



Ball valve Type 21/Type 21 α Pneumatic Actuated Type TA 15~100mm

User's Manual



Thank you for choosing our product.

This instruction manual contains important information for safe use of our product, so please be sure to read it before handling the product.

After reading this manual, please be sure to keep it in a place where the user can see it at any time.

ASAHI YUKIZAI CORPORATION



-SAFETY PRECAUTIONS-

This instruction manual is written on the assumption that the person who handles our products has a basic knowledge of our products, electrical equipment, machinery, control, etc., and it contains technical terms depending on the handling contents.

Please read this manual carefully and fully understand the contents and observe the safety precautions for proper use.

In this manual, the warning, caution, prohibition, and enforcement are categorized together with the symbol to inform the situation and scale of human injury or property damage.

Failure to observe this precaution may result in unexpected failure or damage. Be sure to observe this precaution.

<WARNING/CAUTION indications>

A Warraina	Indicates a potentially hazardous situation which, if not avoided, could result in death
⚠Warning	or serious injury.
 Caution	Indicates a potentially hazardous situation which, if not avoided, may result in minor
Caution	or moderate injury or property damage.

<Prohibited/Forced display>

Prohibition	In the handling of the product, it is prohibited to do it in "Do not do it".
Forcing	In the handling of the product, it is forced by "contents to be carried out without fail".



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1. Our product warranty coverage

Unless otherwise stated in the Contract or Specifications, etc., the warranty for the piping material products (hereinafter referred to as "applicable products") such as valves manufactured or sold by us is as follows.

Applicable to

This warranty applies only when the product is used in Japan. If you intend to use the product overseas, please contact us.

Warranty Period

The warranty period is one year after delivery.

Guaranteed range

In the event of failure or malfunction due to our responsibility during the above warranty period, we will replace or repair the product with a substitute free of charge.

Provided, however, that even within the warranty period, the warranty shall not apply to any of the following cases (charged service).

- ▶ When the storage, operating conditions, precautions, etc. described in the specifications, instruction manual, etc. are not adhered to in the construction, installation, handling, maintenance, etc.
- ▶ Defects, such as the design of the customer's equipment or software, caused by other than the target product.
- ▶ The fault is due to modification or secondary processing of the product by something other than us.
- ▶ In the case of a failure which can be deemed to have been avoided if the periodic inspection described in the instruction manual, etc. or the maintenance or replacement of consumable parts has been performed normally.
- ▶ The component is used for purposes other than the product's intended use.
- ▶ Failure or malfunction due to causes that could not be foreseen by our level of science and technology at the time of shipment.
- ▶ The fault is due to an external factor that is not our responsibility, such as natural disaster or disaster.

Disclaimer

- ▶ The warranty will not cover secondary damage (damage to equipment, loss of opportunity, loss of profit, etc.) or any other damage caused by the failure of our product.
- ▶ Although we strive to improve the quality and reliability of our products, we do not guarantee their integrity. Especially when using this product for equipment that may infringe human life, body or property, take appropriate safety design measures, etc., with full consideration of problems that may normally occur. We assume no responsibility for such use if we have not obtained our consent in advance in writing of specifications, etc.
- ▶ Please observe the product specifications and precautions when using our products. We shall not assume any responsibility for any damage to the customer caused by the customer's negligence. However, this does not apply to damage caused by a defect in our product.



2. Safety Instructions

Unpacking, Transportation and Storage





Prohibition

Serious injury can result.

▶ When hanging or slinging a valve, pay sufficient attention to safety, and do not enter under the load.

⚠ Caution



Prohibition

The valve can be damaged, or leak.

- ▶ Do not subject the product to impact by throwing, dropping or hitting.
- ▶ Do not scratch or pierce the product with a sharp object such as a knife or hand hook.
- ▶ Do not pile up cardboard boxes forcefully to prevent the load from collapsing.
- ► Avoid contact with coal tar, creosote (a wood preservative), white pesticides, insecticides, paints, etc.



Forcing

The valve can be damaged, or leak.

- ► Keep in cardboard until just before piping, and store indoors (at room temperature) away from direct sunlight. Also, avoid storing the product in places of high temperature. (The strength of cardboard packaging decreases when it gets wet. Be very careful when storing and handling it.)
- ► After unpacking, make sure that the product is correct and that it meets the specifications.



Handling of products

⚠Warning						
Prohibition	 Serious injury can result. ▶ Do not disassemble the actuator. ▶ Do not touch moving parts during operation with hands, feet or tools. 					
Forcing	 There is a danger of injury. If positive pressure gas is used for our resin piping material, a dangerous condition may occur due to the repulsive force peculiar to compressible fluids even if the pressure is the same as the water pressure. Therefore, be sure to take safety measures for the surrounding area, such as covering the piping with protective materials. If you have any questions, please contact us separately. This valve is structurally dead space. Vaporizing fluids such as hydrogen hydroxide (H₂O₂) and soda hypochlorite (NaClO) may vaporize in the dead space and cause an abnormal pressure rise inside the valve. Be very careful. (Gas with abnormal pressure increase due to vaporization is a compressible fluid. Therefore, if a valve should break, fragments will scatter explosively, which is very dangerous.) When conducting a pipe leak test after completion of piping construction, be sure to check with water pressure. Contact us in advance if you are unavoidable to test with a gas. 					

O Prohibition	 The valve can be damaged, or leak. ▶ Do not step on the valve or place heavy objects on it. ▶ Keep away from fire and hot objects. ▶ Do not use the product in places where it may be submerged. ▶ Do not subject the valve to large vibrations. 					





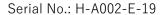


There is a danger of injury.

► Secure sufficient space for maintenance and inspection when piping.

The valve can be damaged, or leak.

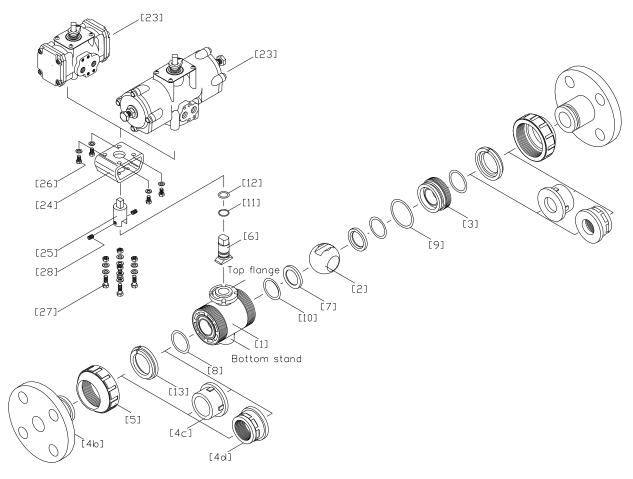
- ▶ Use the supplied handle or a tool specified by the manufacturer for manual operation.
- When performing manual operation, make sure that the actuator is not operated by the motor.
- Secure sufficient space for maintenance and inspection when piping.
- ► Check the voltage on the power supply and nameplate before use.
- ▶ Pay attention to the atmosphere where the valve is installed. Avoid locations where the product is exposed to sea breezes, corrosive gases, chemical liquids, sea water, steam, etc.
- Keep the pressure and temperature of the fluid within the allowable range. (The maximum allowable pressure includes water hammer pressure.)
- ▶ Use a valve of suitable material for the operating conditions. (Depending on the type of chemical liquid, the parts may be damaged. Contact us in advance for details.)
- Use fluids containing crystalline material under conditions that do not recrystallize.
- ▶ Avoid any place where the valve is constantly exposed to splashes of water and dust, or direct sunlight, or protect the valve with a cover or the like to cover the entire area.
- ▶ Perform maintenance on a regular basis referring to "11. Inspection items." Pay particular attention to temperature changes and aging during long-term storage or shutdown or use.
- ▶ If internal leakage occurs when the valve is fully closed, adjust the stopper.
- ▶ When installing a valve, provide an appropriate valve support so that excessive force is not applied to the valve and piping.
- ► Always use the product within the indicated product specifications.
- ▶ If the valve is used at an intermediate position, the mark of the ball opening will remain on the seat (PTFE), and sealing performance may temporarily deteriorate when the valve is fully closed. Therefore, it is recommended to use the valve fully open or closed.
- If you notice an unusual odor, heat, or smoke, immediately turn off the power supply. If any abnormality is found, be sure to consult your dealer or us for inspection.
- ▶ Keep the ambient temperature of the installation location within-10 to 50°C.
- ▶ Avoid locations with volatile gases or poor atmospheres. Provide a cover, etc., to cover the entire area.
- ▶ Use clean, dehumidified and dedusted operating air. However, please consult with us in advance when using high dry air with a dew point of-40°C or less.





