

# Cylinder Actuator



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## 1. General

### 1.1 Introduction to Actuator

- A) The Komoto pneumatic cylinder actuator has been designed to meet the requirements of valve operation.
- B) The Komoto pneumatic cylinder actuator has been designed for easy maintenance.
- C) The Komoto pneumatic cylinder 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.

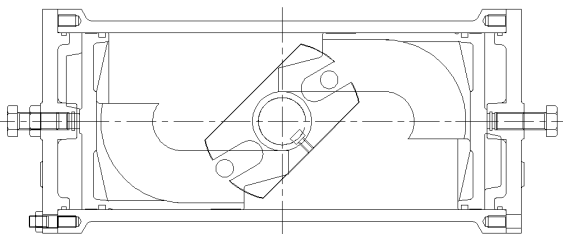
#### **\* Recommendations**

Engineer who has professional assembly capabilities are required to maintain Cylinder 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.

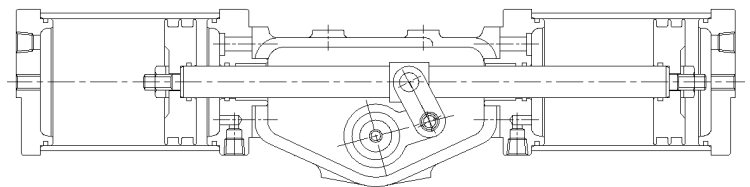
**To avoid possible injury to personnel or damage to valve parts, WARNING and CAUTION notes must be strictly followed. Modifying this product, substituting non-factory parts or using maintenance procedures other than outlined could drastically affect performance, be hazardous to personnel and equipment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

### 1.2 Actuator Structure

- A) The Komoto pneumatic cylinder actuator is largely classified into Scotch Yoke and Linkage types. <See FIG. 1-1, 1-2>



<FIG. 1-1> Scotch Yoke Type



<FIG. 1-2> Linkage Type

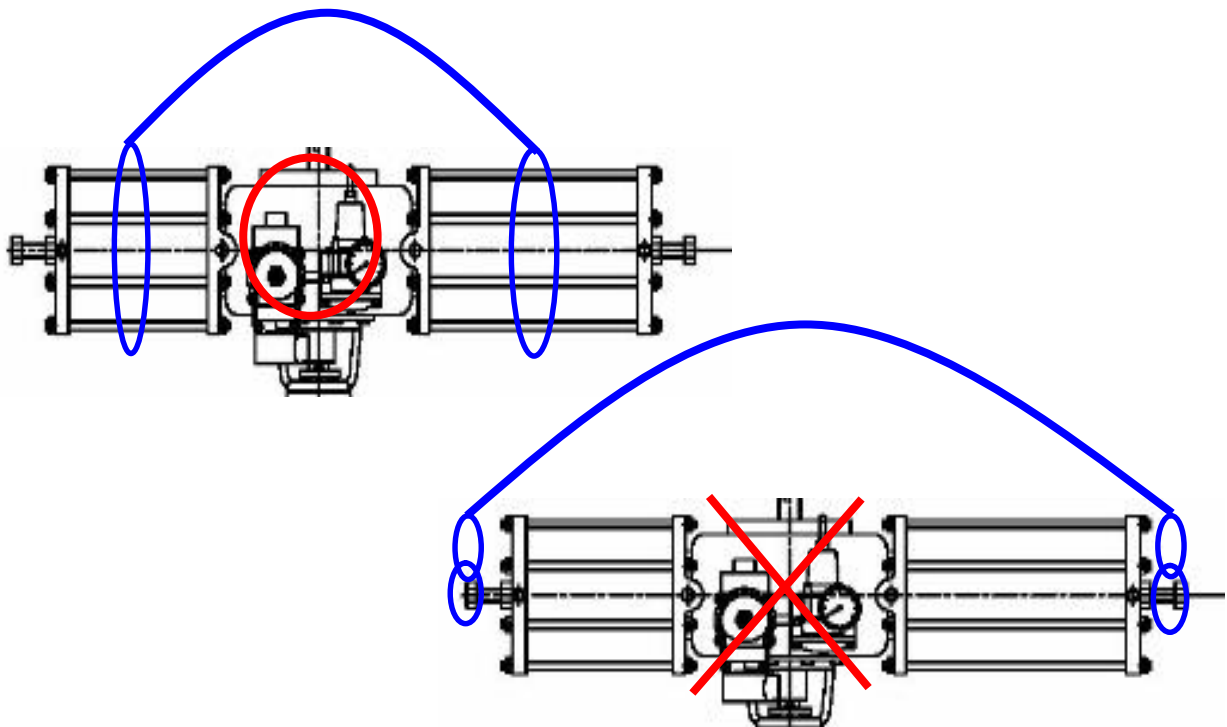
## 2. Storage

- 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  $-29^{\circ}\text{C}$  ( $-20^{\circ}\text{F}$ ) and  $48^{\circ}\text{C}$  ( $120^{\circ}\text{F}$ ).  
 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.)

