

Serial No.

H-V077-E

Ball Valve Type 21α (Flow control type)

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

User's Manual







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This user's guide contains very important information for the proper installation, maintenance and safe use of an ASAHI AV Product. Please store this manual in an easily accessible location.




<Warning, Caution, Prohibited & Mandatory Action Signs>




 Warning	This symbol reminds the user to take caution due to the potential for serious injury or death.
 Caution	This symbol reminds the user to take caution due to the potential for damage to the valve if used in such a manner.
	Prohibited: When operating the valve, this symbol indicates an action that should not be taken.
	Mandatory action: When operating the valve, this symbol indicates mandatory actions that must be adhered to.

1. Be sure to read the following warranty clauses of our product




- Always observe the specifications of and the precautions and instructions on using our product.
- We always strive to improve product quality and reliability, but cannot guarantee perfection. Therefore, should you intend to use this product with any equipment or machinery that may pose the risk of serious or even fatal injury, or property damage, ensure an appropriate safety design or take other measures with sufficient consideration given to possible problems. We shall assume no responsibility for any inconvenience stemming from any action on your part without our written consent in the form of specifications or other documented approval.
- The related technical documents, operation manuals, and other documentation prescribe precautions on selecting, constructing, installing, operating, maintaining, and servicing our products. For details, consult with our nearest distributor or agent.
- Our product warranty extends for one and a half years after the product is shipped from our factory or one year after the product is installed, whichever comes first. Any product abnormality that occurs during the warranty period or which is reported to us will be investigated immediately to identify its cause. Should our product be deemed defective, we shall assume the responsibility to repair or replace it free of charge.
- Any repair or replacement needed after the warranty period ends shall be charged to the customer.
- The warranty does not cover the following cases:
 - (1) Using our product under any condition not covered by our defined scope of warranty.
 - (2) Failure to observe our defined precautions or instructions regarding the construction, installation, handling, maintenance, or servicing of our product.
 - (3) Any inconvenience caused by any product other than ours.
 - (4) Remodeling or otherwise modifying our product by anyone other than us.
 - (5) Using any part of our product for anything other than the intended use of the product.
 - (6) Any abnormality that occurs due to a natural disaster, accident, or other incident not stemming from something inside our product.
- * Note that damage induced by a defect of our product is not covered by warranty.
- This guarantee applies to the use of our product only in Japan. If it is used overseas, please inquire with us separately.

2. General operating instructions

 Warning	
	<ul style="list-style-type: none"> - A ball-type valve structurally has a dead space. Be careful of volatile liquids such as hydrogen peroxide solution and sodium hypochlorite because those liquids may turn into gas in the dead space and cause an abnormal rise of pressure in the valve. The gas that causes an abnormal rise of inner pressure through vaporization is compressible fluid. So, if the valve breaks, its fragments explosively scatter, and it is very dangerous.
	<ul style="list-style-type: none"> - Using a positive-pressure gas with our plastic piping may pose a dangerous condition due to the repellent force particular to compressible fluids even when the gas is under similar pressures used for liquids. Therefore, be sure to take the necessary safety precautions such as covering the piping with protective material. For inquiries, please contact us. - For conducting a leak test on newly installed piping, be sure to check for leaks under water pressure. If absolutely necessary to use a gas in testing, please consult your nearest service station beforehand.

