

Contents

# 3-WAY TRUE UNION BALL VALVES

## User's Manual

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## General operating instruction

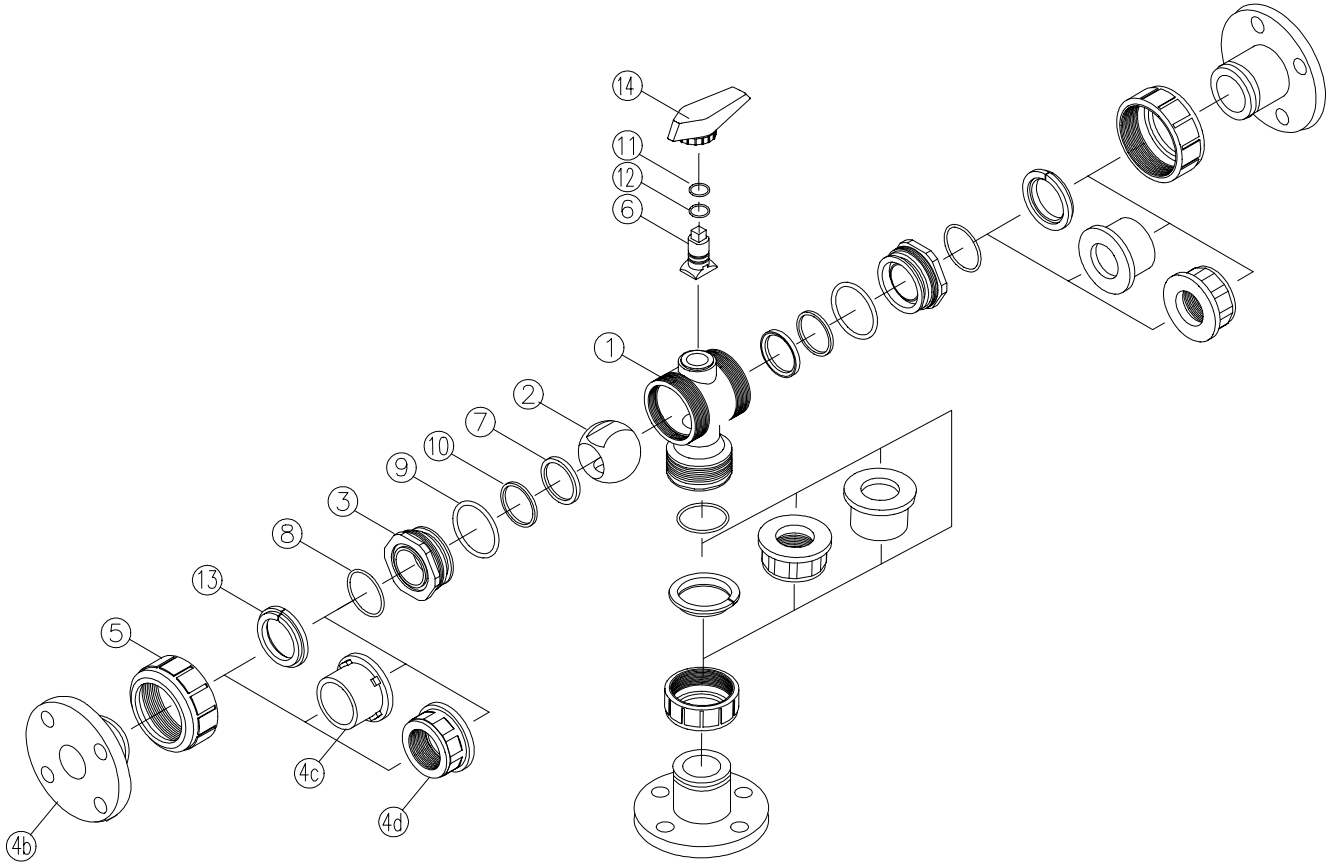
- Operate the valve within the range of the published working temperature and pressure.  
(The valve can be damaged by operation beyond the maximum allowable range of temperature vs pressure.)
- To select a valve in appropriate materials, refer to “CHEMICAL RESISTANCE ON ASAHI AV VALVE”.  
(Some chemicals give heavy damage to valve materials.)
- The valve is not designed to bear any kind of external load. Never stand on or place anything heavy on the valve at anytime.
- When the valve is disposed of, contact waste disposal specialist.  
(The valve generates toxic gas.)
- The valve should be installed at place where space for periodic inspection & maintenance is sufficient.
- Do not store or install the valve near any heat source or hot surface.
- Do not use the valve for fluid containing slurry. (The valve will not operate properly.)
- Do not use the valve on condition that fluid has crystallized.  
(The valve will not operate properly.)
- Caution: Certain liquid such as H<sub>2</sub>O<sub>2</sub>, NaClO, etc may be prone to vaporization which may cause irregular pressure increases, which may destroy the valve.

