

Serial No.	H-A042-E-2
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**Diaphragm Valve Type 14**

**Electric Actuated Type M**

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

**True Union Diaphragm Valve Type 14**

**Electric Actuated Type M**

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

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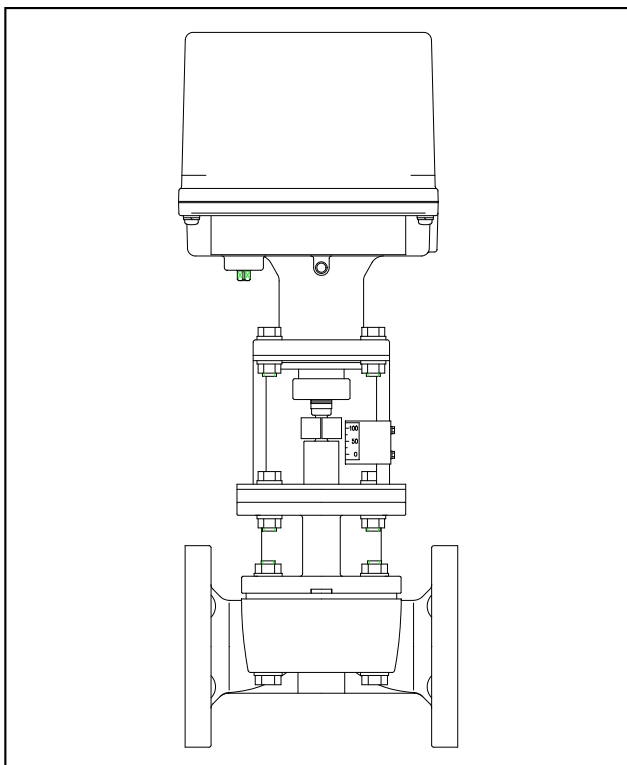
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**User's Manual**





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 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 & Mandatory Action Signs>

	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.

**(2) General operating instructions**



Warning

- Do not disassemble or remodel the actuator.



- Keep hands and other extremities away from moving parts under all circumstances.

(Any such practice may get your hand, arm, or other part of your body caught.)

- 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.

- Before using the product, check the operating power supply and the voltage specification on the nameplate. Using a wrong voltage may cause equipment damage or malfunction.

- Before manual operation, ensure that the actuator is not activated by the motor.



Caution

- Do not step on or apply excessive weight on valve. (It can be damaged.)

- Do not use AV valves in a place where they may become submerged in water.

- Do not apply a great impact or vibration to the actuator. (Any such practice may result in breakdown.)

- Do not use the valve in conditions where the fluid may have crystallized.

(The valve will not operate properly.)



- Keep the valve away from excessive heat or fire. (It can be damaged, or destroyed.)

- Avoid locations with corrosive gas or otherwise bad atmospheres. Install a cover or something similar that covers the entire area.

- Always operate the valve within the pressure vs. temperature range.

(The valve can be damaged or deformed by operating beyond the allowable range.)

- Allow sufficient space for maintenance and inspection.

- 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.)

- 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 periods of prolonged storage, rest, or operation.)

- When installing a valve, provide an appropriate support. (Lack of such a support may cause the valve and piping to be overstrained, resulting in damage or other defect.)

- In the case of malodor, overheating, or smoking, turn off the power supply immediately. (Continued use despite an abnormality present may result in a fire. If you detect any abnormalities, be sure to consult the dealership where you bought the product or our service station nearest your premises and ask them to perform an inspection.)

- For manual operation, be sure to use the handle furnished with the product by the manufacturer.

- When using the product in explosive atmosphere, ensure that the actuator complies with the explosion-proof specifications required for that area.

- Keep the ambient temperature of the installed location within the range -10°C and 50°C.

**(3) General instructions for transportation, unpacking and storage**



Warning

- When suspending and supporting a valve, take care and do not stand under a suspended valve.



Caution

- 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.

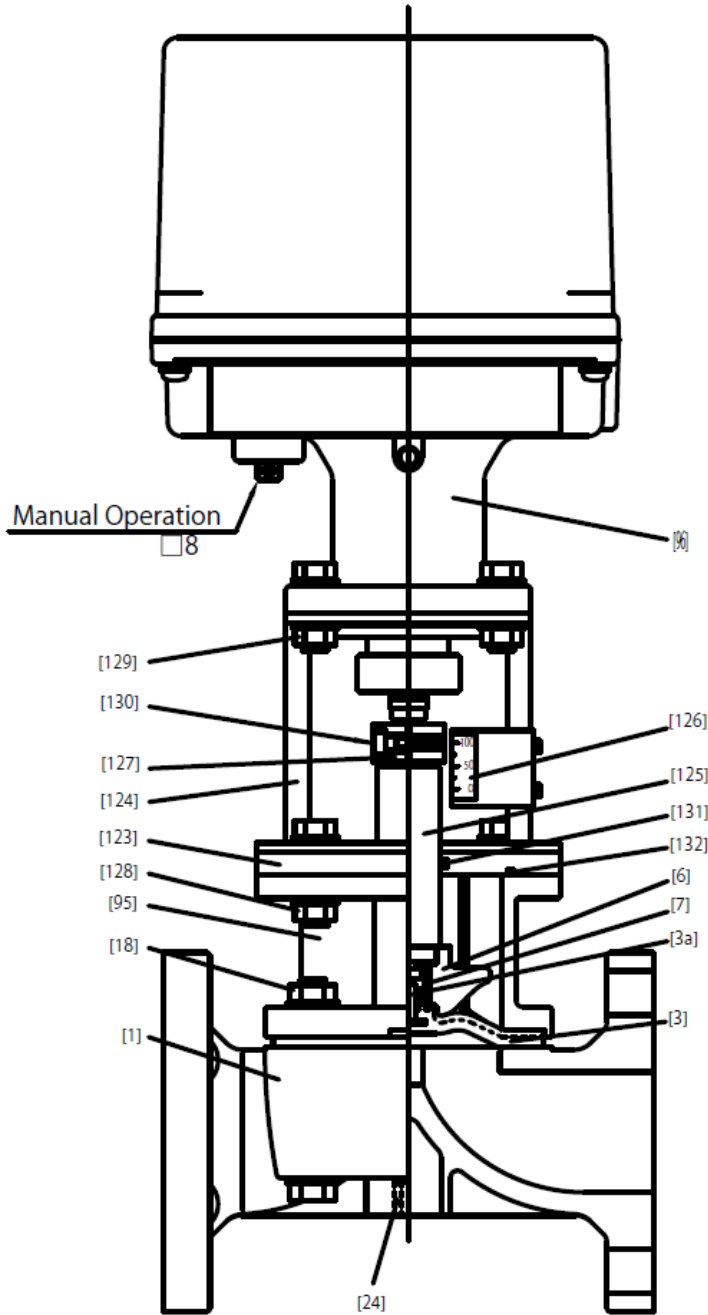


- Store products in their corrugated cardboard boxes. Avoid exposing products to direct sunlight, and store them indoors (at room temperature). Also avoid storing products in areas with excessive temperatures. (Corrugated cardboard packages become weaker as they become wet with water or other liquid. Take care in storage and handling.)

- After unpacking the products, check that they are defect-free and meet the specifications.

