XP100

Pneumatic Positioner　　Operating Manual

## Linkage lever/Rotary motion

# XP-S3


SSS Co., Ltd.

IM-XP1S3／00-R6

# Safety precautions

Cautions and Warnings – read before operating

⚠ Warning! Indicates a situation where incorrect operation while failing to heed the warning could result in death or serious injury if not avoided.

## ⚠ Warning

When removing or disassembling component screws or pressure gauges etc. for inspection reduce the output pressure to 0 and then disconnect the supply pressure.

When operating the equipment during adjustment or inspection (see pages 1 and 2), do not touch moving parts such as cams, bearings, clamps or levers with your hands.

⚠ Caution! Indicates a situation where incorrect operation while failing to heed the caution could result in malfunction or physical damage.

During use ensure the supply pressure remains within the maximum POSI-POWER range of 0.7 MPa.

The normal value during single acting and double acting is 0.14 – 0.28 MPa and 0.4 MPa respectively.

Use the equipment with the POSI-POWER cover Assy installed.

If drainage or debris etc. accumulates in the pressure line on the supply side, the orifice will become plugged and cause a malfunction, so install an air filter (such as Mini-Set, manufactured by SSS Co., Ltd.) of 5 microns or less and supply air cleansed by a dryer etc.

When checking to see if debris or blockage is observed in the orifice or mesh filter, first shut off the supply pressure.

When carrying out pipe work, always flush the pipes sufficiently.

When screwing pipes and fittings, leave about one fifth of the screw and bind remainder with seal tape or apply liquid sealant.

Using lubricator on the supply side will block the orifice or nozzle. Avoid using lubricator.

# Index


1. Introduction — 1
1. Operation — 1
(1) Single acting — 1
(2) Double acting — 2
(3) Operation flow-chart — 2
3. Specifications — 3
4. Installation — 4
(1) Cam and lever — 4
(2) Installation when valve open at $90^0$ — 4
(3) Installation other than when valve is open at $90^0$ — 4
5. Cam — 5
(1) Cam type and code — 5
(2) Cam characteristics and specifications — 5
6. Pneumatic piping — 6
7. Adjustment — 7
(1) Zero point adjustment — 7
(2) Range adjustment — 7
(3) Seat adjuster — 8
(4) A/M Selector — 8
(5) Linearity adjustment — 9
8. Change of operation — 10
(1) Double acting — 10
(2) Single acting — 10
9. Maintenance — 11
9 – 1 Regular inspection — 11
9 – 2 Replacing or changing unit parts — 12
(1) Replacing pilot relay unit — 12
(2) Changing the orifice — 12
(3) Changing to equal % Cam characteristics — 13
(4) Replacing orifice Ass'y — 13
(5) Changing to split range — 13
10 Troubleshooting — 14
11 Part names — 16
12 Model notation — 17

# 1. Introduction Page 1

This manual is intended for use with the link lever type for rotary motion single and double acting pneumatic positioner valve.

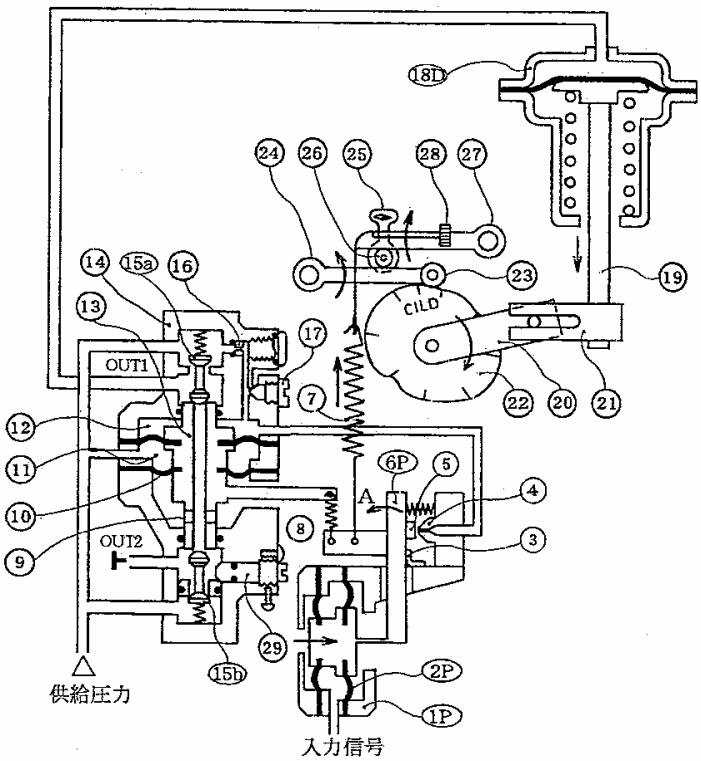
Please refer to the relevant manual for other types.

# 2. Operation

## (1) Single acting

When an input current is applied to input chamber (1P), the flapper holder (6P) moves in the direction of arrow A by the flexure. This movement separates the flapper (5) from the nozzle (4) to reduce pressure in the nozzle back chamber (12), the balance between this pressure and that in the pressure chamber (11) is lost and eventually the relay spool (13) opens port (15a) to introduce the output of OUT1 to the pressure chamber (18D) of the diaphragm actuator, thereby lowering the stem (19).

This movement is transmitted to the feedback levers (20) and (21), cam (22), range (24) and zero arm (27) to expand the feedback spring (7) until the tension of this spring and the output of input chamber (1P) balance, obtaining a change in the stem (19) proportional to the input current.

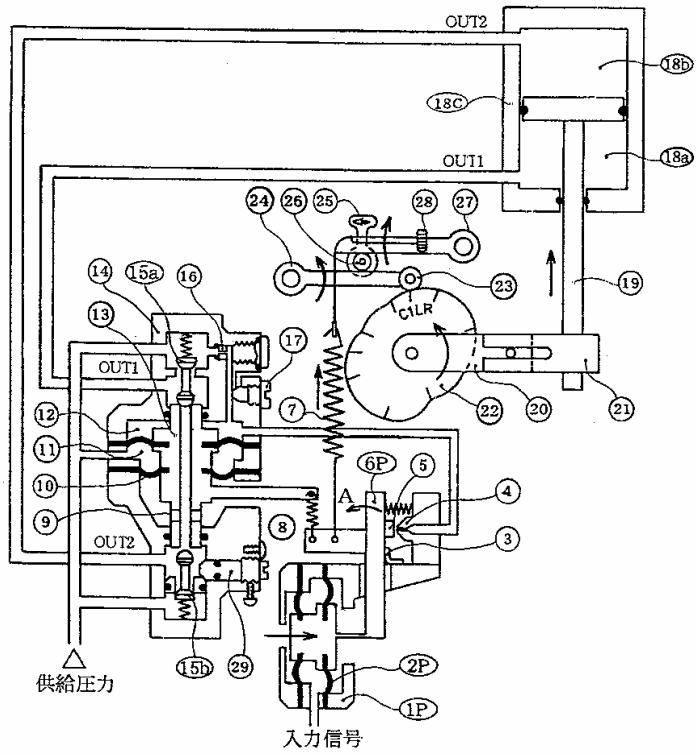



1P Input chamber
2P Armature
3 Flexure
4 Nozzle
5 Flapper
6P Flapper holder
7 Feedback Spring
8 Stabilizer Spring
9 Exhaust
10 Diaphragm
11 Pressure Chamber
12 Nozzle Back Pressure
13 Relay Spool
14 Pilot Relay Body
15a Port A
15b Port B
16 Orifice
17 A/M Selector
18D Diaphragm Actuator (Pressure Chamber)
19 Stem
20 Feedback Lever A
21 Feedback Lever B
22 Cam
23 Bearing
24 Range arm
25 Range Adjuster
26 Roller Shaft
27 Zero Arm
28 Zero Adjustment Knob
29 Seat Adjuster

