Diaphragm Valve Type 15
Pneumatic Actuated Type AV

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

<Warning & Caution Signs>

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Warning]</td>
<td>This symbol reminds the user to take caution due to the potential for serious injury or death.</td>
</tr>
<tr>
<td>![Caution]</td>
<td>This symbol reminds the user to take caution due to the potential for damage to the valve if used in such a manner.</td>
</tr>
</tbody>
</table>

<Prohibited & Mandatory Action Signs>

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Prohibited]</td>
<td>Prohibited: When operating the valve, this symbol indicates an action that should not be taken.</td>
</tr>
<tr>
<td>![Mandatory action]</td>
<td>Mandatory action: When operating the valve, this symbol indicates mandatory actions that must be adhered to.</td>
</tr>
</tbody>
</table>

(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

- Never attempt to disassemble an actuator. (If disassembled forcibly, internal parts may jump out and this is very dangerous.)

- 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.

- 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 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.)
- 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.)
- The travel stop may have to be adjusted if media leakage is detected between the upstream & downstream sides of the valve.
- Bonnet bolt torque should be checked before installation, as they may become loose after long-term storage. A periodic check of the valve condition as well as bonnet & flange bolt torque should be made part of preventative maintenance program properly re-tightening the bolts as necessary. It is especially important to re-tighten all bolts during the first shutdown.
- Set valve support on the valve.
- The AV valves must be used within the specifications specifically applicable to the product.

- The actuator of diaphragm valve have draw and exhaust vent. (The back side) The fluid might spout when the diaphragm is damaged by the condition. Perform periodic maintenance.
(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.)

- **Caution**
  - 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 125~150mm (5”~6”)

<table>
<thead>
<tr>
<th>No.</th>
<th>DESCRIPTION</th>
<th>No.</th>
<th>DESCRIPTION</th>
<th>No.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Body</td>
<td>21</td>
<td>Gauge cover</td>
<td>50</td>
<td>Actuator (double acting)</td>
</tr>
<tr>
<td>3</td>
<td>Diaphragm</td>
<td>23</td>
<td>Bolt-nut</td>
<td>51</td>
<td>Actuator (air to open)</td>
</tr>
<tr>
<td>3a</td>
<td>Insert metal of diaphragm</td>
<td>24</td>
<td>Bolt-nut</td>
<td>52</td>
<td>Actuator (air to shut)</td>
</tr>
<tr>
<td>4</td>
<td>Cushion</td>
<td>24a</td>
<td>Washer</td>
<td>56</td>
<td>Stand (A)</td>
</tr>
<tr>
<td>5</td>
<td>Cushion cover</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Stopper</td>
<td>29</td>
<td>Spring washer</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Use with the PVDF body)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In case of body material is PVDF.
(5) Working pressure vs. temperature

- **Double acting**

- **Single acting**
(6) Specifications of actuator

<table>
<thead>
<tr>
<th>Nominal size</th>
<th>125mm (5&quot;)</th>
<th>150mm (6&quot;)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard operating pressure MPA {kgf/cm²}</td>
<td>All type</td>
<td>4.0 {4.1} - 6.0 {6.1}</td>
</tr>
<tr>
<td>Air consumption N/ per 1 open and close (at 0.4MPa)</td>
<td>Double action type</td>
<td>36.6 - 67.3</td>
</tr>
<tr>
<td>Air to open type</td>
<td>55.6 - 84.2</td>
<td></td>
</tr>
<tr>
<td>Air to close type</td>
<td>38.4 - 60.5</td>
<td></td>
</tr>
<tr>
<td>Air supply bore</td>
<td>All type</td>
<td>Rc 1/4</td>
</tr>
</tbody>
</table>

(7) Specifications of option

(Specifications of Solenoid valve)

<table>
<thead>
<tr>
<th>Actuation</th>
<th>Nom. size</th>
<th>Type sign</th>
<th>Pipe bore</th>
<th>Effective cross section area</th>
<th>Power consumption</th>
<th>Additional function</th>
</tr>
</thead>
<tbody>
<tr>
<td>All type</td>
<td>125,150mm (5&quot;, 6&quot;)</td>
<td>4N3S102K-W□-G31193</td>
<td>Rc 1/4</td>
<td>10mm² or more</td>
<td>AC : 6VA DC : 5.5W</td>
<td>○Bypass valve built-in ○Silencer with needle valve attached (to be used as speed controller)</td>
</tr>
</tbody>
</table>

4N3S102K-W□-G31193

*( ) is special order.

connection diagram

<table>
<thead>
<tr>
<th>Specification</th>
<th>sign</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC100V 50/60Hz</td>
<td>1</td>
</tr>
<tr>
<td>AC110V 50/60Hz</td>
<td>2</td>
</tr>
<tr>
<td>AC200V 50/60Hz</td>
<td>3</td>
</tr>
<tr>
<td>AC220V 50/60Hz</td>
<td>4</td>
</tr>
<tr>
<td>DC24V</td>
<td>5</td>
</tr>
<tr>
<td>DC48V</td>
<td>6</td>
</tr>
<tr>
<td>DC100V</td>
<td>7</td>
</tr>
<tr>
<td>DC125V</td>
<td>9</td>
</tr>
</tbody>
</table>

JIS sign

Diaphragm Valve Type 15 Pneumatic Actuated Type AV
(Specifications of Limit switch)