**\* Valve Handling Method (During Transportation)**



## 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.  
(Cylinder Actuator: 5.0 kgf/cm<sup>2</sup>, Special specification: 6.0 kgf/cm<sup>2</sup>)

#### - Warning -

- ❶ 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.
- ❷ 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.
- ❸ 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

### \* 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

❶ 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	

### \* Occasional 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 cylinder actuator moves the piston in the cylinder pipe, which is transformed into rotation and moves the valve. This procedure is to adjust the valve position to the required position by responding to control signals using air pressure.

### **- Warning -**

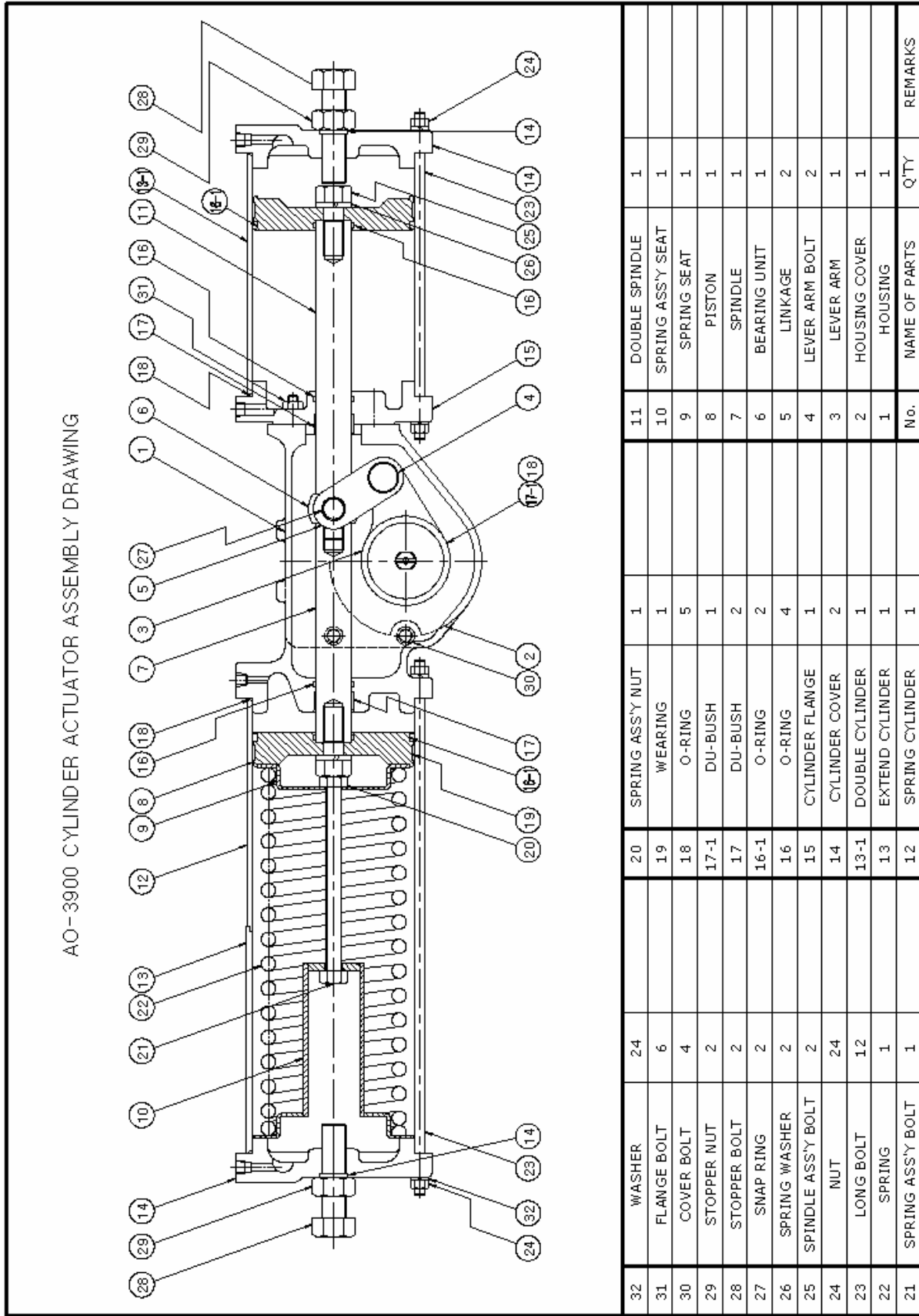
The components of a spring return type actuator are pressed down by a spring. Take general safety measures and disassemble correctly. Otherwise, injuries and damages may result.

