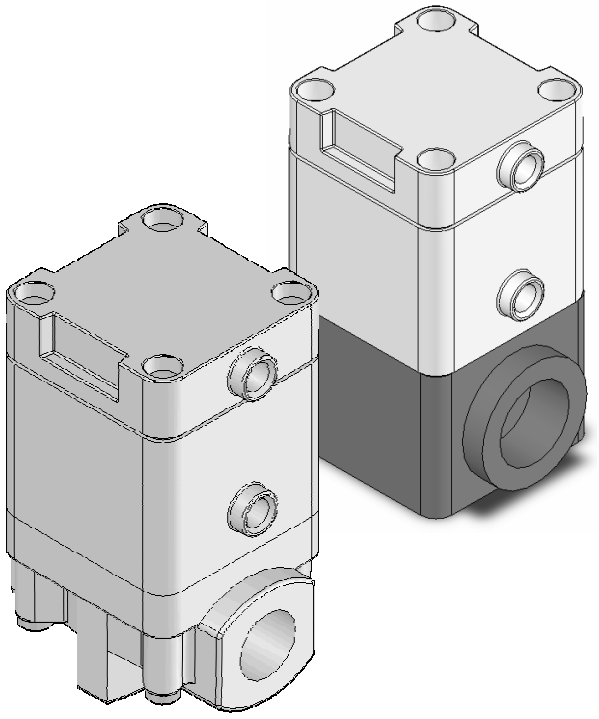
SM-50710-A/3

CKD

# INSTRUCTION MANUAL

## Clean Cylinder Valve
## LAD※ Series



- Please read this instruction manual carefully before using this product, particularly the section describing safety.
- Retain this instruction manual with the product for further consultation whenever necessary.

3rd Edition
CKD Corporation

# Introduction

Thank you for choosing CKD's air operated valve (LAD series). The LAD series are diaphragm type air operated valves developed after many years of experience.
You can depend on CKD products, since all products are made under strict quality control.
Please read this instruction manual to ensure a more effective use of CKD products.
Please refer to the latest drawing for outer dimensions, internal structure, and parts list.

This product is made for persons who handle control valves (such as solenoid valves, electrically operated valves, and air operated valves), and who has basic knowledge of certain areas including materials, fluids, piping, and electricity. CKD shall not be held responsible for accidents caused by valves selected and/or used by persons who lack knowledge of control valves, and who have insufficient training.

Product usage varies greatly among our customers, and CKD cannot grasp every usage. Intended performance may not be reached and accidents may occur, depending on the product usage such as fluids, piping, and other conditions. To satisfy your intended product usage, you shall be responsible for confirming product specifications and usage.

Although this product incorporates various safety measures, mishandling may result in accidents. In order to avoid accidents, **you must read this instruction manual thoroughly and understand the contents well before using this product.**

# Contents

# 1.Safety precautions

When designing and manufacturing a device using CKD products, the manufacturer is obligated to manufacture a safe product by confirming safety of the system comprising the following items:

- Device mechanism
- Pneumatic or fluid control circuit
- Electric control that controls the above

It is important to select, use, handle, and maintain the product appropriately to ensure that the CKD product is used safely.
Observe warnings and precautions to ensure device safety.
Check that device safety is ensured, and manufacture a safe device.

## ⚠ WARNING

1. **This product is designed and manufactured as a general industrial machine part. It must be handled by someone having sufficient knowledge and experience.**

2. **Use this product within its specifications.**
   If this product is to be used beyond its specifications, or if this product is to be used outdoors, or if this product is to be used under the following conditions or environments, consult CKD before using the product. Never modify or machine the product.
   ①Use for special applications requiring safety including nuclear energy, railroad, aviation, ship, vehicle, medical equipment, equipment or applications coming into contact with beverage or food, amusement equipment, emergency shutoff circuits, press machine, brake circuits, or for safeguard.
   ②Use for applications where life or assets could be adversely affected, and special safety measures are required.

3. **Observe corporate standards and regulations, etc., related to the safety of device design and control, etc.**
   ISO4414, JIS B 8370 (pneumatic system rules)
   JFPS2008 (principles for pneumatic cylinder selection and use)
   Including High Pressure Gas Maintenance Law, Occupational Safety and Sanitation Laws, other safety rules, standards and regulations, etc.

## 4. Do not handle, pipe, or remove devices before confirming safety.

①Inspect and service the machine and devices after confirming safety of the entire system related to this product.

②Note that there may be hot or charged sections even after operation is stopped.

③When inspecting or servicing the device, turn off the energy source (air supply or water supply), and turn off power to the facility. Release any compressed air and fluid from the system, and pay enough attention to possible fluid leakage and leakage current.

