	○	×	○	○	
150	6	○	×	×	×	×	
200	8	○	×	×	×	×	
250	10	○	×	×	○	×	
300	12	○	○	×	×	×	
350	14	○	×	×	○	○	
400	16	○	×	○	○	○	
450	18	○	×	—	○	○	
500	20	○	×	—	○	○	
600	24	○	×	—	○	○	

Remark; ○: Applicable, ×: 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, ×: 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
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 solid gaskets can be used.

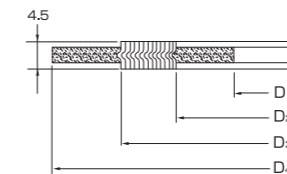
## 302A/304A Piping gasket

- 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	×	134	140
100	4	115	124	146	×	159	165
125	5	140	151	177	×	190	202
150	6	166	178	207	×	220	237
200	8	217	227	257	×	270	282
250	10	268	282	318	×	332	354
300	12	319	331	362	×	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; ×: 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	○	○	○	×	×	○
100	4	○	○	○	×	×	○
125	5	○	○	○	×	×	○
150	6	○	○	○	×	×	○
200	8	○	○	○	×	×	○
250	10	○	○	○	×	×	○
300	12	○	○	○	×	×	○
350	14	○	○	○	×	×	○
400	16	○	○	○	×	×	○
450	18	○	○	○	×	×	○
500	20	○	○	○	×	×	○
600	24	○	○	○	×	×	○

Remark; ○: Applicable, ×: 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				
mm	inch		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
100	4	124	×	○	○	○	○	×	○	○	○	○
125	5	151	×	○	○	○	○	×	○	○	○	○
150	6	178	×	○	○	○	○	×	○	○	○	○
200	8	227	×	○	○	○	○	×	○	○	○	○
250	10	282	×	○	○	○	○	×	○	○	○	○
300	12	331	×	○	○	○	○	×	○	○	○	○
350	14	362	○	○	○	○	○	○	○	○	○	○
400	16	414	○	○	○	○	○	○	○	○	○	○
450	18	468	○	○	○	○	○	○	○	○	○	○
500	20	518	○	○	○	○	○	○	○	○	○	○
600	24	619	○	○	○	○	○	○	○	○	○	○

Remark: ○: Applicable, ×: Not applicable

### 302Y/304Y 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: 7030, 7031or 7035				
mm	inch		JIS 5K	JIS 10K	JIS 16K JIS 20K	ANSI 150• 300Lb	JPI 150• 300Lb	JIS 5K	JIS 10K	JIS 16K JIS 20K	ANSI 150• 300Lb	JPI 150• 300Lb
50	2	69	○	○	○	○	○	○	○	○	○	○
65	2 1/2	81	○	○	○	○	○	×	×	×	○	○
80	3	97	○	○	○	○	○	○	○	○	○	○
100	4	124	○	○	○	○	○	○	○	○	○	○
125	5	151	○	○	○	○	○	○	○	○	○	○
150	6	178	○	○	○	○	○	○	○	○	○	○
200	8	227	○	○	○	○	○	○	○	○	○	○
250	10	282	○	○	○	○	○	○	○	○	○	○
300	12	331	○	○	○	○	○	○	○	○	○	○

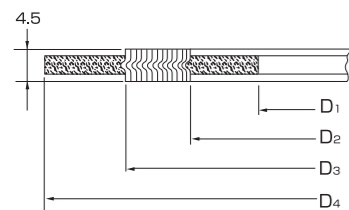
Remark: ○: Applicable, ×: Not applicable

### 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

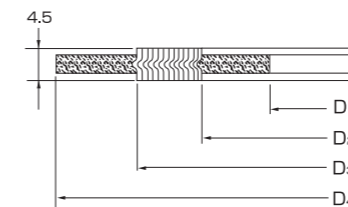
Nominal size		JIS flange					ANSI flange				
mm	inch	10K, 16K, 20K		10K	16K, 20K	150•300Lb			150Lb	300Lb	
		D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>4</sub>	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>4</sub>
40	1 1/2	48	54	73	89	89	48	54	73	85	95
50	2	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