## (2) Double acting Page 2

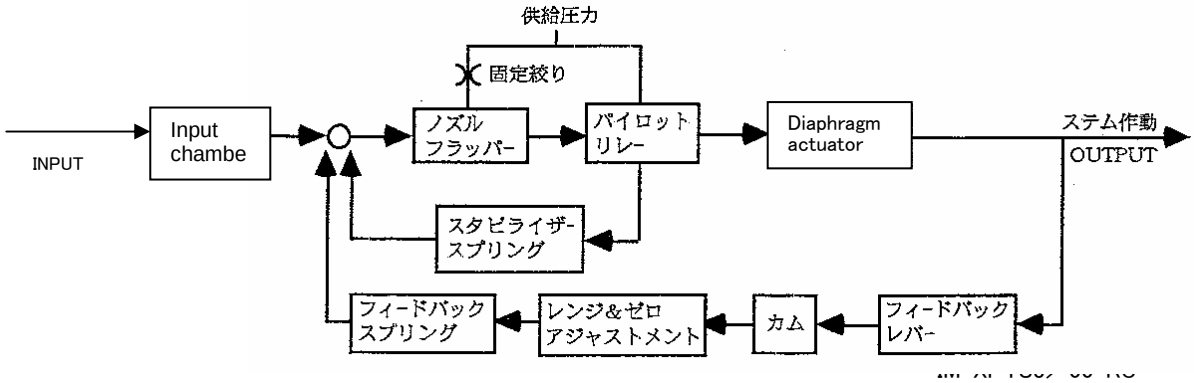
When an input current is applied to input chamber (1P), the flapper holder (6P) moves in the direction of arrow A by the flexure. This movement separates the flapper (5) from the nozzle (4) to reduce pressure in the nozzle back pressure chamber (12). As a result, the balance between the above chamber and that in the pressure chamber (11) is lost, and eventually the relay spool (13) opens port (15a) and port (15b) simultaneously separates from the end of the relay spool. In response to this movement, the output of OUT 1 flows into the lower cylinder chamber (18a) and the upper cylinder chamber (18b) connects to the vent to raise steam.

This movement is transmitted to the feedback levers (20) and (21), cam (22), range (24) and zero arm (27) to expand the feedback spring (7) until the tension of this spring and the output of the input chamber (1P) balance, obtaining a change in the stem (19) proportional to the input current.




1P Input chamber
2P Diaphragm
3 Flexure
4 Nozzle
5 Flapper
6P Flapper holder
7 Feedback Spring
8 Stabilizer Spring
9 Exhaust
10 Diaphragm
11 Pressure Chamber
12 Nozzle Back Pressure
13 Relay Spool
14 Pilot Relay Body
15a Port A
15b Port B
16 Orifice
17 A/M Selector
18c Cylinder
18a lower cylinder chamber
18b upper cylinder chamber
19 Stem
20 Feedback Lever A
21 Feedback Lever B
22 Cam
23 Bearing
24 Range arm
25 Range Adjuster
26 Roller Shaft
27 Zero Arm
28 Zero Adjustment Knob
29 Seat Adjuster

## (3) Operation flow-chart



# 3. Specifications Page 3

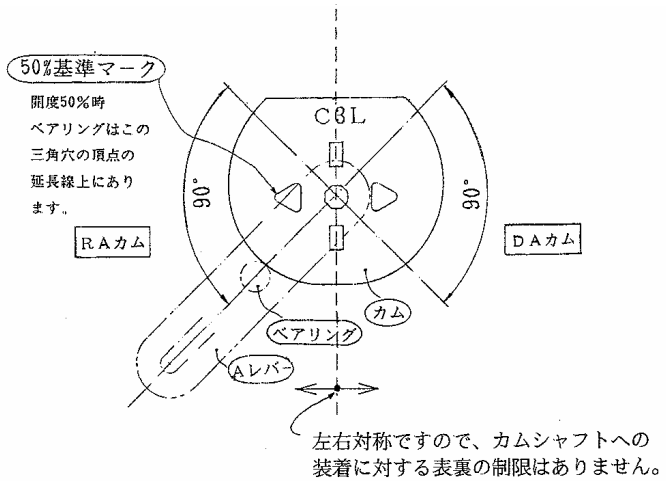
| Specifications | Single acting | Double acting |
|---|---|---|
| Input current | 20～100KP a | |
| Supply air pressure | 0.14～0.7MPa／140～700 k Pa | |
| Stroke | 90°（60°） | |
| Air connector | Rc1/4(pressure measurement Rc 1/8 ) Option; NPT1/4(pressure measurement NPT1/8) | |
| Pressure gauge | | 0 - 0.2Mpa, |
| | Standard; | 0-0.4 Mpa, Option; kPa, psi, bar |
| | | 0-1.0 Mpa psi, bar only NPT |
| Construction | Standard: anti-dust, anti-drip IP65 equivalent (IEC529-1989) | |
| Cam | Standard; Linear, Equal Option; non-linear characteristics | |
| Ambient temperature | Standard use (S); -20 to 83$^0$C<br>Low temperature use (L); -50 to 60$^0$C<br>High temperature use (L); 0 to 100$^0$C | |
| Weight | 1.3kg | 1.4kg |
| Material | Main body; Cast aluminium (special alumite treatment)<br>Cover; PBT resin (containing glass fibre)/Cast aluminium…optional | |

| Characteristics | Single acting | Double acting |
|---|---|---|
| Linearity | ±2.0%F.S | |
| Hysteresis | 1.0%F.S | |
| Repeatability | 0.5%F.S | |
| Sensitivity | 0.5%F.S | |
| Supply pressure change | 0.3%/0.01MPa | |
| Vibration resistance | 1%/1G | |
| Posture error | 0.2%／10°、4%／90° | |
| Maximum air processing (Nl/min) | 10 Nℓ/min /0.4 MPa (under standard specifications) | |
| Maximum Air processing (Nl/min) | 370 / 0.4 MPa<br>Output side at max. open (orifice φ5) | |