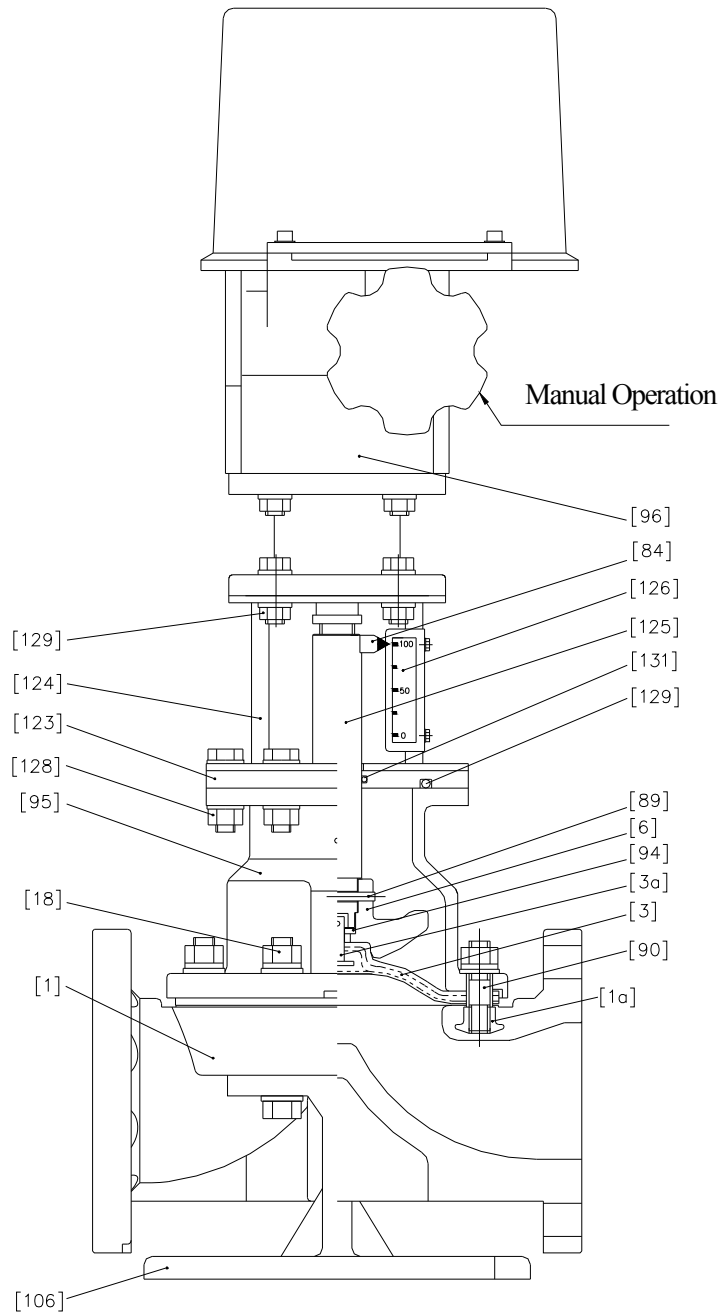
(4) Name of parts

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



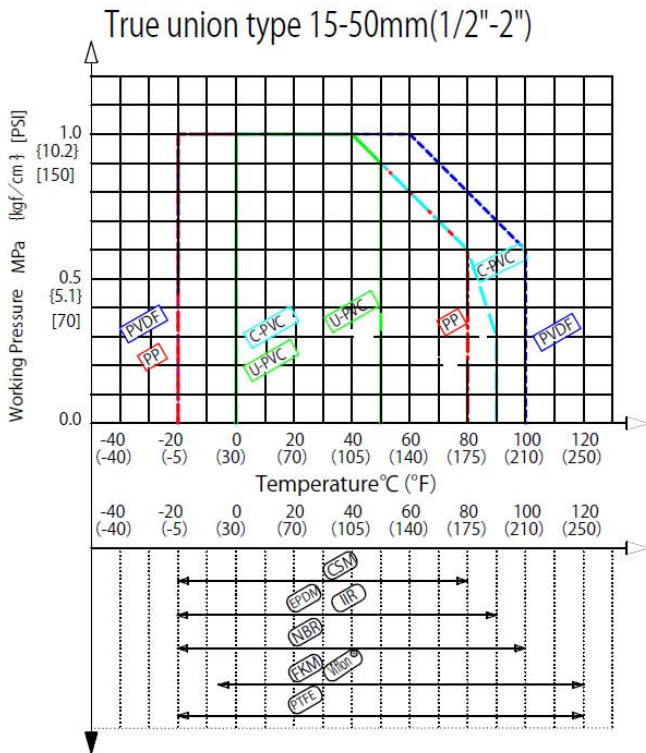
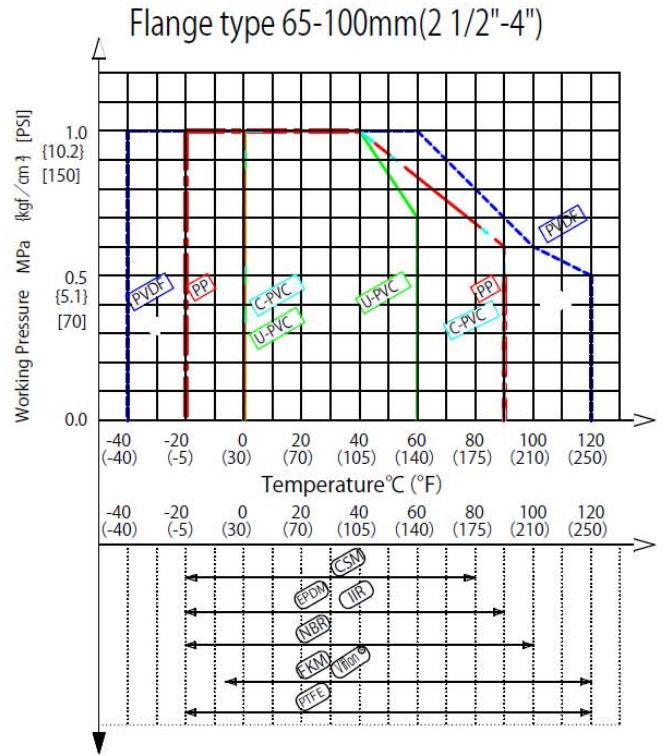
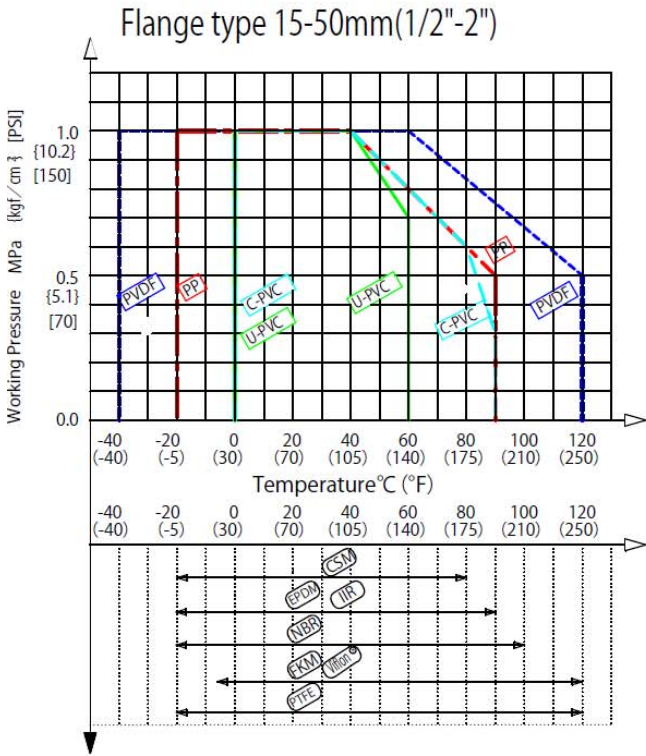
[1]	Body	[24]	Ensat (Insert metal )	[127]	Joint
[3]	Diaphragm	[95]	Motor bonnet	[128]	Bolt-nut(E)
[3a]	Insert metal of diaphragm	[96]	Actuator (motor)	[129]	Bolt-nut(F)
[4]	Cushion	[123]	Spacer(A)	[130]	Bolt (F)
[6]	Compressor	[124]	Stand (A)	[131]	O-ring (J)
[7]	Joint	[125]	Stem (D)	[132]	O-ring (K)
[18]	Bolt-nut(A)	[126]	Indicator Seal		

