Discontinue

SM-50455-A

# INSTRUCTION MANUAL

## FAN ROTARY VALVE

## FRB2－10A～32A－F

● 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.

# FOR SAFETY USE

The Product is to be used by those who has a basic knowledge about material, fluid, piping electricity regarding Control Valves (solenoid valves, motor valves, air operated valves and so on).

Never use this Product by those who have no knowledge or are not well trained about Control Valves.

Should be any trouble or accident caused by a wrong selection and/or wrong use of the Product even by a person of basic knowledge about Control Valves, we are not responsible therefore.

Since any customer of the Product have a variety of its application, we are not in a position to get all the information on how and where the Product is used. There may be the cases where that the Product may not meet customers' requirement or may cause any trouble or accident,by fluid,piping or other condition that are not within the specifications of the Product.
Under such a circumstance, select with their responsibility the most suitable application and use of the Product according to the customers' requirements.

The Product incorporates a various safety arrangement, however miss-handling of the product may lead to any trouble or accident on customers side. **To avoid any possibility of trouble, read this INSTRUCTION MANUAL carefully and understand it fully.**

Pay your attention to the items described in this Text, as well as the items indicated below.

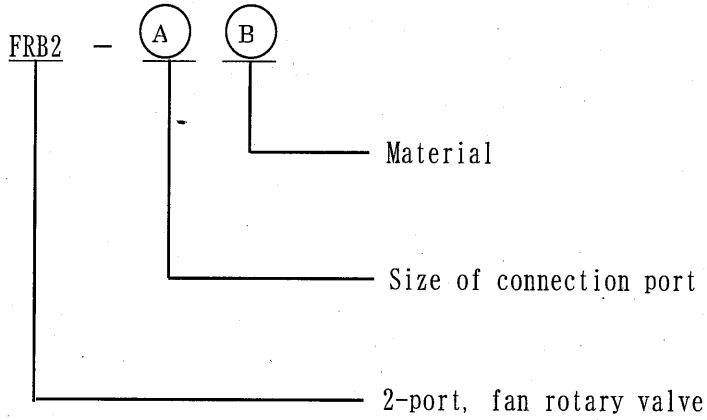
**CAUTIONS**

- When energized, heat is generated at coil portion of solenoid valves and motor valves particularly "Class H "coil where may have high temperature.
- There may have electric shock when wire connecting portion of solenoid valves or motor valves are touched. In case of disassembly or inspection, turn off power supply beforehand. Do not touch live portion by wet hands.
- Make piping so as not to have leakage and check for no leakage before use, because in case of control valves for high temperature fluid like steam, leakage may cause heat injury.

Thank you for choosing FRB2V-series fan rotary valves. CKD's products are all manufactured under strict quality control for your worry-free.
For more effective use of CKD's products, read through this operation manual.

(CONTENTS)