<table>
<thead>
<tr>
<th>Actuation</th>
<th>Nominal size</th>
<th>Type sign</th>
<th>Protection grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Double actuation, Single actuation type</td>
<td>125,150mm (5&quot;, 6&quot;)</td>
<td>1LS1-J</td>
<td>IP67 (IEC529)</td>
</tr>
</tbody>
</table>

Limit switch rating

<table>
<thead>
<tr>
<th>Rate voltage (V)</th>
<th>Resitive load (A)</th>
<th>Inductive load (A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC125</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>AC250</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>DC115</td>
<td>0.8</td>
<td>0.2</td>
</tr>
<tr>
<td>DC230</td>
<td>0.4</td>
<td>0.1</td>
</tr>
</tbody>
</table>

(connection diagram)

(Specification of pressure reducing valve with filter)

<table>
<thead>
<tr>
<th>Actuation</th>
<th>Nom. size</th>
<th>Type sign</th>
<th>Pipe bore</th>
<th>Element degree of filtration</th>
</tr>
</thead>
<tbody>
<tr>
<td>All type</td>
<td>125,150mm (5&quot;, 6&quot;)</td>
<td>ARU2-02-8A-B</td>
<td>Rc 1/4</td>
<td>5μm</td>
</tr>
</tbody>
</table>

(Specification of speed controller)

<table>
<thead>
<tr>
<th>Actuation</th>
<th>Nom. size</th>
<th>Type sign</th>
<th>Pipe bore</th>
</tr>
</thead>
<tbody>
<tr>
<td>All type</td>
<td>125,150mm (5&quot;, 6&quot;)</td>
<td>SC7-08A</td>
<td>Rc 1/4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Actuation</th>
<th>Effective cross section area (mm²)</th>
<th>Needle No. of revolution</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Free flow</td>
<td>Control flow</td>
</tr>
<tr>
<td>All type</td>
<td>11.0(0.017)</td>
<td>8.3(0.013)</td>
</tr>
</tbody>
</table>
### (8) Installation procedure

- 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.)

- 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 stress.

- Before a water test, be sure that the flange is tightly fastened.

- Fasten the flange while avoiding the parallelism and axial misalignment of the flange surface.

- When connecting a ASAHI AV Valve to metal piping, take care not to let the pipe stress on the ASAHI AV Valve.

- 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
- AV gasket

#### 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.

- 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)

<table>
<thead>
<tr>
<th>Nominal size (inch)</th>
<th>Axial (a-b)</th>
<th>Parallelism (a-b)</th>
</tr>
</thead>
<tbody>
<tr>
<td>125mm (5&quot;)</td>
<td>1.0mm (0.04&quot;)</td>
<td>1.0mm (0.04&quot;)</td>
</tr>
<tr>
<td>150mm (6&quot;)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

- Tighten the bolts and nuts gradually with a torque wrench to the specified torque level in a diagonal manner.

<table>
<thead>
<tr>
<th>Recommended torque value</th>
<th>Unit: N·m [kgf·cm] [lb·inch]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nom. Size</td>
<td>125mm (5&quot;)</td>
</tr>
<tr>
<td>Torque value</td>
<td>40.0</td>
</tr>
<tr>
<td></td>
<td>{408}</td>
</tr>
<tr>
<td></td>
<td>[355]</td>
</tr>
</tbody>
</table>
(9) Air piping procedure

**<1> For a standard type and an attached speed controller type**

- Do not remove a dust-proof cap provided to piping port before piping work starts.
- Avoid excessive tightening. (The threaded area of a pipe can be damaged.)
- Check the connection locations, air pipe sizes, and screw types with the approved drawings and other documents for the product. Then lay the air piping.
- The operating fluid must be clean air filtered through a pertinent air filter.
- If the actuator is used in an environment below 5°C temperature, its operating fluid must be free from the water and moisture contained in it because of possible problems due to the freeze.
- Steel pipes must always be of the plated.
- Before installing an actuator in pipeline, flash the inside of pipeline completely.
- Do not apply a sealant excessively lest it fall off in the pipeline when an actuator is piped.
- Threaded area of a pipe must be free from the sharp edges and burr.

**Necessary items**

- Spanner wrench
- Seal tape
- Steel pipe or tube for piping
- Joint for steel pipe or tube

**Procedure**

1) Wind a seal tape onto the male screw of the joint with a blank about 3mm (about 2 threads) left at the end.

2) Screw the joint in the piping female screw of the actuator by hand fully.

3) Screw the joint one turn with a spanner wrench.
   * Avoid excessive tightening. (The valve can be damaged.)

4) Mount a steel pipe or a tube.

*Pictures above have no speed controller, but the piping procedure is the same as above.*
For a pressure reducing valve with a solenoid valve and a pressure reducing valve with a filter.

---

**Caution**

- Do not remove a dust-proof cap provided to piping port before piping work starts.
- Avoid excessive tightening. (The threaded area of a pipe can be damaged.)
- Steel pipes must always be of the plated.
- Before installing an actuator in pipeline, flash the inside of pipeline completely.
- Do not apply a sealant excessively lest it fall off in the pipeline when an actuator is piped.
- Threaded area of a pipe must be free from the sharp edges and burr.
- Solenoid valve-A speed controller adjusts and fasten a lock nut by open ended spanners.
- Open the drain periodically in order to exhaust the deposit.
- The equipment must be used at a pressure below the maximum operating pressure specified for the product.