Nominal size 65-100mm (2 1/2"-4")



[1]	Body	[90]	Stud Bolt•Nut	[126]	Indicator Seal
[3]	Diaphragm	[94]	Metal of Compressor	[128]	Bolt-nut(E)
[3a]	Insert metal of diaphragm	[95]	Bonnet	[129]	Bolt-nut(F)
[4]	Cushion	[96]	Actuator (motor)	[131]	O-ring (J)
[6]	Compressor	[106]	Stand	[132]	O-ring (K)
[18]	Bolt-nut(A)	[123]	Spacer(A)	[1a]	Inserted Nut
[84]	Indicator	[124]	Stand (A)		
[89]	Compressor Pin	[125]	Stem (D)		

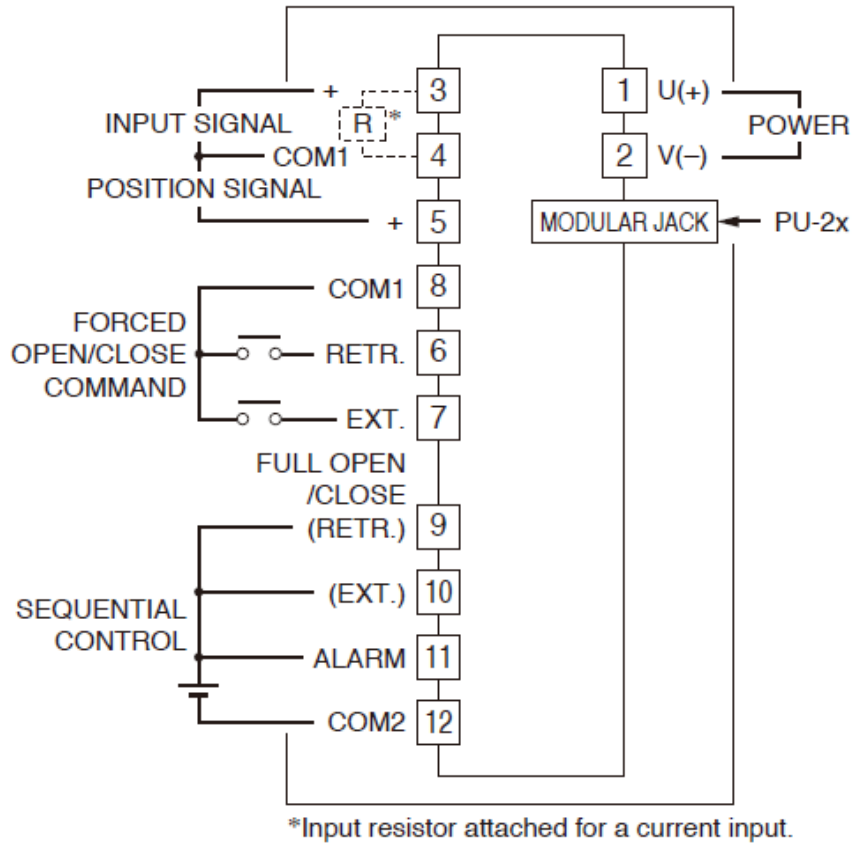
(5) Working pressure vs. temperature



(6) Specifications of actuator

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

Wiring diagram



List of Specifications

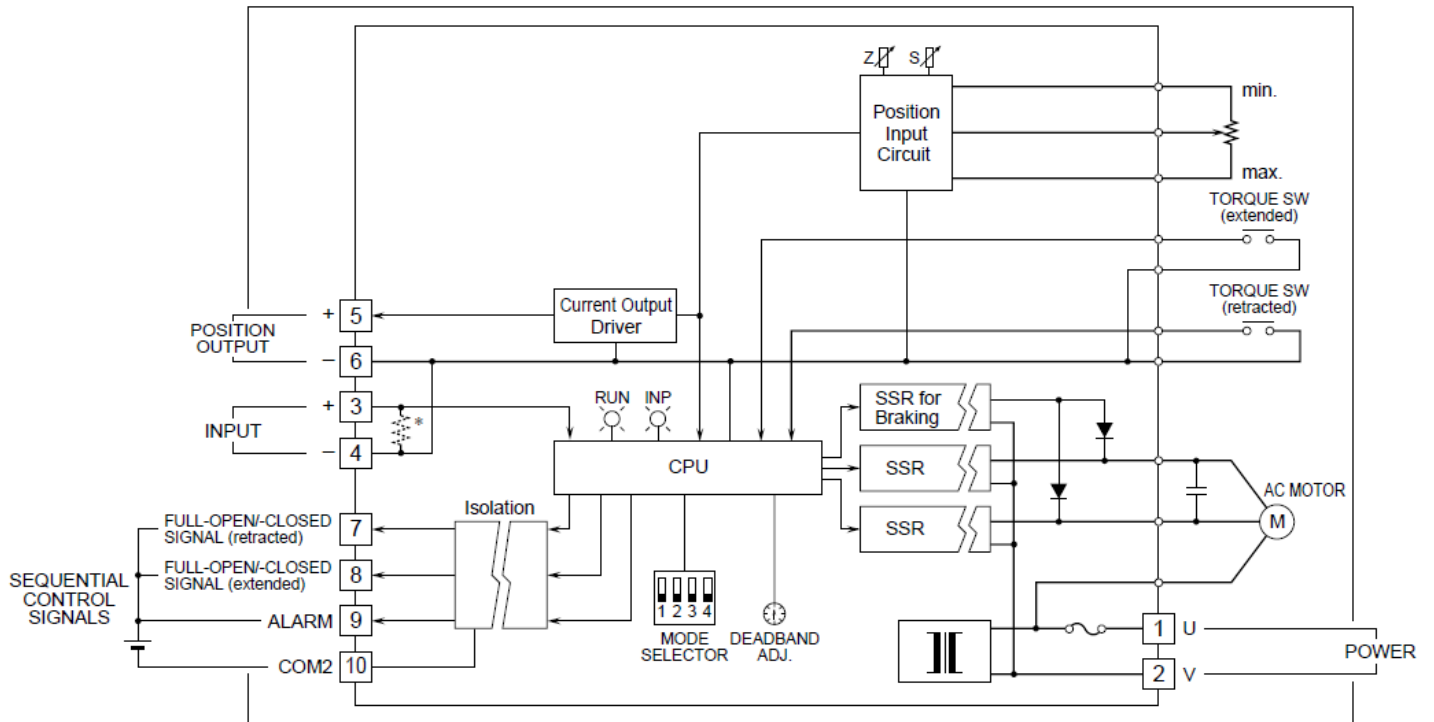
Adaptive Nominal Size mm (inch)		15mm,20mm (1/2", 3/4")	25mm,32mm (1", 1 1/4")	40mm (1 1/2")	50mm (2")
Actuator Type		PSN1		PSN3	
Opening and Closing Time (sec.)*	50Hz, 60Hz	7	9	21	25
Protection Structure		IP 55			
Motor current (A/PHASE)		3.0			
Number of Rotations of Manual Operating Handle		24	30	50	60
Nominal Diameter of cable connector		2 - G 1/2			
Motor insulation type		E type			

\* Opening and closing times are for reference only. Valves shown are measured without valve load to actuator.



Nominal size 65-100mm (2 1/2"-4")

Wiring diagram



\*Input shunt resistor incorporated for current input.

