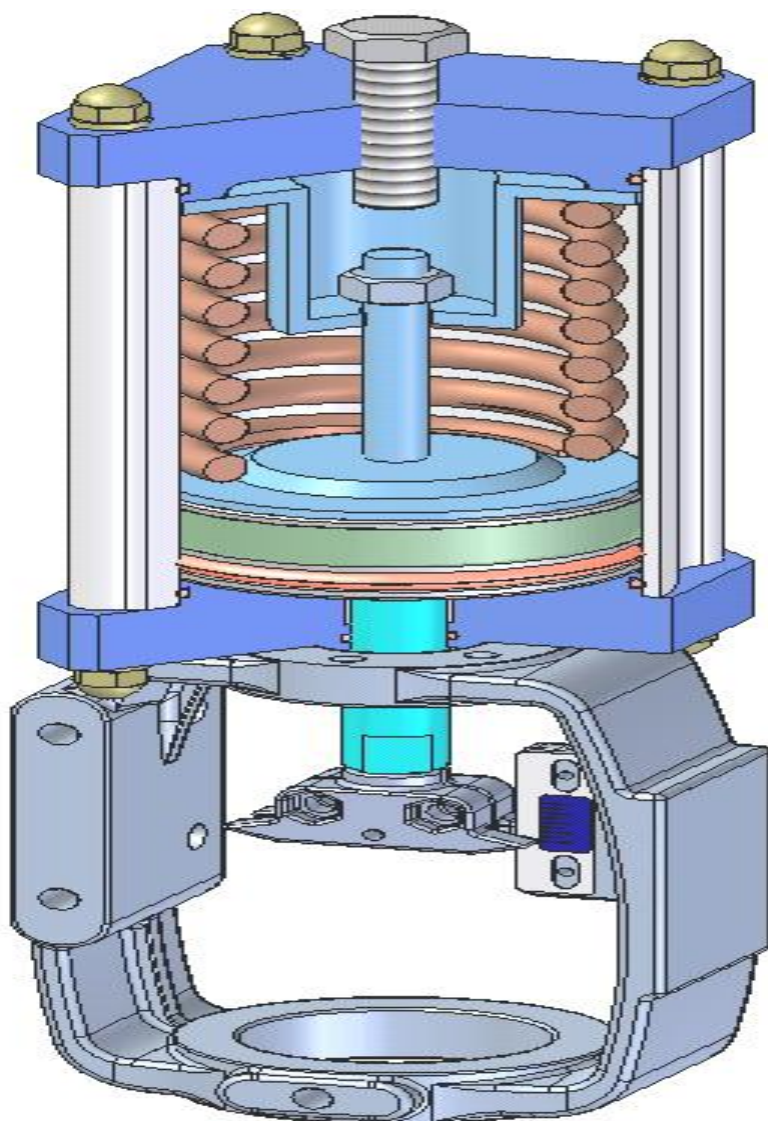


Series 1600, 1700

# Piston Actuator

70-17-41-07-ENG



Revision:

## Contents

<b>1. General</b> .....	<b>1</b>
1.1 Introduction to Actuator .....	1
1.2 Actuator Structure .....	1
<b>2. Storage</b> .....	<b>2</b>
<b>3. Operation</b> .....	<b>3</b>
3.1 Inspections before Operation .....	3
<b>4. Maintenance and Repair</b> .....	<b>4</b>
4.1 Valve Disassembly .....	4
4.2 Disassembly and Assembly of Actuator .....	5
4.2.1 Disassembly <See FIG. 4-1> .....	5
4.2.2 Assembly <See FIG. 4-1> .....	5
<b>5. Preventive Maintenance and Troubleshooting</b> .....	<b>8</b>
5.1 Troubleshooting .....	8
<b>6. Others</b> .....	<b>9</b>

## 1. General

### 1.1 Introduction to Actuator

- A) The Komoto pneumatic piston actuator has been designed to meet the requirements of valve operation.
- B) The Komoto pneumatic piston actuator has been designed for easy maintenance.
- C) The Komoto pneumatic piston actuator boasts a long life span and has few faults. To use the product to its full life span, you should install it correctly according to the manual and maintain it according to the prescribed procedures while using it.

