

XP100

Pneumatic Positioner Operating Manual

Linear motion / Back lever type

XP-B4



3S Co., Ltd.

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Safety precautions

Cautions and Warnings – read before operating



Warnings: Indicate a situation where incorrect operation while failing to heed the warning could result in death or serious injury if not avoided.

- 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, do not touch moving parts such as cam, bearings, clamps or levers with your hands.

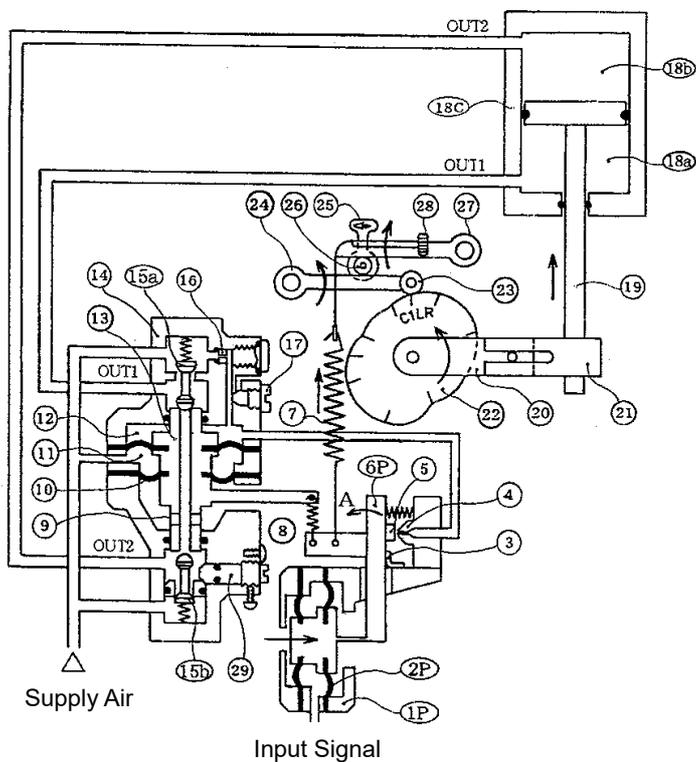


Cautions: Indicate a situation where incorrect operation while failing to heed the caution could result in malfunction or physical damage

- During use ensure the supply pressure remains within the maximum range of 0.7MPa.
- Use the equipment with the 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 3S Co., Ltd.) of 5um or less and supply air cleansed by a dryer etc.
- Using lubricator will block the orifice or nozzle. Avoid using lubricator.
- 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.
- Use a regulator and supply stable air pressure according to the use environment.

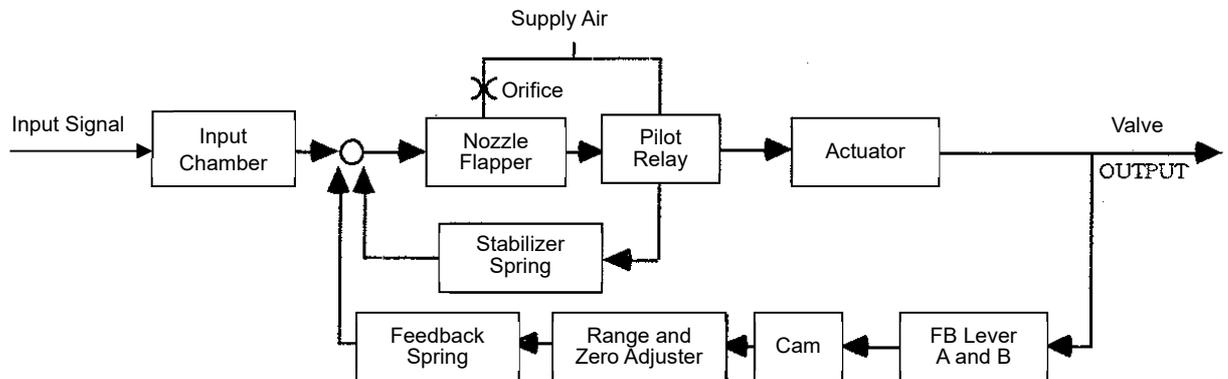
2-2. Double acting

When Input Signal is applied to Input Chamber (1P), Flapper Holder (6P) moves in the direction of arrow A by Flexure (3). This movement separates Flapper (5) from Nozzle (4) to reduce pressure in Nozzle Back Pressure Chamber (12). As a result, the balance between the above chamber and that in Pressure Chamber (11) is lost, and eventually Relay Spool (13) opens Port A (15a) and B (15b) simultaneously separates from the end of Relay Spool. In response to this movement, OUT1 flows into Lower Chamber (18a) and Upper Chamber (18b) connects to the vent to raise Stem (19). This movement is transmitted to FB Lever A (20) and B (21), Cam (22), Range Arm (24) and Zero arm (27) to expand Feedback Spring (7) until the tension of this spring and the output of Input Chamber (1P) balance, obtaining a change in Stem (19) proportional to Input Signal.