List of Specifications

Adaptive Nominal Size mm (inch)		65mm (2 1/2")	80mm (3")	100mm (4")
Actuator Type		CSP471	CSP771	
Opening and Closing Time (sec.)*	50Hz / 60Hz	58 / 49	72 / 61	85 / 73
Protection Structure		IP 56		
Motor current (A/PHASE)		3.0		
Number of Rotations of Manual Operating Handle		41	50	60
Nominal Diameter of cable connector		2 - G 1		
Motor insulation type		B type		

\* Opening and closing times are for reference only. Valves shown are measured without valve load to actuator.

**(7) Installation procedure**

- Warning**
- ⚠️ - When suspending and supporting a valve, take care and do not stand under a suspended valve.
  - ⚠️ - Be sure to conduct a safety check on all hand and power tools to be used before beginning work.
  - ⚠️ - Wear protective gloves and safety goggles as fluid remain in the valve even if the pipeline is empty. (You may be injured.)
- Caution**
- ⚠️ - Do not use the valve to fluid containing slurry. (The valve will not operate properly.)
  - ⚠️ - When installing a pipe support by means of a U-band or something similar, take care not to over-tighten. (Excessive force may damage the pipe.)
  - ⚠️ - When installing pipes and valves, ensure that they are not subjected to tension, compression, bending, impact, or other excessive.
  - The installed valve must never be opened or closed when foreign matter such as sand is present in the pipeline.
  - 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 specification should be followed.)

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

Procedure

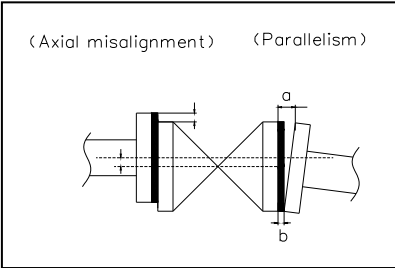
- 1) Set the AV gasket between the flanges.
- 2) Insert washers and bolts from the pipe side, insert washers and nuts from the valve side, then temporarily tighten them by hand.

**Caution**

⚠️ - The parallelism and axial misalignment of the flange surface should be under the values shown in the following table to prevent damage the valve.  
(A failure to observe them can cause destruction due to stress application to the pipe)

Unit: mm (inch)

Nom. Size	Axial Misalignment	Parallelism (a-b)
15-32mm (1/2"-1 1/4")	1.0 (0.04")	0.5 (0.02")
40-80mm (1 1/2"-3")	1.0 (0.04")	0.8 (0.03")
100mm (4")	1.0 (0.04")	1.0 (0.04")



(Axial misalignment) (Parallelism)

- 3) Tighten the bolts and nuts gradually with a torque wrench to the specified torque level in a diagonal manner. (Refer to fig.1.) \* Avoid excessive tightening. (The valve can be damaged.)

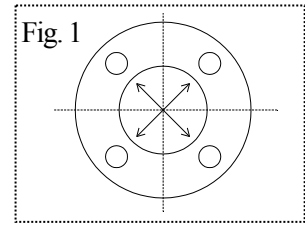


- Avoid excessive tightening. (The valve can be damaged.)

Caution

Nom. Size	Recommended torque value			
	15, 20mm (1/2"-3/4")	25-40mm (1"-1 1/2")	50, 65mm (2, 2 1/2")	80, 100mm (3", 4")
PTFE, PVDF Coated	17.5	20.0	22.5	30.0
	{179} [155]	{204} [177]	{230} [200]	{306} [266]
Rubber	8.0	20.0	22.5	30.0
	{82} [71]	{204} [177]	{230} [200]	{306} [266]

Unit: N·m [kgf·cm] [lb·inch]



## <True Union Diaphragm Valve Type 14>

**Threaded Type** (Body Material: PVC, C-PVC, PP, PVDF)



Caution

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

- Do not use the pipe wrench. (The valve can be damaged.)

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

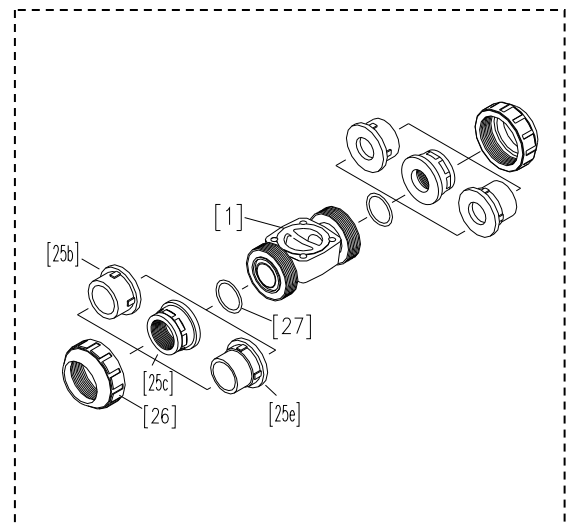
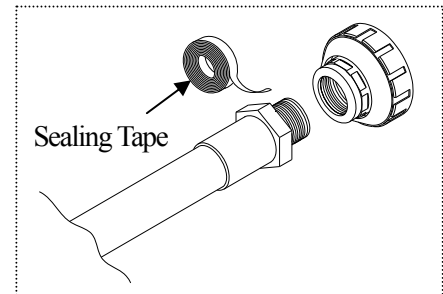
- Wrap the threaded joints on our plastic piping with sealing tape. Using a liquid sealing agent or liquid gasket may cause stress cracks (Environmental Stress Cracking). Our product warranty shall not apply in case of said use, even when said use is unavoidable.

### Necessary items





- Sealing tape
- Strap wrench
- Spanner wrench

### Procedure

- 1) Wind a sealing tape around the external thread of joint, leaving the end (about 3mm) free.
- 2) Loosen the union nut [26] with a strap wrench.
- 3) Remove the union nut [26] and the end connector [25].
- 4) Tighten the external thread of the joint and the end connector [25] lightly by hand.
- 5) Using a spanner wrench, screw in the end connector [25] by turning 180°-360° carefully without damaging it.
  - \* Avoid excessive tightening. (The valve can be damaged.)
- 6) Make sure that the O-ring(C) [27] is mounted.
- 7) Set the end connector [25] and union nut [26] directly on the body without allowing the O-ring (C) [27] to come off.
- 8) Tighten the union nut [25] on each valve until hand tight.
- 9) Using a strap wrench tighten union nuts uniformly on each on each side approx 90° -180° turns, 1/4 to 1/2 turns.
  - \* Avoid excessive tightening. (The valve can be damaged.)



## Socket Type (Body Material: PVC, C-PVC)

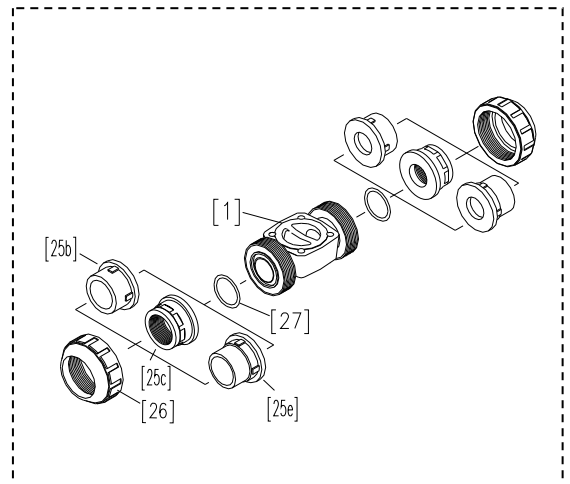
- Warning**  - When using an adhesive, ventilate the space sufficiently, prohibit the use of a fire in the vicinity, and do not inhale adhesive vapors directly.
-  - If an adhesive gets into contact with your skin, wash it off immediately. If you feel sick or find anomaly, receive a physician's diagnosis and take appropriate measures promptly.
- Caution**  - 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-Voltage Type) or something similar to ventilate the space, thus removing the solvent vapors.
-  - Use the appropriate Asahi AV cement.
- Conduct a water test at least 24 hours after joining the pipes with an adhesive.
  - Do not install a socket type valve where the atmospheric temperature is 5 °C (23 °F) or lower. (The valve joint can fail.)