#### ♣ RECOMMENDATIONS

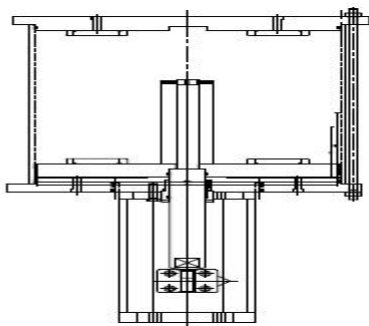
Engineer who has professional assembly capabilities are required to maintain piston Actuator.

Therefore, it is more economical to request repairs of the valves to Komoto. As the valves repaired by Komoto are thoroughly tested and warranted, you are recommended to entrust komoto with repairs.

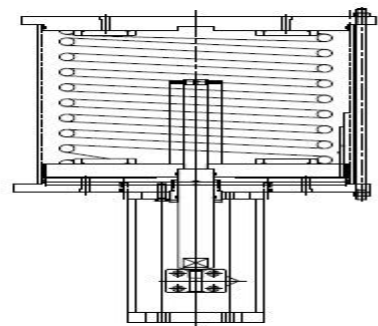
**To avoid possible injury to personnel or damage to valve parts, WARNING and CAUTION notes must be strictly followed. Modifying this product, substituting non-factory parts or using maintenance procedures other than outlined could drastically affect performance, be hazardous to personnel and equipment and may void existing warranties.**

### 1.2 Actuator Structure

- A) The Komoto pneumatic piston actuator is largely classified into Double acting and Spring return types. <See FIG. 1-1, 1-2>



<FIG. 1-1> Double acting Type



<FIG. 1-2> Spring return Type

## 2. Storage

- A) Do not throw, drop or drag the actuator when transporting it.
- B) Keep all parts of the actuator in a well-ventilated place protected from fire, rain and wind.  
Store the valve at a temperature between - 29°C (-20°F) and 48°C (120°F).  
The storage area must be protected from flooding.
- C) Operate the elastomer (O-ring type) of air pressure-type actuator at least once every six months to prevent their functional degeneration. Operate it to the full stroke even under general operation conditions at least three times a month.

**- WARNING -**

**Do not hold it up or drag it using the stopper part when moving it.  
(The stopper part may leak by air pressure.)**

## 3. Operation

### 3.1 Inspections before Operation

- A) Check whether there is any leak from all connections including the air pipe connections.
- B) Check whether the attached manual hand wheel is at the Neutral position.
- C) Check whether the air pressure required for valve operation is accurately set.  
(Piston Actuator: 5.0 kgf/cm<sup>2</sup>, Special specification: 6.0 kgf/cm<sup>2</sup>)

**- WARNING -**

- ① **Remove air pressure from the actuator before using the manual hand wheel. If you use the hand wheel without removing air pressure, it may not work normally and its weak part may get damaged by overstrain.**
- ② **If the manual hand wheel is not at the neutral position during control operation, it may not work normally and its weak part may get damaged.**
- ③ **If you use a pressure higher than the specified pressure on the name plate, the rubber and O-rings of the actuator may be damaged and cause operation problems.**

## 4. Maintenance and Repair

Actuator parts are subject to normal wear and must be inspected and replaced when necessary. The frequency of inspection and replacement depends on the severity of service conditions.

### **REGULAR INSPECTION**

Repair and inspect as described below. If any malfunction occurs, take appropriate measures according to the preventive maintenance procedures and troubleshooting in Chapter 6. Also, disassemble and inspect the system during the regular overhaul period, and replace parts if necessary.

### **♣ RECOMMENDATIONS**

The life span of the valve can increase if you replace parts according to their replacement cycles. Refer to the Part Replacement Cycle sheet shown below.

Part Replacement Cycle Sheet		
Item Name	Replacement Cycle	Others
Piston O-ring	3 years	
Piston Wearing	5 years	

### **IRRGULAR INSPECTIONS**

- A) Are there abnormal noise, vibration or hunting?
- B) Does air pressure escape from actuator?
- C) Are there any loose bolts and nuts?

## 4.1 Valve Disassembly

**- WARNING -**

**To prevent human injuries and damages to control system, remove instrument air and signals from the valve, close the block valve and open the bypass valve to switch over the pressure from the line to the bypass. Then slowly unfasten the bolts from the pipe until the internal pressure of the body is completely released and remove the valve before disassembling the actuator.**

## 4.2 Disassembly and Assembly of Actuator

### **GENERAL INFORMATION**

The Komoto pneumatic Piston actuator moves the piston in the cylinder pipe, which is transformed into rotation and moves the valve. This procedure describes how the actuator can be completely disassembled. When inspection and repairs are required, disassemble only those parts necessary to accomplish the job; then start the assembly at the appropriate step.