3. Name of each part

DN 15~50 mm



[1]	Body *1)	[6]	Stem *1)	[13]	Stop ring
[2]	Ball *1)	[7]	Seat *1)	[23]	Actuator
[3]	Carrier *1)	[8]	O-ring (A)	[24]	Stand
[4b]	End connector (Flange type)	[9]	O-ring(B) *2)	[25]	Joint
[4c]	End connector (socket type)	[10]	O-ring(C) *2)	[26]	Bolt (A)
[4d]	End connector (Threaded end)	[11]	O-ring (D)	[27]	Bolt/nut (B)
[5]	Union nut	[12]	O-ring (E)	[28]	Screw (B)

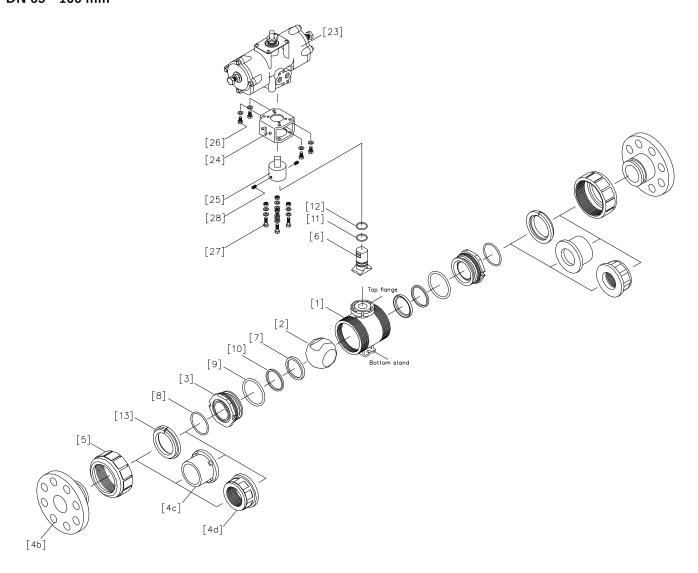
^{*1)} The 21 and 21 α types are not interchangeable.

^{*2)} The 21 and 21 α types are partially incompatible. Contact us for details.





DN 65~100 mm

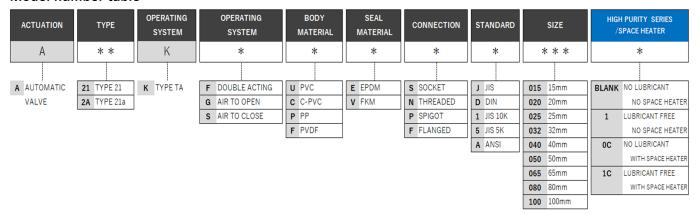


[1]	Body	[6]	Stem	[13]	Stop ring
[2]	Ball	[7]	Seat	[23]	Actuator
[3]	Carrier	[8]	O-ring (A)	[24]	Stand
[4b]	End connector (Flange type)	[9]	O-ring(B)	[25]	Joint
[4c]	End connector (socket type)	[10]	O-ring(C)	[26]	Bolt (A)
[4d]	End connector (Threaded end)	[11]	O-ring (D)	[27]	Bolt/nut (B)
[5]	Union nut	[12]	O-ring (E)	[28]	Screw (B)



4. Product Specifications

Model number table



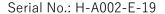
NOTE

- JIS standard socket-type of the body material PVDF is not manufactured.
- JIS standard socket-type 32mm with PP body material is not manufactured.
- Connecting method Spigot type is only DIN standard and body material C-PVC is not manufactured.

Valve

Body material Nominal size	U-PVC	C-PVC	PP	PVDF
15~50mm Type 2		21 α	Тур	e 21
65~100mm			•	

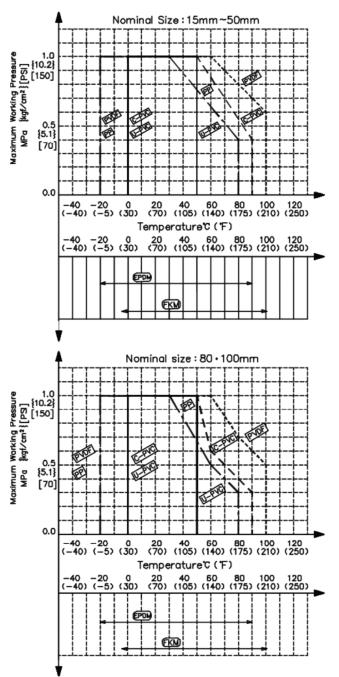
^{*}Model number differs depending on the body material.

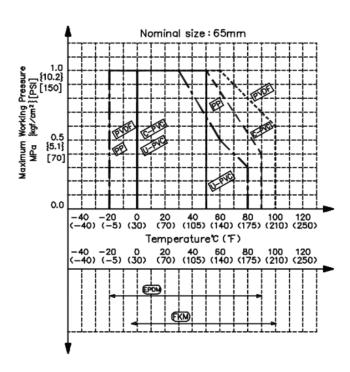




Relationship between maximum allowable pressure and temperature

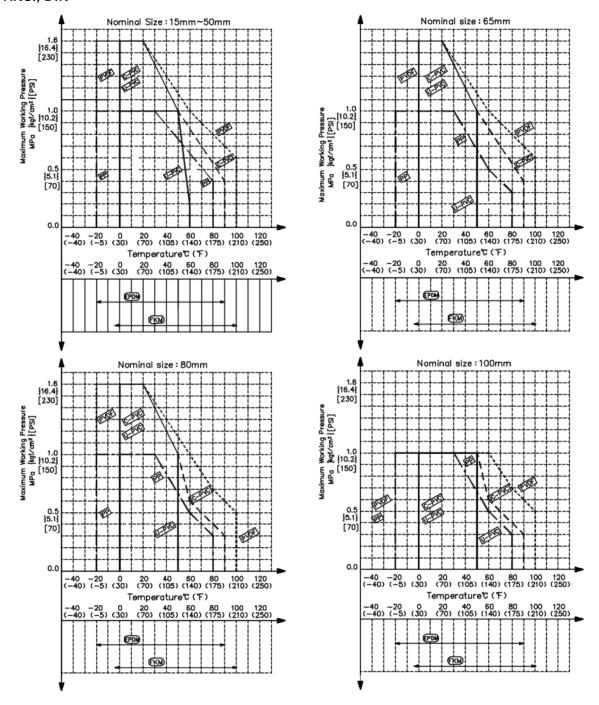








· ANSI, DIN



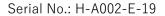


Actuator

Specifications list

Operation	Size (mm)	Actuator Model			Air supply port size
	15~32	For the angle TA2A-0402D adjustment Not possible		0.5	Rc 1/8
Double action	40,50	TA2A-050D	± 5°	0.9	Rc 1/4
	65,80	TA2A-063D	± 5°	1.7	Rc 1/4
	100	TA2A-080D	± 5°	3.2	Rc 1/4
	15~32	TA2A-0402R	For the angle adjustment Not possible	0.8	Rc 1/4
Air to open Air to close	40,50	TA2A-050R	± 5°	1.7	Rc 1/4
	65,80	TA2A-063R	± 5°	3.3	Rc 1/4
	100	TA2A-080R	± 5°	6.1	Rc 1/4

		Operating pressure	Operating temperature
Operation	Size (mm)	range	range
	, ,	(MPa {kgf/cm²})	(°C)
Double action Air to open Air to close	15~100	0.4~0.7 {4.1~7.1}	-5~60





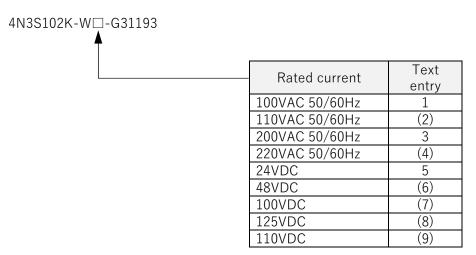
Standard option

Option name	Objectives and specifications	Remarks
Solenoid valve	· Controls opening and closing of valves	15~100mm
	· Possible to retrofit	
	 Dedicated solenoid valve plates are also required for the following products 	
	*Double acting $15\sim32$ mm($40\sim100$ mm not required)	
	*Air to open 15~100 mm	
	*Air to close 15~100 mm	
	 A silencer with a throttle valve is provided as standard at the exhaust port. 	
	· Built-in bypass valve	
Filter-regulator	· Adjust the pressure of the operation air	15~100mm
	 Only with solenoid valve can be retrofitted (single mounting is not possible) 	
Speed controller	· Adjust the actuator operation time.	15~100mm
	· Possible to retrofit	
	· Meter-out system	
Bypass valve	· Used for manual operation of return movement	15~100mm
	· Retrofit possible only without solenoid valve	
	· Built-in speed controller	
Limit switch box	· Detects open/close status of valve	15~100mm
Electro-pneumatic positioner	· Control the valve in proportion to the electric signal (DC4~20mA)	15~100mm
Empty positioner	· Control the valve in proportion to the pneumatic signal (0.02~0.1Mpa)	15~100mm
Full opening adjustment mechanism	· Can be set to any opening in the range of 0 to 45°	15~100mm
Open/close counter	 The number of times the actuator is opened/closed is counted. 	15~100mm
Manual handle	· Valve can be opened and closed during power loss	15~100mm
Metal insert (for bottom stand)	· A metal internal thread for supporting a valve	15~100mm



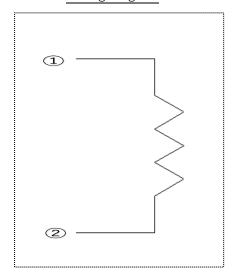
Solenoid valve specifications (option)

		-								
Operation	Nominal	Model code	Piping	Effective	Power	Additional functions				
Operation	size		port size	area	consumption	Additional functions				
Double action						○Built-in bypass valve				
Air to close	15-100mm	4N3S102K- W□-G31193			4N3S102K- W□-G31193	15-100mm	Rc 1/4	10mm ² or higher	AC:6VA DC:5.5W	○With throttle valve and
Air to open		301100				silencer (Use as a speed controller.)				