- 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 Fixed Orifice
- 17 AM Selector
- 18c Actuator
- 18a Lower Chamber
- 18b Upper Chamber
- 19 Stem
- 20 FB Lever A
- 21 FB 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

2-3. Operation flow-chart



3. Specifications

Specifications		Single acting	Double acting
Input		20 to 100kPa (1/2 split range adjustment is available)	
Supply air pressure		0.14 to 0.7MPa	
Stroke		10 to 100mm	
Air connection		Standard: Rc1/4 (Gauge Rc1/8) Option: 1/4NPT (Gauge 1/8NPT)	
Pressure gauge *1	Input	Standard: 200kPa Option: Nothing, MPa, psi , bar	
	Output	Specified one (Only OUT1 in case of single acting)	
Cam		Standard: Linear (Cut-off characteristic) Option: Near Equal %	
Ambient temperature		Standard temp. type (S): -20 to 83°C Low temp. type (L): -50 to 60°C High temp. type (H): 0 to 100°C	
Weight		1.7kg	1.8kg
Material	Main body	Aluminium diecasting	
	Cover	Standard: PBT resin Option: Aluminium diecasting	

Performance		Single acting	Double acting
Linearity		±1.0% F.S.	±2.0% F.S.
Hysteresis		1.0% F.S.	1.0% F.S.
Repeatability		0.3% F.S.	0.5% F.S.
Sensitivity		0.3% F.S.	0.5% F.S.
Supply pressure change		0.2%/0.01MPa	0.3%/0.01MPa
Vibration effect		No resonance in the range 5 to 200Hz at 2G	
Posture error		0.2%/10°, 4%/90°	
Air consumption (NI/min)	Condition	Sup. 0.14MPa, Output 50%	Sup. 0.4MPa, Output 75%
	Standard type	5.0	10.0
	Stable type	8.0	16.0
	Quick Speed type	9.0	18.0
Max air capacity (NI/min)	Condition	Sup. 0.14MPa	Sup. 0.4MPa
	Orifice φ5.0	Standard type: 160 Stable type: 160 Quick Speed type: 180	Standard type: 370 Stable type: 370 Quick Speed type: 450
	Standard type	Orifice φ2.0: 55 Orifice φ1.0: 17 Orifice φ0.7: 9 Orifice φ0.45: 3.5	Orifice φ2.0: 120 Orifice φ1.0: 40 Orifice φ0.7: 25 Orifice φ0.45: 9

Performance are effected by actuator.

*1: The delivery date may change depending on specifications. Please contact us for details.

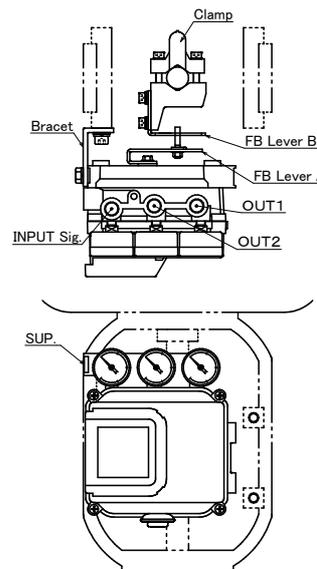
4. Installation

4-1. Installation

(1) Installation

The diagram on the right shows a left-sided mounting for a bracket.