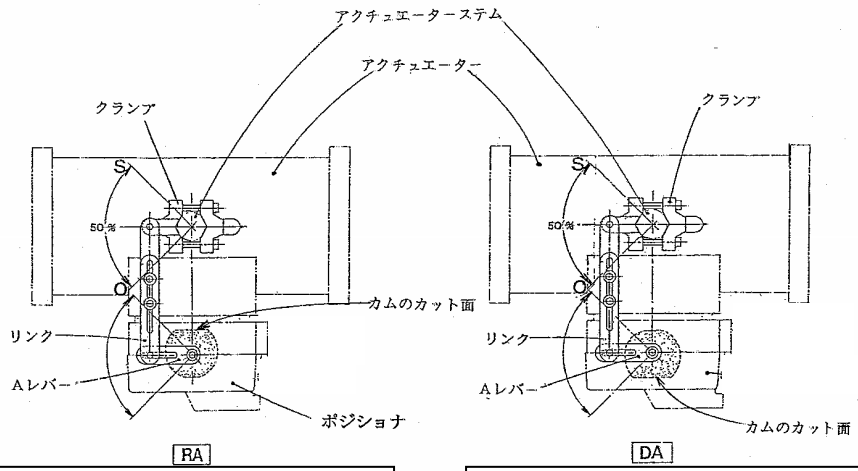
# 4. Installation Pg.4

## (1) Cam and lever

See diagram on right for cam and lever relationship




## (2) Installation when valve open at $90^0$




(RA action)
When the actuator is at 50%, rotate the cam and fit lever A to the cam shaft so that the cut surface of the cam is parallel with the bottom of the base.

(DA action)
When the actuator is at 50%, rotate the cam and fit lever A to the cam shaft so that the cut surface of the cam is even top of the cam cover.

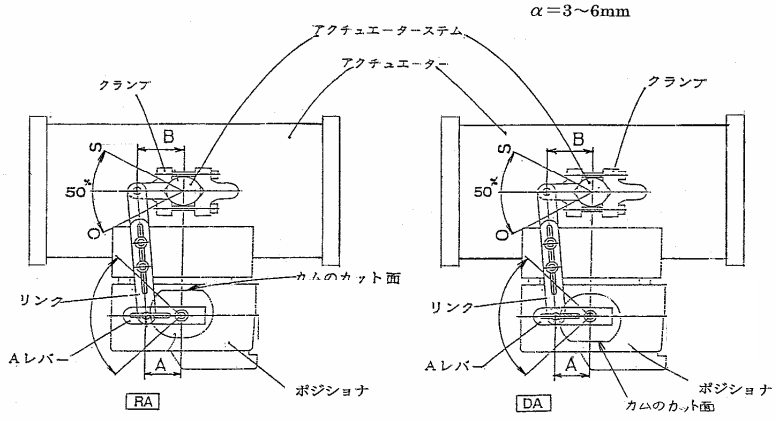
## (3) Installation other than when valve is open at $90^0$

When valve is open at values other than $90^0$, the ratio of A and B shall be in reverse proportion to the ratio of valve opening, as described in the formula below.

Follow procedure in (2) above to set lever A.

$$A = \frac{\text{弁開度}}{90°} \times B + \alpha$$

$\alpha = 3 \sim 6mm$



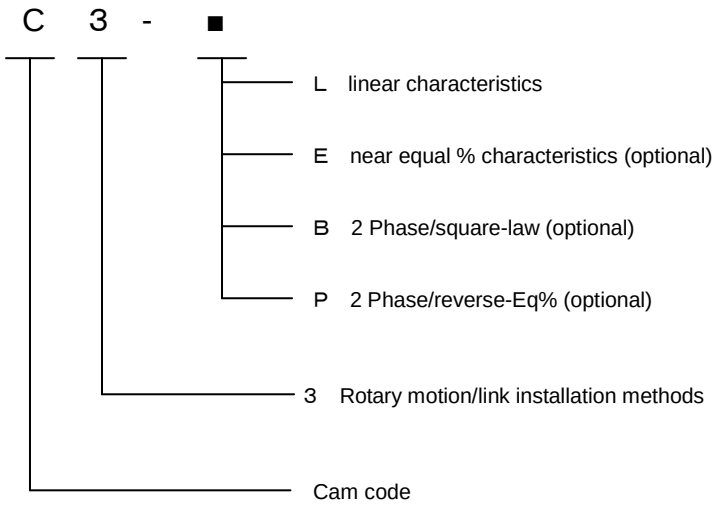
# 5. Cam Pg.5

## (1) Cam type and code

The valve operation (forward, reverse) can be changed without removing the single standard CAM installed.

Moreover, the standard is linear characteristic, but with the option to choose near-equal% characteristic.

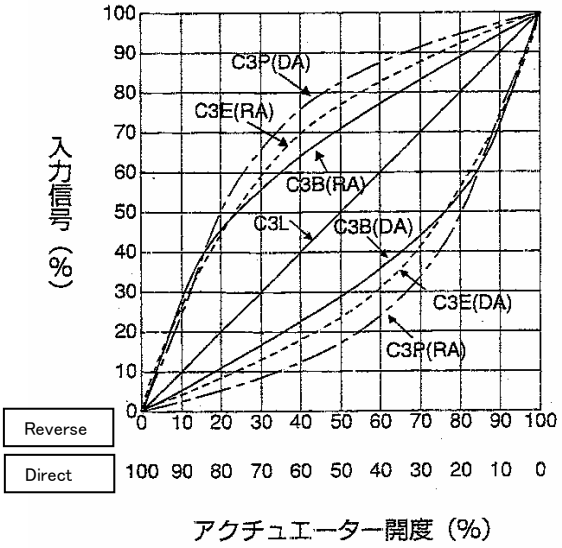
Unless otherwise specified, the default shipping setting is standard linear motion.




## (2) Cam characteristics and specifications

The valve properties and CAM properties can be selected to suit the objectives of use.

The input signal and stroke are related as described in the diagrams below.




Cam characteristics/applications

| Cam code | Cam characteristics/applications | | |
|---|---|---|---|
| | Action | Char.'s | Applicable actuator |
| C3L－D | Rotary motion (link) | Linear | (Nb.1) Clockwise |
| C3L－R | | Linear | (Nb.1) Anti-clockwise |

Nb.1: Clockwise/anti-clockwise refer to direction of rotation as viewed from above the rotary/actuator stem

# 6. Pneumatic piping Page 6

## (1) Pneumatic piping

1) The connection is selectable, either Rc1/4 or NPT1/4 as required. Please use the appropriate connector.

2) Ensure no foreign articles or cutting chips are contained in the piping by purging appropriately.

3) Use supply air that has been dried and filtered.

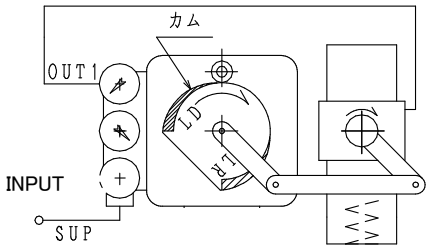
*** Use a filter around the supply air nozzle that has a filtration value of less than 5μ**

***Inappropriate supply air can cause malfunctioning and shorten the product's life-span.**

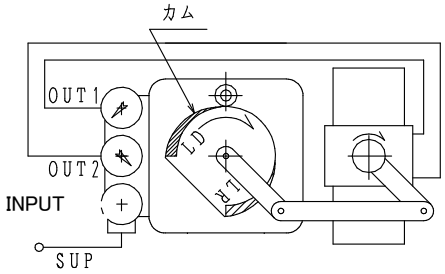
4) Regulate the supply pressure to the required pressure, using for example a Mini-set (pressure reduction valve with filter attached, provided by SSS).