---

**Necessary items**

- Spanner wrench
- Seal tape
- Steel pipe or tube for piping
- Joint for steel pipe or tube

---

**Procedure**

1) Wind a seal tape onto the male screw of the joint with a blank about 3mm (about 2 threads) left at the end.

2) Screw the joint in the piping female screw of the actuator by hand to the full. (fig.1, 2)

3) Screw the joint one turn with a spanner wrench.
   * Avoid excessive tightening.
   (The valve can be damaged.)

4) Mount a steel pipe or a tube.
(10) Support setting procedure

- 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.)

<table>
<thead>
<tr>
<th>Necessary items</th>
</tr>
</thead>
<tbody>
<tr>
<td>● Spanner wrench</td>
</tr>
<tr>
<td>● U-type clamp (with bolt)</td>
</tr>
<tr>
<td>● Rubber sheet</td>
</tr>
</tbody>
</table>

Level installation

Fix the valve stand and the support stand with bolts.

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

Perpendicular installation

Fix the valve stand and the support stand with bolts.

Spread the rubber sheet under the actuator and support it with the stand.
## (11) Connection of limit switch procedure

### Necessary items
- Screw driver (+)
- Connector (G1/2)
- Wire stripper
- Crimp-style terminal
- Terminal crimping tool

### Procedure

1. Loosen the three screws used to attach the limit switch cover with a screwdriver (+) and remove the cover from the limit switch.  
   *These screws are captive.*

2. Pull and remove the protective cap, made of resin, from the cover.

3. Draw the cable through the connector.

4. Strip the cable with a wire stripper.

5. Install a crimp-style terminal on the lead wire with a terminal crimping tool.

6. Connect the terminal screw with a screwdriver (+) according to the internal circuit diagram shown in page 6.  
   *Tighten the screws.  
   *(If not, electric leaks or shocks may occur.)*

7. Tighten the above three screws with a screw driver (+) to install the cover on the limit switch.

8. Tighten the cable by connector.
(12) Connection of solenoid valve procedure

- Go after you surely interrupt a power supply when you do the installation of the terminal base line is combined.
- Be sure that the terminal cover and body cover are put on during the operation.

Necessary items
- Terminal crimping tool
- Screw driver (+)
- Connector (G1/2)
- Wire stripper

Procedure

1. Loosen the hexagon socket head cap screws, and remove the cover.
   * Don’t loose O ring.
   (Short circuit or shocks may occur.)

2. Remove the Faston terminal inserted into coil side and the insulating sleeve.
   * Insulating sleeve isn’t attached in Faston terminal.

3. Draw the cable through the connector to the cover.

4. Strip the cable with wire stripper.

5. Draw the lead wire through the cover.

6. Install the Faston terminal on the lead wire with a terminal-crimping tool.

7. Insert the Faston terminal into the coil side. And fit the cover.

8. Tighten the cover setting screws to fix it.
   [The cover can be set with the wire extraction opening turned upward or downward.(fig.1)]

9. Tighten the cable by connector.

Caution

Warning
(13) Operating procedure

-When AV valve is equipped with a solenoid valve, do not leave solenoid valve terminal cover off. (Contact with the terminal will cause an electric shock.)

- Check that the supply pressure of the pressure reducing valve with a filter is 0.4MPa (4.1kgf/cm²) or more. (AV valve may not function.)

Procedure

1) Supply air to the air supply opening.

2) Check that the air supplying side and the stopper [18] position are matching.
   * When AV valve is equipped with a fully opened adjustment switch, they do not have stoppers.
   Check if the valve is open or close by the direction of the fluid.

3) Stop supplying air.

<For the solenoid valve>

Procedure

1) Supply the air to the solenoid valve.

2) Push the button with a finger, and confirm the action mode shown in the following table.(fig.2)

3) Apply regular rated voltage to the solenoid valve, and confirm the action mode shown in the following table.

4) Turn off the solenoid valve.

<table>
<thead>
<tr>
<th>Push button</th>
<th>Current</th>
<th>Double action/Air to open</th>
<th>Air to close</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pushed</td>
<td>On</td>
<td>Open</td>
<td>Shut</td>
</tr>
<tr>
<td>Not pushed</td>
<td>Off</td>
<td>Shut</td>
<td>Open</td>
</tr>
</tbody>
</table>
<Adjustment of opening / closing speed procedure>

○ Double action type

Necessary items
• Spanner wrench

Procedure

1) Turn to the right the adjustment knob of the solenoid valve fully.
   * Avoid excessive tightening.
   (The speed controller can be damaged.)

2) Supply the air to the solenoid valve.

3) Apply regular rated voltage to solenoid valve, and turn to the left the open side adjustment knob little by little.

4) Turn off the solenoid valve, and turn to the left the shut side adjustment knob little by little.

5) Repeat item 3), 4) to adjust the opening / closing speed required.

6) When the adjustment is finished, while holding the knob with a finger, fix the adjustment knob by turning the locking nut right with a spanner wrench.
   * Avoid excessive tightening.
   (The locking nut can be damaged.)
Adjustment of opening / closing speed procedure

- Single action type

<table>
<thead>
<tr>
<th>Necessary items</th>
<th>Spanner wrench</th>
</tr>
</thead>
</table>

The actuation type changes the speed-adjustable direction.