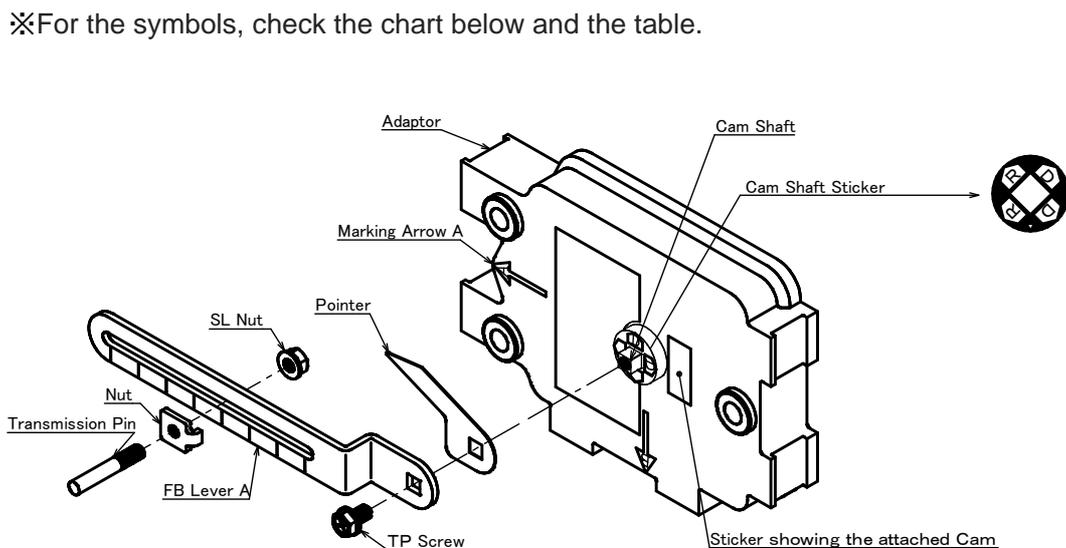
※When using in a place with strong vibrations, take anti-vibration measures such as fixing both ends of the mounting bracket.



(2) FB Lever A

FB Lever A is mounted on the positioner. How to install is as follows.

- ① Stroke measurement lines are etched into FB Lever A, so it fixes to match with the prescribed stroke, completing the lever. In the case of a lever without an engraved mark, fix Transmission Pin to a position where the lever rotation angle becomes 45 degrees. Change the orientation of Nut accordingly depending on the usage situation.
- ② From the symbols (Cam selector) displayed on the Cam Shaft Sticker, check the sign matching the actuator and valve operation, the direction of mounting of the positioner, and at that position the needle and ① in the angular boss of the Cam Shaft fix FB Lever A with the TP screw.



When positioner is mounted on left side

Symbol	Actuator Valve	Diagram of rear side	Symbol	Actuator Valve	Diagram of rear side
Black D	•DA •Push down close	Valve close position (Cam at 100%) Arrow A 22.5° Symbol	Black R	•RA •Push down close	Valve close position (Cam at 0%)
Red D	•RA •Push down open	Valve close position (Cam at 100%) 22.5°	Red R	•DA •Push down open	Valve close position (Cam at 0%)

About symbol of Cam Shaft Sticker

Positioner mounting direction	Actuator	Symbol
Left side	DA	D (Black text)
	RA	R (Black text)
Right side	DA	D (Red text)
	RA	R (Red text)

(3) Installing to actuator

Attach the positioner to the bracket while inserting Transmission Pin of FB lever A into the long hole of FB lever B on the valve stem side.

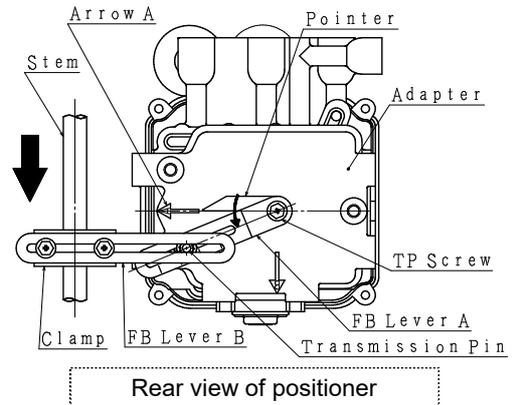
At this point check that FB Lever A and B are level and that Transmission Pin has the prescribed stroke.

4-2. Adjusting the installation position (for left-sided installation)

When lowering the linear characteristics to zero or raising them, follow the guideline below for positioning.