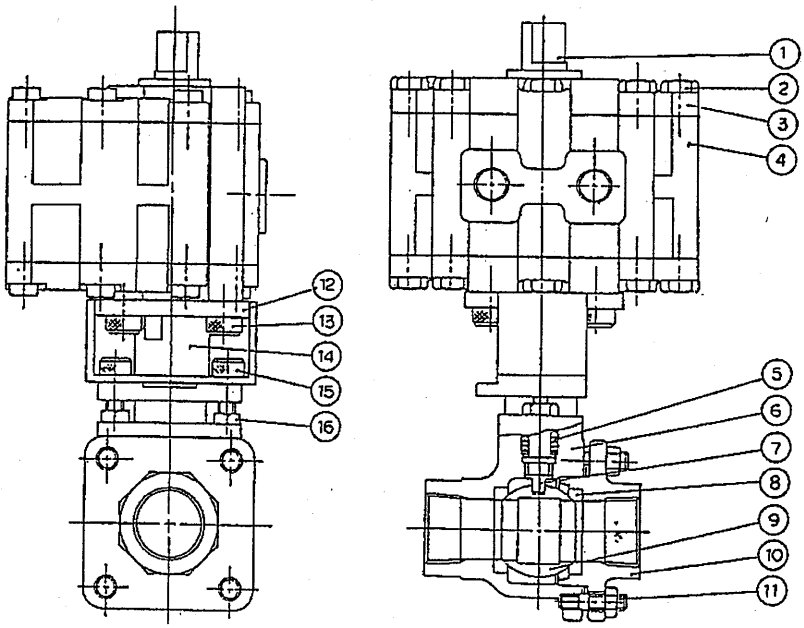
1. Designation of Model




| A | Size of connection port |
|---|---|
| 10A | Rc 3/8 |
| 15A | Rc 1/2 |
| 20A | Rc 3/4 |
| 25A | Rc 1 |
| 32A | Rc $1^{1}/_{4}$ |

| B | Material | | |
|---|---|---|---|
| | Body | Valve seat | Shaft seal |
| F | Stainless | PTFE | PTFE |

## 2. Internal Construction and Parts List




| Part list | | |
|---|---|---|
| Part No. | Part Name | Material |
| ① | Shaft | S45C |
| ② | Hexagon head bolt | SWCH |
| ③ | Cover | ADC12 |
| ④ | Cylinder | ADC12 |
| ⑤ | Packing | PTFE |
| ⑥ | Body | SCS13 |
| ⑦ | Stem | SUS304 |
| ⑧ | Valve sheet | PTFE |
| ⑨ | Ball | SUS304 |
| ⑩ | Cap | SCS13 |
| ⑪ | Cap bolt | SUS304 |
| ⑫ | Frame | SS400 |
| ⑬ | Hexagon socket head bolt | SCM435 |
| ⑭ | Coupler | S35C |
| ⑮ | Hexagon socket head bolt | SCM435 |
| ⑯ | Hexagon nut | SGD400 |

## 3. Precaution in Handling

### 3-1 Precautions for Operation

(1) Use within the specified pressure range. Use at pressures outside the range may cause malfunctions or greatly shorten its life.

(2) It is recommended that the pilot-operating section be used without lubrication. If the valve is lubricated, however, continue to lubricate it. If lubrication is stopped, wear of the packings will advance, causing malfunctions or air leakage. As lubricating oil, use an equivalent of classification 1, ISO VG32 (JIS #90) turbine oil. Also, use a filter with a filter element of 5 $\mu$m or smaller in mesh size.

(3) Strictly observe the specified conditions of ambient temperature, fluid temperature, and operation frequency.

(4) Do not put a heavy object on the actuator, and do not use it as a footboard.

(5) Incorporation of solid impurities into the fluid may damage the valve ball, valve seat, or packing (O-ring), causing inward and outward leaks; so be sure to mount on the inlet side of the valve: an appropriate air filter or a water strainer of 80 mesh or larger.

(6) This valve is for indoor use. Do not use this outdoors.

3-2 Precautions for Piping Work

(1) Any mounting positions are permitted. Secure the valve with the piping support for the ball valve section.

(2) It is recommended that the pipes be arranged as illustrated below.

For easy maintenance and inspection, use union joints or flange joints, and install bypass pipes.

(3) Hold the body when piping work at body side is done, and hold the cap when piping work at cap side is done.

(4) When the valve is tightened, please apply the torque indicated on the diagram blow.

(5) Before mounting this valve, remove foreign matter such as dust and scale from the piping. Flush the piping carefully to ensure the removal of chips, welding residue, and other dirt, which were produced during the piping work, because they may be caught in the valve seat and thereby cause leaks.

(6) Support and secure the piping so that its weight and vibration are not applied directly to the valve.

(7) If there is a possibility of the fluid becoming frozen, perform an antifreezing treatment, for example, a heat retaining treatment.

(8) Secure sufficient space for disassembly of this valve during maintenance and inspection.

(9) The parts (tube, joint) fitted on the ports of the pilot-operating section should be selected according to the specifications and the application of the pilot-operating solenoid valve. (For details, refer to the catalogue.)

(10) After completion of the piping work, check the connections for leaks. Also, conduct the operation test several times with the fluid.