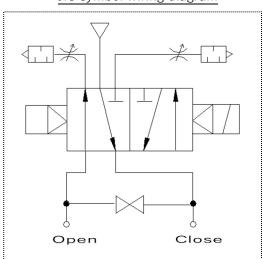


X () Appended text is a special item.

Wiring diagram



JIS symbol wiring diagram





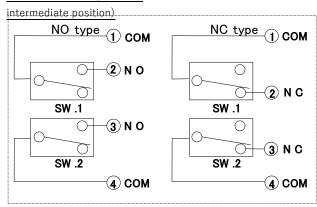
Limit switch specification (option)

Operation	Nominal size	Model code	Protection grade	Limit switch model
Double action Air to open Air to close	15~32mm	SB2-09		
Double action Air to open Air to close	40~80mm	SB2-11	IP65 equivalent	V-112-1C24 (Made of OMRON)
Double action Air to open Air to close	100mm	SB2-16		

Limit switch rating

Rated voltage	Resistance load (A)	Induction load (A)
125VAC	11	7
250VAC	11	7
125VDC	0.5	0.1
250VDC	0.25	0.04

Internal circuit diagram (at

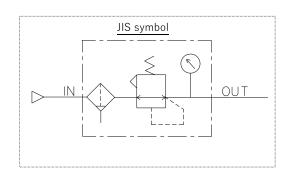


SW.1:	Contact closes when valve is closed (Double action/Air to open)
	Contact closes when valve is opened (Air to close)
SW.2:	Contact closes when valve is opened (Double action/Air to open)
	Contact closes when valve is closed (Air to close)



Specifications of pressure regulator with filter (option)

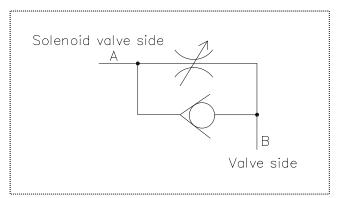
Operation	Nominal size	Model code	Piping port size	Element filtration rating
Double action	15~100mm			
Air to open Air to close	15~100mm	ARU2-02-8A-G	Rc1/4	5 μ m



Speed controller specifications (option)

Operation	Nominal size	Model code	Piping port	Effective area(mm²)		Number of needle	
Operation	Nominal Size	Model Code	size	Free flow	Control flow	rotations	
Double action	15∼32mm	SC7-06A	Rc 1/8	3.8	5.5		
Air to open Air to close						8 rotations	
Double action		SC7-08A	Rc 1/4	11	8.3		
Air to open	40~100mm						
Air to close							

JIS symbol





5. Piping method

Flange type





Prohibition

Serious injury can result.

When hanging or slinging a valve, pay sufficient attention to safety, and do not enter under the load.



Prohibition

The valve can be damaged, or leak.

- ▶ Do not overtighten the union nut.
- ▶ Do not use a pipe wrench to tighten the union nut.
- ▶ Do not tighten the bolts and nuts for piping to the specified torque values in Table 5-2.



Forcing

There is a danger of injury.

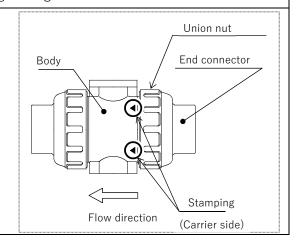
- ▶ Be sure to perform safety inspections of the machine tool and power tool beforehand.
- ▶ Wear appropriate protective equipment according to the type of work being performed.

The valve can be damaged, or leak.

- Install the product so that excessive stress such as tension, compression, bending or impact is not applied to the piping or valve.
- Fix the end connector during piping work or disassembly and reassembly.
- ▶ When attaching the valve to the end of the pipe, be sure to attach the carrier nut and end connector on the secondary side (downstream side).
- ▶ When connecting to metal piping, do not apply piping stress to the valve.
- ► Use a connection flange with a full-face seat.
- ► Check that there is no difference in mutual flange standards.
- ▶ Be sure to use a sealing gasket (AV packing) between the flanges and tighten the pipe bolts/nuts to the specified torque values in Table 5-2 "Flange tightening torque." (When other than AV packing, the tightening torque value will change.)
- ► Keep the axis misalignment and parallelism of the flange surface below the values shown in Table 5-1 "Axis misalignment and parallelism."
- ▶ Tighten the bolts and nuts for piping diagonally in accordance with Table 5-2 "Specified Torque Values for Flange Tightening."

Safe use.

► When installing the valve at the end of the pipe, pay attention to the flow direction. (Check the ◀ mark on the body of the carrier side. The carrier part of the secondary (downstream side) is integrated with the body, so if it is installed at the end of the pipe, it will be safer to use.)





Preparations

Torque Wrench

Belt wrench

wrench or ophthalmic wrench

Piping bolts, nuts, and washers

AV packing

Waste cloth

- 1) Clean mutual flange surfaces with a waste cloth.
- 2) Set AV packing between the flanges.
- **3)** Insert the washer and bolt from the connecting flange side, insert the washer and nut from the valve side, and tighten temporarily by hand.
- **4)** Set the axis misalignment and parallelism of the flange surface below the values shown in Table 5-1, "Axis misalignment and parallelism." (See Fig. 5-1.)
- **5)** Using a torque wrench, gradually tighten the screws diagonally to "Table 5-2 Flange Tightening Specified Torque Values". (See Fig. 5-2.)
- **6)** Tighten it more than two turns clockwise with "Table 5-2 Flange Tightening Torque Specified Values". (See Fig. 5-2.)
- 7) When it is necessary to loosen or remove the union nut for construction reasons, follow the procedure below to tighten the union nut.
- **7-1)** Make sure that the O-ring (A) is installed in the body correctly.
- **7-2)** Bring the end connector and union nut into contact with the body side so that the O-ring (A) does not come off.
- **7-3**) Tighten the union nut by hand until it is tight.
- **7-4)** Screw in the union nut by 1/4 to 1/2 turn with a belt wrench to prevent damage to the union nut.

Table 5-1
Axis misalignment and parallelism

Nominal size	Axis misalignment	Parallelism (a-b)	
15mm			
20mm	1.0 mm	0.5 mm	
25mm	1.0 (((((u.s mm	
32mm			
40mm			
50mm	1.0 mm	0.8 mm	
65mm	1.0 111111	0.8 mm	
80mm			
100mm	1.0 mm	1.0 mm	

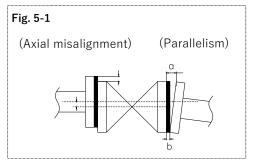
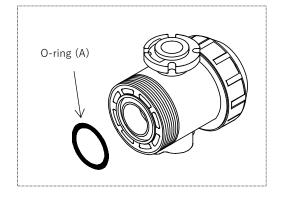
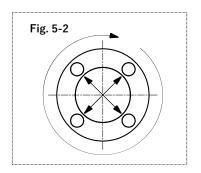


Table 5-2 Flange tightening torque

Nominal size	PTFE coating	PVDF coating	Rubber
15mm	17.5 N-m	17.5 N-m	8.0 N-m
20mm	17.3 IN-III	17.3 IN-III	0.0 11-111
25mm			
32mm	20.0 N-m	20.0 N-m	20.0 N-m
40mm			
50mm	22.5 N-m	22.5 N-m	22.5 N-m
65mm	ZZ.3 IN-III	ZZ.3 IN-III	ZZ.3 IN-III
80mm	30.0 N-m	30.0 N-m	30.0 N-m
100mm	30.0 11-111	30.0 N-M	30.0 11-111







Threaded end





Prohibition

Serious injury can result.

▶ When hanging or slinging a valve, pay sufficient attention to safety, and do not enter under the load.

⚠Caution



Prohibition

The valve can be damaged, or leak.

- ▶ Do not overtighten the screws at the joints.
- ▶ Do not overtighten the union nut.
- ▶ Do not use a pipe wrench to tighten the union nut.



Forcing

There is a danger of injury.

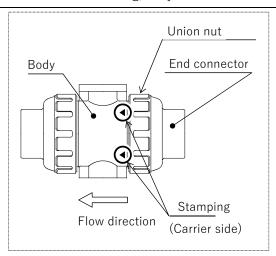
- ▶ Be sure to perform safety inspections of the machine tool and power tool beforehand.
- ▶ Wear appropriate protective equipment according to the type of work being performed.

The valve can be damaged, or leak.

- ▶ The union nut of this product is lightly tightened to make it easier to loosen. Be sure to remove the end connector before installation.
- ► Install the product so that excessive stress such as tension, compression, bending or impact is not applied to the piping or valve.
- Fix the end connector during piping work or disassembly and reassembly.
- ▶ When attaching the valve to the end of the pipe, be sure to attach the union nut and end connector on the secondary side (downstream side).
- ▶ When connecting to metal piping, do not apply piping stress to the valve.
- ► Make sure that the screws at the joints are made of resin.
- ▶ Use sealing tape for the sealing material of the screw-in part. If liquid sealant or liquid gasket is used, stress cracking (environmental stress cracking) may occur.