④When starting or restarting a machine or device that incorporates pneumatic components, make sure that system safety, such as pop-out prevention measures, is secured.

## 5. Observe warnings and cautions on the pages below to prevent accidents.

## ■The safety cautions are ranked as "DANGER", "WARNING" and "CAUTION" in this section.

**DANGER :** When a dangerous situation may occur if handling is mistaken leading to fatal or serious injuries, or when there is a high degree of emergency to a warning.

**WARNING :** When a dangerous situation may occur if handling is mistaken leading to fatal or serious injuries.

**CAUTION :** When a dangerous situation may occur if handling is mistaken leading to minor injuries or physical damage.

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**Note that some items described as "CAUTION" may lead to serious results depending on the situation. In any case, important information that must be observed is explained.**

# 2.Handling precautions

## 2-1.Precautions when designing and selecting

**WARNING**

① This product is not designed as a safety valve such as an emergency shutoff valve. Provide a separate measure to secure safety if such performance is required.

② Bad product selection and product mishandling may cause not only trouble to the product but also trouble to your system. Use the product after you confirm, under your responsibility, the product specifications, and product compatibility with your system.

③ Working fluids

Use the product after confirming the compatibility of the product material with working fluids and ambient environment.

④ Fluid temperature

Use the product within the specified fluid temperature range (refer to 6-2).

⑤ Fluid pressure range

Use the product within the specified pressure range (refer to 6-2).

⑥ Back pressure

Use the product within the allowed range (refer to 6-2). Note the back pressure coming around from other circuits, and back pressure from riser piping water head. Make sure that back pressure is within the allowed range.

⑦ Ambient environment

(1) Use the product after confirming the compatibility of the product material with the ambient environment.

(2) Do not let fluids stick to the product main body.

(3) Use the product within the specified ambient temperature range (refer to 6-2).

(4) Do not use this product under vibration or shock. Do not use this product around heat sources or outdoors.

(5) Avoid using this product under direct sunlight and direct ultraviolet rays.

⑧ Liquid-filled state

When the valve opens and shuts, its diaphragm moves vertically, changing flow path volume. So, if the fluid is incompressive, valve operation under conditions causing the fluid to be encapsulated (liquid-filled state) will cause abnormal pressure on the valve. In such cases, install a relief valve at the valve primary side or valve secondary side to avoid creating a circuit that ingenerates a liquid-filled state.

⑨ Securing space for maintenance

Secure enough space for maintenance and inspection work.

⑩ A port and B port connection when body material is PPS

Select connectors and piping made of resin for the product's PPS body ports.
Note that it may leak from the screwed portion because of the repeating temperature change.

## 2-2. Fluid-product material combination checklist

**WARNING**

This checklist results from tests and knowledge from the past, but do not guarantee performance. If chemicals is your intended fluid, it is your responsibility to decide the compatibility of the product materials and your intended fluid. You should have expertise in chemicals, and the checklist below should be used as reference. Permeable gas not only affects wetted parts, but also may affect other product construction materials, resulting in product leakage and malfunction.

| Fluid | Compatibility | | | | Collateral conditions |
|---|---|---|---|---|---|
| Material combination | P | C | R | F | |
| Material: Body | PPS | PPS | SCS13 | SCS13 | |
| Material: Diaphragm | EPDM | PTFE | EPDM | PTFE | |
| Pure water | ○※1 | ○ | ○※1 | ○ | ※1 : Purity may degrade |
| Sulfuric acid | × | × | × | × | - |
| Hydrochloric acid (5% or less) | ○ | ○ | × | × | - |
| Nitric acid | × | × | × | × | - |
| Hydrogen peroxide water | × | × | × | × | - |
| Ozone water | × | × | × | × | - |
| Sodium hydroxide (30% or less) | ○ | ○ | ○ | ○ | - |
| Ammonia water | △※2 | △※2 | △※2 | △※2 | ※2 : Consult CKD |
| Acetone | ○ | △※2 | ○ | △※2 | ※2 : Consult CKD |
| Isopropyl alcohol | ○ | ○ | ○ | ○ | - |
| Thinner | × | △※2 | × | △※2 | ※2 : Consult CKD |
| Air | ○ | ○※3 | ○ | ○※3 | ※3 : Valve seat may leak up to 1 $cm^3$/min (pneumatic) |
| $N_2$ gas | ○ | ○※3 | ○ | ○※3 | |

- Compatibility is shown as ○ (allowed), △( allowed under certain conditions), and × (do not use).
- Consult CKD for fluids other than shown in the checklist above.
- Unless otherwise specified, compatibility is that within the specified fluid temperature range (refer to 6-2).
- Above is made from sources such as tests and knowledge from the past, material property literature, and information from material manufacturers. However, this data does not guarantee the compatibility of fluids. This checklist shall be used as reference.
- Do not have the fluids stick to the product main body.
- Permeable fluids may leak slightly through threaded portions and cavities.