4. Maintenance and Inspection

4-1 Periodic Inspection

(1) To use the valve in an optimum condition, perform periodic inspections, ordinarily, every 6 months.

(2) Inspection items

a) Check the bolts and the like for looseness.

b) Check the valve for inward or outward leaks.

※ Loosen the hexagon nuts⑯ and tighten the hexagon socket head bolts⑮, if the external leakage happened from the part of grand packing⑤.

c) If the valve is not operated for a long period of time, conduct a non-load run periodically to check for abnormality.

4-2 Disassembly, Assembly, and Inspection

4-2-1 Disassembly

(1) Prior to disassembly, always relieve the pilot-air and fluid pressures. Then bring the ball valve into the half-opened condition by manual operation, see paragraph 4-3, to check for internal pressure.

(2) Remove the hexagon socket head bolts⑬, then the actuator assembly and ball valve assembly can be disconnected.

* Disassembly of the ball valve assembly. (Replacement of the ball, valve sheet, and packing)

(3) Close the ball valve.

(4) Remove the cap bolts⑪, then take out the cap⑩ and ball⑨.
If the valve ball has defects such as flaws and corrosion, replace it with a new ball.

(5) When replacing the valve sheets⑧, first remove those from the body⑥ and cap⑩, and then check the places where they are fitted, for corrosion or the attachment of foreign matter.

(6) Remove the stem⑦ from the body⑥. If the packing⑤ have flaws or permanent strain, replace those with new ones.

4-2-2 Assembly

(1) When reassembling the valve, reverse the disassembly procedures.

(2) Apply a coat of grease* to the packing⑤ and the sliding surfaces of the stem⑦.

* Made by the Shin-Etsu Kagaku Co., Ltd: Shin-Etsu silicon G-30H or equivalent.

(3) If the ball⑨ is damaged or foreign matter is sticking to it, this may cause leakage problem. Sufficiently clean the ball while carefully handling it before assembling it.