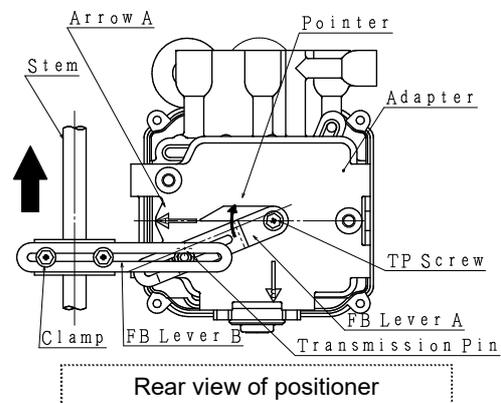
(1) Direct action actuator / Push down close valve

- ① Cam selection code is D (Black text).
- ② Set the drive to 0% valve open. (valve closed)
- ③ Carry out micro-adjustments so that the pointer is slightly lower (no more than 1 degree) from the centre of the output sign “→A” on the rear of the positioner. This position achieves 100% cam operation.



(2) Reverse action actuator/ Push down close valve

- ① Cam selection code is R (Black text).
- ② Set the drive to 0% valve open. (valve closed)
- ③ Carry out micro-adjustments so that the pointer is slightly lower (no more than 1 degree) from the centre of the output sign “→A” on the rear of the positioner. This position equates to 0% cam operation.



(3) Reverse action actuator/ Push down open valve

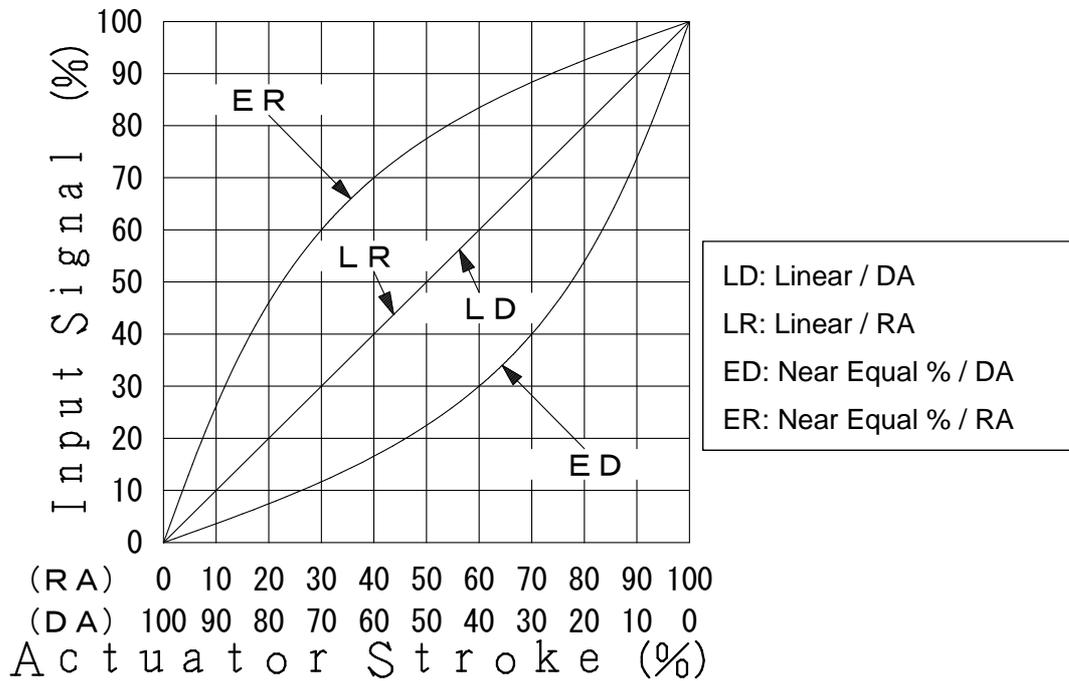
- ① The cam selection code is D (Red text).
- ② Alignment method follows same steps as (1) above.

(4) Direct action actuator/ Push down open valve

- ① The cam selection code is R (Red text).
- ② Alignment method follows same steps as (2) above.

5. Cam

The relationship between Input Signal and Actuator Stroke is as shown below.



Standard C4La cam is cut-off characteristic.