<table>
<thead>
<tr>
<th>Single action</th>
<th>Opening speed</th>
<th>Closing speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air to open type</td>
<td>Not adjustable</td>
<td>Adjustable</td>
</tr>
<tr>
<td>Air to close type</td>
<td>Adjustable</td>
<td>Not adjustable</td>
</tr>
</tbody>
</table>

Procedure

1) Turn right the adjustment knob of the solenoid valve fully.
   * Avoid excessive tightening.
   (The speed controller can be damaged.)

2) Supply the air to the solenoid valve.

3) Apply regular rated voltage to solenoid valve, and turn off the solenoid valve, then turn left the adjustment knob little by little to adjust the opening / closing speed required.

4) When the adjustment is finished, while holding the knob with a finger, fix the adjustment knob by turning the locking nut right with a spanner wrench.
   * Avoid excessive tightening.
   (The locking nut can be damaged.)
(14) Adjustment procedure for stopper

**Warning**
- Never attempt to disassemble an actuator.
  (If disassembled forcibly, internal parts may jump out and this is very dangerous.)
- Do not touch the actuator when it operated. (You may be injured.)
- Do not change or replace valve parts under line pressure.

**Caution**
- If a stopper is loose, adjust it.
- Tighten the stoppers securely. (Too weak a torque on a stopper may cause it to loosen.)

**Necessary items**
- ● Spanner wrench
- ● Allen wrench

**Procedure**

2) Fix stopper (lower side) [43] with spanner wrench and use spanner wrench to loosen stopper (upper side) [43].
3) Remove stopper [43].
4) Fully close valve by controlling the volume of air.
5) Attach stopper (lower side) [43] by hand and tightens until not turning round the stopper (lower side) [43] with the hand.
6) Turn stopper (lower side) [43] with spanner wrench until the position in which fluid begins to leak.
7) Turn stopper (lower side) [43] with spanner wrench 1/4 – 1/2 turns, counterclockwise.
8) Fix stopper (lower side) [43] with spanner wrench and use spanner wrench to tighten stopper (upper side) [21].
   * Insufficient tightening may loosen the stopper.
9) Completely close valve by controlling the volume of air and check for leakage. If there is leakage, repeat steps 2) to 8) until leakage stops.

* Valve option equipped with limit switch or positioner can adjust by same method.
* Turn off the power of positioner.
(15) Disassembling method for replacing parts

**Warning**
- Never attempt to disassemble an actuator.
  (If disassembled forcibly, internal parts may jump out and this is very dangerous.)
- Do not touch the actuator when it is operated. (You may be injured.)
- Do not change or replace valve parts under line pressure.
- 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.)

**Double action and air to open**

<table>
<thead>
<tr>
<th>Necessary items</th>
</tr>
</thead>
<tbody>
<tr>
<td>● Protective gloves</td>
</tr>
<tr>
<td>● Safety goggles</td>
</tr>
<tr>
<td>● Spanner wrench</td>
</tr>
</tbody>
</table>

**<Disassembly> Procedure**

1) Completely discharge fluid from pipes.
2) Shut the main air valve, and open the bypass valve to discharge the air from the actuator[50],[51].
3) Remove the air piping.
4) Loosen the bolt nut between the body [1] and the actuator, [50],[51].
5) Remove actuators[50],[51].
6) Remove the diaphragm [3] by turning it left (counter clockwise).

**<Assembly> Procedure**

1) Shape the diaphragm [3] into (fig.2).
2) Turn the diaphragm [3] right (clockwise) to set. Tighten it up completely, and turn it left so that the center rib of diaphragm accords with the longer rib of compressor.
3) Shape the diaphragm [3] into (fig.3).
4) Supply the air to the actuator[50],[51] and fully open the valve.
5) Put the actuator[50],[51] on the body[1].
6) Set the Blot-nut [24] and tighten the body [1] and actuator[50],[51].
   (As to the body tightening torque, refer to Table 1.)
### Table 1.

<table>
<thead>
<tr>
<th>Diaphragm material</th>
<th>125mm (5&quot;)</th>
<th>150mm (6&quot;)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rubber</td>
<td>45 {459}</td>
<td>45 {459}</td>
</tr>
<tr>
<td>PTFE</td>
<td>45 {459}</td>
<td>45 {459}</td>
</tr>
</tbody>
</table>

#### Air to shut

- Necessary items
  - Spanner wrench
  - Allen wrench
  - Protective gloves
  - Safety goggles

### Disassemble

**Procedure**

1. Completely discharge fluid from line.
2. Remove the gauge cover [21]. Fully close the valve by air operation.
3. Shut the main air valve, and open the bypass valve to discharge the air from the actuator[50],[51].
4. Remove the air piping.
5. Loosen the bolt nut [24] between the body [1] and the actuator[52].
6. Remove actuators[50],[51].

### Assembly

**Procedure**

1. Shape the diaphragm [3] into (fig.2).
2. Turn the diaphragm [3] right (clockwise) to set. Tighten it up completely, and turn it left so that the center rib of diaphragm accords with the longer rib of compressor.
3. Put the actuator[50], [51] on the body[1].
4. Set the Blot-nut [24] and tighten the body [1] and actuator[50],[51].

(As to the body tightening torque, refer to table 1 on page 17.)
(16) Inspection items

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

Periodically inspect and maintain the AV valve in accordance with the decided schedule.