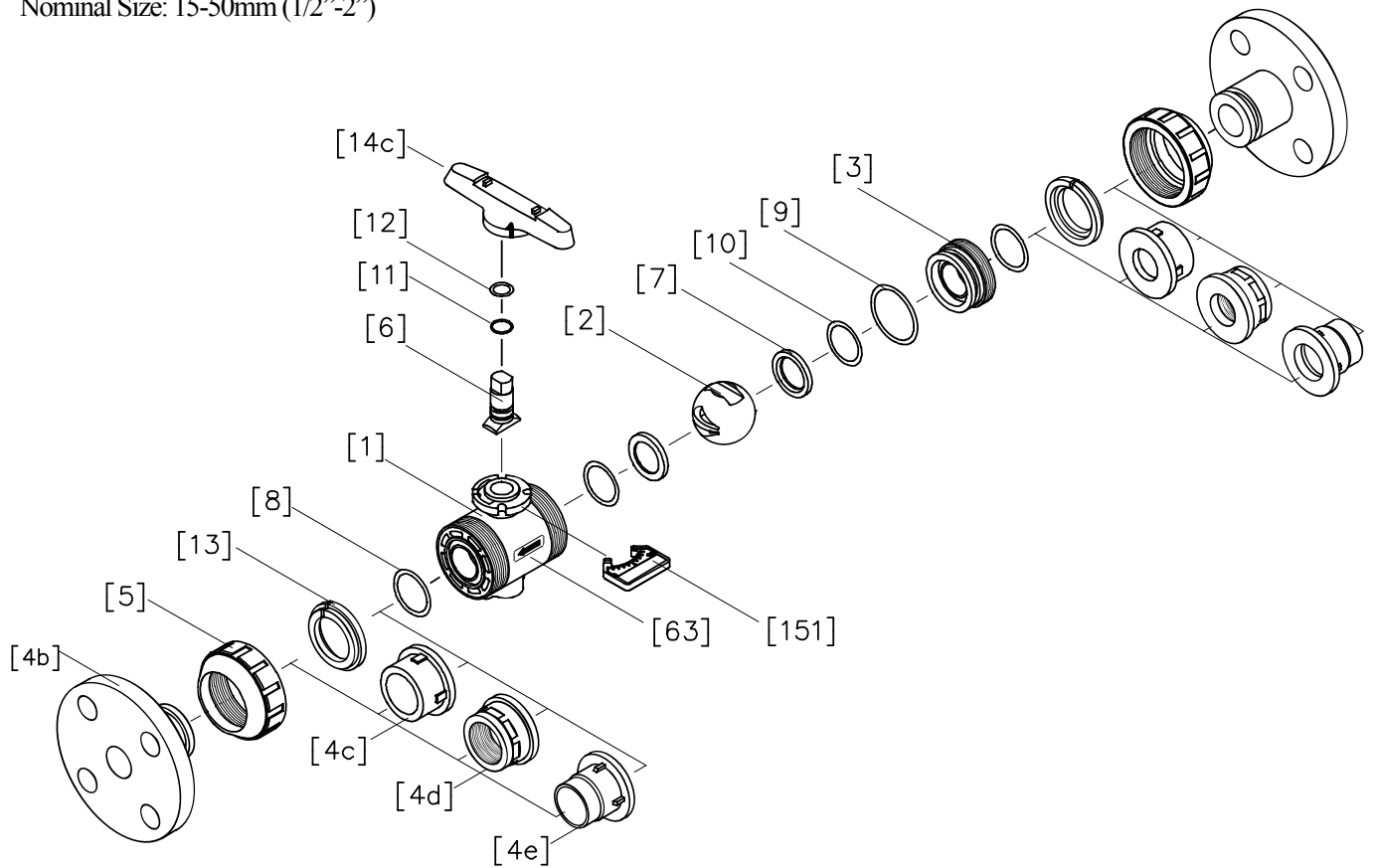
 Caution	
	<ul style="list-style-type: none"> - Do not step on or apply excessive weight on valve. (It can be damaged.) - Do not apply excessive force and shock to the indicator. (Failure to so may cause damaged.) - Keep the valve away from excessive heat or fire. (It can be damaged, or destroyed.) - Do not use the valve to fluid containing slurry. (The valve will not operate properly.)
	<ul style="list-style-type: none"> - Always operate the valve within the pressure vs. temperature range. (The valve can be damaged or deformed by operating beyond the allowable range.) - Select a valve material that is compatible with the media. For chemical resistance information, refer to “CHEMICAL RESISTANCE ON ASAHI AV VALVE”. (Some chemicals may damage incompatible valve materials.) - Allow sufficient space for maintenance and inspection. - Do not use the valve in conditions where the fluid may have crystallized. (The valve will not operate properly.) - Keep the valve out of direct sunlight, water and dust. Use cover to shield the valve. (The valve will not operate properly.) - Perform periodic maintenance. (Leakage may develop due to temperature changes or over periods of prolonged storage, rest or operation.) - Because the edge of the ball opening remains on the seat (PTFE) when always used at an intermediate opening, so that leaks may be caused at the time of full closing. - Please use the indicator as a guide for valve opening.

3. General instructions for transportation, unpacking and storage

 Caution	
	<ul style="list-style-type: none"> - This valve is not designed to handle impacts of any kind. Avoid throwing or dropping the valve. - Avoid scratching the valve with any sharp object. - Do not over-stack cardboard shipping boxes. Excessively stacked packages may collapse. - Avoid contact with any coal tar, creosote, insecticides, vermicides or paint. (These chemicals may cause damage to the valve.) - When transporting a valve, do not carry it by the handle.
	<ul style="list-style-type: none"> - Store products in their corrugated cardboard boxes. Avoid exposing products to direct sunlight, and store them indoors (at room temperature). Also avoid storing products in areas with excessive temperatures. (Corrugated cardboard packages become weaker as they become wet with water or other liquid. Take care in storage and handling.) - After unpacking the products, check that they are defect-free and meet the specifications.

4. Name of parts

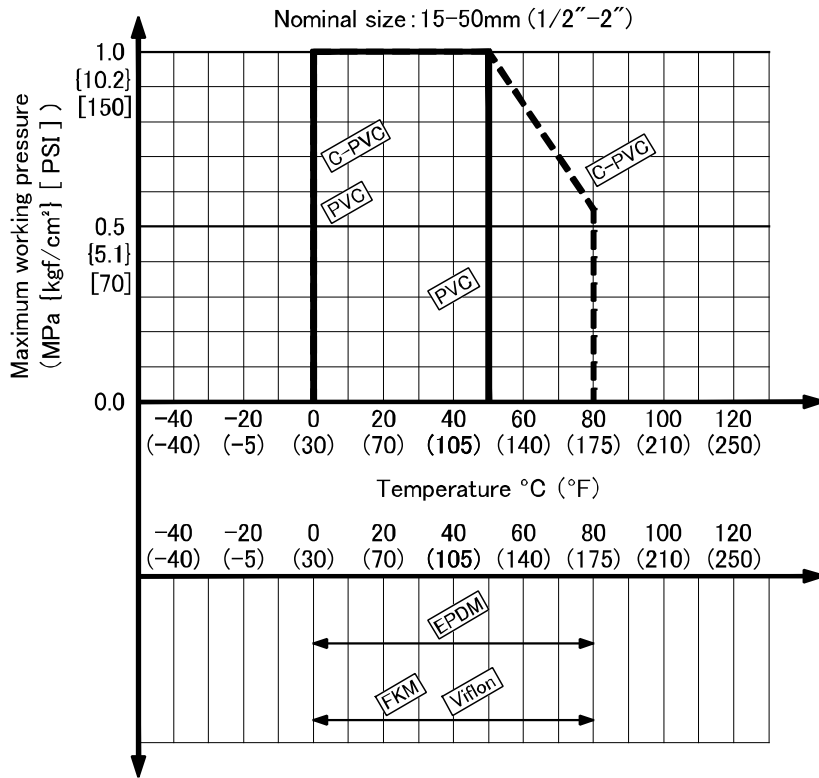
Nominal Size: 15-50mm (1/2"-2")