## 2-3.Unpacking

**CAUTION**

① Check that the model No. shown on the Name Plate of the product is the same with what you ordered.

② Check that the product has no external damages.

③ Open the clean pack in the packing box just before piping to prevent foreign matter from entering the valve.

## 2-4. Precautions when mounting and installing

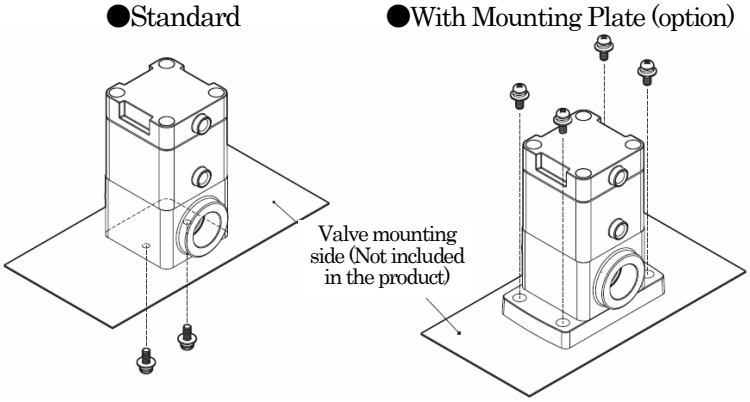
**WARNING**

Bad installation and bad piping may not only cause trouble to the product, but also cause trouble to your system. Furthermore, the product user may die or incur serious injuries. So, under your responsibility, your persons having sufficient knowledge of safety related areas such as system, fluid properties, and fluid compatibility with related devices, shall read this instruction manual thoroughly and perform work.

When mounting

① Fix the product with recommended tightening torque using the thread at the bottom of the body, or the Mounting Plate (option).

| Port size | Thread size at bottom of body | Recommended tightening torque (N·m) |
|---|---|---|
| 10A | M5 | 0.8 to 1.0 |
| 15A | M6 | 1.3 to 1.5 |
| 20A | M6 | 1.3 to 1.5 |
| 25A | M6 | 1.3 to 1.5 |




(Figure 2-1) Example of mounting

② After mounting, confirm that the valve is properly installed by checking for leakage at the piping.

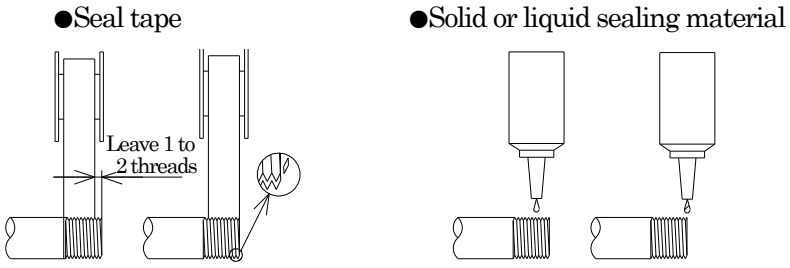
When piping

① When the body material is PPS, use connectors or piping material made of resin, and use those that follow "JIS B0203 Taper pipe threads", for the body A port and B port.

② Observe the effective thread length for the piping. Additionally, chamfer approximately half a pitch from the thread edge.

③ Be sure to flush inside the piping before mounting the valve. Dust and foreign matter in the fluid disturbs valve normal performance. Install a filter at the primary side of the valve at a proper position in your circuit if there is some dust or foreign matter in the fluid.

④ When using sealing material, make sure the sealing material do not enter the piping. Also, make sure there is no external leakage. When taping seal tape to the pipe thread, leave one to two threads at the tip without taping, and tape three to four turns (Fig. 2-2). Also, when using liquid sealing material, leave one to two threads at the tip without applying sealing material, and do not apply too much. Do not apply sealing material to the female thread side.




(Fig.2-2)

⑤ There is an arrow at the side of the body. Be sure to match the arrow with the fluid flow direction when piping.

⑥ When piping, make sure no bending, tension, compression force is applied to the valve main body. Additionally, consider the position and methods to support the piping so pipe weight is not applied to the valve.