## (2) General instructions for transportation, unpacking and storage

- Keep the valve in its original packaging until needed for installation.
- Avoid contact with any coal tar creosote, insecticides, vermicides or paint.  
(The force of swelling may damage the valve.)
- The valve is not designed to handle any kind of impact. Avoid throwing or dropping the valve.
- Avoid scratching the valve with any sharp object.

### (3) Name of parts

Nominal size 15mm-100mm (1/2"-4")



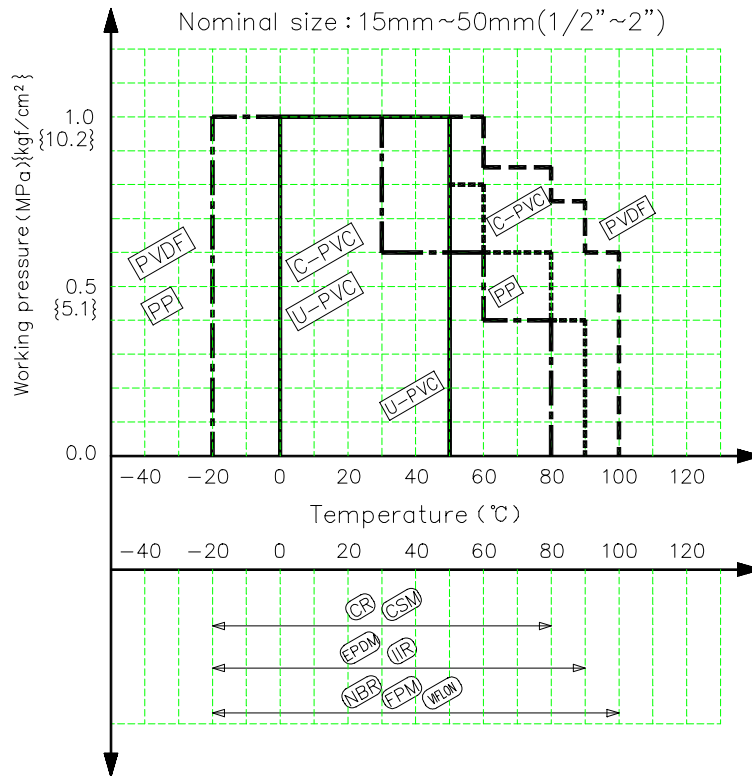
No.	DESCRIPTION
①	Body
②	Ball
③	Carrier
④b	End connector (Flanged end type)
④c	End connector (Socket end type)
④d	End connector (Threaded end type)
⑤	Union nut
⑥	Stem
⑦	Seat
⑧	O-ring (A)
⑨	O-ring (B)
⑩	Cushion
⑪	O-ring (D)
⑫	O-ring (E)
⑬	Stop ring
⑭	Handle

⑬ → Use only with Flanged type

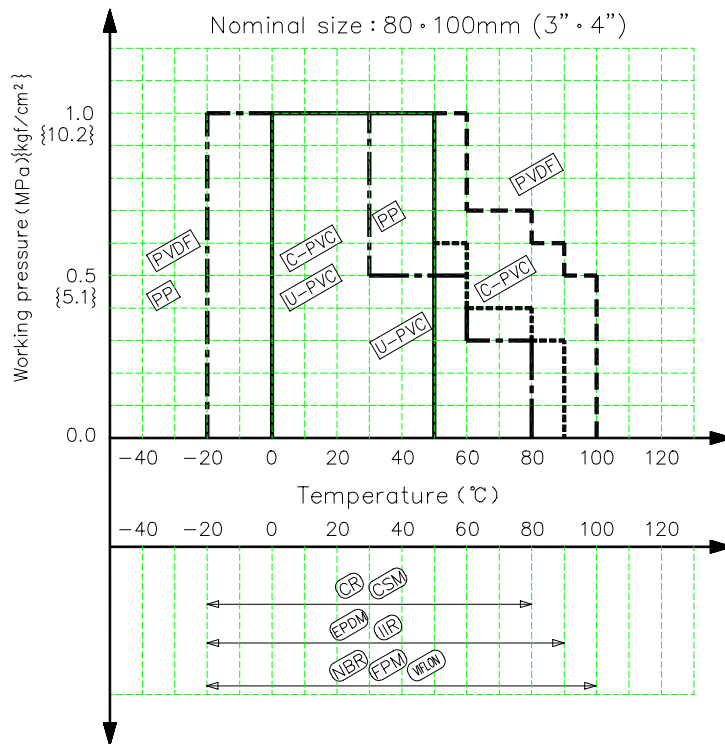
④d → Only with C-PVC 15-25mm (1/2"-1")

(4) Comparison between working temperature and pressure

Nominal size: 15mm-50mm (1/2"-2")



Nominal size: 80mm, 100mm (3", 4")



Caution

Do not operate the valve beyond the range of working temperature and pressure.  
(The valve can be damaged.)