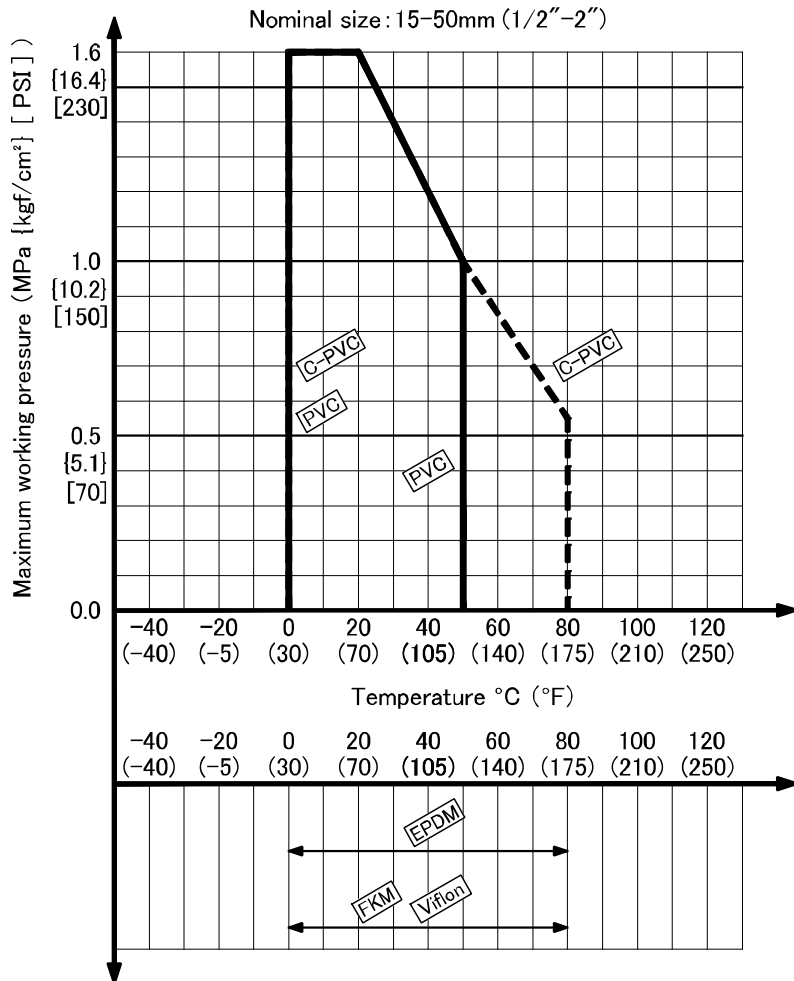
No.	DESCRIPTION	No.	DESCRIPTION
[1b]	Body	[8]	O-ring (A)
[2]	Ball (for flow control type)	[9]	O-ring (B)
[3]	Carrier	[10]	O-ring (C)
[4b]	End connector (Flanged End)	[11]	O-ring (D)
[4c]	End connector (Socket End)	[12]	O-ring (E)
[4d]	End connector (Threaded End)	[13]	Stop ring
[4e]	End connector (Spigot End)	[14c]	Handle (for flow control type)
[5]	Union nut	[151]	Indicator (for flow control type)
[6]	Stem	[63]	Flow indicative seal
[7]	Seat		

5. Maximum working pressure vs. temperature

* Other than DIN standard and ANSI standard



* DIN standard and ANSI standard



6. Specification of valves

Nominal size	Body material	
	PVC	C-PVC
15-50mm (1/2"-2")	Type21α	

7. Installation procedure

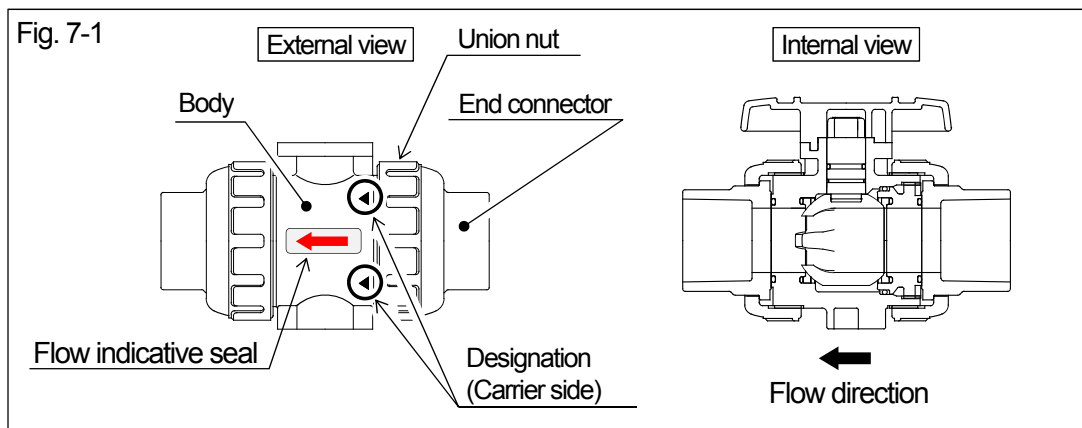
⚠ Caution



- When installing a pipe support by means of a U-type clamp or something similar, take care not to over-tighten. (Excessive force may damage the pipe.)
- Take care not to over-tighten the Union Nut. (The valve can be damaged.)
- Do not use the pipe wrench. (The valve can be damaged.)