Safe use.

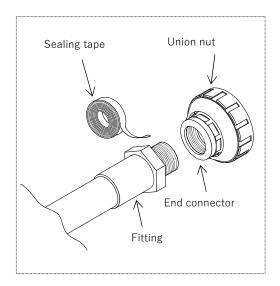
When installing the valve at the end of the pipe, pay attention to the flow direction. (Check ◀ mark on the body of the carrier side. The carrier part of the secondary side (downstream side) is integrated with the body, so if it is installed at the end of the pipe, it will be safer to use.)

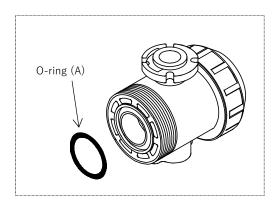




Preparations → Sealing tape ► Belt Wrench ► Spanner or an eyeglass wrench

- 1) Wrap sealing tape around the male thread of the fitting, leaving approximately 3mm at the end.
- 2) Loosen the union nut by hand.
- 3) Remove the union nut and end connector from the body.
- **4)** Tighten the male thread of the fitting and the end connector until tight.
- **5)** Screw in with a wrench or a motor wrench 1/2 to 1 turn to prevent damage to the end connector.
- **6)** Check that the O-ring (A) is correctly installed in the body.
- **7)** Bring the end connector and union nut into contact with the body side so that the O-ring (A) does not come off.
- 8) Tighten the union nut by hand until it is tight.
- **9)** Screw in the union nut by 1/4 to 1/2 turn with a belt wrench to prevent damage to the nut.







Socket-type (Adhesive)

Marning



Prohibition

Serious injury can result.

When hanging or slinging a valve, pay sufficient attention to safety, and do not enter under the load.

Fire or an explosion can result.

▶ Ensure adequate ventilation when using adhesives and do not use open flames in the surroundings.



Prohibition

There is a danger of injury.

► The adhesive contains volatile solvents, so do not inhale odors directly.

The valve can be damaged, or leak.

- ▶ Do not apply too much adhesive. Excessive adhesive will flow into the valve.
- ▶ Do not strike the pipe when inserting it into the end connector.
- ▶ Do not overtighten the union nut.
- ▶ Do not use a pipe wrench to tighten the union nut.



Forcing | There is a danger of injury.

- Be sure to perform safety inspections of the machine tool and power tool beforehand.
- Wear appropriate protective equipment according to the type of work being performed.
- ▶ If the adhesive adheres to the skin, remove it immediately.
- ▶ If you feel worse or feel unusual when using the adhesive, promptly seek a doctor's diagnosis and take appropriate action.

The valve can be damaged, or leak.

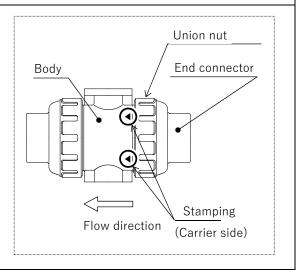
- ▶ The union nut of this product is lightly tightened to make it easier to loosen. Be sure to remove the end connector before installation.
- Install the product so that excessive stress such as tension, compression, bending or impact is not applied to the piping or valve.
- Fix the end connector during piping work or disassembly and reassembly.
- ▶ When attaching the valve to the end of the pipe, be sure to attach the union nut and end connector on the secondary side (downstream side).
- ▶ Be careful when constructing under low temperature, as solvent vapor is less likely to evaporate and tends to remain.
- ▶ After piping, open both ends of the pipe and use a blower (low-pressure type) to ventilate to remove the solvent vapor.
- ► Use "ASAHI AV Cement" depending on the material.
- ▶ Perform the water flow test after 24 hours or more have elapsed after completion of bonding.



⚠Caution

Safe use.

When installing the valve at the end of the pipe, pay attention to the flow direction. (Check ■ mark on the body of the carrier side. The carrier part of the secondary side (downstream side) is integrated with the body, so if it is installed at the end of the pipe, it will be safer to use.)



Preparations : ► ASAHI AV Cement ► Belt Wrench ► Waste cloth

- 1) Loosen the union nut by hand.
- 2) Remove the union nut and end connector from the body.
- 3) Pass the union nut to the pipe side.
- **4)** Wipe off the insertion part of the pipe and the socket part of the end connector with a waste cloth.
- **5)** Refer to "Table 5-3 Adhesive Consumption (Reference)" and apply adhesive evenly in the order of the socket part of the end connector and the pipe insertion part.
- **6)** After applying the adhesive, quickly insert the pipe into the end connector and hold it as is for at least 60 seconds.
- 7) Wipe off any excess adhesive with a waste cloth.
- **8)** Check that the O-ring (A) is correctly installed in the body.
- **9)** Bring the end connector into contact with the body so that the O-ring (A) does not come off.
- 10) Tighten the union nut by hand until it is tight.
- 11) Screw in the union nut by 1/4 to 1/2 turn with a belt wrench to prevent damage to the nut.

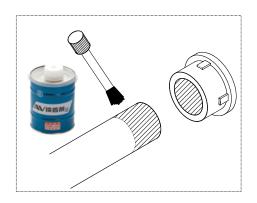


Table 5-3
Usage of adhesives (reference)

Nominal size	Volume used
15mm	1.0 g
20mm	1.3 g
25mm	2.0 g
32mm	2.4 g
40mm	3.5 g
50mm	4.8 g
65mm	6.9 g
80mm	9.0 g
100mm	13.0 g



Socket-type, spigot-type (Fusing)

Marning



Prohibition

Serious injury can result.

▶ When hanging or slinging a valve, pay sufficient attention to safety, and do not enter under the load.

		า				
Prohibition	The valve can be damaged, or leak. ▶ Do not overtighten the union nut. ▶ Do not use a pipe wrench to tighten the union nut.					
Forcing	Forcing There is a danger of injury. ▶ Be sure to perform safety inspections of the machine tool and power tool be ▶ Wear appropriate protective equipment according to the type of work being p					
 The valve can be damaged, or leak. ▶ The union nut of this product is lightly tightened to make it easier to loosen. Be to remove the end connector before installation. ▶ Install the product so that excessive stress such as tension, compression, ber or impact is not applied to the piping or valve. ▶ Fix the end connector during piping work or disassembly and reassembly. ▶ When attaching the valve to the end of the pipe, be sure to attach the union nu end connector on the secondary side (downstream side). 						
-	Safe use. ▶ When installing the valve at the end of the pipe, pay attention to the flow direction. (Check ◀ mark on the body of the carrier side. The carrier part of the secondary side (downstream side) is integrated with the body, so if it is installed at the end of the pipe, it will be safer to use.)	Union nut End connector				

Flow direction

Stamping



· Proparations	. ► Belt Wrench	► Fusing machine	>	Instruction	manual	of .
· Preparations	the fusing machine					:

- 1) Loosen the union nut by hand.
- 2) Remove the union nut and end connector from the body.
- **3)** Pass the union nut to the pipe side.
- 4) From here, please refer to the instruction manual of the welding machine for welding.
- **5)** Check that the O-ring (A) is correctly installed in the body.
- 6) Bring the end connector into contact with the body so that the O-ring (A) does not come off.
- 7) Tighten the union nut by hand until it is tight.
- 8) Screw in the union nut by 1/4 to 1/2 turn with a belt wrench to prevent damage to the nut.



Support of the product

The mounting (panel) and the piping method

	<u>^</u> Caution
O Prohibition	 The valve can be damaged, or leak. ▶ Do not over-tighten when supporting piping with a U-band, etc. ▶ When installing a valve in the piping around the pump, do not cause large vibrations in the valve.
Forcing	 There is a danger of injury. ▶ Be sure to perform safety inspections of the machine tool and power tool beforehand. ▶ Wear appropriate protective equipment according to the type of work being performed.
	 The valve can be damaged, or leak. ▶ Do not over-tighten when supporting piping with a U-band, etc. ▶ When installing the product, make sure that no excessive stress such as tension, compression, bending or impact is applied to the piping or valve. ▶ The union nut of this product is lightly tightened to make it easier to loosen. Be sure to remove the end connector before installation. (External leakage may occur.) ▶ Fix the end connector during piping installation or disassembly and reassembly. ▶ Be sure to attach the union nut and end connector on the secondary side (downstream side) when attaching to the end of the piping line. ▶ When connecting a resin valve to metal piping, make sure that no piping stress is applied to the resin valve. ▶ Make sure that the screws at the joints are made of resin. ▶ Use sealing tape for the thread joints of our resin piping materials. ▶ When installing the valve at the end, pay attention to the flow direction. (The carrier body is marked with · and should be checked. The carrier section of the secondary side (downstream side) is integrated with the main body, so if it is installed at the end, it can be used more safely.) ▶ Install it vertically when screwing in the Ensat. ▶ For detailed handling of the special tool for installation of the Ensat, refer to the instruction manual of the entertainment manufacturer separately.