5) When double acting type is used as a single acting type, blind OUT 2 connector nozzle (or OUT 1 when used as reverse action pilot), remove the pressure gauge and blind that port also.

Single action piping




Double action piping

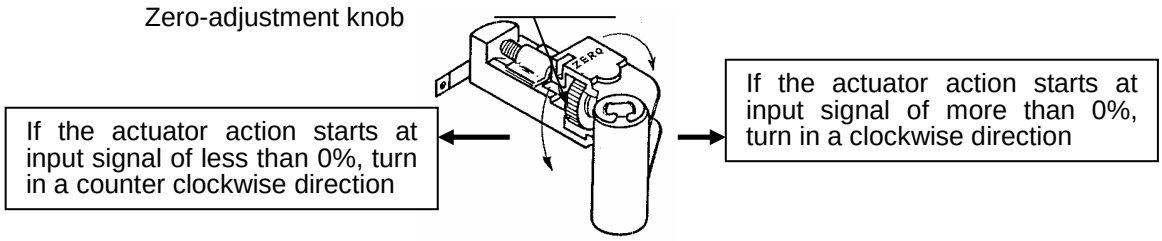



＊ For anti-clockwise rotation of the actuator stem by increase in input current, see piping described on page 10.

# 7. Adjustment Page 7

## (1) Zero point adjustment

1) Set input current to the stroke starting signal (20KPa) then turn the zero adjustment knob clockwise or counter clockwise. (Because the CAM has zero-falling, rising characteristics, adjust by the valve in closed position)



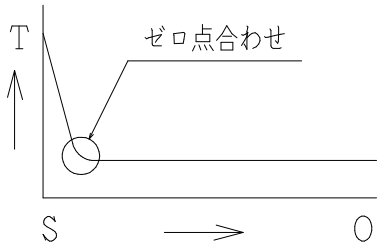

2) For Zero Point Adjustment, we recommend checking Output pressure adjustment as well as the stroke.

The table below shows output pressure when emphasizing tight-shut.

| Output pressure gauge | Double Acting | | Single Acting | |
|---|---|---|---|---|
| | RA | DA | RA | DA |
| OUT1 | 0 | MAX | 0 | MAX |
| OUT2 | MAX | 0 | — | — |

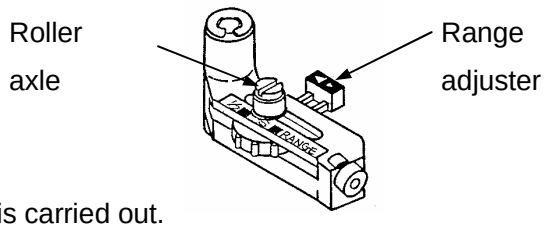
(Units: MPa) ※1When diaphragm motor is SUP0.14MPa (a range of 0.02 – 0.1MPa)

3) When torque is large when closed at the rotary valve, zero align at 5 to 10% (a level at which torque quickly becomes small) (see graph on right)




## (2) Range adjustment

Adjust Range Adjustment so that actuator stops at 0% position of the stroke by the 0% applied input signal and 100% position for 100% input signal respectively. (When Stopper or Valve Seat stays at the 100% or 0% position of the actuator, the adjustment is made at the 10% - 90% position or, otherwise, 25% - 75% position)




① First Zero Adjustment is carried out.

② Check the actuator stroke is positioned at 100% when 100% input signal is applied. Checking for the input signal and stroke has to be done carefully because over-ranged adjustment causes over-traveling in the actuator stroke, before the input signal reaches 100%.

③ Use the controls on the range adjuster ◁ ▷ as marked. The large mark is to increase the range; the small mark is to decrease the range. Page 8

④ The Range Adjuster can be free to move by loosening the Roller Shaft slightly using a screw driver.

Holding the Roller Shaft in place with the screw driver used to loosen the Shaft, move and adjust the Range Adjuster and lock it again. Do not loosen too much because the Roller Shaft will be slanted and its adjustment will become unreliable due to the zero-shifted stroke.

⑤ Range adjustment and zero adjustment is carried out alternately.

⑥ If Range adjustment cannot be achieved by full range movement of the Adjuster, check the position of the transmission pin on the feedback lever.

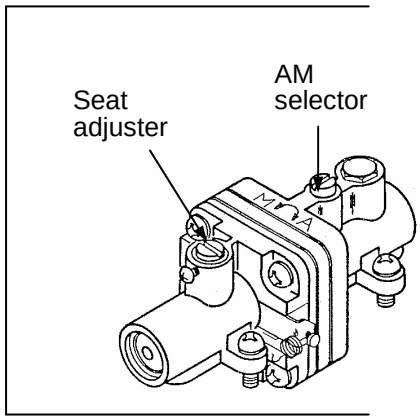
## (3) Seat adjuster

1) The Seat Adjuster is designed to adjust the output pressure balance pressure, and is thus adjusted before the shipment for balanced output pressure (75% - 80% of supply air pressure). Thus, do not adjust unless you have accidentally turned the seat adjuster. Incorrect operation can result in malfunction.

2) Adjusting the balance pressure helps address the following issues. When adjusting follow the directions detailed in 10.3, Troubleshooting/Poor performance. Contact SSS before carrying out any adjustments.

① Alleviates 'hunting' phenomenon ( High Pressure Balance)

② Reduction in Hys. (shifting balance point)




## (4) A/M Selector

A/M Selector is a valve for changing between Auto and Manual

1) When using in Auto mode, turn the Selector towards A (clockwise) until fast.

Use a torque equivalent to JIS or 6x100 screwdriver.

(Shipped products are set to Auto)）

2) To use in manual mode turn the Selector to M (anti-clockwise, about one quarter to one and a half turns)

The actuator can be operated in manual mode using the supply pressure reduction valve. Not available for Single Acting-OUT2 and Double Acting.