- Be sure to conduct a safety check on all hand and power tools to be used before beginning work.
- When conducting piping work, wear personal protective equipment appropriate to the contents of work. (Failure to do so may cause an injury.)
- When installing pipes and valves, ensure that they are not subjected to tension, compression, bending, impact, or other excessive stress.
- When installing, disassembling, or reassembling the piping, fix the End Connector.
- Before a water test, be sure that the Union Nut is tightly fastened.
- Please tighten the union nut after fully closing the valve. (Because the edge of the ball opening remains on the seat (PTFE), so that leaks may be caused at the time of full closing.)
- Fasten the Union Nut while avoiding the parallelism and axial misalignment of the flange surface.
- When installing a piece of equipment at the end of the piping line, be sure to keep the secondary (Downstream) End Connector and Union Nut installed on the valve.
- Piping with care in the flow direction. (Align the flow direction with the arrow of the flow indicative seal. Refer to Fig. 7-1.)
- When installing Ball Valve, note the direction of flow. (Find the mark ◀ molded on the Carrier-side body. On the secondary (Downstream) side, the Carrier is integral with the valve body. This is the preferred method if installation when installing the equipment at the end of the line for safety purposes. Refer to Fig. 7-1.)



- When connecting a ASAHI AV Valve to metal piping, take care not to let the pipe stress on the ASAHI AV Valve.
- When screwing in a Metal Insert (Ensat), install it vertically. Refer to the User's Manual for Metal Insert (Ensat) by the Maker.

Flanged end

⚠ Caution

	- Do not tighten the bolt & nut above the specified torque value. (The valve can be damaged or leaks.)
	<ul style="list-style-type: none"> - Use flat faced flanges for connection to AV Valves. - Ensure that the mating flanges are of the same standards. - Be sure to use sealing gaskets (AV Gasket), bolts, nuts, and washers and tighten them to specified torques. (When a non-AV gasket is used, a different tightening torque instruction should be followed.) - The parallelism and axial misalignment of the flange surface should be under the specified values to prevent damage the valve. (A failure to observe them can cause destruction due to stress application to the pipe.)

Necessary items

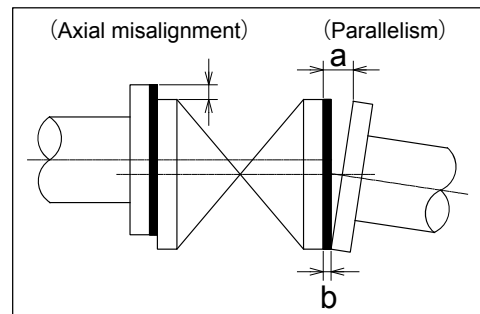
- Torque wrench
- Spanner wrench
- AV gasket
- Bolt, Nut, Washer (For many flanges specification)

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 by hand.
- 3) Tighten the bolts and nuts gradually with a torque wrench to the specified torque level in a diagonal manner. (Refer to Fig.7-1.)
- 4) Tighten it more than 2 turns clockwise with specified torque.

Specified values for parallelism & axial misalignment

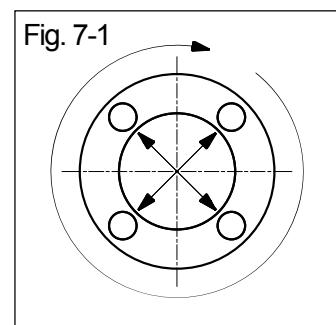
Nominal size	Axial misalignment	Parallelism (a-b)
15~32mm (1/2"-1 1/4")	1.0 mm {0.04 inch}	0.5 mm {0.02 inch}
40, 50mm (1 1/2", 2")	1.0 mm {0.04 inch}	0.8 mm {0.03 inch}



Specified torque value

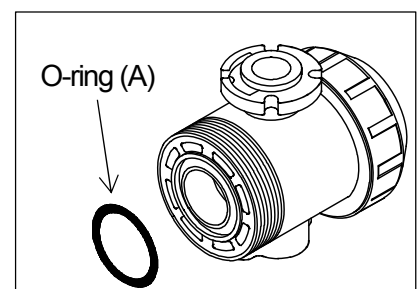
Unit: N-m {kgf-cm} [lb-inch]

Nom. size	15, 20mm (1/2", 3/4")	25~40mm (1"-1 1/2")	50mm (2")
AV gasket material			
PTFE coted	17.5 {179}	20.0 {204}	22.5 {230}
PVDF coted	[155]	[177]	[200]
Rubber	8.0 {82}	20.0 {204}	22.5 {230}
	[71]	[177]	[200]






* When Union nut is loosened or removed, please install in the following way.