1				
· Preparations	. ► Wrench	► Rubber sheet	► U-band (with bolt)	i
:	' ▶ Bolts/nuts/was	shers > Ensat	► Ensat mounting tool	

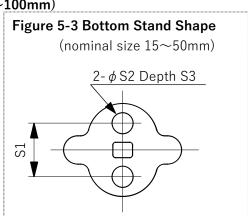
► Attach Ensat to the bottom stand.

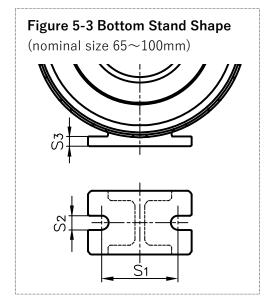
[Procedure]

1) Screw Ensat into the bottom stand by referring to Ensat's manual.

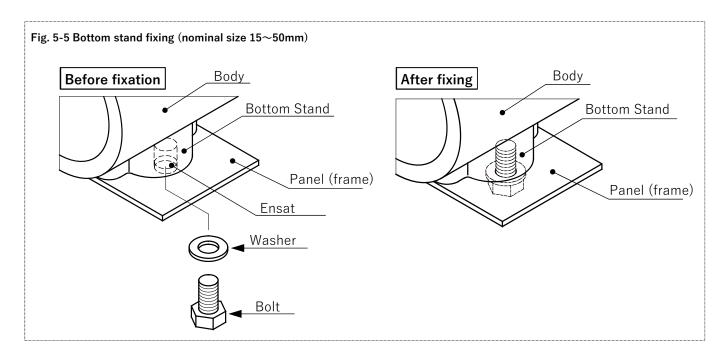
Table5-4 Bottom Stand and Ensat Dimensions (Nominal Diameter 15∼100mm)

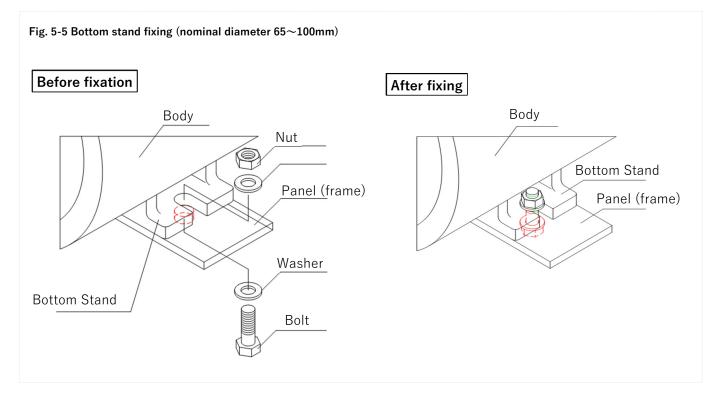
Nominal	Bottom Stand			Ensat		
size	S1	S2	S3	Nominal	Leng	Material
				thread	th	
15mm	19	7.3	11	M5	10	
20mm	19	7.3	11	M5	10	Stainless steel or Brass
25mm	19	7.3	11	M5	10	
32mm	30	9	15	M6	14	
40mm	30	9	15	M6	14	
50mm	30	9	15	M6	14	
65mm	48	9	6	_	_	_
80mm	55	11	7	_	_	
100mm	65	11	8	_	_	













How to install support

<u> </u>					
Prohibition	 The valve can be damaged, or leak. ▶ Do not over-tighten when supporting piping with a U-band, etc. ▶ When installing a valve in the piping around the pump, do not cause large vibrations in the valve. 				
Forcing	 There is a danger of injury. ▶ Be sure to perform safety inspections of the machine tool and power tool beforehand. ▶ Wear appropriate protective equipment according to the type of work being performed. The valve can be damaged, or leak. ▶ Do not over-tighten when supporting piping with a U-band, etc. ▶ When installing the product, make sure that no excessive stress such as tension, compression, bending or impact is applied to the piping or valve. ▶ Be sure to attach the union nut and end connector on the secondary side (downstream side) when attaching to the end of the piping line. ▶ When connecting a resin valve to metal piping, make sure that no piping stress is applied to the resin valve. ▶ When installing the valve at the end, pay attention to the flow direction. (The carrier body is marked with · and should be checked. The carrier section of the secondary side (downstream side) is integrated with the main body, so if it is installed at the end, it can be used more safely.) 				

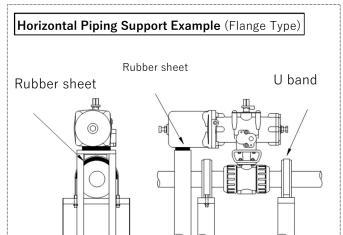


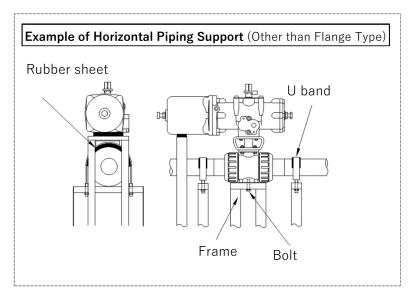
► Support valve and piping (horizontal piping)

[Procedure]

- 1) Secure the bottom stand (Ensat) and the frame with the bolts. (For the dimensions of the valve bottom surface, refer to "How to pipe the entertainment and frame (panel).")
 For flange type, lay the rubber sheet on the flange part of the valve. Lay a rubber sheet on top of the pipe section if it is not a flange type.
- **2**) Put the U-band over the rubber sheet and secure it to the frame with the nut.

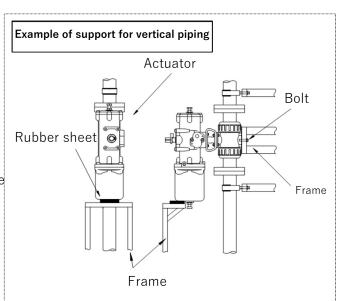
(Support installation example)





► Supporting the valve and piping (vertical piping)

- 1) For flange type, lay the rubber sheet on the flange part of the valve. Lay a rubber sheet on top of the pipe section if it is not a flange type.
- **2**) Put the U-band over the rubber sheet and secure it to the frame with the nut.
- **3)** Place the rubber sheet between the actuator and the frame.





6. Air piping method

<1> Without option or with speed controller

\triangle	Warı	ning
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Prohibition

There is a danger of injury.

▶ Do not remove the protective plug until just before connecting the air piping.

Caution



Prohibition

Damage may occur.

▶ Do not over-tighten the fitting for air piping. (risk of damage)

ACaution



Forcing

There is a danger of injury.

▶ Wear appropriate protective equipment according to the type of work being performed.

Otherwise damage or malfunction can result.

- Confirm the connection location, air piping size, and screw type from the approval delivery drawing etc. of the product, and then connect the air piping.
- For the supply air, please use dehumidified and dedusted clean items. Consult with CKD when using high dry air with a dew point of-40°C or less.
- When using at an ambient temperature of 5°C or less, remove moisture from the operation air to prevent freezing.
- ▶ When using copper piping for air piping, use one with rust-proof treatment on the inner surface of the pipe.
- ► Flush the inside of the air piping thoroughly before connecting the air piping.
- ▶ When connecting the air piping, be careful that foreign matter, such as sealant, does not enter the piping.
- ▶ Be sure to remove burrs from the pipe fittings/threads. (This may cause gargle or air leakage.)

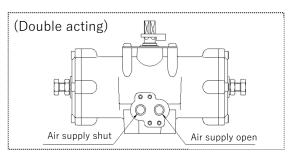


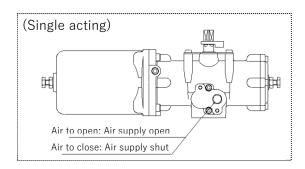
Copper or tube for air piping ➤ wrench

Preparations

Copper or tube fittings ➤ sealing tape

- 1) Wrap sealing tape around the male thread of the fitting, leaving approximately 3mm at the end.
- **2)** Tighten the fitting to the piping port of the actuator.
- 3) Screw the fitting in one turn with a wrench.
- 4) Attach copper piping or tube piping for air piping.







<2> With solenoid valve and regulator with filter

Marning



There is a danger of injury.

Do not remove the protective plug until just before connecting the air piping.

⚠ Caution



Prohibition

Damage may occur.

Do not over-tighten the fitting for air piping. (risk of damage)





Forcing

There is a danger of injury.

▶ Wear appropriate protective equipment according to the type of work being performed.

Otherwise damage or malfunction can result.

- ▶ When using copper piping for air piping, use one with rust-proof treatment on the inner surface of the pipe.
- ▶ Flush the inside of the air piping thoroughly before connecting the air piping.
- ► When connecting the air piping, be careful that foreign matter, such as sealant, does not enter the piping.
- ▶ Be sure to remove burrs from the pipe fittings/threads. (Jamming or air leakage occurs)
- ▶ Do not over-tighten the fitting for air piping. (risk of damage)
- ▶ Be sure to lock the adjustment knob of the solenoid valve after adjustment.

Regularly drain the drain from the pressure regulator with filter.

► Set the secondary pressure of the regulator with filter to a setting that meets the equipment specifications.