<table>
<thead>
<tr>
<th>Portion to be inspected</th>
<th>Inspection item</th>
</tr>
</thead>
</table>
| Actuator                | - Check for flaw, crack, or deformation on the valve.  
                           - Check for leaks to the outside or inside.  
                           - Existence of abnormality in opening and closing operating sounds.  
                           - Check that all fasteners are tight.  
                           * It is unnecessary to supply oil to this actuator. |
| Valve                   | - Existence of scratches, cracks, deformation, and discoloring.  
                           - Existence of leakage from the valve to the outside.  
                           - Existence of leakage when the valve is opened fully at right or left.  
                           - Tightening condition of bolt (B)(loose or not). |

(17) Troubleshooting

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>The valve does not operate by air operations</td>
<td>The power source of the control panel is turned off.</td>
<td>Turn on the power source.</td>
</tr>
<tr>
<td></td>
<td>The solenoid valve is disconnected.</td>
<td>Check the connection again. (Refer to page 7,13)</td>
</tr>
<tr>
<td></td>
<td>Air is not supplied to the solenoid valve.</td>
<td>Supply air to solenoid valve.</td>
</tr>
<tr>
<td></td>
<td>The supply voltage to the solenoid valve is wrong.</td>
<td>Check voltage with a tester and set specified voltage.</td>
</tr>
<tr>
<td></td>
<td>The voltage to the solenoid valve is low.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The bypass valve opens.</td>
<td>Closed bypass valve by turning the bypass valve knob in a clockwise direction.</td>
</tr>
<tr>
<td></td>
<td>The speed controller’s knob is fully turned in a clockwise direction.</td>
<td>Turn speed controller’s knob in a counterclockwise direction.</td>
</tr>
<tr>
<td></td>
<td>The operation pressure is low.</td>
<td>Check the operating pressure.</td>
</tr>
<tr>
<td></td>
<td>The diaphragm is worn.</td>
<td>Replace the diaphragm with a new one. (Refer to page 18)</td>
</tr>
<tr>
<td></td>
<td>The diaphragm or the body is scratched.</td>
<td>Replace scratched parts with new ones. (Refer to page 18)</td>
</tr>
<tr>
<td>Problem</td>
<td>Cause</td>
<td>Treatment</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>--------------------------------------------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Fluid leaks from the valve.</td>
<td>The bolt between the body and actuator is loose.</td>
<td>Tighten the bolt to the specified torque. (Refer to page 19).</td>
</tr>
<tr>
<td></td>
<td>The diaphragm or the body is scratched.</td>
<td>Replace scratched parts with new one.</td>
</tr>
<tr>
<td></td>
<td>There is foreign matter between the diaphragm and the body.</td>
<td>Disassemble valve to remove foreign matter. (Refer to page 18)</td>
</tr>
<tr>
<td>The actuator operates, but the valve does not open or close.</td>
<td>The diaphragm or the joint metal fitting is broken.</td>
<td>Replace broken parts. (Refer to page 18)</td>
</tr>
</tbody>
</table>

(18) 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 15
Pneumatic Actuated Type AV

[Automatic Valve]

ASAHI YUKIZAI CORPORATION

http://www.asahi-yukizai.co.jp/en/

Information in this manual is subject to change without notice.
Diaphragm Valve Type 72
Pneumatic Actuated Type AV
(200, 250mm)

(1) Be sure to read the following warranty clauses of our product ........................................... 1
(2) General operating instructions ........................................... 2
(3) General instructions for transportation, unpacking and storage ........................................... 3
(4) Name of parts ......................................................................... 4
(5) Working pressure vs. temperature ........................................... 5
(6) Specifications of actuator ........................................... 6
(7) Specifications of option ........................................... 6
  Specifications of solenoid valve ........................................... 6
  Specifications of limit switch ........................................... 7
  Specifications of pressure reducing valve with filter ........................................... 7
  Specifications of speed controller ........................................... 7
(8) Installation procedure ........................................... 8
(9) Air piping procedure ........................................... 9
(10) Support setting procedure ........................................... 10
(11) Connection of limit switch procedure ........................................... 11
(12) Operating procedure Adjustment of opening / closing speed procedure ........................................... 12
(13) Adjustment procedure for stopper ........................................... 13
(14) Disassembling method for replacing parts ........................................... 14
(15) Inspection items ........................................... 15
(16) Troubleshooting ........................................... 16
(17) Handling of residual and waste materials ........................................... 16
This user's guide contains information important to the proper installation, maintenance and safe use of an ASAHI AV Product. Please store this manual in an easily accessible location.

<Warning & Caution Signs>

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warning</td>
<td>This symbol reminds the user to take caution due to the potential for serious injury or death.</td>
</tr>
<tr>
<td>Caution</td>
<td>This symbol reminds the user to take caution due to the potential for damage to the valve if used in such a manner.</td>
</tr>
</tbody>
</table>

<Prohibited & Mandatory Action Signs>

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forbidden</td>
<td>Prohibited: When operating the valve, this symbol indicates an action that should not be taken.</td>
</tr>
<tr>
<td>Mandatory</td>
<td>Mandatory action: When operating the valve, this symbol indicates mandatory actions that must be adhered to.</td>
</tr>
</tbody>
</table>

(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

- Never attempt to disassemble an actuator.
  (If disassembled forcible, internal parts may jump out and this is very dangerous.)

- 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.

- 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 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.)
- 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.)
- The travel stop may have to be adjusted if media leakage is detected between the upstream & downstream sides of the valve.
- Bonnet bolt torque should be checked before installation, as they may become loose after long-term storage. A periodic check of the valve condition as well as bonnet & flange bolt torque should be made part of preventative maintenance program properly re-tightening the bolts as necessary. It is especially important to re-tighten all bolts during the first shutdown.
- Set valve support on the valve.
- The AV valves must be used within the specifications specifically applicable to the product.