### Necessary items

- Adhesive for hard vinyl chloride pipes
- Strap wrench

### Procedure

- 1) Loosen the union nut [26] with a strap wrench.
- 2) Remove the union nut [26] and end connector [25].
- 3) Lead the union nut [26] through the pipe.
- 4) Clean the hub part of the end connector [25] by wiping with a waste cloth.
- 5) Apply adhesive evenly to the hub part of the end connector [25] and the pipe spigot.
  - \* Do not apply more adhesive than necessary. (The valve can be damaged due to solvent cracking.)



### 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)	1.0	1.3	2.0	2.4	3.5	4.8

- 6) After applying adhesive, insert the pipe quickly to the end connector [25] and leave it alone for at least 60 seconds.
- 7) Wipe away overflowing adhesive.
- 8) Make sure that O-ring(C) [27] is mounted
- 9) Set the end connector [25] and union nut [26] directly on the body without allowing the O-ring(C) [27] to come off.
- 10) Tighten the union nut [26] on each valve hand tight.
- 11) Using a strap wrench tighten union nuts uniformly on each on each side approx 90° -180° turns, 1/4 to 1/2 turns.

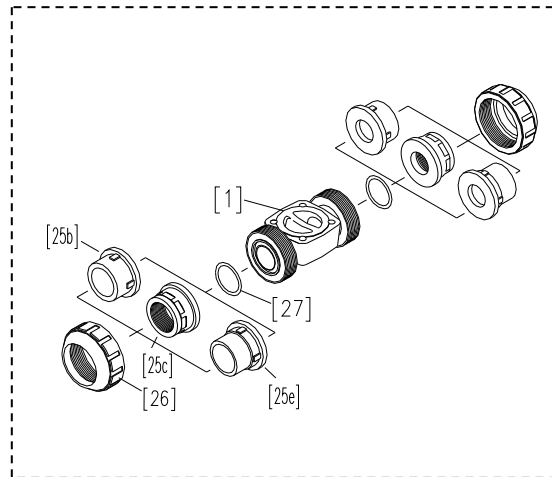
**Socket Type** (Body Material: PP, PVDF)**Spigot Type** (Body Material: PVDF)

## Necessary items

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

Procedure

- 1) Loosen the union nut [26] with a strap wrench.
- 2) Remove the union nut [26] and the end connector [25].
- 3) Lead the union nut [26] through the pipe.
- 4) For the next step, refer to the user's manual for the sleeve welder or the automatic welding machine.
- 5) After welding, make sure that the O-ring (C) [27] is mounted.
- 6) Set the end connector [25] and the union nut [26] directly without allowing the O-ring (C) [27] to come off.
- 7) Tighten the union nut [26] on each valve until hand tight.
- 8) Using a strap wrench tighten union nuts uniformly on each on each side approx 90° -180° turns, 1/4 to 1/2 turns. \* Avoid excessive tightening. (The valve can be damaged.)

**(8) Support setting procedure**

Caution

- Do not subject the valve to pump vibrations. (The valve may be damaged.)



- Set valve support on the valve.

- When installing a pipe support by means of a U-band or something similar, take care not to fasten it too much. (Excessive tension may damage it.)

## Necessary items

- Spanner wrench
- U-type clamp (with bolt)
- Rubber sheet

## Level installation

- Using an insert metal & U-type clamp

Fix the insert metal (under the valve) and the support stand with bolts.

Spread the rubber sheet on the pipe and secure pipe with U-type clamp.

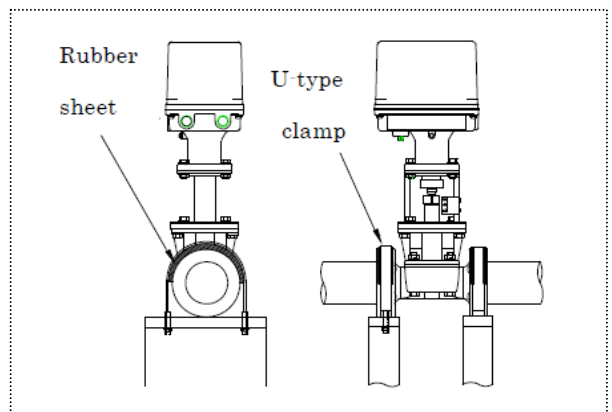
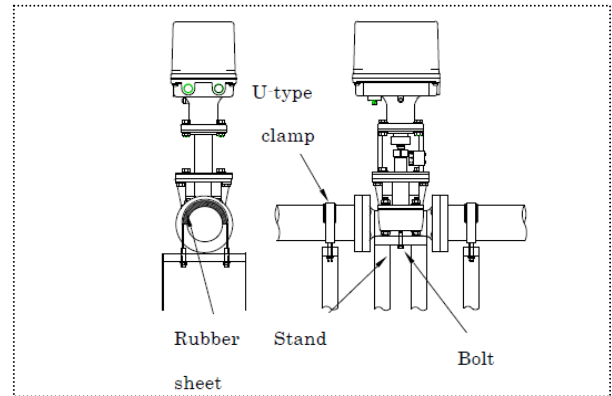
### Bolt size

Nom. size	15-32mm (1/2"-1 1/4")	40, 50mm (1 1/2", 2")
Nominal	M5	M6

Nom. size	65mm (2 1/2")	80, 100mm (3", 4")
Nominal	M8	M12

- Using U-type clamp

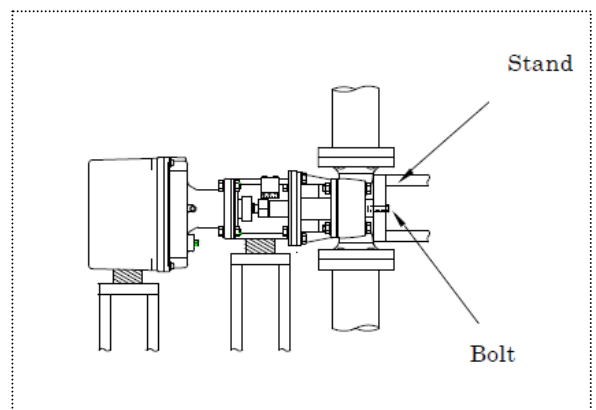
Spread the rubber sheet on the flange of the valve and secure the pipe with U-type clamp.



## Perpendicular installation

Fix the insert metal (under the valve) and the support stand with bolts.

Spread the rubber sheet under the actuator, and support with the support stand.



**(9) Electric wiring procedure**



Warning

- Do not touch any parts on actuator circuit board or terminal block or connect or disconnect wires while the actuator is energized. (Any such practice may result in an electric shock or equipment damage.)
- Keep hands and other extremities away from moving parts under all circumstances. (Any such practice may get your hand, arm, or other part of your body caught.)
- Be sure to establish a connection to ground. (A defective ground may result in an electrical shock, fire, or other incident.)
- At the time of adjustment or inspection, ensure that your hands are free of water and oil. (Any such substance on your hands may result in an electric shock or equipment damage.)
- Do not operate the manual override while the actuator is energized.