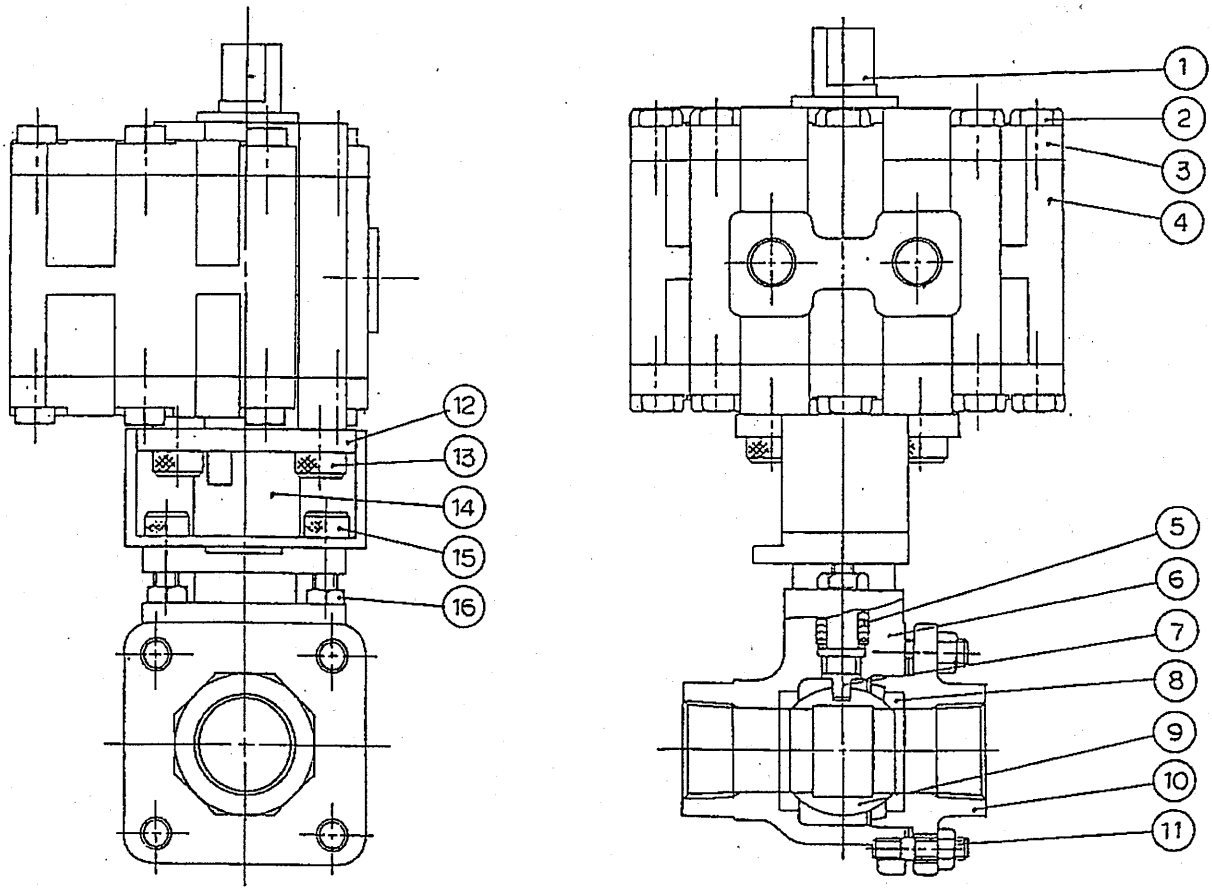
4-2-3 Inspection

(1) Pressurize the fluid and check for internal leaks in the fully closed state by manual operation. Then bring the valve to the half-opened state to check for outward leaks.

(2) Next, pressurize the pilot air to check for normal closing and opening operations.

4-3 Manual Operation

Cut off the pilot air, relieve the residual pressure in the actuator, set the monkey wrench on the opposite sides of the shaft at the top of the actuator, then rotate slowly.




| Part No. | Part Name |
|---|---|
| ① | Shaft |
| ② | Hexagon head bolt |
| ③ | Cover |
| ④ | Cylinder |
| ⑤ | Packing |
| ⑥ | Body |
| ⑦ | Stem |
| ⑧ | Valve sheet |
| ⑨ | Ball |
| ⑩ | Cap |
| ⑪ | Cap bolt |
| ⑫ | Frame |
| ⑬ | Hexagon socket head bolt |
| ⑭ | Coupler |
| ⑮ | Hexagon socket head bolt |
| ⑯ | Hexagon nut |

## 4-4 Troubleshooting

When the valve does not operate normally, check according to the table below.

| Fault | Causes | Measures |
|---|---|---|
| Valve will not operate | Actuator operating pressure is too low. | Ajust within the specified operating pressure range. |
| | Actuator operating pressure is not switched. | Investigate the operating valve. |
| | Controlled fluid pressure is too high. | Set the pressure within the specified range. |
| | Controlled fluid viscosity is too high. | Reduce the viscosity below 500 $mm^2/S$ (cSt) |
| | Foreign matter in the controlled fluid, such as solids, are caught. | the inside of the ball valve to remove the cause. |
| | Foreign matter are stuck to the valve seat or valve ball. | |
| | Actuator operating pressure is too low. | Ajust within the specified operating pressure range. |
| Valve operates abnormally | Controlled fluid pressure is too high. | Set the pressure within the specified range. |
| | Foreign matter in the controlled fluid, such as solids, are caught. | Check the inside of the ball valve to remove the cause. |
| | Foreign matter are stuck to the valve seat or valve ball. | |
| Leaks are occurring. (Valve is not closed completely) | Foreign matter in the controlled fluid, such as solids, are caught. | 1. Replacement of ball valve assembly.<br>2. Repair of ball valve. (Replacement of ball, Replacement of valve sheet, Replacement of packing) |

When your problem turns out to be difficult to solve by yourself, consult us or our agency through the store from which you purchased the valve with the model and size of your valve, the fluid used, and the fault content.