### **- WARNING -**

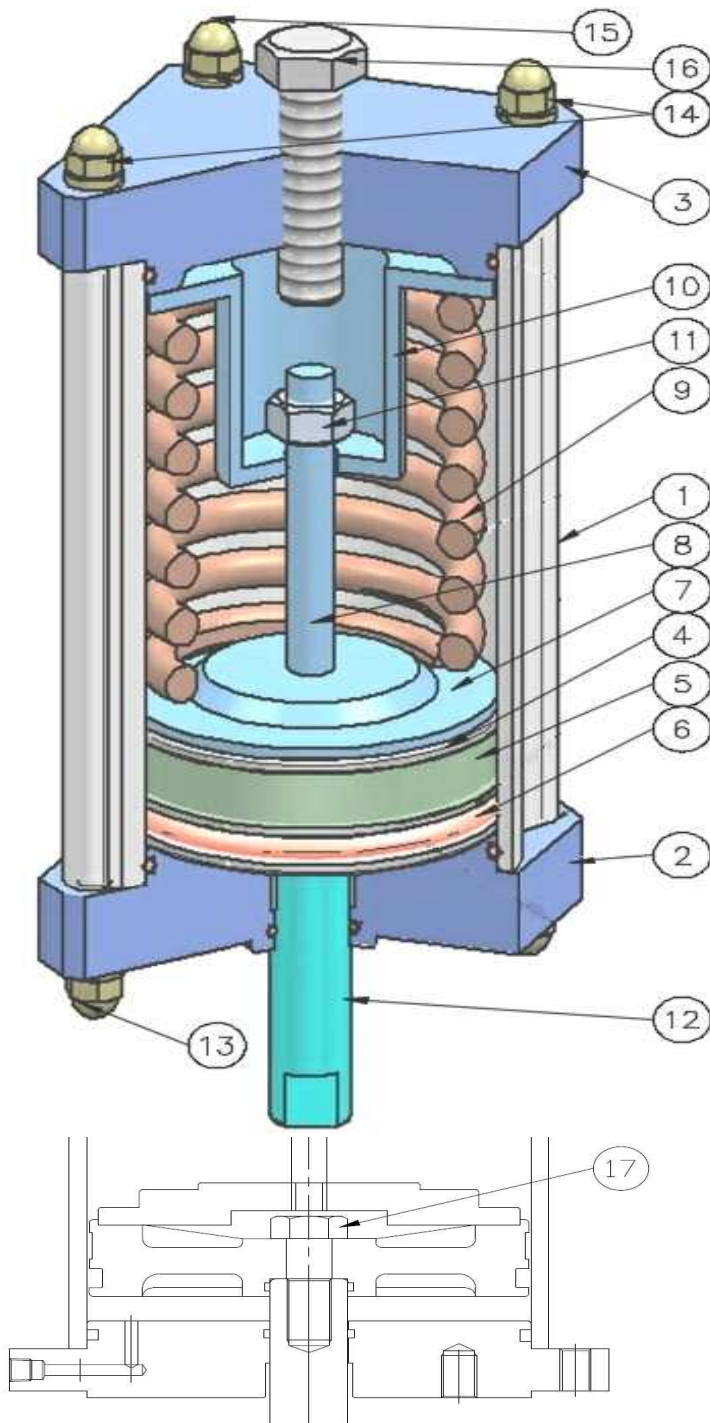
**The components of a spring return type actuator are pressed down by a spring. Take general safety measures and disassemble correctly. Otherwise, injuries and damages may result.**

### 4.2.1 Disassembly <See FIG. 4-1>

- ① Remove actuator from the valve.
- ② Release the air pressure from inside the actuator and disconnect the air piping.
- ③ Replace ⑮ long bolts and remove ⑭ short bolts.
- ④ Slowly remove the remaining ⑮ long bolts while keeping the actuator ⑨ spring without load.
- ⑤ Remove ③ the cover.
- ⑥ Remove the spring set assembly(⑦+⑧+⑨+⑩+⑪) from ① the cylinder.
- ⑦ Separate ⑰ the spindle bolt from ⑫ the spindle, and then pull out ⑫ the spindle from ② flange while taking care not to damage the surface of the spindle.
- ⑧ Check the O-rings and wearing, and replace them if necessary.