## (5) Installation procedure

### Flanged Type

#### Necessary items

- Torque wrench
- AV gasket
- Spanner wrench
- Bolt, Nut, Washer (For many flanges specification)

(When a non-AV gasket is used, a different tightening torque specification should be followed.)

#### Procedure

- 1) Set the AV gasket between the flanges.
- 2) Insert washers and bolts from the pipe side, insert washers and nuts from the valve side, then temporarily tighten them by hand.

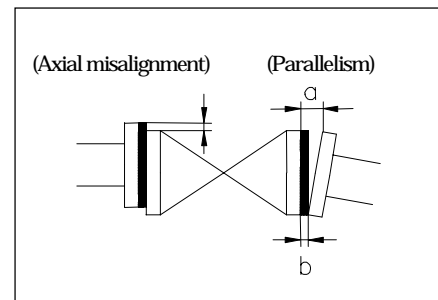
#### Remark

The parallelism and axial misalignment of the flange surface should be below the values in the following. The three ways are all as following.

(A failure to observe then can cause destruction due to stress application to the pipe)

Unit : mm (inch)

Nom. Size	Axial Misalignment	Parallelism (a-b)
15-25mm (1/2"-1")	1.0 (0.04)	0.5 (0.02)
40-80mm (1 1/4"-3")	1.0 (0.04)	0.8 (0.03)
100mm (4")	1.0 (0.04)	1.0 (0.04)



- 3) Using a torque wrench, tighten the bolts and nuts gradually to the specified torque in a diagonal manner. (Refer to fig.1.)

#### Specified torque value

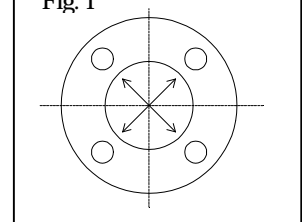
Unit: N-m {kgf-cm} [lb-inch]

Nom. Size	15mm (1/2")	20mm (3/4")	25mm (1")	40mm (1 1/2")	50mm (2")	80mm (3")	100mm (4")
Torque value	17.5 {179} [155]	17.5 {179} [177]	20.0 {204} [200]	20.0 {204} [200]	22.5 {230} [200]	30.0 {306} [266]	30.0 {306} [266]

#### Remark

Avoid excessive tightening. (The valve can be damaged.)

Fig. 1



## Threaded type

### Necessary items

- Sealing tape (A non-sealing tape can cause leakage.)
- Strap wrench (Do not use Pipe wrench.)
- Spanner wrench

### Remark

Make sure that the threaded connections are plastic x plastic.  
(Metallic thread can damage the body cap)

### Procedure

- 1) Wind a sealing tape around the external thread of joint, leaving the end (about 3mm) free.
- 2) Loosen the union nut (5) with a strap wrench.
- 3) Remove the union nut (5) and the end connector (4).
- 4) Lead the union nut (5) through the pipe.
- 5) Tighten the external thread of the joint and the end connector (4) lightly by hand.
- 6) Using a spanner wrench, screw in the end connector by turning  $180^{\circ}$  -  $360^{\circ}$  carefully without damaging it.

### Remark

Avoid excessive tightening. (The valve can be damaged.)

- 7) Make sure that the O-ring (A) (8) is mounted.
- 8) Tighten the union nut (5) lightly by hand.
- 9) Using a strap wrench, screw it in by turning  $90^{\circ}$  -  $180^{\circ}$  carefully without damaging it.

### Remark

Avoid excessive tightening. (The valve can be damaged.)

## Socket type

### Necessary items

- Adhesive for hard vinyl chloride pipes
- Strap wrench (Do not use the pipe wrench)

### Remark

Do not install a socket type valve where the atmospheric temperature is 5°C or lower.  
(The valve can be damaged.)

### Procedure

- 1) Loosen the union nut ⑤ with a strap wrench.
- 2) Remove the union nut ⑤ and end connector ④c.
- 3) Lead the union nut ⑤ through the pipe.
- 4) Clean the hub part of the end connector ④c by wiping with waste cloth.
- 5) Apply adhesive evenly to the hub part of the end connector and the pipe spigot.

### Remark

Do not apply more adhesive than necessary.  
(The valve can be destroyed due to solvent cracking.)