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

- A) Remove actuator from the valve.
- B) Release the air pressure from inside the actuator and disconnect the air piping.
- C) Replace 2 tension bolts and remove the others.
- D) Slowly remove the remaining 2 bolts while keeping the actuator spring without load.
- E) Remove the cylinder cover.
- F) Remove the pipe, and then remove the piston from the spindle.
- G) Remove the spindle from the arm while taking care not to damage the surface of the spindle, and then pull out the arm from the housing.
- H) Check the O-ring and wearing, and replace them if necessary.

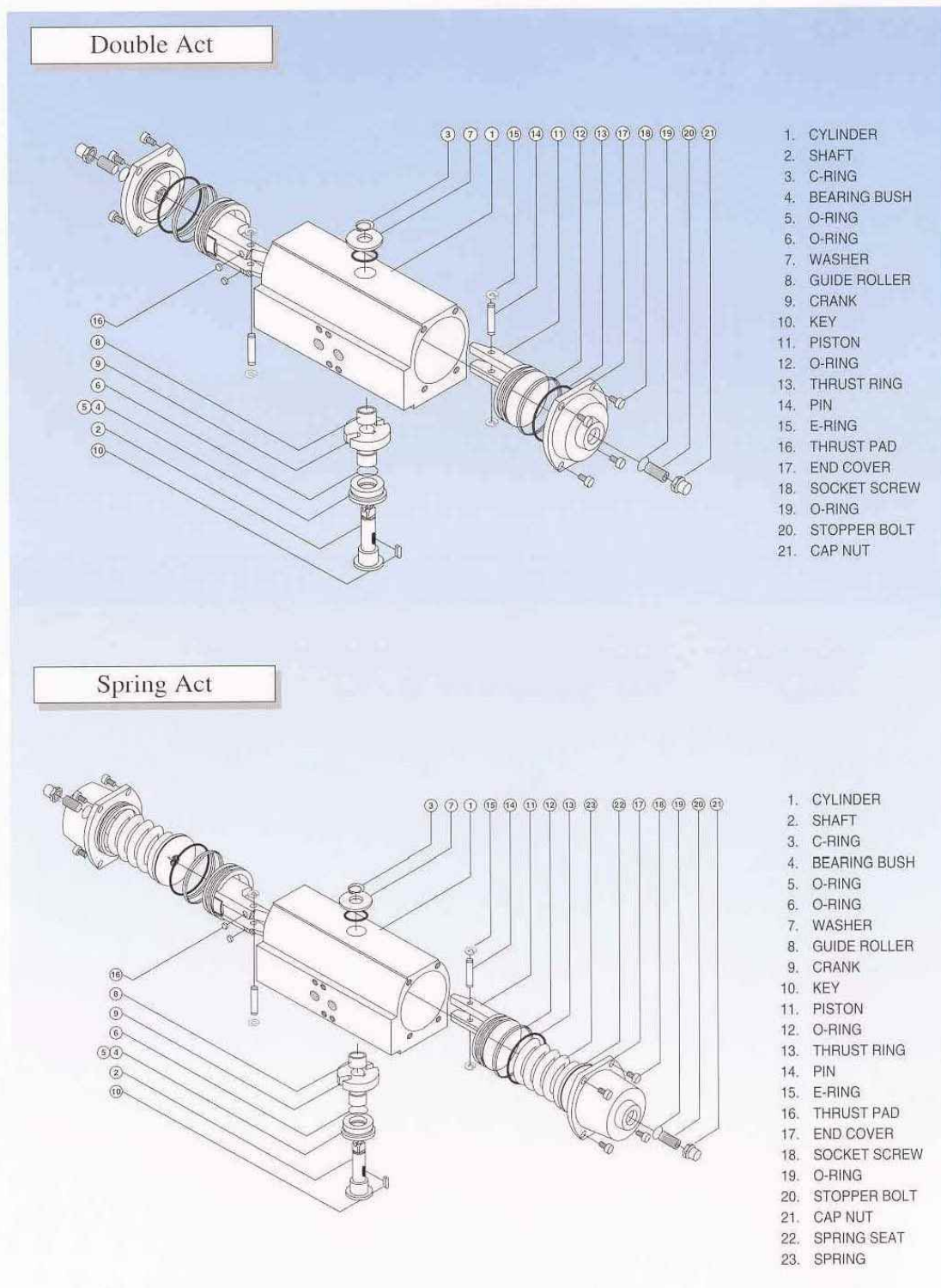
### 4.2.2 Assembly <See FIG. 4-1>

- A) Assemble in the reverse sequence of the disassembly.



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





<FIG. 4-2 > Actuator Assembly Diagram (Scotch yoke 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.