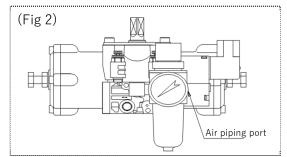
(Otherwise, malfunction or failure may result.)

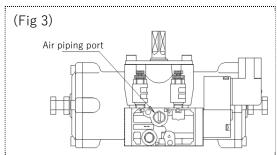


[Procedure]

1) Wrap sealing tape around the male thread of the fitting, leaving approximately 3mm at the end.

- 2) Tighten the fitting to the air piping port (see Fig. 2 and Fig.
- 3) with a fitting.
- **3)** Screw the fitting in one turn with a wrench.
- 4) Attach copper piping or tube piping for air piping.







7. Wiring method

Limit switch





There is a risk of electric shock.

▶ Do not perform wiring while the power is on.

Caution



Prohibition

Otherwise failure or malfunction of the machine can result.

▶ If the product is installed outdoors or in a location where there is a possibility of rainwater or moisture intrusion, make sure that rainwater, etc. does not enter through the wiring port.





Forcing

There is a danger of injury.

- ▶ Be sure to perform safety inspections beforehand for the machine tools to be used.
- ► Wear appropriate protective equipment according to the type of work being performed.

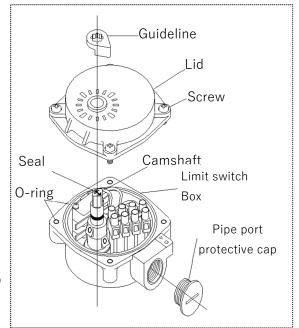
Otherwise failure or malfunction of the machine can result.

- ► Connect the wires using solderless terminals with insulation covering so that they do not come into contact with the cover or housing.
 - (If the crimp terminal comes into contact with the cover, the cover may not close and may cause a ground fault.)
- ► If the limit switch is used in 1mA~100mA, 5VDC~30VDC, contact your nearest sales office.



▶ Phillips screwdriver ▶ Connector (G1/2) Preparations ► Flathead screwdriver ► Wire stripper

- 1) Remove the pointer by hand.
- 2) Loosen the four screws securing the lid with a Phillips screwdriver to remove it. **Do not lose the O-ring.
- 3) Turn the pipe port protection cap counterclockwise to remove it.
- 4) Pass the cable through the connector.
- 5) Peel off the outer skin of the cable with a wire stripper.
- 6) Wire the terminal screw with a flathead screwdriver according to the internal circuit diagram on page 8.
- 7) Tighten the connector to secure the cable.
- 8) After attaching the lid, tighten the screws (4 places) alternately and evenly with a Phillips screwdriver. *Do not forget the O-ring when attaching the lid. (Failure to do so may result in electric leakage or electric shock.)
- 9) Insert the pointer so that the direction of the seal arrow on the camshaft head matches the direction of the pointer.





Solenoid valve

Marning



There is a risk of electric shock.

- ▶ Do not connect or separate lines to the solenoid valves while the power is on.
- Do not perform any work with wet hands or tools.

⚠ Caution



Forcing

There is a danger of injury.

- ▶ Be sure to perform safety inspections beforehand for the machine tools to be used.
- ▶ Wear appropriate protective equipment according to the type of work being performed.

Otherwise, the machine may malfunction.

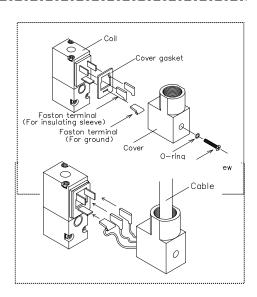
▶ Be sure to lock the adjustment knob of the solenoid valve after adjustment.

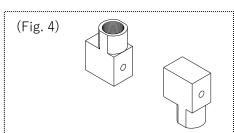
Preparations

- ► Phillips screwdriver ► terminal crimping tool
- ► Connector (G1/2) ► wire stripper

[Procedure]

- 1) Loosen the cover set screw with a Phillips screwdriver and remove the cover. \times Do not lose the O-ring.
 - (Failure to do so may result in electric leakage or electric shock.)
- 2) Pull out the Faston terminal and the insulation cover inserted in the coil side terminal.
 - **%**A circular sleeve is not attached to the grounding terminal.
- 3) Pass the scale through the connector, then through the cover.
- 4) Peel off the outer skin of the cable with a wire stripper.
- 5) Pass the lead wire through the insulation cover.
- 6) Use a terminal crimping tool to attach the Faston terminal to the lead wire.
- 7) Insert the Faston terminal into the coil side terminal and put the insulation cover on.
- 8) Attach the cover with the cover set screw.※The cover can be attached with the wiring outlet at either the top or bottom. (Fig. 4)
- 9) Tighten the cable with the connector.







8. Commissioning method

Manual Operation < Double acting>

⚠Warning		
Prohibition	Serious injury can result. ▶ Do not supply air during manual operation.	
	▶ Do not supply air during manual operation.	

<u>^</u> Caution		
Prohibition	 You may be electrocuted or injured. For models with solenoid valves, do not leave the solenoid valve terminal cover removed. ▶ Keep hands free of moisture and oil during operation. 	
Forcing	 Doing so may damage the machine. ▶ Do not turn the manual override further than necessary from the fully open/closed positions. 	

[Procedure]

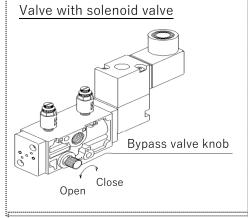
*For models with a solenoid valve, turn the knob of the bypass valve counterclockwise. (Opening and closing operations are not possible.)

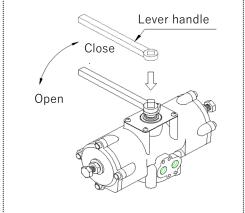
Engage TA lever handle (optional accessory) or wrench with the upper output shaft of the actuator and fully open ⇔ fully close the actuator 1 to 2 times while observing the position indicator.
 ※Do not forcibly turn TA type lever-handle (optional item) or wrench from the fully open/closed positions. (It will malfunction.)

Rotate Right (Clockwise)

- ⇒ Closing direction
- Left Rotation (Counterturn)
- ⇒ Open direction
- 2) Fully open or closed to remove TA type lever-handle (sold separately) or wrench from the upper output shaft of the actuator.

%For models with a solenoid valve, turn the bypass valve knob to the right. (Air leaks)







Manual operation <Single acting (Air to open/Air to close)>



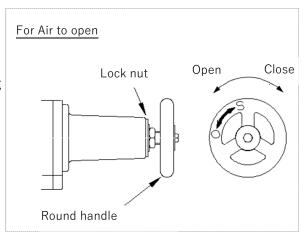
Preparations : ▶ Dedicated manual hand wheel unit (optional mounting) ▶ wrench

DN (mm)	Manual override (optional)
15~32	Not possible
40~100	Possible

[Procedure]

- 1) Loosen the lock nut with a spanner.
- 2) Turn the manual operation round handle while observing the position indicator,

Fully open \Leftrightarrow close 1 to 2 times.



Round handle rotation direction	Air to open	Air to close
Rotate Right (Clockwise)	Closing direction	Open direction
Left Rotation (Counterclockwise)	Open direction	Closing direction

- 3) Turn the manual operation round handle clockwise to the fully open/closed position.
- 4) Tighten the lock nut with a spanner.



Air Operation





Forcing

Serious injury can result.

► Check that the spanner for manual operation is not mated with the upper output shaft of the actuator.





Prohibition

Otherwise, the valve may be damaged, or inoperative.

▶ Use the product within the indicated product specifications.

[Procedure]

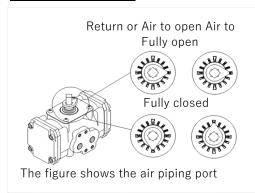
- 1) Supplies air to the air piping port.
- 2) Check that the air supply side and the display position match.
- 3) Stop the air supply.

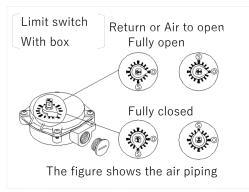
<For models with solenoid valve>

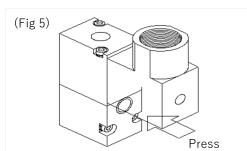
[Procedure]

- 1) Supplies air to the solenoid valve.
- 2) Check that the operation shown in the table below is achieved by pressing the push button (Fig. 5) below the solenoid valve terminal cover with your finger.
- Confirm that the operation shown in the table below is achieved by energizing or de-energizing the solenoid valve.
- 4) Turn off the power to the solenoid valve.

Fully open/closed display







Push button	Power supply	Recovery/Air to open	Air to close
Press	Energizing	Valve fully open	Valve fully closed
Do not press	De-energizing	Valve fully closed	Valve fully open



Adjusting the Opening/Closing Speed < Double acting>

ACaution



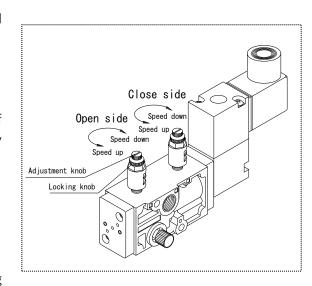
Otherwise damage to the solenoid valve or malfunction can result.