### 337Y Piping gasket

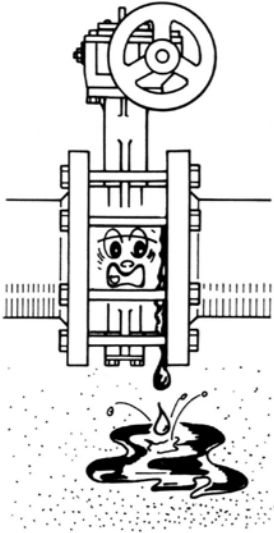
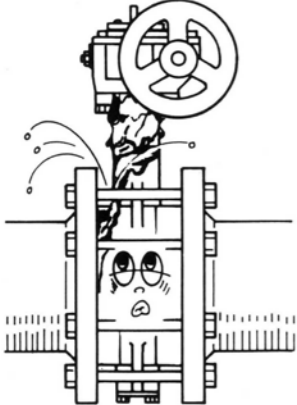
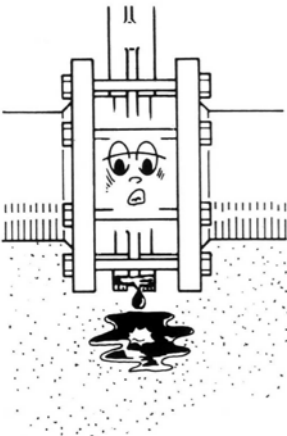
#### 337Y Special spiral gasket size

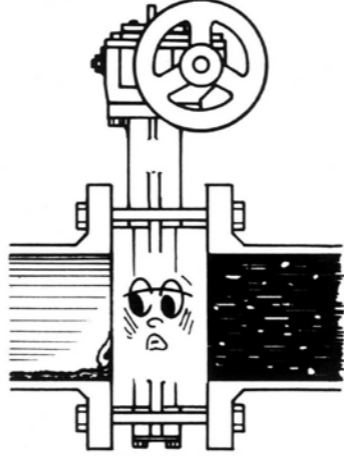
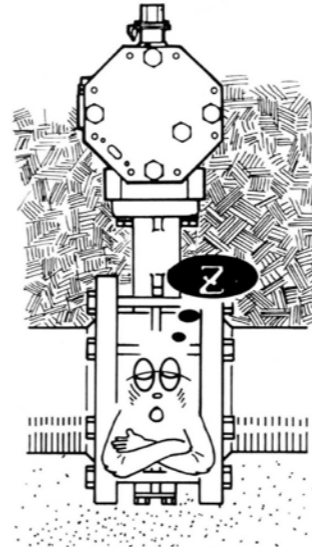
Nominal size		JIS flange					ANSI flange				
mm	inch	10K, 16K, 20K			10K	16K, 20K	150•300Lb			150Lb	300Lb
		D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>4</sub>	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>4</sub>
50	2	61	69	88	104	104	61	69	88	104	111
65	2 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