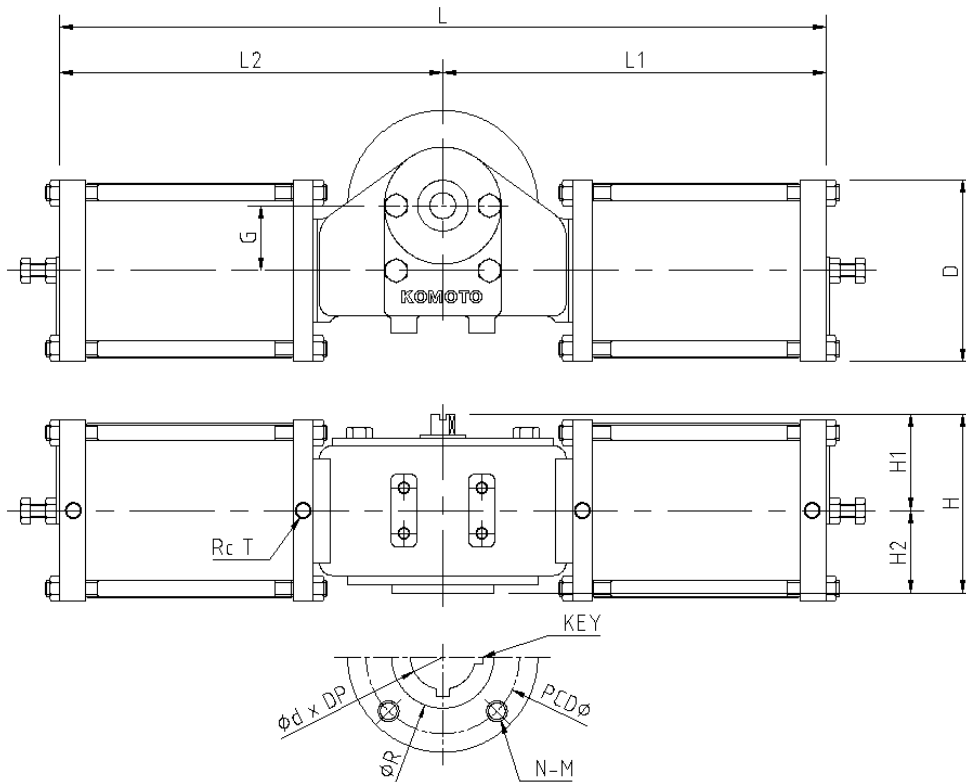
### 5.1 Troubleshooting

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

Table 5-1

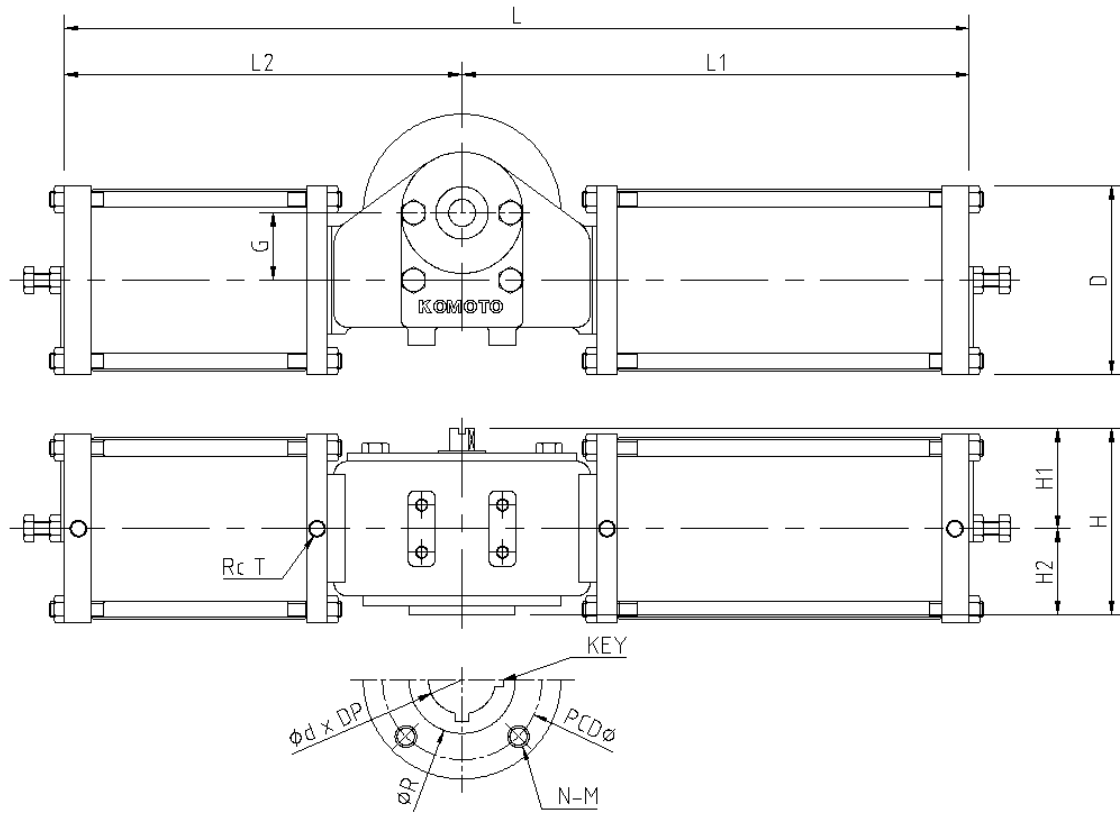
Problem	Solution
When actuator does not operate	<ol style="list-style-type: none"> <li>1. Check the air pressure supplied to the actuator.</li> <li>2. Remove the actuator and check spring and piston.</li> </ol>
Leak from actuator components	<ol style="list-style-type: none"> <li>1. Fasten the bolts on 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



### DOUBLE ACTING (AC15DD ~ 40DD)

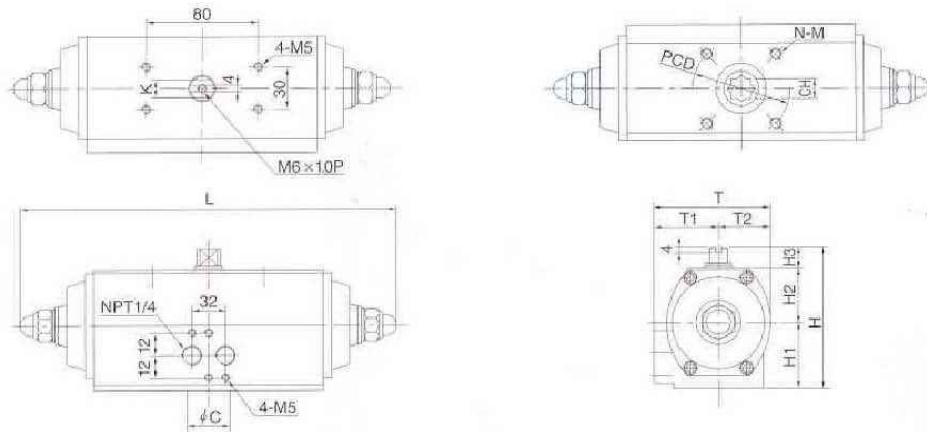
SIZE	ISO BASE	L	L1	L2	D	G	H	H1	H2	ØR	PCDØ	KEY	Ød x DP	N -M	Rc T
AC15	F12	586	290	296	182	50	162	92	70	Ø85	Ø125	12x8	Ø40 x 40	4-M12	1/4"
AC17	F14	823	398	425	194	71	228	124	104	Ø100	Ø140	14x9	Ø45 x 45	4-M16	1/4"
AC20	F16	858	429	429	250	71	228	124	104	Ø130	Ø165	18x11	Ø65 x 60	4-M20	1/4"
AC25	F25	1018	509	509	300	88	295	161	134	Ø200	Ø254	22x14	Ø75 x 75	8-M16	3/8"
AC30	F25	1354	677	677	356	116	295	161	134	Ø200	Ø254	25x14	Ø90 x 85	8-M16	3/8"
AC35	F30	1558	773	785	430	144	364	195	169	Ø230	Ø298	28x16	Ø105 x 100	8-M20	3/8"
AC40	F30	1522	755	767	490	144	364	195	169	Ø230	Ø298	32x18	Ø120 x 115	8-M20	3/8"