Caution

- Do not exceed the rated capacity of limit switch contacts. If you wish to apply very small loads (1-100 mA, 5-30 V), consult our service station nearest to you.
- Do not connect two or more motor-driven valves in series. Also, each motor driven valve should have a separate switch or relay contact.
- Do not use the product near high-voltage wire, inverter, or any other equipment that produces electrical noise or magnetism. (The presence of such nearby may cause malfunction or breakdown.)
- Check the integrity of wiring insulation before connecting to the actuator. (Failure to observe this precaution may result in wire damage, electric shock, fire, or other incident.)
- Ensure all covers are tightly fastened prior to operation. (Insufficient fastening may allow rainwater, dust, or dirt to come in, resulting in breakdown.)
- When connecting wires, be sure to observe the connection diagram and make the connections correctly. Moreover, after wiring, ensure that the connections are securely made before turning on the power. (Failure to take this precaution may cause malfunction or breakdown.)
- Each cover part is sealed with an O-ring. When laying wiring or in similar cases, where the cover is removed and replaced, ensure that the O-ring is installed in the proper location and securely sealed. (Insufficient sealing may cause the actuator to be penetrated by rainwater or other foreign matter, resulting in electric shock or breakdown.)
- If you wish to use the product outdoors or in any other location exposed to rainwater or other forms of moisture, protect the wiring conduit of the actuator against ingress of rainwater and all other wetness. (Failure to take such a precaution may cause the actuator to be penetrated by rainwater or something similar, resulting in electric shock or breakdown.)
- In the case of malodor, overheating, or smoking, turn off the power supply immediately. (Continued use despite an abnormality present may result in a fire. If you detect any abnormalities, be sure to consult the dealership where you bought the product or our service station nearest your premises and ask them to perform an inspection.)

Necessary items

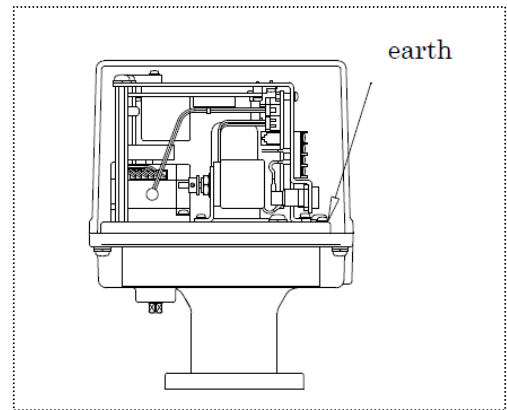
- Wire stripper
- Terminal crimping tool
- Crimp-style terminal
- Screwdriver (+)
- Connector

\* Check supply voltage indicated on the actuator and make sure it is the same as the voltage applied, before completing the wiring. (Wiring at different voltages will cause problems in the AV valve.)



Procedure

- 1) Loosen the four screws with a Screwdriver and remove the cover from the actuator.
- 2) Remove the conduit plug with a spanner wrench.
- 3) Install a conduit connector into the cable entrance.
- 4) Draw a wire through the connector.
- 5) Strip the wire using with a wire strippers.
- 6) Install a Crimp-style terminal on the wire lead with a terminal crimping tool.
- 7) Connect to the terminal board with a screwdriver in accordance with page 7-8.  
\* Tighten the screws. (Electric leaks or shocks may occur.)
- 8) Connect the earth wire to a good ground.
- 9) Tighten the connector. (Electric leaks or shocks may occur.)
- 10) Tighten above four screws with a screwdriver to fix and install the cover of the actuator.



## (10) Operating procedure



Warning

- Do not touch any parts on actuator circuit board or terminal block or connect or disconnect wires while the actuator is energized. (Any such practice may result in an electric shock or equipment damage.)

- Keep hands and other extremities away from moving parts under all circumstances.

(Any such practice may get your hand, arm, or other part of your body caught.)



- Be sure to establish a ground. (A defective ground may result in an electrical shock, fire, or other incident.)

- At the time of adjustment or inspection, ensure that your hands are free of water and oil.

(Any such substance on your hands may result in an electric shock or equipment damage.)

- Do not operate the manual override while the actuator is energized.



Caution

- Do not connect two or more motor-driven valves in series. Also, install a switch (or a relay contact) for each motor-driven valve.

- Do not use the product near a high-voltage wire, inverter or other equipment that produces electrical noise or magnetism. (The presence of such nearby may cause malfunction or breakdown.)



- Check the integrity of wiring insulation before connecting to the actuator.

(Failure to observe this precaution may result in wire damage.)

- Ensure all covers are tightly fastened prior to operation.

(Insufficient fastening may allow rainwater, dust, or dirt to come in, resulting in breakdown.)

- When connecting wires, be sure to observe the connection diagram and make the connections correctly.

Moreover, after wiring, ensure that the connections are securely made before turning on the power.

(Failure to take this precaution may cause malfunction or breakdown.)



## Manual Operating Procedure



- Turn off the power source.

(If the power source is turned on during the manual operation, you may be injured.)

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

- Spanner wrench (8mm)

#### Procedure

- 1) Attach the spanner wrench to the manual shaft of the actuator.
- 2) Turn the spanner wrench within the operating torque range (1.8N·m).  
(Do not rotate handle past the open/close travel positions. (It may damage the product))

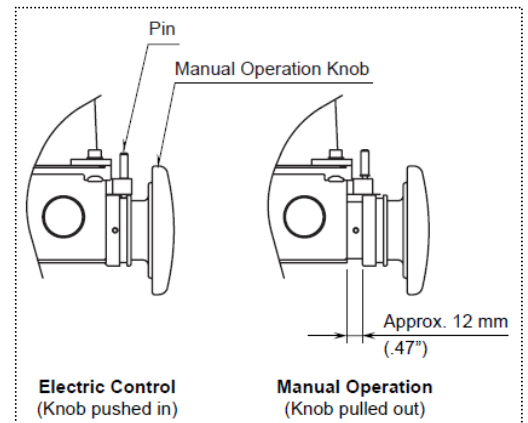
Right turn (clockwise) → Open direction  
Left turn (counterclockwise) → Close direction

- 3) Detach the spanner wrench from the manual shaft of the actuator.

### Nominal size 65-100mm (2 1/2"-4")

#### Procedure

- 1) With the pin extended, pull out the manual operation knob while twisting slightly from side to side to the manual control position.
- 2) Turn the manual handle while watching the valve travel indicator.  
Right turn (clock wise) → Shut direction  
Left turn (counter clock wise) → Open direction  
\*Do not turn the handle forcibly past the open/close positions. (Ignoring this could develop problems in the valve.)
- 3) After manual operation, push in the knob while twisting slightly from side to side back to the electric control position. Confirm that the pin is retracted to the original position.
- 4) Confirm the knob's position before turning on the power supply.



## Motor-Driven Operating Procedure



- Do not operate the actuator while the cover is removed. (Coming into contact with a terminal in this state can give you an electric shock.)

- Check to ensure that the hexagon or the manual handle is not applied to the end of the manual operation shaft. (If not, the Allen wrench will be flown by the rotation of the manual operation shaft, and injury may occur)

#### Procedure

- 1) If the spanner wrench is attached to the manual shaft of the actuator, detach it (only for PSN1, PSN3).
- 2) Turn on the power source.
- 3) Input an open/close signal and check to ensure that the valve indicating direction and the operating direction agree with each other.
- 4) Shut down the power source.

## (11) Disassembling method for replacing parts

**Warning**

- Do not disassemble or modify the actuator.
- Do not touch any parts on actuator circuit board, terminal block, connect/disconnect wires while the actuator is energized. (Any such practice may result in an electric shock or equipment damage.)
- Do not change or replace valve parts while pipe line is pressurized.

**!**

- Be sure to conduct a safety check on all hand and power tools to be used before beginning work.
- Wear protective gloves and safety goggles as fluid remain in the valve even if the pipeline is empty. (You may be injured.)