- 1) Fully close the valve.
- 2) Make sure that the O-ring (A) is properly mounted to the body.
- 3) Set the End connector directly on the body without allowing the O-ring (A) to come off.
- 4) Tighten Union nut on each valve until hand tight.
- 5) Using a strap wrench tighten Union nuts uniformly on each side approx. 90°-180°turns, 1/4 to 1/2 turns.



Threaded end

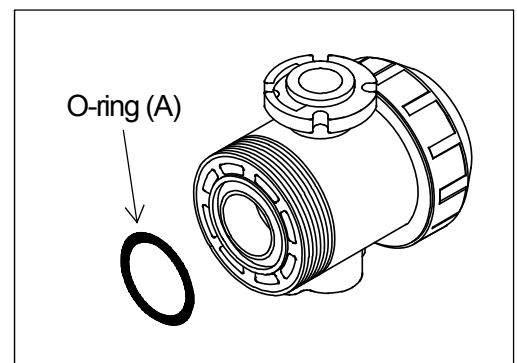
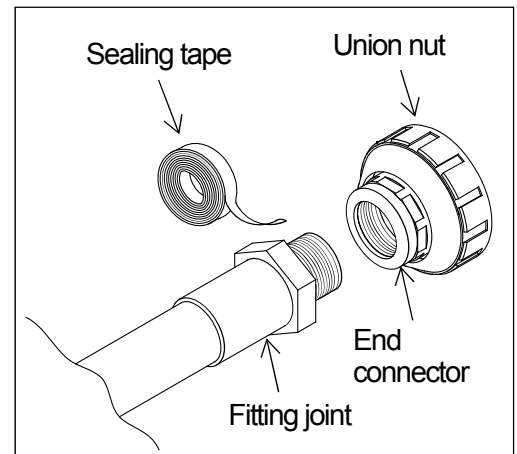
 Caution	
	- Avoid excessive tightening. (The valve can be damaged.)
	<ul style="list-style-type: none"> - The union nut of this product is fastened lightly so that it can be loosened easily. Be sure to remove the end connector before carrying out the work. (Failure to do so may cause external leakage.) - Make sure that the threaded connections are plastic x plastic. (Metallic thread can cause damage.) - Wrap the threaded joints on our plastic piping with sealing tape. Using a liquid sealing agent or liquid gasket may cause stress cracks (Environmental Stress Cracking). Our product warranty shall not apply in case of said use, even when said use is unavoidable.

Necessary items

- Sealing tape
- Strap wrench
- Spanner wrench or Monkey wrench

Procedure

- 1) Fully close the valve.
- 2) Wind a sealing tape around the external thread of joint, leaving the end (about 3mm) free.
- 3) Loosen the union nut with a strap wrench.
- 4) Remove the union nut and the end connector.
- 5) Tighten the male thread of fitting and the female thread of valve hardly with hand.
- 6) Using a Spanner wrench or Monkey wrench, screw in the end connector by turning 180° -360° carefully without damaging it.
- 7) Make sure the valve is fully closed.
- 8) Make sure that the O-ring (A) is mounted to the valve body.
- 9) Set the end connector and union nut directly on the body without allowing the O-ring (A) to come off.
- 10) Tighten Union nut on each valve until hand tight.
- 11) Using a strap wrench tighten Union nuts uniformly on each side approx. 90°- 180°turns, 1/4 to 1/2 turns.



Socket end

Warning



- When using an adhesive, ventilate the space sufficiently, prohibit the use of a fire in the vicinity, and do not inhale adhesive vapors directly.

Caution



- Do not apply more adhesive than necessary. (The valve can be damaged due to solvent cracking.)
 - Do not under any circumstances try to insert a pipe into another fitting or valve by striking it. (Which may break the piping.)



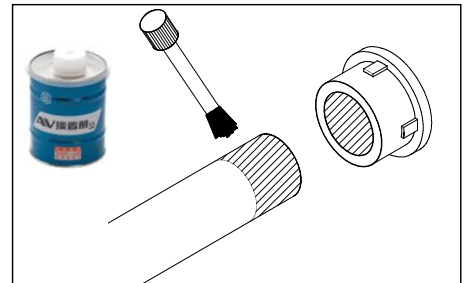
- If an adhesive gets into contact with your skin, wash it off immediately. If you feel sick or find anomaly, receive a physician's diagnosis and take appropriate measures promptly.
 - Take care in doing work at low temperatures. Solvent vapors are hard to evaporate and are likely to remain. (Solvent cracks may occur, damaging the equipment.)
 - After assembling the piping system, open both ends of the piping and use a fan (of the Low-pressure Type) or something similar to ventilate the space, thus removing the solvent vapors.
 - Use the appropriate Asahi AV cement.
 - Do not apply more adhesive than necessary. (The valve can be damaged due to solvent cracking.)
 - The union nut of this product is fastened lightly so that it can be loosened easily. Be sure to remove the end connector before carrying out the work. (Failure to do so may cause external leakage.)
 - Conduct a water test at least 24 hours after joining the pipes with an adhesive.