## SPRING RETURN DOUBLE CYLINDER (AC15SD ~ 30SD)

SIZE	ISO BASE	L	L1	L2	D	G	H	H1	H2	ØR	PCDØ	KEY	Ød x DP	N -M	Rc T
AC15	F12	781	485	296	182	50	162	92	70	Ø85	Ø125	12x8	Ø40 x 40	4-M12	1/4"
AC17	F14	1033	608	425	194	71	228	124	104	Ø100	Ø140	14x9	Ø45 x 45	4-M16	1/4"
AC20	F16	1049	620	429	250	71	228	124	104	Ø130	Ø165	18x11	Ø65 x 60	4-M20	1/4"
AC25	F25	1348	839	509	300	88	295	161	134	Ø200	Ø254	22x14	Ø75 x 75	8-M16	3/8"
AC30	F25	1746	1069	677	356	116	295	161	134	Ø200	Ø254	25x14	Ø90 x 85	8-M16	3/8"

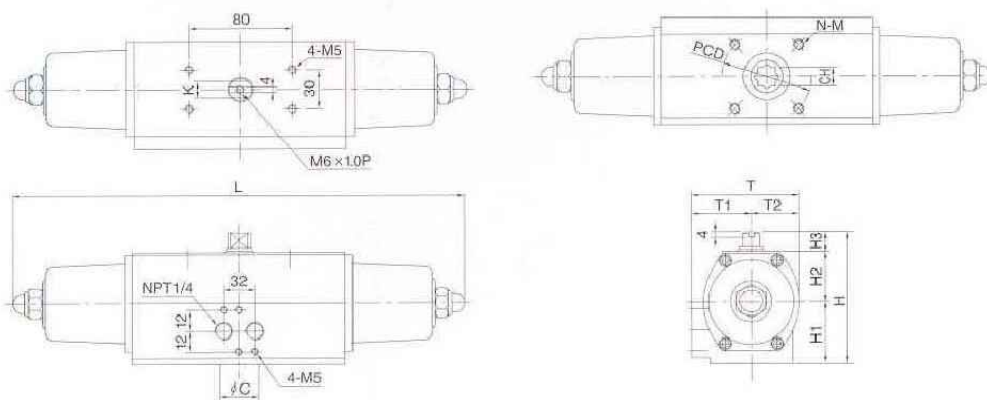
**3800D dimension table**



UNIT : mm

SIZE	ISO	L	T	T1	H	H1	K	CH	P.C.D (□)	N-M	DEPTH	WEIGHT (kg)
AC 05D	F03/F05	188	69	40	87	67	11	11 X 11	50	4-M5/M6	13	1.5
AC 06D	F05/F07	234	83	46	108	86	13	14 X 14	50/70	4-M6/M8	17	2.5
AC 08D	F07	286	98	56	123	103	17	17 X 17	70	4-M8	19	4
AC 10D	F07/F10	344	114	62	143	123	22	22 X 22	70/102	4-M8/M10	26	7
AC 12D	F07/F10	443	136	68	164	144	22	22 X 22	70/102	4-M8/M10	26	11
AC 14	F10/F12	486	158	79	180	160	22	27 X 27	102/125	4-M10/M12	30	18

**3800S dimension table**



UNIT : mm

SIZE	ISO	L	T	T1	H	H1	K	CH	P.C.D (□)	N-M	DEPTH	WEIGHT (kg)
AC 05S	F03/F05	258	69	40	87	67	11	11 X 11	50	4-M5/M6	13	1.6
AC 06S	F05/F07	320	83	46	108	86	13	14 X 14	50/70	4-M6/M8	17	3.2
AC 08S	F07	418	98	56	123	103	17	17 X 17	70	4-M8	19	5.4
AC 10S	F07/F10	506	114	62	143	123	22	22 X 22	70/102	4-M8/M10	26	10
AC 12S	F07/F10	649	135	68	164	144	22	22 X 22	70/102	4-M8/M10	26	17
AC 14S	F10/F12	716	158	79	180	160	22	27 X 27	102/125	4-M10/M12	30	24