**Caution**

- Securely fasten all covers. (Insufficient fastening may allow ingress of rainwater, dust, or dirt, resulting in breakdown.)
- The actuator has been adjusted at the factory. If reconfiguration or adjustment is needed, do so according to the relevant operation manual. (Failure to observe this instruction may cause malfunction or breakdown.)
- Each cover part is sealed with an O-ring. When laying wiring or in similar cases, where the cover is removed and replaced, ensure that the O-ring is installed in the specified location and securely sealed. (Insufficient sealing may cause the actuator to be penetrated by rainwater or other foreign matter, resulting in electric shock or breakdown.)

Necessary items

- Spanner wrench
- Allen wrench(5mm)
- Protective gloves
- Safety goggles

### <Disassembly>

#### Procedure

- 1) Completely discharge fluid from pipes.
- 2) Fully shut the valve by the motor-driven operation or manual operation.
- 3) Turn off the power source.
- 4) Remove bolt-nut (A) [18].
- 5) Remove the actuator [96] from the valve.
- 6) Turn the diaphragm [3] 90 degrees and remove it.

### <Assembly>

#### Procedure

- 1) Shape the diaphragm [3] into (fig.2).
- 2) Insert the diaphragm [3] into the actuator and rotate it 90°.
- 3) Shape the diaphragm [3] into (fig.3). (In case PTFE diaphragm.)
- 4) Insert an Allen wrench or the manual handle (option) in the hexagon hole of the manual operation shaft on the actuator.
- 5) Turn the Allen wrench or the manual handle (option) left (count clockwise) to close the valve fully, while watching the valve travel indicator.
- 6) Put the actuator [96] on the body [1].
- 7) Set the bolt-nut (A) [18] and tighten the body [1] and the bonnet [9]. (According to the body tightening torque in Table 1.)

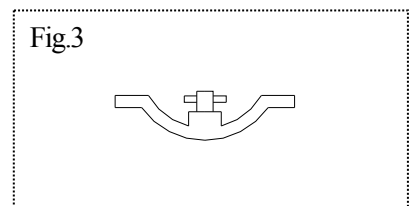
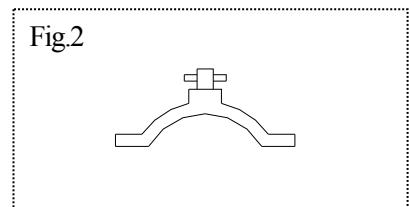


Table1 Body tightening torque value

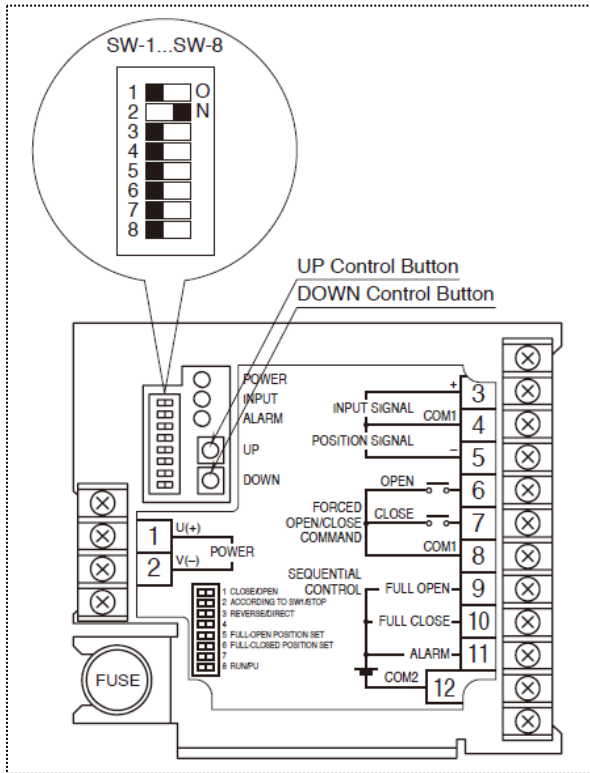
Unit: N·m {kgf·cm} [lb·inch]

Nom. Size Diaphragm Material	15, 20mm (1/2"-3/4")	25, 32mm (1"-1 1/4")	40mm (1 1/2")	50mm (2")	65mm (2 1/2")	80mm (3")	100mm (4")
Rubber	3.0 {31} [27]	5.0 {51} [44]	12.0 {122} [106]	15.0 {153} [133]	13.0 {133} [116]	18.0 {184} [160]	35.0 {357} [310]
PTFE	5.0 {51} [44]	8.0 {82} [71]	15.0 {153} [133]	20.0 {204} [177]	15.0 {153} [133]	20.0 {204} [177]	40.0 {408} [355]

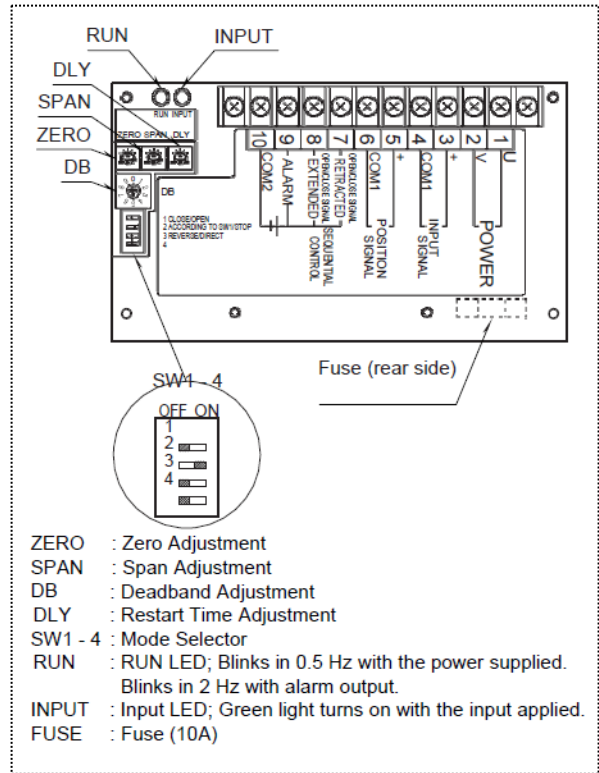
**(12) Adjustment procedure**

Adjust the full-open and full-closed positions referring to the figure below. Other adjustments can be also conducted as explained below : reverse acting for operation, and default position setting for loss of signal operation.

**Nominal size: 15-50mm (1/2"-2") (Actuator Type:PSN)**



**Nominal size 65-100mm (2 1/2"-4") (Actuator Type:CSP)**



- ZERO : Zero Adjustment
- SPAN : Span Adjustment
- DB : Deadband Adjustment
- DLY : Restart Time Adjustment
- SW1 - 4 : Mode Selector
- RUN : RUN LED; Blinks in 0.5 Hz with the power supplied.  
Blinks in 2 Hz with alarm output.
- INPUT : Input LED; Green light turns on with the input applied.
- FUSE : Fuse (10A)

**■ OPERATION AT ABNORMALLY LOW INPUT (SW-1, SW-2)**

When the input goes down to 0.37±0.1V DC or below, the PSN goes to loss of signal operation mode.

Abnormal low input operation & switch positions

MODE	SW1	SW2
Stop	※1	ON
Full open	OFF	OFF
Full shut	ON	OFF

※1. SW-1 position is disregarded in STOP mode.

**■ ACTUATOR ACTION (SW-3)**

Use SW-3 for inverted actuator operation.

Actuator action

MODE	SW-3	ACTION
Normal operation	ON	Fully open at 0% input.
Reverse acting	OFF	Fully closed at 0% input.

※In reverse acting operation, the input signal 0 - 100% corresponds to a position input signal of 20 – 4mA DC.