⑦ The operation port (X or Y port) that is not pressurized by operating pressure shall be open to atmosphere. If you do not want the valve to supply and exhaust air directly because of the ambient atmosphere and dust dispersal, take off the Set Screw, connect piping, and supply and exhaust air where there will be no trouble.

⑧ Solenoid valve for operation, which is connected to the operation ports (X and Y ports), shall be used to follow specifications and intended usage.

⑨ Tighten the connector to the operation port (X and Y ports) with tightening torque 0.4 to 0.6 N・m. Stronger tightening torque may break the port or break the thread.

⑩ Refer to the table below for the Body A port and B port tightening torques. Fix the Body when piping, so bending, tension, and compression forces will not be applied to the actuator assembly. (Note that excessive tightening torque may break the port)

| Port size | Recommended tightening torque (N・m) | |
|---|---|---|
| Body material | PPS | SCS13 |
| 10A | 1.0 to 1.5 | 22 to 24 |
| 15A | 2.0 to 2.5 | 28 to 30 |
| 20A | 2.5 to 3.0 | 31 to 33 |
| 25A | 3.0 to 3.4 | 36 to 38 |

## ⚠ CAUTION

① When controlling fluids inside a tank, pipe a little above the tank bottom.

## 2-5.Precautions during operation

### ⚠ WARNING

① This product cannot be used as an emergency shutoff valve.

② Use this product at or below the maximum working pressure (maximum value of the working pressure range)(refer to 6-2).

### ⚠ CAUTION

① Use this product after confirming compatibility of the product material with working fluids and ambient atmosphere (refer to 2-2).

② When the fluid is gas such as $N_2$ gas or air, valve seat may leak up to 1 $cm^3$/min (pneumatic) (when the Diaphragm material is PTFE).

③ Note that sudden fluid temperature change may lead to leakage from the valve seat.

④ The upper side of the Diaphragm (Cylinder side) is not wetted by the fluid. However, fluid gas may permeate, and the upper side of the diaphragm may become a fluid atmosphere. Additionally, valve operation causes small amounts of permeated gas to be emitted from the respiration hole that is on the side of the cylinder.

⑤ Operation air shall be air or inert gas that passed through a filter of performance of 5 μm or finer.

⑥ Do not use the product as footings, or place heavy loads on the product.

⑦ If the product has not been used for a long time, carry out trial run before operation.

⑧ When the diaphragm material is EPDM, and when a normally open (NO) type valve is closed for a long time, the rubber may adhere, delaying the valve to return to the original position, or not returning at all. In such case, detach the Set Screw on Y port, apply operation pressure, and make the valve to return to the original position.

⑨ Flow at the secondary side of the valve will be turbulent.
If a device, such as a flow meter and requires fluid flow to be laminar, is to be installed at the secondary side of the valve, install the device far enough from the valve. In that way, the device will not be affected by the turbulence flow caused by the valve.

⑩ Do not open and close the valve when at a liquid filled state. Otherwise, valve performance may be affected.

⑪ If supply time of the operation air or exhaust time of the operation air is short, the valve may fail to follow.

⑫ Do not let the fluid adhere to the valve main body.

⑬ Depending on fluid pressure conditions, there may be water hammer and vibration. Most of such problems can be improved by controlling the speed to open and shut the valve. In other cases, reconsider your fluid pressure and piping conditions.

# 3.Maintenance and inspection

**DANGER**

① Read this instruction manual thoroughly and understand the contents well when performing maintenance and inspection.

② Be sure to release operation air and fluid before performing maintenance.

③ When replacing the valve, flush the remainder fluid adequately with pure water or air to avoid adverse effects by the fluid to nearby devices and persons.

Additionally, although the upper side of the diaphragm (cylinder side) is not wetted by the fluid, fluid gas may permeate and the upper side of the diaphragm may become a fluid atmosphere. Note the following for safe handling:

（1）Valve operation causes small amounts of permeated gas to be emitted from the respiration hole that is on the side of the cylinder.

（2）When handling the valve, read the Material Safety Data Sheet (MSDS) of the fluid, and wear necessary protective equipments.

**CAUTION**

① When replacing the product, be sure to replace it with the same model number product. Note that products with the same appearance may have different specifications.

② Store the unused product away from direct sunlight, and away from high temperature. Additionally, when handling the product, do not damage or apply shock by throwing it hooking it onto something.

## 3-1.Disassembling

**DANGER**

Do not disassemble the product. Some products have a built-in high load spring, and is very dangerous. Consult us or your nearest dealer if the product must be disassembled.

Additionally, we cannot guarantee the product once disassembled.

## 3-2.Periodic inspection

**DANGER**

To maintain valve optimum performance, perform the following periodic inspections every once or twice an year.