Necessary items

- Asahi AV cement
- Strap wrench
- Waste cloth

Procedure

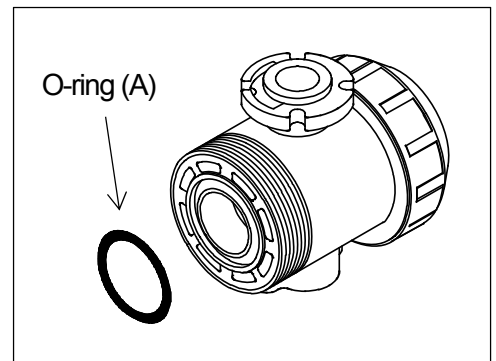
- 1) Fully close the valve.
- 2) Loosen the Union nut with a strap wrench.
- 3) Remove the Union nut and the End connector.
- 4) Lead the Union nut through the pipe.
- 5) Make sure the hub part of the End connector is clean with waste cloth.
- 6) Apply adhesive evenly to the hub part of the End connector and the pipe spigot.



Adhesive quantity (guideline)

Nominal size	15mm (1/2")	20mm (3/4")	25mm (1")	32mm (1 1/4")	40mm (1 1/2")	50mm (2")
Quantity (g) [oz]	1.0 [0.035]	1.3 [0.046]	2.0 [0.071]	2.4 [0.085]	3.5 [0.123]	4.8 [0.169]

- 7) After applying adhesive, insert the pipe quickly to the End connector and leave it alone for at least 60 seconds.
- 8) Wipe away overflowing adhesive.
- 9) Make sure the valve is fully closed.
- 10) Make sure that the O-ring (A) is properly mounted to the body.
- 11) Set the End connector directly on the body without allowing the O-ring (A) to come off.
- 12) Tighten Union nut on each valve until hand tight.
- 13) Using a strap wrench tighten Union nuts uniformly on each side approx. 90°- 180°turns, 1/4 to 1/2 turns.



Spigot end (DIN/PVC only)

Caution



- The Union nut of this product is fastened lightly so that it can be loosened easily. Be sure to remove the End connector before carrying out the work. (Failure to do so may cause external leakage.)

Necessary items



- Strap wrench
- Sleeve welder or automatic welding machine
- User's manual for sleeve welder or automatic welding machine

Procedure

- 1) Fully close the valve.
- 2) Loosen the Union nut with a strap wrench.
- 3) Remove the Union nut and the End connector.
- 4) Lead the Union nut through the pipe.
- 5) For the next step, refer to the user's manual for the sleeve welder or the automatic welding machine.
- 6) After welding, make sure the valve is fully closed.
- 7) Make sure that the O-ring (A) is properly mounted to the body.
- 8) Set the End connector directly on the body without allowing the O-ring (A) to come off.
- 9) Tighten Union nut on each valve until hand tight.
- 10) Using a strap wrench tighten Union nuts uniformly on each side approx. 90°- 180° turns, 1/4 to 1/2 turns.

8. Operating procedure

Caution

	<ul style="list-style-type: none"> - Do not exert excessive force in open/close the valve. (The hand wheel can be damaged.) - Do not apply shock to the indicator. (Failure to so may cause damaged.) - Do not open/close the valve when foreign matters such as dust are included in fluid.
	<ul style="list-style-type: none"> - When operating the handle, be sure to do so with your hand. (Using a tool may damage the hand wheel.) - Before opening or closing a lubricant free product, be sure to apply water. - Please use the indicator as a guide for valve opening.

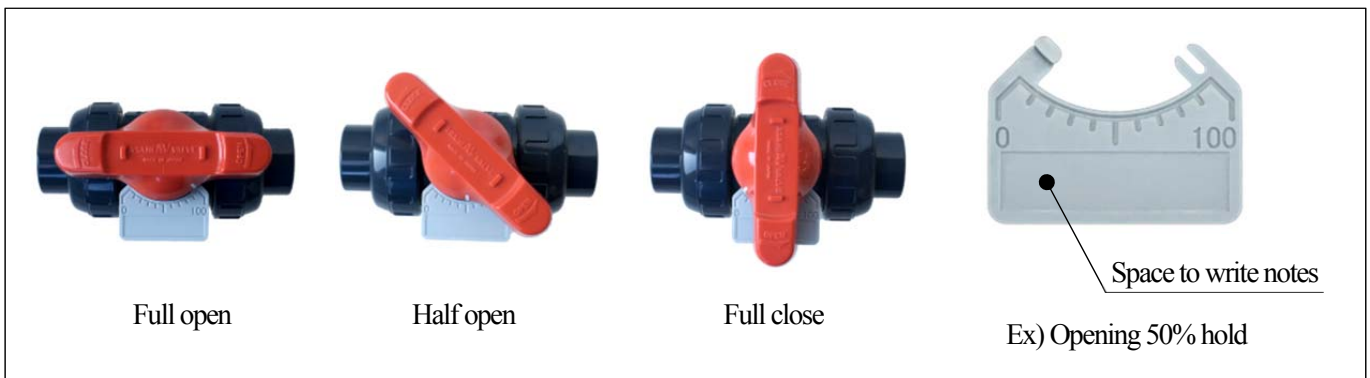
○ Turn the hand wheel to open and close. Turning it clockwise will close it, turning it counter-clockwise will open it.

Fully closed; the position of the handle should be perpendicular to the pipe.

Fully opened; the position of the handle should be parallel to the pipe.

[Note 1]


There is space to write notes on the indicator. It is used for display of setting opening etc.