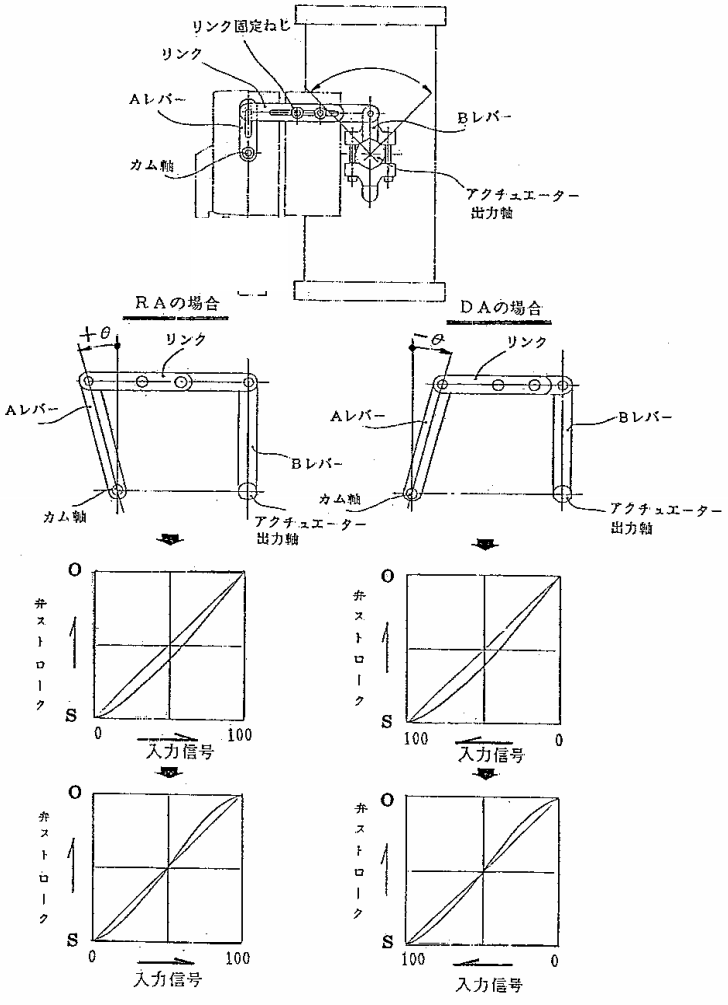
## (5) Linearity adjustment Page 9

1) Causes of linearity errors

(a) When A and B levers are not installed in parallel at signal 50%

(b) When input signal is 0%, make the output pressure 0 MPa

(at input signal zero)




2) How to adjust in case of abovementioned (a) and (b)

① In case of (a)

In manually setting the actuator portion at 50%, adjust the link length by loosening link-fix-screw so as to bring A and B levers parallel.

① In case of (b)

By adjusting length of link with link-fix-screw loosened, set $\theta$ ＝1 - 6° by distorting parallel of A and B levers.

(When characteristics are S-shaped, only the above procedures can be carried out)

# 8. Change of operation Page 10

For anti-clockwise rotation of the actuator stem by increase in input current, follow the guidelines below.

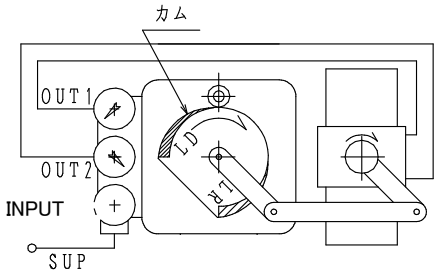
(clockwise and anti-clockwise refer to the direction of rotary actuator stem rotation as seen from above) )

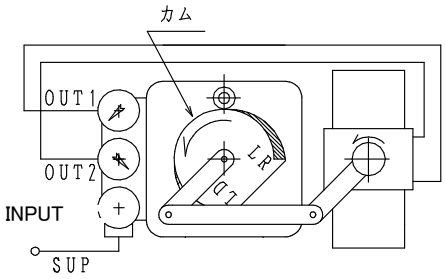
## (1) Double acting

① Flip OUT1, 2 wires.

② Change Cam range of use from LD to LR

③ Adjust Zero and Span adjustments.



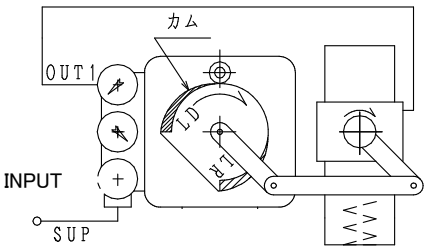

Clockwise rotation from increase in input signal

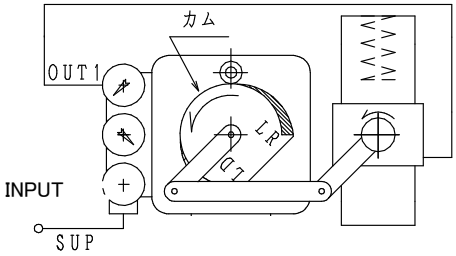
Anti-clockwise rotation from increase in input signal

## (2) Single acting

① Change Cam range of use from LD to LR

② Adjust Zero and Span adjustments.




Clockwise rotation from increase in input signal

Anti-clockwise rotation from increase in input signal

※ For reverse direction pilot (lower output through increase in input current), flip output piping and output pressure gauge to OUT2. Move screw plug to OUT1 side.

# 9. Maintenance Page 11

## 9 – 1 Regular inspection

Carry out regular inspections for maintenance. Refer to the Regular Inspection Manual below.

Refer to pages 1, 2 and 16 for unit names and position of parts.

Regular Inspection Manual

○ Check (Replace defective parts) ◇ Checking and Cleaning ■ Replace △ Checking and Greasing

| Unit | Check point | Checking period (Year) | | | | | | | | | | Summary of checking contents |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.5 | 1 | 1.5 | 2 | 2.5 | 3 | 3.5 | 4 | 4.5 | 5 | |
| Base & Cover | Supply pressure filter<br>Pressure gauge<br>Cover packing | | ◇<br>○ | | ○ | | ◇<br>○<br>○ | | ○ | | ◇<br>■<br>■ | Alien objects, dust etc.<br>Indication error<br>Defects |
| Zero & & Range Arm | Shaft holder<br>Bearing<br>Zero-adjustment plate | | △ | | | | △<br>○ | | | | △<br>○<br>○ | Greasing<br>Damage, wear<br>Wear |
| Cam & Lever | Cam Plate<br>Cam Shaft/Spring<br>Transmission Pin<br>Cam Shaft packing | | △<br>○ | | | | △<br>○<br>○ | | | | ○<br>△<br>○<br>■ | Wear<br>Wear/Greasing<br>Wear<br>Defects |
| Input chamber unit ※1 | Flexure spring<br>Nozzle, flapper | | ◇ | | | | ◇ | | | | ◇<br>◇ | Loose screws<br>Dirt/Wear&Tear |
| Pilot Relay ※3 | Fixed Orifice<br>Filter mesh (when cleaner attached) | | ○ | | ○ | | ○ | | ○ | | ■ | Dirt, clogging |

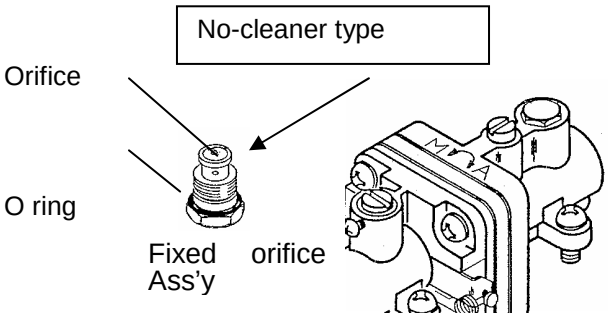
Note1. Dismantling the input chamber unit (※1) can harm the **performance of the explosion-proof characteristics and is prohibited**.

Note 2. Dismantling the Pilot Relay Unit (※3) can harm the **performance of the explosion-proof characteristics and is prohibited**.

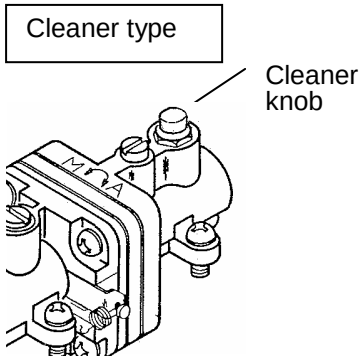
Note 3. Change the Pilot Relay Unit every five years using the units provided.