（1）Check for outside leakage

（2）Check for leakage from the port thread portions

（3）Check for loose and detached tubes of the operation air piping

## 3-3.Troubleshooting

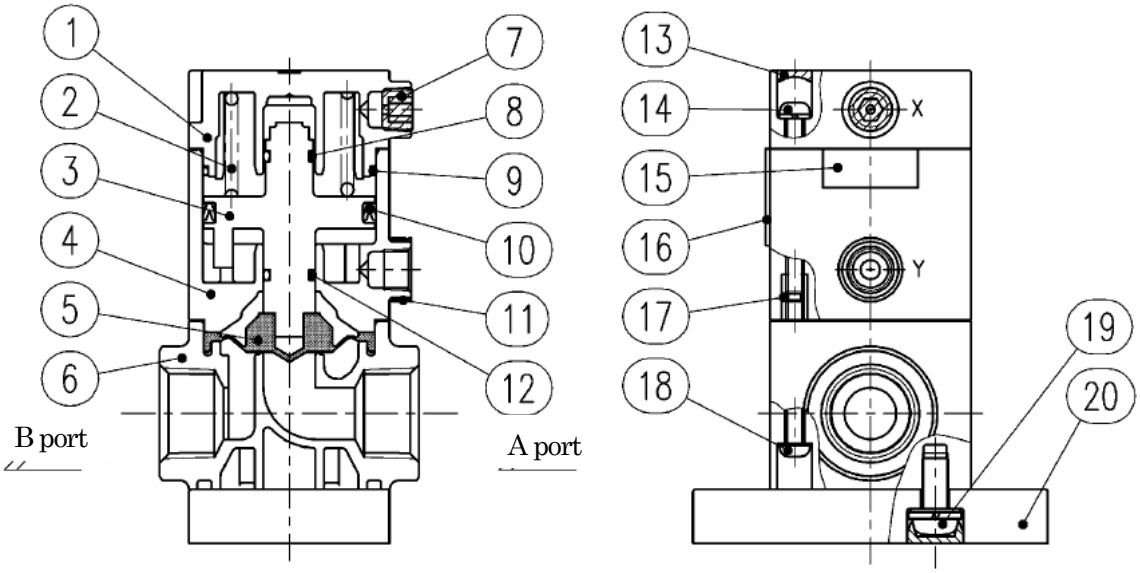
If the valve does not operate as intended, check according to the following table.

| State of failure | | | Cause | Countermeasure |
|---|---|---|---|---|
| Valve does not shut, or valve leaks | | | Pressurized from wrong port (B port) | Match the flow direction with the arrow shown on the valve body (pressurize from A port) |
| | | | Fluid pressure is too high | Adjust fluid pressure |
| | | | Back pressure is too high | Adjust back pressure |
| | | | Failure of the solenoid valve for operation | Replace the solenoid valve for operation |
| | Type | Normally closed | X port is closed | Open the X port to the atmosphere |
| | | | Operating pressure in Y port is not released | Release operating pressure to atmospheric pressure |
| | | Normally open or Double acting | Y port is closed | Open the Y port to the atmosphere |
| | | | Operating pressure is not supplied to X port, or pressure supplied is too low | Supply operating pressure to X port within specified range |
| Valve does not open, or flow rate is not sufficient | | | Fluid is not supplied | Check the circuit, and supply the fluid |
| | | | Failure of the solenoid valve for operation | Replace the solenoid valve for operation |
| | Type | Normally closed | X port is closed | Open the X port to the atmosphere |
| | | | Operating pressure is not supplied to Y port, or pressure supplied is too low | Supply operating pressure to Y port within specified range |
| | | Normally open or Double acting | Y port is closed | Open the Y port to the atmosphere |
| | | | Operating pressure in X port is not released | Release operating pressure to atmospheric pressure |
| | | | (Normally open type) Valve has been shut for a long time | Supply operation pressure temporarily to Y port, and return the valve |

●Consult us or your nearest dealer for other unclear problems.