[Note 2]

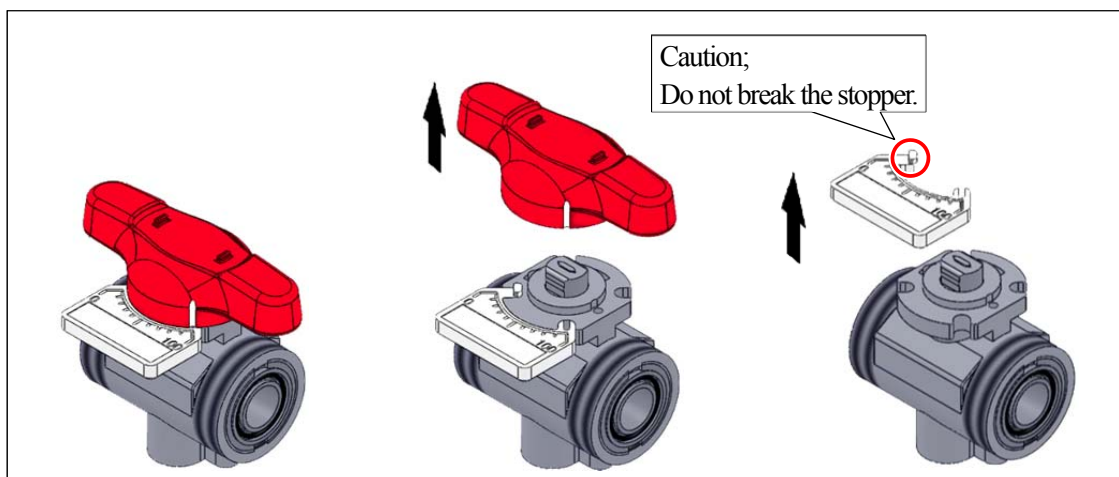
The indicator can be attached or removed as follow ways.

Caution

	<p>-Be careful not to damage the stopper of indicator. (The indicator cannot be attached.)</p>
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How to remove the indicator

- 1) Remove the handle.
- 2) Remove the indicator.



9. Disassembling method for replacing parts

Warning



-Be sure to conduct a safety check on all hand and power tools to be used before beginning work.

Caution



Take care not to over-tighten the Union Nut. (The valve can be damaged.)
Do not use the pipe wrench. (The valve can be damaged.)



- If you do work with the piping installed, drain the piping of all its fluid. Some fluid will remain in the valve. Therefore wear protective goggles and protective gloves. (You may otherwise get injured.)
- When attaching a seat, confirm the front and rear sides of the seat.
- When attaching a ball, confirm the flow direction. (Refer to Fig. 7-1 of “7. Installation procedure”.)
- Please tighten the union nut and carrier after fully closing the valve. (Because the edge of the ball opening remains on the seat (PTFE), so that leaks may be caused at the time of full closing.)

Necessary items

● Strap wrench

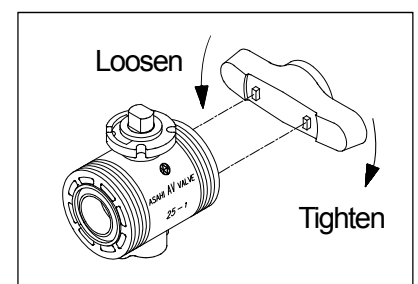
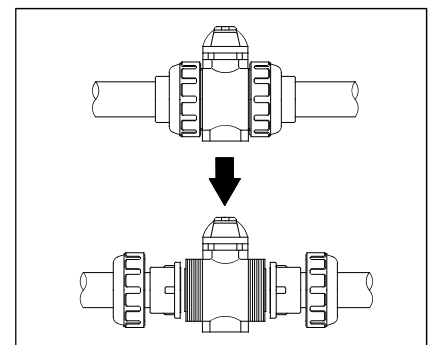
● Safety goggles

● Protective gloves

<Disassembly>

Procedure

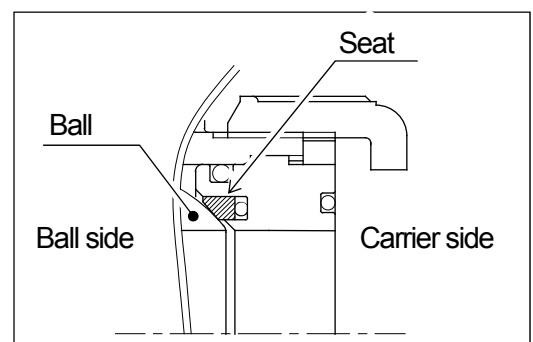
- 1) Half open the valve.
- 2) Completely discharge fluid from pipes.
- 3) Turn the handle to full close.
- 4) Loosen the right union nut and the left one with a strap wrench.
- 5) Remove the body part from pipe line.
- 6) Half open the valve, drain the fluid completely, and then fully close the valve.
- 7) Remove the O-ring (A) from the valve body part.
- 8) Pull the handle off the valve body part.
- 9) Remove the indicator from the body.
- 10) Engage the upper convex part of the handle with the concave part of the carrier.
- 11) In the engaged state, turn the handle clockwise to loosen it and remove the carrier.
- 12) Remove the seat, O-ring (B), and O-ring (C) from the carrier.
- 13) Push out the ball by hand.
- 14) Push out the stem from the top flange side to the body side.
- 15) Remove the seat and O-ring (B) from the valve body.
- 16) Remove the O-ring (D) and O-ring (E) from the stem.



<Assembly>

Procedure

- 1) Carry out the assembly work in the reverse procedure from item 16).
 - When attaching a seat, confirm the front and rear sides of the seat.
(Dent side is in contact with the ball)
 - When attaching a ball, confirm the flow direction.
(Refer to Fig. 7-1 of “7. Installation procedure”.)