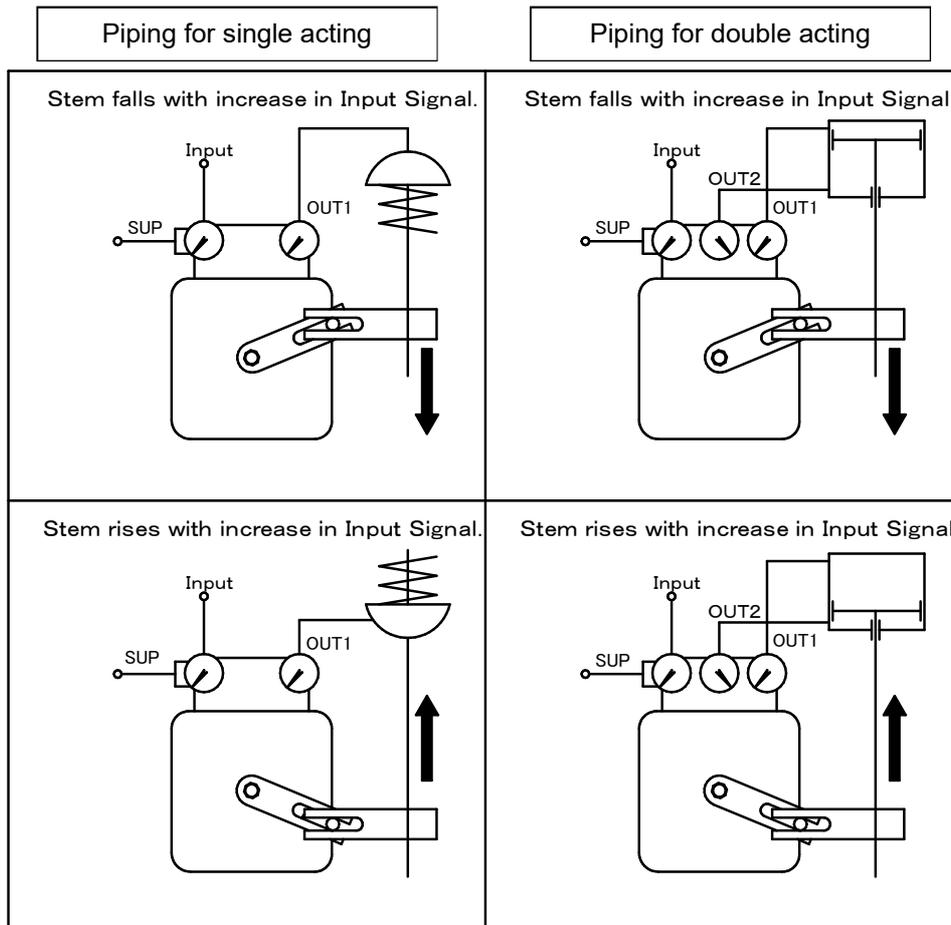
The cut-off characteristic is to tight shut the valve as follows.

- RA actuator: When Input Signal is 0%, set OUT1 output to zero.
- DA actuator: When Input Signal is 100%, set OUT1 output pressure to supply pressure.

6. Pneumatic piping

Check [Safety precautions](#) at the beginning of the bullet, pay attention to the following matter.

- The connection is selectable, either Rc1/4 or 1/4NPT as required. Use the appropriate connector.
- When double acting type is used as a single acting type, blind OUT2 connector nozzle (or OUT1 when used as reverse action pilot), remove the pressure gauge and blind that port also.



For single acting / reverse action pilot (the method of using OUT2 with reduced output from increase in input signal) see [8. Change of operation](#)

7. Adjustment

7-1. Zero point adjustment

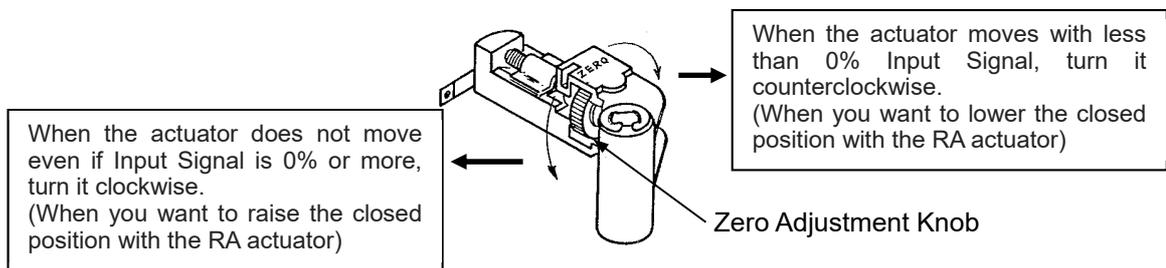
After mounting the positioner, adjust to zero and range with reference to the following.

It is recommended to repeatedly adjust zeros and spans at 25% and 75% of the input signal in the case of specifications other than linear characteristics (for example, near equal% etc.) or cut-off characteristics (such as C4La cam).

In the case of the standard specification C4La cam, check the pressure gauge by applying the input signal that closes the valve after zero and range adjustment, and confirm that it is tight shut.