# 4. Internal construction

## 4-1.PTFE diaphragm type




| No. | Part name | Material | Quantity |
|---|---|---|---|
| 1 | Cover | PPS | 1 |
| 2 | Spring | SUS 304 | 1※1 ※2 |
| 3 | Piston Rod | PPS | 1 |
| 4 | Cylinder | PPS | 1 |
| 5 | Diaphragm | PTFE | 1 |
| 6 | Body | PPS or SCS13 | 1 |
| 7 | Set Screw | PFA | 1※1 |
| 8 | O ring | FKM | 1 |
| 9 | O ring | FKM | 1 |
| 10 | Piston Packing | FKM | 1 |
| 11 | Reinforcing Ring | SUS 304 | 1※1 |
| 12 | O ring | FKM | 1 |
| 13 | Cap | FKM | 6※3 ※4 |
| 14 | Cross Recessed Pan Head Machine Screw | SUS XM7 | 4 |
| 15 | Piping Notice Plate | PET | 1 |
| 16 | Name Plate | PET | 1 |
| 17 | Insert Nut | SUS 304 | 4 |
| 18 | Cross Recessed Pan Head Machine Screw | SUS XM7 | 4 |
| 19 | Cross Recessed Pan Head Machine Screw | SUS XM7 | 2 |
| 20 | Mounting Plate | PPS | 1 |

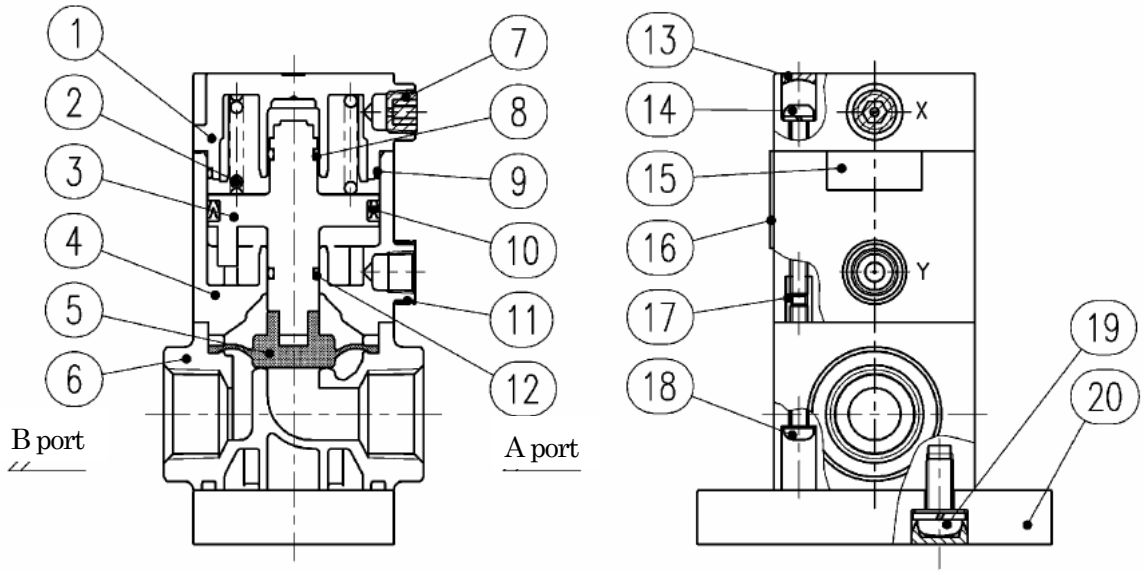
※1. Figure shows LAD1 type (NC) with ⑳ Mounting Plate.
For LAD2 type (NO), ② Spring is attached below ③ Piston Rod. ⑦ Set Screw and ⑪ Reinforcing Ring is attached on Y port.
For LAD3 type (double acting), ②Spring and ⑦Set Screw is not attached. Two ⑪ Reinforcing Rings are attached.

※2. For LAD1 type (NC) 20A and 25A, two ②Springs are attached.

※3. If the Mounting Plate is not attached, ⑬Cap will be attached at the bottom of ⑱Screw, and there will be eight Caps.

※4. If ⑥Body material is SCS13, there will be no ⑬Cap.

## 4-2.EPDM diaphragm type




| No. | Part name | Material | Quantity |
|---|---|---|---|
| 1 | Cover | PPS | 1 |
| 2 | Spring | SUS 304 | 1※1 ※2 |
| 3 | Piston Rod | PPS | 1 |
| 4 | Cylinder | PPS | 1 |
| 5 | Diaphragm | EPDM<br>SUS 303 | 1 |
| 6 | Body | PPS or<br>SCS13 | 1 |
| 7 | Set Screw | PFA | 1※1 |
| 8 | O ring | FKM | 1 |
| 9 | O ring | FKM | 1 |
| 10 | Piston Packing | FKM | 1 |
| 11 | Reinforcing Ring | SUS 304 | 1※1 |
| 12 | O ring | FKM | 1 |
| 13 | Cap | FKM | 6※3 ※4 |
| 14 | Cross Recessed Pan Head Machine Screw | SUS XM7 | 4 |
| 15 | Piping Notice Plate | PET | 1 |
| 16 | Name Plate | PET | 1 |
| 17 | Insert Nut | SUS 304 | 4 |
| 18 | Cross Recessed Pan Head Machine Screw | SUS XM7 | 4 |
| 19 | Cross Recessed Pan Head Machine Screw | SUS XM7 | 2 |
| 20 | Mounting Plate | PPS | 1 |