▶ Be sure to lock the adjustment knob of the solenoid valve after adjustment. (Do not tighten the lock nut with excessive force.)

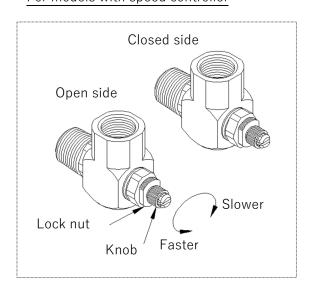
Preparations : ► Wrench

[Procedure]

- 1) Turn the adjustment knobs of both open and close speed controllers clockwise until they do not turn.
- 2) Supplies air to the solenoid valve.
- 3) Energize the solenoid valve and turn the adjusting knob of the open-side speed controller counterclockwise little by little.
- 4) Turn off the solenoid valve side and turn the adjusting knob of the closed side speed controller counterclockwise little by little.
- 5) Repeat steps 3) and 4) to set the desired opening/closing speed.
- 6) When the desired speed is achieved, hold the adjustment knob with your finger and rotate the lock nut clockwise with the spanner to secure the adjustment knob.



For models with speed controller





Opening/Closing Speed Adjustment Method <Single Action (Air to open/Air to close)>

Caution



Otherwise damage to the solenoid valve or malfunction can result.

► Be sure to lock the adjustment knob of the solenoid valve after adjustment. (Do not tighten the lock nut with excessive force.)

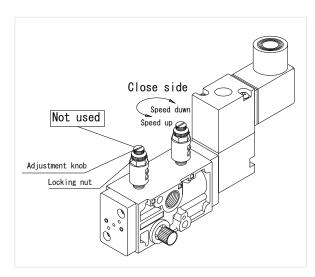
Preparations : Wrench

Actuation	Speed at which it opened	Speed at which it closes
Air to open	Cannot adjust	Can be adjusted
Air to close	Can be adjusted	Cannot adjust

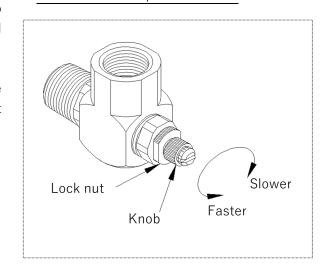
[Procedure]

- 1) Turn the speed controller knob clockwise until it does not turn.
- 2) Supplies air to the solenoid valve.
- 3) After energizing the solenoid valve, stop energizing, and turn the speed controller adjustment knob counterclockwise little by little to set the desired opening/closing speed.
- 4) When the desired speed is achieved, hold the adjustment knob with your finger and rotate the lock nut → with the spanner to secure the adjustment knob.

With a solenoid valve



For models with speed controller





9. Improvement of internal leakage (seat leakage)

If internal leakage (seat leakage) occurs when the valve is fully closed, tightening the carrier may improve seat leakage.

If seat leakage does not improve even after retightening the carrier, replace the valve according to "10. How to disassemble/assemble for parts replacement".





Forcing | Serious injury can result.

▶ A little fluid remains in the valve. Wear protective gloves and eye protection.

Caution



Prohibition

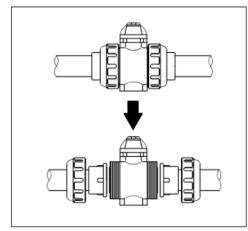
The valve can be damaged, or leak.

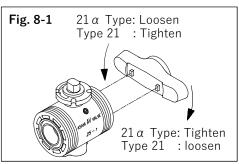
- ▶ Do not overtighten the carrier.
- ▶ Do not overtighten the union nut.
- Do not use a pipe wrench to tighten the union nut.

Belt Wrench Hand wheel for manual override (sold separately) Preparations protective gloves ► Protective goggles

[Procedure]

- 1) Zero the pressure in the piping to completely drain the fluid.
- **2)** Close the air source valve to exhaust air from the actuator.
- 3) Turn off the power of the solenoid valve if it is equipped with a solenoid valve.
- 4) Loosen the right and left union nuts with a belt wrench.
- **5)** Remove the body from the piping.
- **6)** Remove the O-ring (A) attached to the carrier.
 - ※For the nominal diameter 15~50mm, remove the O-ring (A) from the carrier on the right-hand side towards the trademark (AV marking).
- 7) Mate the convex part on the top of the handle for manual valve (optional item) with the concave part of the carrier.
 - %The nominal diameter 15 \sim 50mm is adjustable only for the carrier on the right-hand side towards the trademark (AV marking).
- 8) Turn the manual override and rotate the carrier with reference to Fig. 8-1 to adjust the surface pressure.
- 9) After the adjustment is completed, attach the O-ring (A) to the carrier.
- **10)** Return the body part to the piping so that there is no misalignment.
- 11) Screw the right and left union nuts onto the body until they are hand tight.
- 12) Screw the union nut 1/4 to 1/2 turn to prevent it from being damaged by the belt wrench.
- 13) Check that fluid flows into the piping and that the valve operates smoothly by opening and closing several times with automatic operation and that there is no external leakage.
- 14) Fully close the valve by automatic operation and check that there is no seat leakage.







10. How to disassemble/assemble for parts replacement

If internal leakage (seat leakage) or external leakage occurs when the valve is fully closed, the leakage may be improved by replacing the parts.

If the leak does not improve after replacing the parts, remove and replace the valve according to this item.

⚠Warning		
Forcing	 There is a danger of injury. ▶ Be sure to perform safety inspections of the machine tool and power tool before starting operation. ▶ Wear appropriate protective equipment for the work details when installing piping. 	

<u>^</u> Caution			
 ▶ Prohibition Damage may occur. ▶ When replacing the valve or replacing parts, completely drain the fluid from the pipir to reduce the fluid pressure to zero. ▶ Do not over tighten the union nut. ▶ Do not use a pipe wrench when tightening the union nut. 			
Forcing	 Damage may occur. Fix the end connector during piping installation or disassembly and reassembly. Be sure to confirm that the union nut is fully tightened before the water flow test. Tighten the union nut paying attention to the shaft center misalignment and face-to-face dimension. When connecting a resin valve to metal piping, be careful not to apply piping stress to the resin valve. The ball valve 21 and 21 α types differ in some parts. Check the valve model when replacing parts. (Some parts: Body [1], Ball [2], Carrier [3], Stem [6], Sheet [7]) 		



į –			
•	: ► Belt Wrench	Handle for manual valve (sold separately)	i
i	Preparations Protective gloves	► Protective goggles	i
•	•		i
i	. ► Handle (Hand whee	l Allen key)	:

<Disassembly method>

[Procedure]

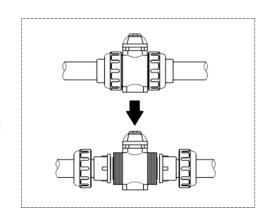
- 1) Completely drain the fluid in the piping.
- 2) Close the air source valve to exhaust air from the actuator.
- **3)** Turn off the power of the solenoid valve if it is equipped with a solenoid valve.
- **4)** Loosen the bolt (B) between the mounting base and the body, and remove the actuator and the mounting base.

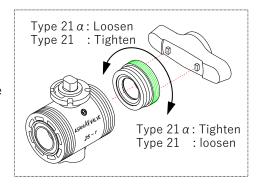
 \divideontimes At this time, remember the opening of the ball toward the trademark (AV mark) and the orientation of the actuator.

(Important during assembly)

- **5)** Turn the stem to fully close the valve.
- **6)** Loosen the right and left union nuts with a belt wrench.
- 7) Remove the body from the piping.
- **8)** After removing the fluid remaining in the valve by half-opening the valve with the manual handle, fully close the valve and remove the handle.
- 9) Remove the O-rings (A) attached to both ends of the body part.
- **10)** Mate the convex part of the upper part of the hand handle and the concave part of the carrier.
- 11) Rotate the hand handle to remove the carrier.

	Type 21	Type 21 α	
Loosen	Counterclockwise	Clockwise	
Tighten	Clockwise	Counterclockwise	





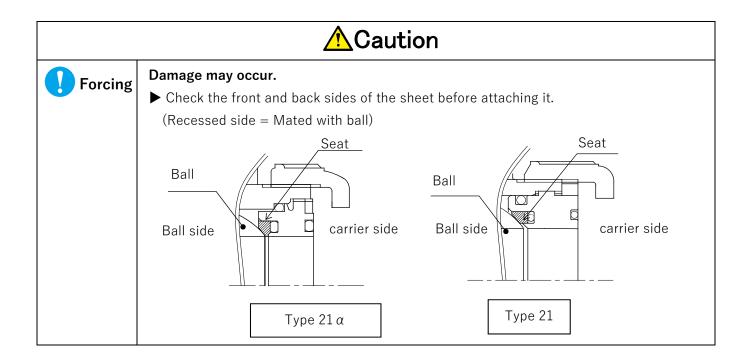
- 12) Remove the seat, O-ring (B) and O-ring (C) attached to the carrier, taking care not to damage them.
- 13) Push out the ball by hand.
- **14)** Push the stem from the top flange side to the body side.
- **15)** Remove the seat and O-ring (C) from the body without damaging them.
- **16**) Remove the O-ring (D) and O-ring (E) from the stem, taking care not to damage them.