**■ FULL-OPEN/CLOSED POSITIONS**

**Nominal size: 15-50mm (1/2"-2") only (Actuator Type:PSN)**

- 1) Turn ON SW-8 in order to put the PSN in the local calibration mode, allowing the input signal to be disregarded.
- 2) Turn ON SW-5 and adjust to the fully open end position by pressing UP/DOWN control buttons.
- 3) When the stem reaches the desired position, turn OFF SW-5. The position is saved as the fully open position.
- 4) Turn ON the SW-6 and adjust the fully closed position pressing UP/DOWN control buttons.
- 5) When the output stem reaches the desired position, turn OFF the SW-6. The position is saved as the fully closed position.
- 6) Turn OFF the SW-8 in order to put the PSN in operating mode. Apply input signals and confirm the full open/closed positions.

**Nominal size 65-100mm (2 1/2"-4") (Actuator Type:CSP) >**

**Zero and Span**

- 1) Turn on the power supply. Apply 0% [100%] input. Turn the zero adjustment to adjust the full open position (valve stem fully retracted).
- 2) With 100% [0%] input, turn the span adjustment to adjust the full closed position (valve stem fully extended).
- 3) With 0% [100%] input again, check that the stem is at the fully extended position. If the position is shifted, go through the above procedure again.

**(13) Actuator output signal**

Opening output

This signal is output at 4 mA when the valve is at the full close position and at 20 mA when the valve is at the full open position. These positions are set by the full open/full close position adjustment.

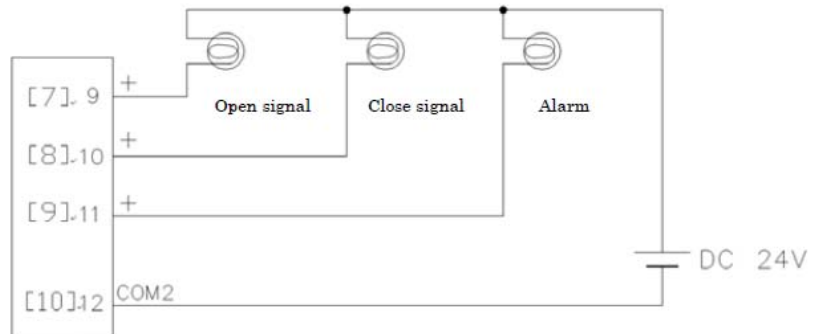
The minus side of this signal is internally connected to the minus side of the input signal, so they are not individually insulated.

Full open/close signals

This actuator has a transistor open collector output. The full open/close signals are output when the valve is at the position set by the full open/full close signal position adjustment.

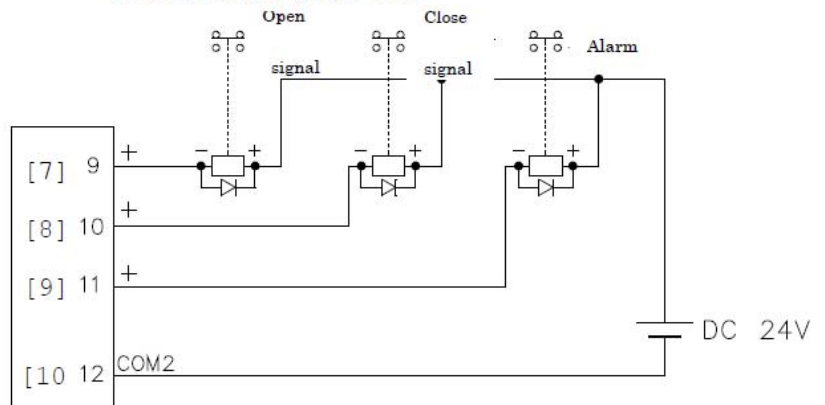
Example of open collector output wiring

When lamp is used  
(The lamp is for 24 V, 2W or less.)



[ ] Terminal number: CSP

When relay is used  
(The relay excitation current is 100 mA or less.)



[ ] Terminal number: CSP

Trouble alarm signal



- Trouble detection

When the output axis does not operate due to troubles such as overload and failure even when there is a deviation between the input signal and the signal position, the motor operates at the maximum torque and start operation is repeated. When the output axis does not operate even after that, it is determined that a trouble has occurred, so a trouble alarm is output and the power supply to the motor is stopped. To reset this state after trouble detection, repeat 0% and 100% alternatively by the input signal several times or turn off the power.

- Protection from abnormal temperature rise

When the temperature sensor inside the unit detects abnormal temperature rise of the motor, the trouble alarm blinks (repeats 0.5 seconds ON and 0.5 seconds OFF) until the temperature drops and the power supply to the motor is stopped. The unit will be automatically recovered after a few minutes. However, the higher the ambient temperature is, the longer the recovery time is required.

(14) Inspection items



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

Portion to be inspected	Inspection item
Actuator	<ul style="list-style-type: none"> <li>- Existence of rust, peeling of paint, and dirt of inspection hole of valve travel indicator.</li> <li>- Tightening condition of respective threaded portions. (Loose or not)</li> <li>- Existence of rust and corrosion around the limit switch, and existence of internal disconnection.</li> <li>- Existence of rust and corrosion of terminal board, and existence of disconnection.</li> <li>- Existence of abnormality in opening and closing operating sounds.</li> <li>- Smooth operation of manual handle.</li> <li>* It is unnecessary to supply oil to this actuator.</li> </ul>
Valve	<ul style="list-style-type: none"> <li>- Existence of scratches, cracks, deformation, and discoloring.</li> <li>- Existence of leakage from the valve to the outside. (As for True Union Diaphragm Valve Type 14, tightening condition of the union nut (loose or not).)</li> <li>- Existence of leakage when the valve is in the full closed position.</li> <li>- Tightening condition of bolt (A) (loose or not.)</li> </ul>

## (15) Troubleshooting

Problem	Cause	Treatment
The handle can't be turned when the valve is operated manually.	The valve has already been opened fully.	Turn handle in the reverse direction.
	The valve is being driven in a direction opposite to handwheel rotation by the actuator.	Turn off the power source.
	Foreign matter is in the valve.	Disassemble the valve to remove foreign matter. (Refer to page 17)
The valve does not operate by motor-driven operations	The power source of the control panel is turned off.	Turn on the power source.
	The actuator is disconnected.	Check the connection again. (Refer to page 7,8)
	Open and close are electrified simultaneously.	
Fluid leaks from the valve even when the valve is closed fully.	The diaphragm is worn.	Replace the diaphragm with a new one. (Refer to page 17)
	The diaphragm or the body is scratched.	Replace scratched parts with new ones. (Refer to page 17)
	There is foreign matter between the diaphragm and the body.	Disassemble valve to remove foreign matter. (Refer to page 17)
	The voltage is low.	Check the voltage.
Fluid leaks from the valve.	The bolt between the body and actuator is loose.	Tighten up the bolt to the specified torque. (Refer to page 18).
The actuator operates, but the valve is not opened or closed.	The diaphragm or the body is scratched.	Replace scratched parts with new one.
	There is foreign matter between the diaphragm and the body.	Disassemble valve to remove foreign matter. (Refer to page 17)
	The diaphragm or the joint metal fitting is broken.	Replace broken parts. (Refer to page 17)

## (16) Handling of residual and waste materials



 - 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.)

**Diaphragm Valve Type 14 Electric Actuated Type M**  
15-100mm (1/2"-4")  
**True Union Diaphragm Valve Type 14 Electric Actuated Type M**  
15-50mm (1/2"-2")

[Automatic Valve]

**ASAHI YUKIZAI CORPORATION**

Distributor

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Information in this manual is subject to change without notice.

2016.4

**Diaphragm Valve Type 14 Electric Actuated Type M 15-100mm (1/2"-4")**  
**True Union Diaphragm Valve Type 14 Electric Actuator Type M 15-50mm (1/2"-2")**