※1. Figure shows LAD1 type (NC) with ⑳ Mounting Plate.
For LAD2 type (NO), ②Spring is attached below ③Piston Rod. ⑦Set Screw and ⑪ Reinforcing Ring is attached on Y port.
For LAD3 type (double acting), ②Spring and ⑦Set Screw is not attached. Two ⑪ Reinforcing Rings are attached.

※2. For LAD1 type (NC) 20A and 25A, two ② Springs are attached.

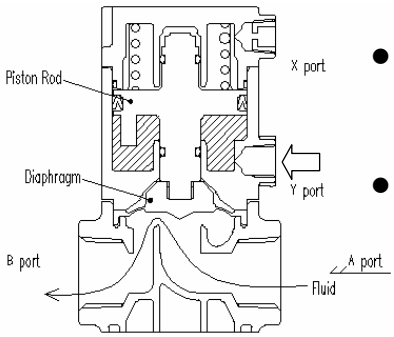
※3. If the Mounting Plate is not attached, ⑬ Cap will be attached at the bottom of ⑱ Screw, and there will be eight Caps.

※4. If ⑥Body material is SCS13, there will be no ⑬Cap.

# 5. Operating mechanism

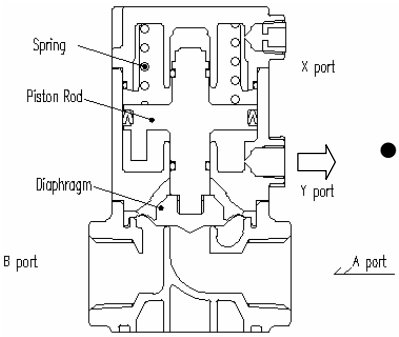
## 5-1.Normally closed (NC) type ——— Connect operation air to Y port

Open




- Supply operation air from Y port.
- Operation air is supplied to the chamber below the Piston Rod.
- Piston Rod, with the Diaphragm connected to the Piston Rod, moves upward. Body valve seat opens and the fluid flows.

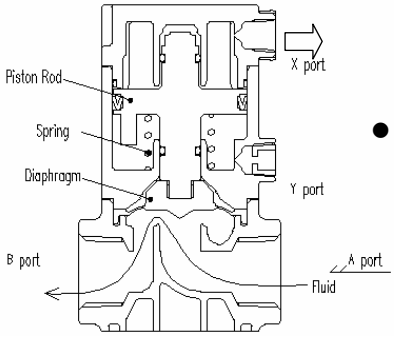
Shut




- Operation air in the chamber below the Piston Rod is released to the atmosphere through Y port.
- Piston Rod, with the Diaphragm connected to the Piston Rod, is pushed down by Spring reaction force. Body valve seat closes and the fluid is sealed.

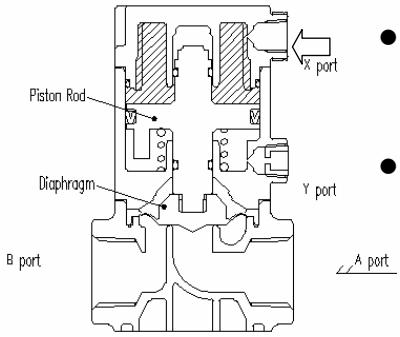
## 5-2.Normally open (NO) type ——— Connect operation air to X port

Open




- Operation air in the chamber above the Piston Rod is released to the atmosphere through X port.
- Piston Rod, with the Diaphragm connected to the Piston Rod, is pushed up by Spring reaction force. Body valve seat opens and the fluid flows.

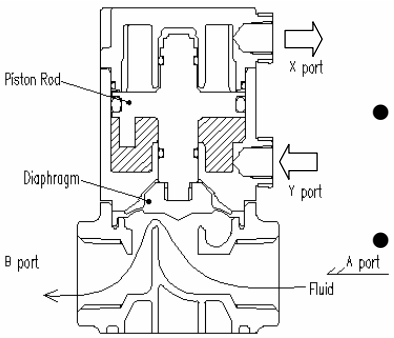
Close




- Supply operation air from X port.
- Operation air is supplied to the chamber above the Piston Rod.
- Piston Rod, with the Diaphragm connected to the Piston Rod, moves downward. Body valve seat closes and the fluid is sealed.