- The actuator of diaphragm valve have draw and exhaust vent. (The back side) The fluid might spout when the diaphragm is damaged by the condition. Perform periodic maintenance.
(3) General instructions for transportation, unpacking and storage

- When suspending and supporting a valve, take care and do not stand under a suspended valve.
- 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.)
- 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 200, 250mm (8", 10")

<table>
<thead>
<tr>
<th>No.</th>
<th>DESCRIPTION</th>
<th>No.</th>
<th>DESCRIPTION</th>
<th>No.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Body</td>
<td>18</td>
<td>Stopper</td>
<td>29</td>
<td>Conical spring washer</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(Use with the PVDF body)</td>
</tr>
<tr>
<td>3</td>
<td>Diaphragm</td>
<td>21</td>
<td>Gauge cover</td>
<td>50</td>
<td>Actuator (double acting)</td>
</tr>
<tr>
<td>3a</td>
<td>Insert metal of diaphragm (A)</td>
<td>23</td>
<td>Stud bolt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Cushion</td>
<td>24</td>
<td>Bolt-nut</td>
<td>56</td>
<td>Stand (A)</td>
</tr>
<tr>
<td>5</td>
<td>Cushion cover</td>
<td>24a</td>
<td>Washer</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Rubbers)  
(PTEF)  
(Spec. cushion cover)

(In case of body material is PVDF)
(5) Working pressure vs. temperature

- Double acting

![Graph showing working pressure vs. temperature for Diaphragm Valve Type 72 Pneumatic Actuated Type AV 200, 250mm.](image)
(6) Specifications of Actuator

<table>
<thead>
<tr>
<th>Nominal size</th>
<th>200mm (8&quot;)</th>
<th>250mm (10&quot;)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard operating pressure MPa (kgf/cm²) [PSI]</td>
<td>Double action type</td>
<td>0.4 {4.1} [58] – 0.6 {6.1} [84]</td>
</tr>
<tr>
<td>Air consumption N/ per 1 open and close (at 0.4MPa)</td>
<td>Double action type</td>
<td>87.3</td>
</tr>
<tr>
<td>Air supply bore</td>
<td>Double action type</td>
<td>Re 3/8</td>
</tr>
</tbody>
</table>

(7) Specifications of Option

(Specifications of Solenoid valve)

<table>
<thead>
<tr>
<th>Actuation</th>
<th>Nom. size</th>
<th>Type sign</th>
<th>Pipe bore</th>
<th>Effective cross section area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Double action type</td>
<td>200, 250mm (8&quot;, 10&quot;)</td>
<td>2503-4E1-54W</td>
<td>Re 3/8</td>
<td>15mm²</td>
</tr>
</tbody>
</table>

connection diagram

JIS sign

Diaphragm Valve Type 72 Pneumatic Actuated Type AV 200, 250mm
(Specifications of Limit switch)

<table>
<thead>
<tr>
<th>Actuation</th>
<th>Nominal size</th>
<th>Type sign</th>
<th>Protection grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Double actuation</td>
<td>200, 250mm (8&quot;, 10&quot;)</td>
<td>1LS1-J</td>
<td>IP67 (IEC529)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rate voltage (V)</th>
<th>Resistive load (A)</th>
<th>Inductive load (A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC125</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>AC250</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>DC115</td>
<td>0.8</td>
<td>0.2</td>
</tr>
<tr>
<td>DC230</td>
<td>0.4</td>
<td>0.1</td>
</tr>
</tbody>
</table>

(Specification of pressure reducing valve with filter)

<table>
<thead>
<tr>
<th>Actuation</th>
<th>Nom. size</th>
<th>Type sign</th>
<th>Pipe bore</th>
<th>Element degree of filtration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Double actuation</td>
<td>200, 250mm (8&quot;, 10&quot;)</td>
<td>FR-300-03</td>
<td>Rc 3/8</td>
<td>5μm</td>
</tr>
</tbody>
</table>

(Specification of speed controller)

<table>
<thead>
<tr>
<th>Actuation</th>
<th>Nom. size</th>
<th>Type sign</th>
<th>Pipe bore</th>
</tr>
</thead>
<tbody>
<tr>
<td>Double actuation</td>
<td>200, 250mm (8&quot;, 10&quot;)</td>
<td>KSC-31</td>
<td>Rc 3/8</td>
</tr>
</tbody>
</table>
(8) 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**
- 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 stress.
- Before a water test, be sure that the flange is tightly fastened.
- Fasten the flange while avoiding the parallelism and axial misalignment of the flange surface.
- When connecting a ASAHI AV Valve to metal piping, take care not to let the pipe stress on the ASAHI AV Valve.
- 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
- AV gasket
- Spanner wrench
- 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.)