10. Mounting insert-metal and base (Panel)

⚠ Caution

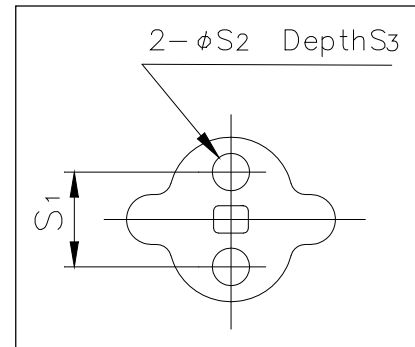


- When screwing in a Metal Insert (Ensat), install it vertically.
- Refer to the User's Manual for Metal Insert (Ensat) by the maker.

○ **Attach Metal insert to the bottom stand.**

Procedure

Refer to the user's manual for the Metal Insert. (Commercially available)



Bottom stand dimension

Unit; mm [inch]

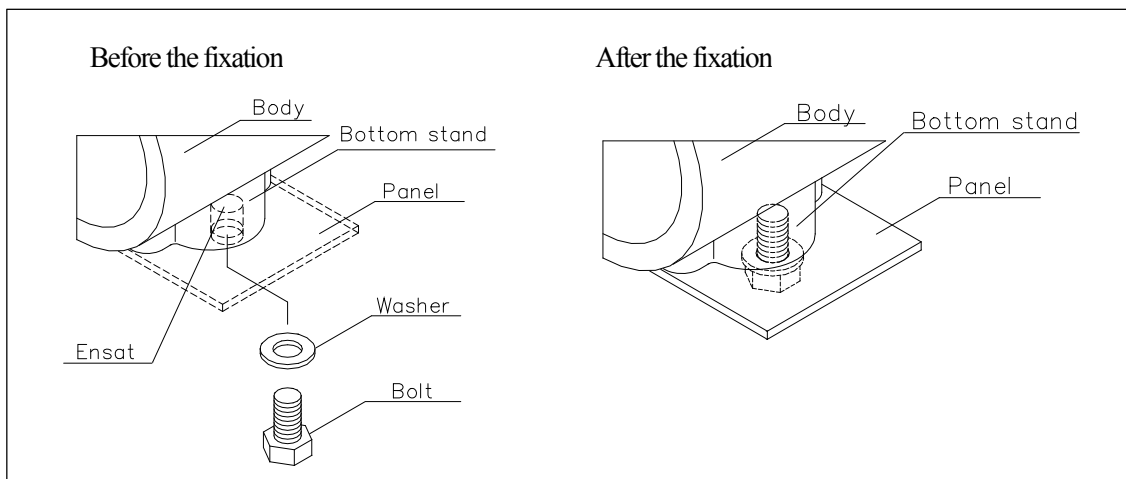
Nominal Size	S1	S2	S3
15mm (1/2")	19 [0.75]	7.3 [0.29]	11 [0.43]
20mm (3/4")	19 [0.75]	7.3 [0.29]	11 [0.43]
25mm (1")	19 [0.75]	7.3 [0.29]	11 [0.43]
32mm (1 1/4")	30 [1.18]	9 [0.35]	15 [0.59]
40mm (1 1/2")	30 [1.18]	9 [0.35]	15 [0.59]
50mm (2")	30 [1.18]	9 [0.35]	15 [0.59]

Metal insert (Ensat) specification

Nominal Size	Screw size	Length	Material
15mm (1/2")	M5	10mm [0.39]	Brass
20mm (3/4")	M5	10mm [0.39]	
25mm (1")	M5	10mm [0.39]	
32mm (1 1/4")	M6	14mm [0.55]	
40mm (1 1/2")	M6	14mm [0.55]	
50mm (2")	M6	14mm [0.55]	

Maker; Kerb-Konus-Vertriebs-GmbH

○ **Fixation of bottom stand with panel**



11. Inspection items

Caution



- Perform periodic maintenance. (Leakage may develop due to temperature changes or over periods of prolonged storage, rest or operation.)

○ Inspect the following items.

(1)	Check for any flaw, cracks, or deformation on the outside.
(2)	Check whether fluid leaks to the outside.
(3)	Check whether the union nut has been loosened.
(4)	Check whether the handle can be operated smoothly.

12. Troubleshooting

Problem	Cause	Treatment
Fluid leaks to the outside.	The union nut is loosened.	Tighten the union nut.
	The O-ring protrudes from the groove.	Replace the O-ring with a new one.
	The O-ring is scratched or worn.	
	The sliding face or the fixed face of the O-ring is scratched or worn.	Replace scratched parts with new one.
The handle cannot be turned smoothly.	Foreign matter is in the valve.	Clean up.
	Valve torque is increasing due to piping stress.	Remove the piping stress.
	The torque is increased by the influence (temperature, components, pressure) of fluid on the valve.	Check the service condition.
	The carrier is tightening too much.	Adjust the carrier.
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.

13. Handling of residual and waste materials

Warning



- Make sure to consult a waste treatment dealer for recommendations on the proper disposal of plastic valves. (Poisonous gas is generated when the valve is burned improperly.)

Ball Valve Type 21 α
(Flow control type)
15-50mm (1/2~2")

ASAHI YUKIZAI CORPORATION



Distributor

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