### Adhesive quantity (guideline)

Nom. Size	15mm (1/2")	20mm (3/4")	25mm (1")	40mm (1 1/2")	50mm (2")	65mm (2 1/2")	80mm (3")	100mm (4")
Quantity(g)	1.0	1.3	2.0	3.5	4.8	6.9	9.0	13.0

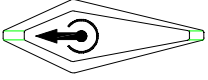
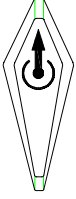
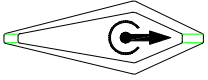
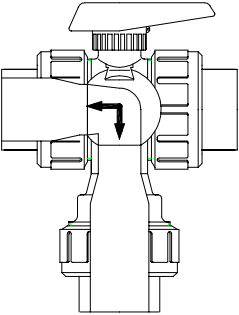
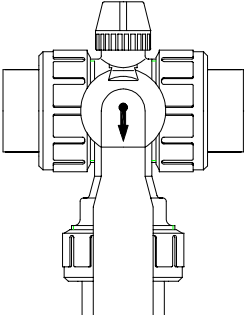
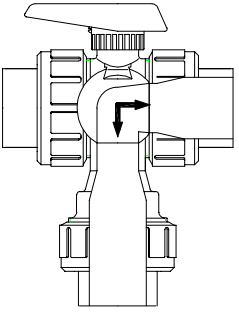
- 6) After applying adhesive, insert the pipe quickly to the end connector ④c and leave it alone for at least 60 seconds.
- 7) Wipe away overflowing adhesive.
- 8) Make sure that O-ring(A) ⑧ is mounted
- 9) Tighten the union nut ⑤ lightly by hand.
- 10) Using a strap wrench, screw it in by turning 90° - 180° carefully without damaging it.

### Remark

Avoid excessive tightening. (The valve can be damaged.)

## (6) Operating Procedure

- Turn the handle gently to open or close. The handle can be turned 360° .  
(Turn the handle clockwise to close and counter clockwise to open.)
- The arrow on top of the handle indicates the flow direction.

		
		
<p>Open to the left</p>	<p>Fully closed</p>	<p>Open to the right</p>
<p>The handle is parallel to the pipe. The direction of the arrow is left.</p>	<p>The handle is perpendicular to the pipe.</p>	<p>The handle is parallel to the pipe. The direction of the arrow is right.</p>

- With AV 3-WAY TRUE UNION BALL VALVES, the direction of flow, left and right, is shown above.

## (7)Disassembling Method for Replacing Parts

### Necessary items

- Strap wrench
- Protective gloves
- Wrench or vice
- Safety goggles
- Screwdriver (+)

### Caution

Wear protective gloves and safety goggles as some fluid remains in the valve.  
(You may be injured.)

### <Disassembly>

#### Procedure

- 1) Completely discharge fluid from pipes.
- 2) Turn the handle to full close.
- 3) Loosen the union nuts ⑤ on both sides with a strap wrench.  
(With 3-WAY TRUE UNION BALL VALVES, loosen the three union nuts.)
- 4) Disconnect three joints and remove the body part only. As for the flanged type, remove the bolt.  
(With 3-WAY TRUE UNION BALL VALVES, the body part can be pulled up just with loosening the union nut ⑤.)
- 5) Loosen the screw of the handle with a screwdriver (+), and pull the handle ⑭ off the body part.
- 6) Using a wrench or vice, engage the carrier ③.
- 7) Turn the carrier ③ counter clockwise to loosen.
- 8) Follow 6) and 7) for the other side.  
(With 3-WAY TRUE UNION BALL VALVES, loosen the carrier ③ in the same way.)
- 9) Push out the ball ② by hand.
- 10) Push out the stem ⑥ from the top flange side to the body side.

### <Assembly>

#### Procedure

Carry out the assembly work in the reverse procedure.

## (8) Inspection items

○ Inspect the following items;

(1)	Check for any flaw, crack, or deformation on the outside.
(2)	Check whether fluid leaks to the outside.
(3)	Check whether tightness of bolt nut.
(4)	Check whether the handle operates smoothly.

## (9) Troubleshooting and action

Problem	Cause	Action
Fluid leaks from the valve even when the valve is closed fully.	The carrier is loosened .	Adjust the face pressure between the ball and the seat. (Refer to page 8)
	The seat is scratched or worn.	Replace the seat with a new one.
	Foreign matter is in the valve.	Clean the valve.
	The ball is scratched or worn.	Replace the scratched ball with a new one.
Fluid leaks from the valve.	The O-ring is scratched or worn.	Replace the O-ring with a new one.
The handle is not (can not be) turned smoothly.	Foreign matter is in the valve.	Clean the valve.
	Deformation. (By heat etc.)	Replace the parts.
The handle fails to engage.	The stem is broken.	Replace the stem with a new one.
	The engagement between the stem and the ball is broken.	Replace the stem and ball with new ones.

## (10) Handling of residual and waste materials

Remark

In discarding remaining or waste materials, be sure to ask waste service company.  
(Poisonous gas is generated.)

## (11) Inquiries

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**3-WAY TRUE UNION BALL VALVE**

**ASAHI ORGANIC CHEMICALS INDUSTRY CO., LTD.**