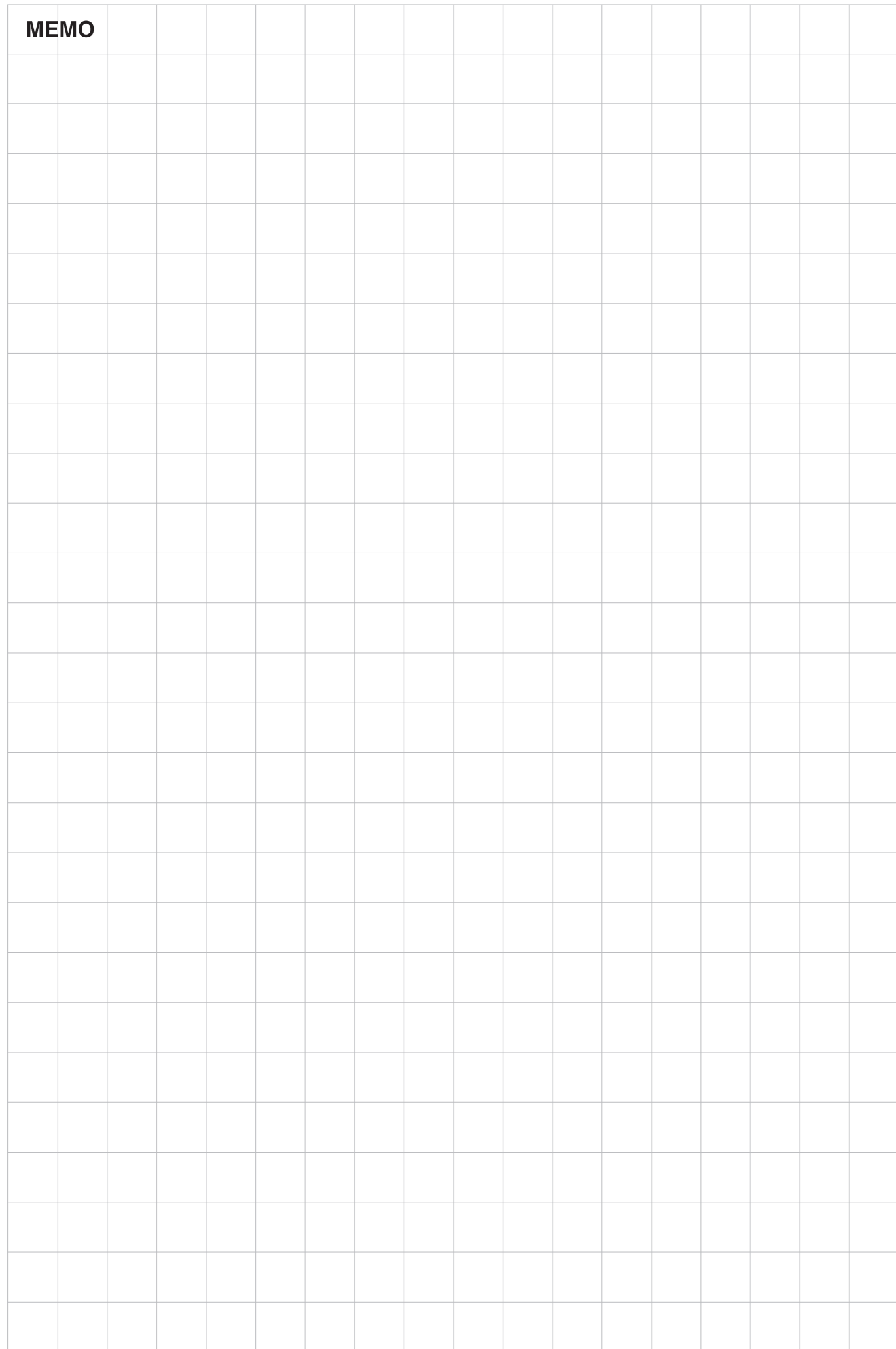
# TROUBLESHOOTING

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

Problem	Cause	Countermeasure
<p>There is a leak between the body and pipe flange faces.</p> 	The piping bolts are loose or they were not tightened evenly.	Loosen the bolts and then retighten them.
	The flange gasket face is scratched or there is waste material or other foreign matter adhering.	Remove the body and clean the flange gasket face. Clean the piping flange gasket face and re-install the valve.
	The valve is misaligned.	Loosen the bolts and realign the valve correctly.
<p>There is a leak from the gland.</p> 	The gland nuts are loose.	Retighten the gland nuts.
	The gland packing is damaged or has deteriorated.	Replace the gland packing. (Refer to "Gland Packing Replacement Procedure".)
<p>There is a leak from the bottom cover.</p> 	The bottom cover installation bolts are loose.	Re-tighten the bottom cover installation bolts.
	The seat packing is damaged or has deteriorated.	Replace the seat packing with a new one.

Problem	Cause	Countermeasure
<p>There is leaking from the valve seat.</p> 	The wrong material was selected for the fluid application. (Parts are being corroded.)	Change the material. Please inquire with us regarding selection.
	There is damage to the disc seal or seat ring due to the presence of foreign matter inside the piping.	Replace the disc seal wrapping and the seat ring.
	Movement of disc in the fully closed position.	Adjust the fully closed position of the disc.
	The disc cannot fully close due to insufficient output from the actuator.	Refer to the actuator selection table for correction.
	Fluid specification is not compatible with valve specification. (Specifications have been exceeded.)	Re-check the specifications.
	There is torsion of stem due to an unusual increase in opening/closing torque.	Replace the valve body.
	Movement of disc in fully closed position due to loose actuator installation bolts.	Re-adjust the fully closed disc position by re-tightening the installation bolts.
	Uneven connection between seat ring and disc due to unequal tightening of piping bolts.	Loosen the piping bolts and then re-tighten them.
<p>Faulty operation (The valve does not work.)</p> 	Wearing of seat ring due to long period of use.	Replace the seat ring.
	Prescribed actuator air pressure or voltage not being supplied.	Check by using a pressure gauge, tester, or similar.
	For pneumatic pressure cylinder types, diaphragm of speed controller is stuck in the fully closed position.	Open the diaphragm of the speed controller.
	By-pass valve is in the open position.	Close the by-pass valve.
	Insufficient output due to damaged cylinder parts.	Apply the prescribed pressure and observe functioning. If defective parts are suspected, replace them with new parts.
	Erroneous actuator selection.	Refer to the actuator selection table for correction.
	Increased torque due to presence of foreign matter in the piping.	Keep valve in the fully opened position and flush out the foreign material.

MEMO



MEMO