<table>
<thead>
<tr>
<th>Nom. Size</th>
<th>Axial Misalignment</th>
<th>Parallelism (a-b)</th>
</tr>
</thead>
<tbody>
<tr>
<td>200, 250mm (8”, 10”)</td>
<td>1.5mm (0.06”)</td>
<td>1.0mm (0.04”)</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Nom. Size</th>
<th>200mm (8&quot;)</th>
<th>250mm (10&quot;)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Torque value</td>
<td>55 {561} [488]</td>
<td>55 {561} [488]</td>
</tr>
</tbody>
</table>

---

### (9) Air piping procedure

**Caution**
- Do not remove a dust-proof cap provided to piping port before piping work starts.
- Avoid excessive tightening. (The threaded area of a pipe can be damaged.)
- Check the connection locations, air pipe sizes, and screw types with the approved drawings and other documents for the product. Then lay the air piping.
- The operating fluid must be clean air filtered through a pertinent air filter.
- If the actuator is used in an environment below 5°C temperature, its operating fluid must be free from the water and moisture contained in it because of possible problems due to the freeze.
- Steel pipes must always be of the plated.
- Before installing an actuator in pipeline, flash the inside of pipeline completely.
- Do not apply a sealant excessively lest it fall off in the pipeline when an actuator is piped.
- Threaded area of a pipe must be free from the sharp edges and burr.

**Necessary items**
- Joint for steel pipe or tube
- Spanner wrench
- Steel pipe or tube for piping
- Seal tape

**Procedure**

1) Wind a seal tape onto the male screw of the joint with a blank about 3mm (about 2 threads) left at the end.

2) Screw the joint in the piping female screw of the actuator by hand fully.

3) Screw the joint one turn with a spanner wrench.

4) Mount a steel pipe or a tube.
(10) Support setting procedure

- 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.)

Caution

Necessary items

- Spanner wrench
- U-type clamp (with bolt)
- Bolt-nut (M20)

Level installation

Fix the valve stand [56] and the support stand with bolts.

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

Perpendicular installation

Fix the valve stand [56] and the support stand with bolts.

Spread the rubber sheet under the actuator and support it with the support stand.
(11) Connection of limit switch procedure

Warning
- Shut down the power on the equipment before connecting wires. There are risks of electrical shock depending on the level of operating voltage.

Caution
- Be sure that the terminal cover and body cover are put on during the operation.
- If you use the limit switch at 1mA-100mA or 5-30V, consult near Asahi dealer.

Necessary items
- Screw driver (+)
- Connector (G1/2)
- Crimp-style terminal
- Wire stripper
- Terminal crimping tool

Procedure

1) Loosen the three screws used to attach the limit switch cover with a screwdriver (+) and remove the cover from the limit switch.
   *These screws are made so that they won’t detach from the cover.

2) Pull and remove the protective cap, made of resin, from the cover.

3) Draw the cable through the connector.

4) Strip the cable with a wire stripper.

5) Install a crimp-style terminal on the lead wire with a terminal crimping tool.

6) Connect the terminal screw with a screwdriver (+) according to the internal circuit diagram show in page 7.

7) Tighten the above three screws with a screwdriver (+) to install the cover on the limit switch.

8) Tighten the cable by connector.
(12) Operating procedure

- When AV valve is equipped with a solenoid valve, do not leave solenoid valve terminal cover off. (Contact with the terminal will cause an electric shock.)
- Check that the supply pressure of the pressure reducing valve with a filter is 0.4MPa (4.1kgf/cm²) or more. (AV valve may not function.)

Procedure

1) Supply air to the air supply opening.

2) Check that the air supplying side and the stopper [18] position are matching.

3) Stop supplying air.

<For the solenoid valve>

Procedure

1) Supply the air to the solenoid valve.

2) Push the button with a finger, and confirm the action mode shown in the following table.

3) Apply regular rated voltage to the solenoid valve, and confirm the action mode shown in the following table.

4) Turn off the solenoid valve.

<table>
<thead>
<tr>
<th>Push button</th>
<th>Current</th>
<th>Double action/Air to open</th>
<th>Air to close</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pushed</td>
<td>On</td>
<td>Open</td>
<td>Shut</td>
</tr>
<tr>
<td>Not pushed</td>
<td>Off</td>
<td>Shut</td>
<td>Open</td>
</tr>
</tbody>
</table>
<Adjustment of opening / closing speed procedure>

**Necessary items**

- Spanner wrench

**Procedure**

1. Turn right the adjustment knob of the solenoid valve fully.
   - Avoid excessive tightening.
   - (The speed controller can be damaged.)
2. Supply the air, and turn left the adjustment knob little by little to adjust the opening / closing speed required.
3. When the adjustment knob is adjusted to the required speed, fix the knob by turning the locking nut right with a spanner wrench, while holding the knob with a finger.
   - Avoid excessive tightening. (The locking nut can be damaged.)

(13) Adjustment procedure for stopper

- Never attempt to disassemble an actuator.
  - (If disassembled forcibly, internal parts may jump out and this is very dangerous.)
- Do not touch the actuator when it operated. (You may be injured.)
- Do not change or replace valve parts under line pressure.
- If a stopper is loose, adjust it.
- Tighten the stoppers securely. (Too weak a torque on a stopper may cause it to loosen.)

**Necessary items**

- Spanner wrench
  - Allen wrench

**Procedure**

2. Fix stopper (lower side) [43] with spanner wrench and use spanner wrench to loosen stopper (upper side) [43].
3. Remove stopper [43].
4. Fully close valve by controlling the volume of air.
5. Attach stopper (lower side) [43] by hand and tightens until not turning round the stopper (lower side) [43] with the hand.
6. Turn stopper (lower side) [43] with spanner wrench until the position in which fluid begins to leak.
7) Turn stopper (lower side) [43] with spanner wrench 1/4 – 1/2 turns, counterclockwise.