NB Determine the exchange period based on the conditions of use (frequency, opening and closing speed) and ambient range of temperature.

Note 4. Check that the supply air source is stopped and there is no residual pressure before cleaning the orifice (※4).




Checking the filter mesh for foreign objects and cleaning. Remove the orifice Ass'y from the pilot relay unit, and clean with 0.3 diameter piano wire and purified air.




Push the cleaner knob (red), and dispose of rubbish

## 9 – 2 Replacing or changing unit parts Page 11

(1) Replacing pilot relay unit

Before replacing parts, always cut off the supply air pressure and check that no residual pressure remains.

Removing

① Remove the stabilizer spring from the hanger using a pin set.

* Be careful not to bend or stretch the stabilizer spring.

② Remove the four installation screws (M4 small cross hole screws: CN4-12WFWS), and remove the Pilot Relay Unit.

＊ When removing, check to make sure that O-ring on the Pilot Relay side is not still attached to the base side.

If it is still attached then remove.

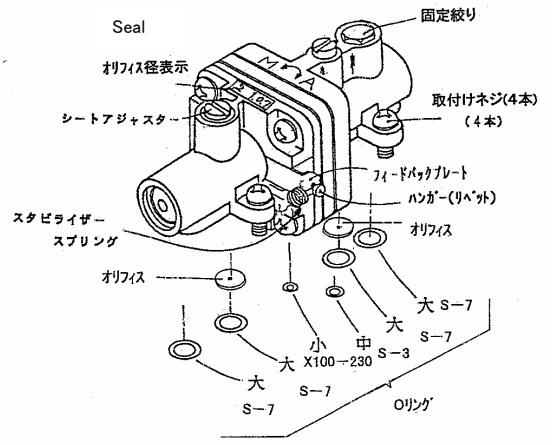
Installation, checking

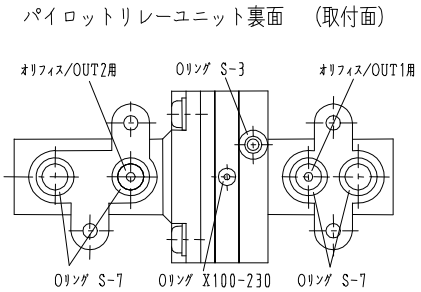
① Before installing the new Pilot Relay Unit, check that all the O-rings on the install seating are attached.

Check particularly for S-3 and X100-230 O-rings, which are small and can get lost during removal of the unit.

② Set the new Pilot Relay Unit on the base, fix in place with the four installation screws and then hang the stabilizer spring from the hanger.

③ Before finishing the operation, check the operation and hysteresis. Check that there is no air release sound to indicate air release from the base of the Pilot Relay Unit installation. A loud hissing sound could suggest major air release, in which case check that the O-rings are attached correctly.




Pilot relay unit

(2) Changing the orifice

When using small capacity actuator, hunting (or overshooting) may occur. If this happens, replace the actuator capacity on the orifice on the Positioner output side (Pilot Relay attachment) in accordance with the guidelines below.

| Actuator capacity (litres) | Orifice diameter (φ) |
|---|---|
| 0.5～0.7 | 0.7 |
| 1.0 | 1.0 |

| | |
|---|---|
| 2.0＜V | 2.0, 5.0 (when increasing action speed |

① After removing the Pilot Relay Unit following the replacement guidelines in (1) above, remove the 0-ring (S-7) for use in the unit rear seat pressure output OUT1 and OUT2, and the orifice to be replaced.

② After replacing with the specified orifice, attach the O-ring (S-7), and install the Pilot Relay Unit and Stabilizer Spring.

＊ Circle the appropriate figures for the diameter of the new orifice on the orifice diameter sticker.

③ After replacement, follow the guidelines above, and check activity and functionality.

(3) Changing to equal % Cam characteristics Page 13

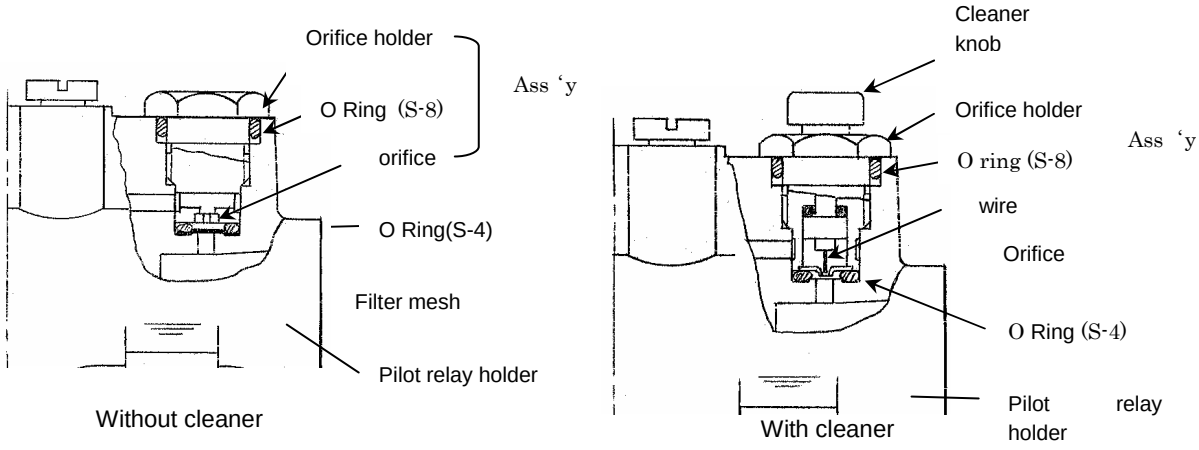
① After removing the Positioner side A Lever, remove the Adaptor mounted on the rear surface of the base.

② After converting for Equal % the CAM Ass'y (CAM and CAM shaft) installed in the Adaptor, reassemble as per the original assembly, carry out Zero and Span adjustment and check operation.

(4) Replacing orifice Ass'y

The orifice Ass'y comes in versions with cleaner attached and without cleaner. (Internal construction differs. See diagram below.)

Follow the guidelines below when converting from non-cleaner to cleaner-attached versions to avoid problems arising from quality of supply air. (When converting make sure the supply air is turned off and that there is no residual pressure).)




① Use an auxilary 10 spanner and remove the orifice Ass'y from the Pilot Relay Menu.

② Using a tool such as tweezers, remove the O-ring and filter mesh from the bottom of the hole left by the removal of the orifice Ass'y. (Use new O-ring's for the O-ring (S-4)

③ If the orifice Ass'y installation holes are dirty, clean by method such as applying air

pressure to the area.

④ Re-attach the O-rings (S-4) to the holes. (Do not use the filter mesh)

⑤ Remove the orifice Ass'y and check operations.