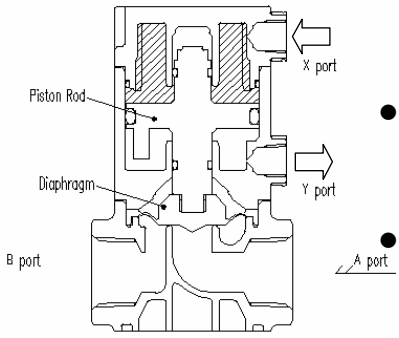
## 5-3.Double-acting ——— Connect operation air to X and Yports

Open




- Supply operation air from Y port, and release operation air to the atmosphere through X port.
- Operation air is supplied to the chamber below the Piston Rod.
- Piston Rod, with the Diaphragm connected to the Piston Rod, moves upward. Body valve seat opens and the fluid flows.

Close




- Supply operation air from X port, and release operation air to the atmosphere through Y port.
- Operation air is supplied to the chamber above the Piston Rod.
- Piston Rod, with the Diaphragm connected to the Piston Rod, moves downward. Body valve seat closes and the fluid is sealed.

# 6. Product specifications

## 6-1.Model number display

LAD① − ② − ③ ④

| Symbol | Contents |
|---|---|
| **① Operation Type** | |
| 1 | Normally Closed (NC) |
| 2 | Normally Open (NO) |
| 3 | Double Acting |

| **② Port** | |
|---|---|
| 10A | Rc3/8 |
| 15A | Rc1/2 |
| 20A | Rc3/4 |
| 25A | Rc1 |

| **③ Material Combination** | | |
|---|---|---|
| | Body | Diaphragm |
| P | PPS | EPDM |
| C | PPS | PTFE |
| R | SCS13 | EPDM |
| F | SCS13 | PTFE |

| **④ Other options** | |
|---|---|
| None | No option |
| B | Mounting Plate |

## 6-2.Product specifications

（1）PTFE diaphragm type

| Item | | | LAD1 | LAD2 | LAD3 |
|---|---|---|---|---|---|
| Operation type | | | Normally closed (NC) type | Normally open (NO) type | Double acting type |
| Working fluids | | | Water, pure water, air, $N_2$ gas, and non-corrosive, non-permeable fluids(notes 1) | | |
| Fluid temperature | | ℃ | PPS body: 5 to 90　SCS13 body: 5 to 100 | | |
| Withstanding pressure (water) | | MPa | 0.9 | | |
| Working pressure range (A→B) | | MPa | 0 to 0.3 | | |
| Valve seat leakage | | $cm^3$/min | 0 (water), 1 or less (pneumatic) | | |
| Back pressure | | MPa | 0 to 0.1 | | |
| Ambient temperature | | ℃ | 0 to 60 | | |
| Mounting orientation | | | Free | | |
| Operating portion | Operating pressure range | MPa | 0.3 to 0.5 | | 0.3 to 0.4 |
| | Operating pressure connecting port | | Rc1/8(notes 2) | | |

Notes 1: Use this product after confirming compatibility of the product material with working fluids and ambient atmosphere (refer to 2-2).

Notes 2: Reinforcing Ring made of stainless steel is attached.

※ Refer to individual drawings for outer dimensions.

（2）EPDM diaphragm type

| Item | | | LAD1 | LAD2 | LAD3 |
|---|---|---|---|---|---|
| Operation type | | | Normally closed (NC) type | Normally open (NO) type | Double acting type |
| Working fluids | | | Water, air, $N_2$ gas, and non-corrosive, non-permeable fluids(notes 1) | | |
| Fluid temperature | | ℃ | 0 to 60 | | |
| Withstanding pressure (water) | | MPa | 10A and 15A: 1.5　20A and 25A: 1.2 | | |
| Working pressure range (A→B) | | MPa | 10A and 15A: 0 to 0.5　20A and 25A: 0 to 0.4 | | |
| Valve seat leakage | | $cm^3$/min | 0 (water), 0.12 or less (pneumatic) | | |
| Back pressure | | MPa | 0 to 0.1 | | |
| Ambient temperature | | ℃ | 0 to 60 | | |
| Mounting orientation | | | Free | | |
| Operating portion | Operating pressure range | MPa | 0.3 to 0.5 | | 0.3 to 0.4 |
| | Operating pressure Connecting port | | Rc1/8(notes 2) | | |

Notes 1: Use this product after confirming compatibility of the product material with working fluids and ambient atmosphere (refer to 2-2).

Notes 2: Reinforcing Ring made of stainless steel is attached.

※ Refer to individual drawings for outer dimensions.

MEMO