## 4.2.2 Assembly <See FIG. 4-1>

Assemble in the reverse sequence of the disassembly.



No.	Part name	Materials
1	Cylinder	-
2	Flange	-
3	Cover	-
4	Piston	-
5	Wear ring	-
6	O-ring	-
7	Spring seat	-
8	Spring set bolt	-
9	Spring	-
10	Spring set	-
11	Spring set nut	-
12	Spindle	-
13	Cap nut	-
14	Short bolt	-
15	Long bolt	-
16	Stopper	-
17	Spindle Bolt	-

<FIG. 4-1 > Actuator Assembly Diagram (Spring return type)

## 5. Preventive Maintenance and Troubleshooting

### ♣ NOTE

Check and replace actuator wearing and O-ring once every 3 years depending on the frequency of use. For other parts, replace them to prevent damages to other devices when they show a wearing sign.

### 5.1 Troubleshooting

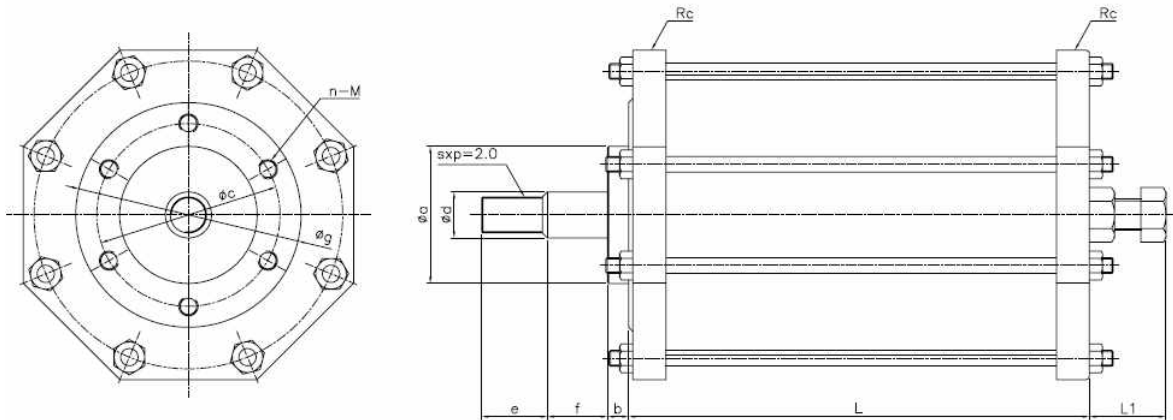
Table 5-1 shows some remedies to general problems that may occur at the site while using piston actuator. For more serious problems, transport the system to the factory.

Table 5-1

Problem	Solution
When actuator does not operate	<ol style="list-style-type: none"> <li>1. Check the air pressure supplied to the actuator.</li> <li>2. Remove the actuator and check spring and piston.</li> </ol>
Leak from actuator components	<ol style="list-style-type: none"> <li>1. Fasten the bolts on the cylinder frame.</li> <li>2. Disassemble the actuator. Check the O-ring and wearing, and replace them with new ones if they are damaged.</li> </ol>
The stroke time is delayed.	<ol style="list-style-type: none"> <li>1. Check the air pressure supplied to the actuator.</li> <li>2. Check the air pressure of the filter regulator.</li> <li>3. Check the adjustment of accessories such as solenoid.</li> </ol>



## 6. Others



Size	B	a	b	c	g	n-M	d	s	e	f	Rc	L1	L	
													1700	1600
AC10	120	35	10	52	-	4-M8	20	20	26	36	1/4	33	167	266
AC13	150	45	10	64	-	4-M8	30	30	34	36	1/4	39	199	342
AC15	182	45	11	64	-	4-M10	30	30	34	40	1/4	39	209	395
AC17	194	55	10	80	120	6-M10	35	33	36	40	1/4	49	271	500
AC20	250	55	10	80	120	4-M12	35	33	36	44	3/8	49	330	513
AC25	300	80	31	116	180	6-M16	45	45	46	52	3/8	59	456	726
AC30	356	80	28	116	180	8-M16	50	48	48	56	3/8	63	577	864
AC35	430	94	25	134	180	8-M16	60	60	58	64	3/8	77	616	1140
AC40	490	94	28	134	180	8-M18	60	60	58	68	3/8	77	675	1270