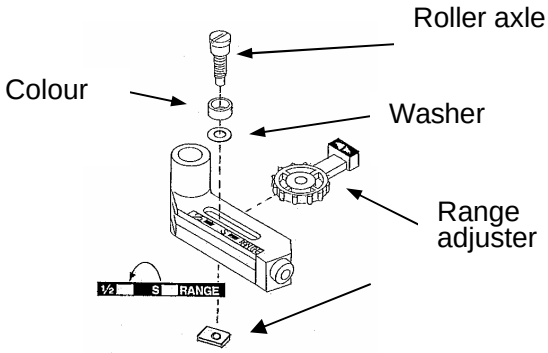
＊ At this point check that O-ring (S-8) is attached to the orifice Ass'y.

(5) Changing to split range

When converting to Split Range remove the roller shaft as shown below, then adjust as described above after repositioning the Range Adjuster gears to the 1/2 mark.

For 4-12mA range: Adjust to 4mA at 0% and 12mA at 100%.

For 12-20mA range: Adjust to 12mA at 0% and 20mA at 100%.



## 1) No operation despite application of input signal

**Identification and assessment of problems can be done by gently moving the counter block (with flapper attached) by hand and attaching it to the nozzle and checking the output pressure.**

| Check at counterblock | Cause | Action |
|---|---|---|
| When counterblock is moved, output pressure is activated/switched normally | Incorrect wiring (+/-) | Tighten or correct wiring |
| | Torque motor is open or short circuited | Replace motor （※） |
| | Loose or incorrectly mounted feedback lever | Tighten or re-mount |
| When nozzle is closed at counterblock, OUT1 is raised and at a constant level | Orifice or cleaner orifice is jammed | Clean or replace/press cleane knob |
| | Incorrect replacement of A/M selector | Tighten towards arrow A |
| | Incorrect flapper contact, broken flapper | Replace motor （※） |
| When nozzle is open at counterblock, OUT1 is raised and at a constant level | Low or no supply pressure | Check DP Valve, or original pressure |
| | Jammed nozzle | Replace motor （※） |
| | Faulty pilot relay unit | Replace pilot relay unit |

## 2) Malfunction

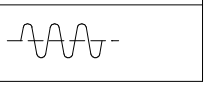
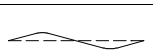
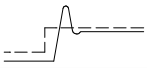
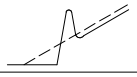
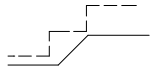
| Issue | Cause | Action |
|---|---|---|
| Incorrect zero position | Loose feedback lever connection | Tighten and readjust |
| | Metal material near cover | Remove materials and readjust |
| Wrong stroke | Transmission pin wrongly positioned | Tighten and readjust |
| | Cam wrongly positioned | |
| | Loose range adjuster roller shaft | |
| Operation is not smooth | Loose set or lock screws | Tighten and readjust |
| | Cam shaft worn out | Replace if backlash is too big |
| Wrong linearity | Feedback lever setting is wrongly positioned | Correct setting |
| | Cam is worn out | Replace cam and readjust |
| Response time is slow (both wasy) | Supply port screen is clogged | Clean |
| | DP valve filter is clogged | Replace filter |
| Extremely slow response (one way, OUT1 pressure hard to raise | A/M selector not completely closed | Rotate to arrow |
| | Clogged orifice | Clean or replace |
| | Incorrect contact between nozzle and flapper | Replace motor （※） |





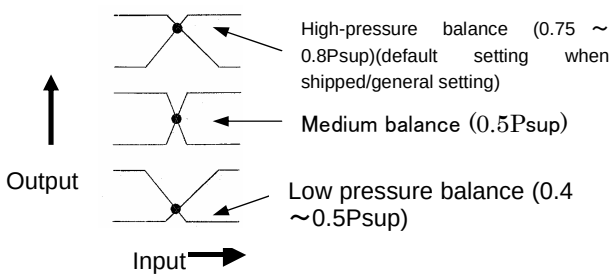
**※Motors returned to SSS will be replaced**

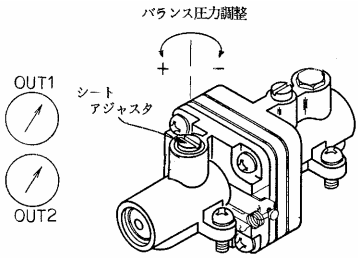
## 3) Poor Performance Page 15

| Issue | Cause | Action |
|---|---|---|
| 周期の速いハンチング  | Fixed orifice becoming clogged | Clean or replace |
| 周期の遅いハンチング  | Grand packing worn out | Increase the actuator size |
| | Insufficient actuator strength | Replace grand packing or increase actuator size |
| | Pilot relay balance pressure too low | Adjust seat adjuster （※） |
| オーバーシュート  | Pilot relay balance pressure too low | Adjust seat adjuster（※） |
| | Delayed transmission of feedback circuit | Check wearing and backlash |
| ジャンピング動作  | Insufficient actuator torque | Increase the actuator size |
| ハンチング動作  | Pilot relay balance pressure too low | Adjust seat adjuster （※） |
| | Actuator defect | Switch to manual mod, check and repair |
| | Lack of supply pressure capacity or clogged SUP filter | Increase DP valve size and clean or replace |
| ヒスが大きい  | Feedback circuit is worn | Tighten loose screws/replace defective equipment |
| | Balance pressure not adjusted | Readjust seat adjuster （※） |
| 感度が悪い  | Problem with balance pressure | Readjust seat adjuster （※） |
| | Damaged, dirty or mispositioned nozzle/flapper | Replace torque motor (SSS will replace) |

### （※） Adjusting the Seat Adjuster

If the Seat Adjuster is turned in the wrong direction, and emergency recovery is required, follow the guidelines below.




① ・So that the actuator balances at arbitrary intermediate values (other than at full-open or tight-shut), change the input signal appropriately and check the internal air pressure of the balance point cylinder.
(Warning: When air escapes from between the positioner and actuator, the balance point becomes lower)

② When lowering the balance point, rotate the Seat Adjuster clockwise, and when raising the balance point rotate in an anti-clockwise direction.

(After rotational adjustment (about 1/10 of a full rotation), change the input signal and check the output pressure balance point.