<Assembly method>

[Procedure]

- 1) Follow the procedure from step 13) to the reverse procedure in <Disassembly>.
 - XThe sheet has both sides. When installing, check the front and back sides.
 - **Recessed side = side to be fitted with ball





11. Inspection item

ACaution



Forcing

Fluid may leak from the valve or the actuator may fail.

▶ Maintenance should be performed every 3 to 6 months as a guide in order to keep the watch in normal condition and use it for a long time. Pay particular attention to temperature changes and aging during long-term storage or shutdown or use.

You may be electrocuted or injured.

- ► Turn off the power before removing the actuator cover.
- ▶ When removing the valve from the piping when replacing the valve or parts, completely remove the fluid from the piping before starting work.
- ► If any trouble is found, take the appropriate action referring to "12. Cause of malfunction and remedy"





Daily inspection

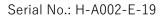
Daily inspection			
Inspection items and inspection methods	Guideline of judgment	Check point	Treatment method
External leakage (visual inspection)	For leakage No	[Flange type] Pipe flange connection	 Retighten the pipe bolts to the specified torque. Remove the valve from the pipe and retighten the pipe bolts. (Ref: 5. Piping method [Flange type])
		[Socket type] Adhesive construction section	Remove the valve from the piping and retry the bonding process. (Ref: 5. Piping method [Socket type])
		[Threaded end] Threaded connection	Remove the valve from the piping and screw the valve in again. (Ref: 5. Piping method [Threaded end])
		Top flange of the valve	Remove the valve from the piping and replace the valve or defective part. (Ref: 10. How to disassemble for parts replacement)
		Union nut portion of the valve	 Retighten the union nut Remove the valve from the piping, check the O-ring and sealing surface, and replace the defective part. (Ref: 5. Piping method)
		Surface of the entire valve	Remove the valve from the pipe and replace the valve. (Ref: 10. How to disassemble for parts replacement)
Internal leakage (visual and measurement)	For leakage No	Leakage to secondary side when valve is fully closed	Remove the valve from the piping and replace the valve or defective part. (Ref: 10. How to disassemble for parts replacement)
		Measured values of flowmeters, pressure gauges, etc.	Remove the valve from the piping and replace the valve or defective part. (Ref: 10. How to disassemble for parts replacement)
Abnormal noise (hearing)	Of abnormal noise No	Valves and actuators	Remove the valve from the pipe and replace the valve or actuator. (Ref: 10. How to disassemble for parts replacement)
		Piping around the valve	Reconfirm the conditions of use (Ref: 2. Safety Instructions)



Periodic inspection

●Guideline for the inspection cycle: 3 months

Inspection items and inspection methods	Guideline of judgment	Check point	Remedy for malfunctions
Vibration (palpation)	To differences from other parts No	Valves and actuators	Recheck the operating conditions and remove the source of vibration. (Ref: 2. Safety Instructions)
			Remove the valve from the pipe and replace the valve or actuator. (Ref: 10. How to disassemble for parts replacement)
		Piping around the valve	Recheck the operating conditions and remove the source of vibration. (Ref: 2. Safety Instructions)





●Guideline of the inspection cycle: 6 months

		1	
Inspection items and inspection methods	Guideline of judgment	Check point	Remedy for malfunctions
Operability of manual handle (touch)	Smoothly Turning	Manual operation unit	Remove the valve from the pipe and replace the valve or actuator. (Ref: 10. How to disassemble for parts replacement)
Looseness of bolts (visual and palpation)	Loose No	For mounting base + valve	Retighten the mounting bolts with the following torque. Nominal size 15~32mm : 5 N-m 40, 50mm : 6 N-m 65, 80mm : 8 N-m 100mm : 10 N-m
		For mounting base + actuator	Retighten the mounting bolts with the following torque. Nominal size 15~100mm: 8 N-m
		For fixing the actuator cover	Retighten the screws with the following torque Nominal size 15~100mm: 5 N-m
		Terminal block	Retighten the screws with the following torques Nominal size 15~100mm: 1 to 1.5 N-m
		[Flange type] For flange piping	Retighten the pipe bolts to the specified torque. (Ref: 5. Piping method [Flange type])
Water-intrusion (visual inspection)	Of the intrusion	In actuator	Replace the actuator (Ref: 10. How to disassemble for parts replacement)
Intrusion of foreign objects (visual inspection)	Of the intrusion No	In actuator	Replace the actuator (Ref: 10. How to disassemble for parts replacement)



12. Cause of malfunction and remedy

ACaution



Forcing

You may be electrocuted or injured.

- ▶ If any malfunction is found, immediately stop using the product and take appropriate action.
- ▶ When removing the valve from the piping when replacing the valve or parts, completely remove the fluid from the piping before starting work.
- ► Turn off the power before removing the actuator cover.

Failure phenomenon	Possible cause	Measures and measures
During manual operation, the lever handle (wrench) does not turn (cannot turn).	The valve is already fully open (or fully closed).	Rotate the lever handle (spanner) in the reverse direction. (Ref. 8. Commissioning method)
	Air is supplied to the actuator.	Close the air source valve and open the bypass valve.
	Foreign matter caught in valve	Remove the valve from the piping, disassemble it, and remove foreign matter. (Ref: 10. How to disassemble for parts replacement)
	Piping stress is applied to the valve.	Remove the piping stress
	The torque of the valve has increased due to the effects of the fluid (temperature, components, pressure, etc.)	Reconfirm the conditions of use (Ref: 2. Safety Instructions)
Do not open or close	Air is not supplied	Supply air.
by air operation.	Solenoid valve voltage is different. Solenoid valve voltage is low	Check the voltage with a tester to obtain the correct voltage.
		(Ref: 4. Product Specifications)
	The bypass valve is open.	Close the bypass valve by turning the knob clockwise.
	The speed controller adjustment knob is turned all the way to the right.	Turn the knob to the left (Ref.: 8. Commissioning method)
	Foreign matter caught in valve	Remove the valve from the piping, disassemble it, and remove any foreign matter. (Ref: 10. How to disassemble for parts replacement)
	Valve torque is increasing due to piping stress.	Remove the piping stress. (Ref: 4. Product Specifications)
	The torque of the valve increases due to the effect of the fluid (temperature, component, pressure).	Check the operating conditions again.



CAUSE OF FAILURE AND HOW TO REMEDY (continued)

Failure phenomenon	Possible cause	Measures and measures
Do not open or close by air operation.	Piping stress is applied to the valve.	Remove the piping stress
	The torque of the valve has increased due to the effects of the fluid (temperature, components, pressure, etc.)	Reconfirm the conditions of use (Refer to P2_2. Safety Instructions)
Fluid leaks even when fully closed (internal leak)	High fluid pressure	Use below the maximum allowable pressure
		(Ref: 10. How to disassemble for parts replacement)
	The carrier is loose.	Remove the valve from the pipe and tighten the carrier to adjust the surface pressure. (Ref: 9. How to adjust the surface pressure of the ball and seat)
	Sheet or ball is worn or scratched	Remove the valve from the piping, replace the relevant part, or replace the valve. (Ref: 10. How to disassemble for parts replacement)
	Missing parts	Remove the valve from the piping and attach the relevant part or replace the valve. (Ref: 10. How to disassemble for parts replacement)
	Foreign matter caught in valve	Remove the valve from the piping, disassemble it, and remove foreign matter. (Ref: 10. How to disassemble for parts replacement)
	Piping stress is applied to the valve.	Remove the piping stress (Ref: 10. How to disassemble for parts replacement)



CAUSE OF FAILURE AND HOW TO REMEDY (continued)

Failure phenomenon	Possible cause	Measures and measures
Fluid leaks from valve (external leak)	Union nut is loose	Retighten the union nut (Ref: 5. Piping method)
	O-ring is scratched, worn, melted, or altered	Stop using the product immediately, remove the valve from the piping, replace the relevant part, or replace the valve. (Ref: 10. How to disassemble for parts replacement)
	Scratches or wear are found on the sliding or fixing surfaces of the O-ring.	Stop using the product immediately, remove the valve from the piping, replace the relevant part, or replace the valve. (Ref: 10. How to disassemble for parts replacement)
	Valve is cracked or broken	Stop using the product immediately, remove the valve from the piping, and replace the valve. (Ref: 5. Piping method)
Actuator is operating but valve is not open or closed	Damaged stem, ball, or fitting	Stop using the product immediately, remove the valve from the piping, replace the relevant part, or replace the valve. (Ref: 10. How to disassemble for parts replacement)



13. Disposal method of residual materials and waste materials





Forcing

When burnt, toxic gas is generated.

▶ When disposing of the product or parts, please dispose of them according to the guidelines of each local authority by a professional disposal company.



Inquiries

Contact the nearest distributor, our sales office, or our web website for inquiries about this product.

[User's Manual]

Ball Valve 21/21 α Pneumatic actuated Type TA 15~100mm





https://www.asahi-yukizai.co.jp/

Please note that the content of this manual is subject to change without notice.

May 2024