8) Fix stopper (lower side) [43] with spanner wrench and use spanner wrench to tighten stopper (upper side) [21].
  * Insufficient tightening may loosen the stopper.

9) Completely close valve by controlling the volume of air and check for leakage.
   If there is leakage, repeat steps 2) to 8) until leakage stops.


  * Valve option equipped with limit switch or positioner can adjust by same method.
  * Turn off the power of positioner.

---

(14) Disassembling method for replacing parts

**Warning**
- Never attempt to disassemble an actuator.
  (If disassembled forcible, internal parts may jump out and this is very dangerous.)

**Caution**
- 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.)
- Do not change or replace valve parts under line pressure.

**Necessary items**
- Spanner wrench
- Protective gloves
- Safety goggles

<Disassembly>

**Procedure**

1) Completely discharge fluid from pipes.
2) Shut the main air valve, and open the bypass valve to discharge the air from the actuator [50].
3) Remove the air piping.
4) Loosen the bolt nut between the body [1] and the actuator [50] completely.
5) Remove actuator [50].
6) Remove the diaphragm [3] by turning it left (counter clockwise).
<Assembly>

Procedure

1) Shape the diaphragm [3] into (fig.1).
2) Turn the diaphragm [3] right (clockwise) to install. Tighten it up completely, and turn it left so that the center rib of diaphragm aligns with the longer rib of compressor.
3) Supply the air to the actuator [50] and fully open the valve.
4) Put the actuator [50] on the body [1].
5) Set the bolt-nut [24] and tighten the body [1] and actuator [50].
   (As to the body tightening torque, refer to Table 1.)

(Table 1.) Body tightening torque value Unit: N·m (kgf·cm) [lb·inch]

<table>
<thead>
<tr>
<th>Diaphragm Material</th>
<th>Norm. Size</th>
<th>200mm(8”)</th>
<th>250mm(10”)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rubber</td>
<td></td>
<td>30.0 [306]</td>
<td>30.0 [306]</td>
</tr>
<tr>
<td>PTFE</td>
<td></td>
<td>30.0 [306]</td>
<td>30.0 [306]</td>
</tr>
</tbody>
</table>

(15) Inspection items

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

Periodically inspect and maintain the AV valve in accordance with the decided schedule.

<table>
<thead>
<tr>
<th>Portion to be inspected</th>
<th>Inspection item</th>
</tr>
</thead>
</table>
| Actuator                | - Check for flaw, crack, or deformation on the valve.  
- Check for leaks to the outside or inside.  
- Existence of abnormality in opening and closing operating sounds.  
- Check that all fasteners are tight.  

* It is unnecessary to supply oil to this actuator.  

| Valve                   | - Existence of scratches, cracks, deformation, and discoloring.  
- Existence of leakage from the valve to the outside.  
- Existence of leakage when the valve is closed fully.  
- Tightening condition of bolt-nut (loose or not). |
## (16) Troubleshooting

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>The valve does not operate by air operations</td>
<td>The power source of the control panel is turned off.</td>
<td>Turn on the power source.</td>
</tr>
<tr>
<td></td>
<td>The solenoid valve is disconnected.</td>
<td>Check the connection again. (Refer to page 6, 11)</td>
</tr>
<tr>
<td></td>
<td>Air is not supplied to the solenoid valve.</td>
<td>Supply air to solenoid valve.</td>
</tr>
<tr>
<td></td>
<td>The supply voltage to the solenoid valve is wrong.</td>
<td>Check voltage with a tester and set specified voltage.</td>
</tr>
<tr>
<td></td>
<td>The voltage to the solenoid valve is low.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The speed controller’s knob is fully turned in a clockwise direction.</td>
<td>Turn speed controller’s knob in a counterclockwise direction.</td>
</tr>
<tr>
<td></td>
<td>The operation pressure is low.</td>
<td>Check the operating pressure.</td>
</tr>
<tr>
<td></td>
<td>The diaphragm is worn.</td>
<td>Replace the diaphragm with a new one. (Refer to page 14)</td>
</tr>
<tr>
<td></td>
<td>The diaphragm or the body is scratched.</td>
<td>Replace scratched parts with new ones. (Refer to page 14)</td>
</tr>
<tr>
<td></td>
<td>Foreign matter is in the valve</td>
<td>Disassemble valve to remove foreign matter. (Refer to page 14)</td>
</tr>
<tr>
<td>Fluid leaks from the valve.</td>
<td>The bolt between the body and actuator is loose.</td>
<td>Tighten up the bolt to the specified torque. (Refer to page 14).</td>
</tr>
<tr>
<td></td>
<td>The diaphragm or the body is scratched.</td>
<td>Replace scratched parts with new one (Refer to page 14).</td>
</tr>
<tr>
<td></td>
<td>There is foreign matter between the diaphragm and the body.</td>
<td>Disassemble valve to remove foreign matter. (Refer to page 14)</td>
</tr>
<tr>
<td>The actuator operates, but the valve is not opened or closed.</td>
<td>The diaphragm or the joint metal fitting is broken.</td>
<td>Replace broken parts. (Refer to page 14)</td>
</tr>
</tbody>
</table>

## (17) 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.)

**Warning**
Diaphragm Valve Type 72
Pneumatic Actuated Type AV

[Automatic Valve]

ASAHI YUKIZAI CORPORATION

http://www.asahi-yukizai.co.jp/en/

Information in this manual is subject to change without notice.

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