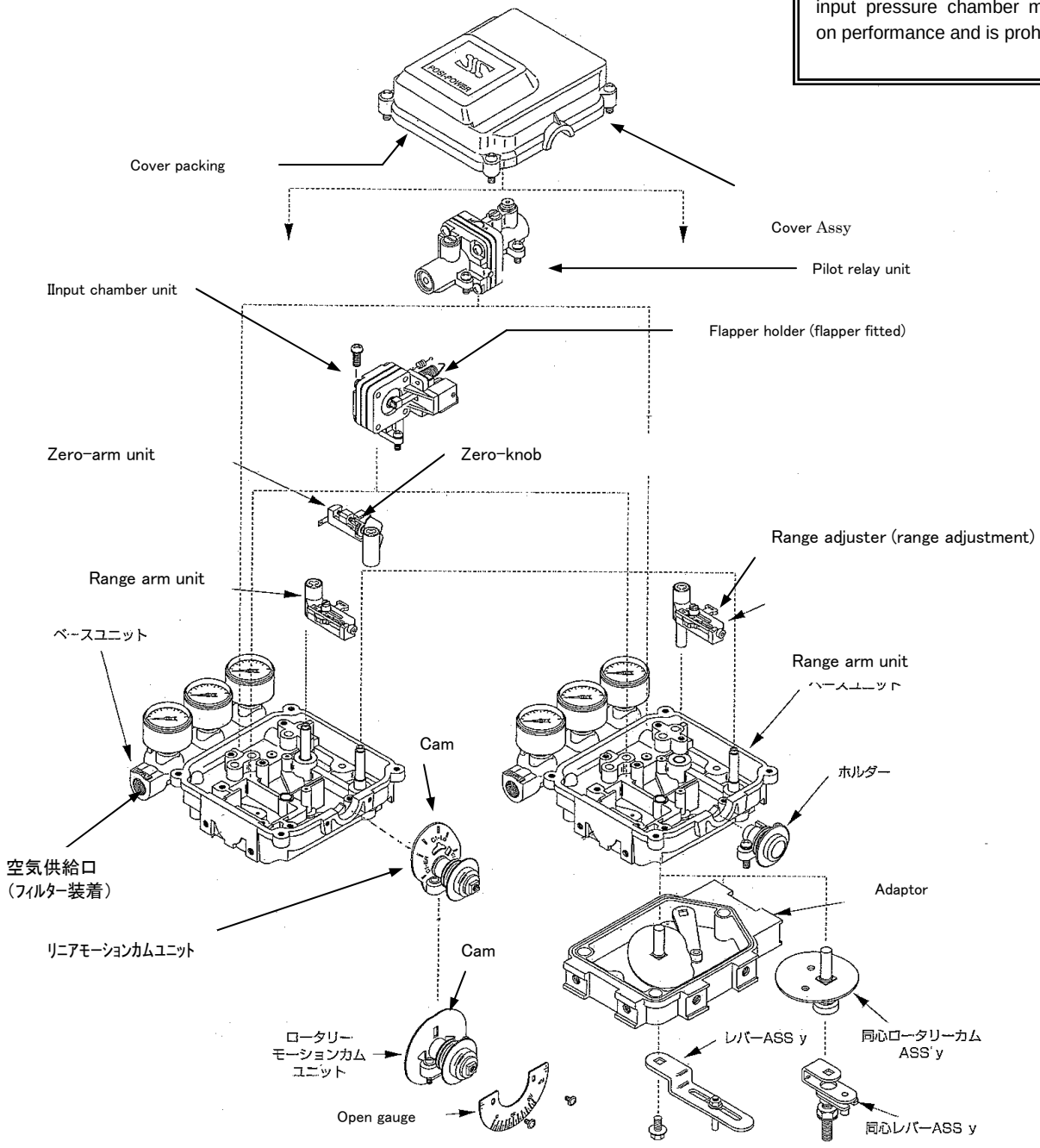
If the value falls outside the standard range for adjustment, rotate slightly in either direction as required.

The maximum rotation range is 1/4 of a full rotation. Excessive rotation will damage the unit.

A difference in the effective surface area of pistons on either side, a spring inserted from one side, heavy loading can all cause pressure difference between OUT1 and OUT2. In such cases, set a high standard pressure.

# 11. Names of parts (common to XP models) Page 16

－Disassembly prohibited－
Disassembly of pilot relay unit and input pressure chamber may impact on performance and is prohibited.




| Linear motion (Side lever type) | Rotary motion (Link lever type) | Linear motion (Back lever type) | Concentric motion (Back lever type) |
|---|---|---|---|
| S1 | **S3** | B4 | B7 |

# 12 Model notation

| Basic model | | | | | | | | Auxiliary Model | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | 2 | | 3 | | 4 | | 5 a | | 5 b | |
| Unit | | Series | | Housing | | Functions and connections | | ※ Ambient Temp. Range | | Mounting method | |
| **XP** | Pneumatic | **1** | 100 Series | **0** | Standard Type | **1** | Rc(PT)1/4 Single acting | **S** | Standard: -20 ～ 83℃ | **S1** | Linear motion/ Side lever type |
| | | | | | | **2** | Rc(PT)1/4 Double acting | | | **S3** | Link type Rotary motion |
| | | | | | | 3 | NPT1/4Single acting | | | **B4** | Linear motion/ Back lever type |
| | | | | | | 4 | NPT1/4Double acting | L | −50～60℃ | **B7** | Concentric Rotary motion |
| | | | | | | 5 | Rc(PT)1/4 Position transmitter | H | 0～100℃ | | |
| | | | | | | 6 | NPT1/4 Position transmitter | | | | |
| | | | | | | | | | | | |

| Additional model | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | | 7 | | | | 8 | | 9 | | 10 | |
| ※2 Outlet Pressure gauge | | Pilot Relay/Orifice | | | | Input current | | Cam | | Lever & Clamp | |
| **M2** | 0.2MPa | Standard Type | | | | **B1** | 20～100 KPa | **C1a** | Linear motion/45$^0$ 4Phase linear/Eq% | LOO | Linear motion/side lever type Multi-stage lever combined with clamp |
| | | Cleaner | | Orifice Dia | | | | | | | |
| **M4** | 0.4MPa | No | Yes | | | **B2** | 20～60 KPa | **C3L** | Linear/rotary/90$^0$ 2Phase/linear | lOO | Multi-stage lever combined without clamp |
| | | F1 | Q1 | $\phi$5 | | | | | | | |
| **M0** | 1.0MPa | **F2** | **Q2** | $\phi$2(STD) | | **B3** | 60～100 KPa | C3E | Linear/rotary/90$^0$ 2Phase/Eq% | DOO | Direct lever combines/with clamp |
| | | F4 | Q4 | $\phi$1.0 | | | | | | | |
| **K2** | 200kPa | F5 | Q5 | $\phi$0.7 | | | | C3B | Linear/rotary/90$^0$ 2Phase/square-law | dOO | Direct lever combines/without clamp |
| | | F6 | Q6 | $\phi$0.45 | | | | | | | |
| **K4** | 400kPa | Stability type | | | | | | C3P | Linear/rotary/90$^0$ 2Phase/reverse Eq% | KOO | Linkage lever type rotary motion Linkage lever combined/with clamp |
| | | G1 | J1 | $\phi$5.0 | | | | | | | |
| **K0** | 1000Kpa | **G2** | **J2** | $\phi$2(STD) | | | | **C4La** | Linear motion/45$^0$ 4Phase/linear | kOO | Linkage lever combined/without clamp |
| | | G4 | J4 | $\phi$1.0 | | | | | | | |
| P2 | 30psi | G5 | J4 | $\phi$0.7 | | | | **C7L** | Rotary/concentric/ 90$^0$ 2Phase/linear | HOO | Linear motion/back lever type L type lever combined/with clamp |
| | | G6 | J6 | $\phi$0.45 | | | | | | | |
| P4 | 60psi | High Rangeability Type | | | | | | | | hOO | L type lever combined/without clamp |
| | | R1 | T1 | $\phi$5.0 | | | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P0 | 150psi | | | | | | V○○ | Concentric rotary motion<br>Concentric rotary combined/M8 screw combined |
| B2 | 2bar | | | | | | | |
| B4 | 4bar | | | | | | | |
| B0 | 10bar | | | | | | | |

Note) Model notation in bold type is for standard and in normal type for optimal specifications

※ 1. The explosion proof type is only available for the standard product(s)

※ 2. Contact SSS for psi, bar displays