(1) Zero adjustment

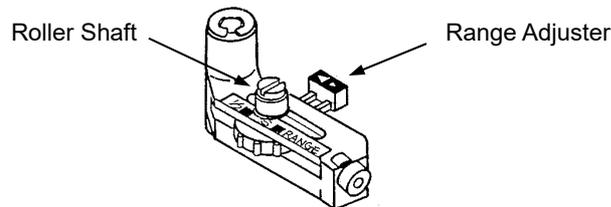
Adjust the input signal that the actuator starts moving.



It is recommended to apply and adjust the Input Signal 25%.

(2) Range adjustment

Adjust the position of the actuator section when Input Signal is 100%.



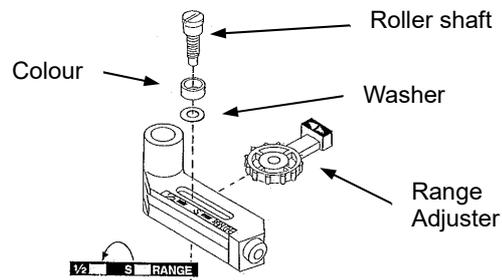
Use the controls on Range Adjuster  as marked. The large mark is to increase the range; the small mark is to decrease the range.

Range Adjuster can be free to move by loosening Roller shaft slightly using a screw driver. After adjustment, tighten and fix Roller Shaft. Be careful when Roller Shaft is loosened excessively during adjustment, Roller Shaft will tilt and will shift with the fixed after adjustment.

When Range adjustment cannot be achieved by full range movement of the Adjuster, check the position of Transmission Pin on FB lever A.

7-2. Changing to split range

When changing to split range, remove Roller Shaft as shown below, then adjust as described above after repositioning Range Adjuster gear to the 1/2 mark.

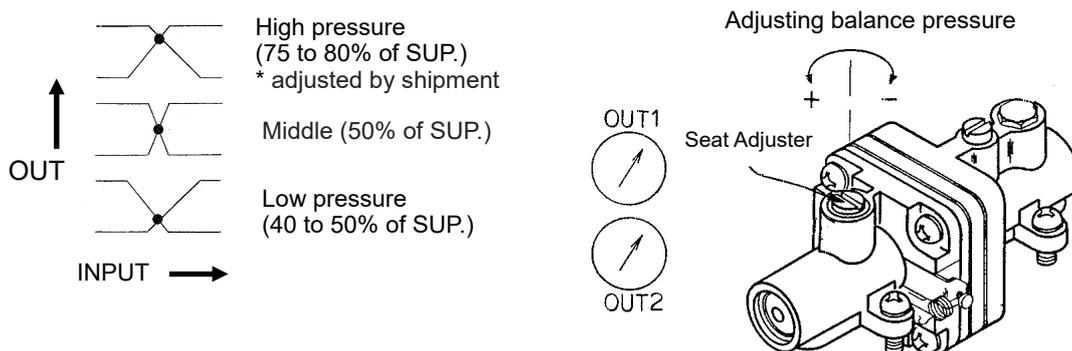


7-3. Seat adjuster

CAUTION; Seat Adjuster has been adjusted and shipped according to the specifications.

Be careful as incorrect adjustment will cause abnormal operation.

Seat Adjuster is a mechanism to adjust the balance pressure of the double acting output pressure. It is usually adjusted at about 75% of the supply pressure. Hunting and hysteresis may be improved by adjusting balance pressure. Do not turn Seat Adjuster more than 1/4 turn from the position which is adjusted by shipment.



When adjustment is necessary, refer to below.

- ① Change Input Signal so that the actuator balances at any intermediate position (other than fully closed, fully open position) and confirm the pressure of OUT1 and 2 at balance. In the case of a large actuator, it may take time until the pressure stabilizes. Also, be careful when there is air leak between the positioner and the actuator, the balance pressure will be low.
- ② Turn Seat Adjuster slightly (about 30 degrees) in the clockwise direction to lower the balance pressure, and counterclockwise to raise it. After turning, change Input Signal and confirm OUT1 and 2 at balance. When it is not the target value, fine-adjust.

When the effective area of OUT1 and 2 is different, spring is in one side, large load is applied to the valve, etc., a pressure difference will occur in OUT1, 2. In such a case, adjust based on the higher pressure.

7-4. AM Selector

AM Selector is a valve for changing between Auto and Manual. Shipped products are set to Auto.

(1) Auto

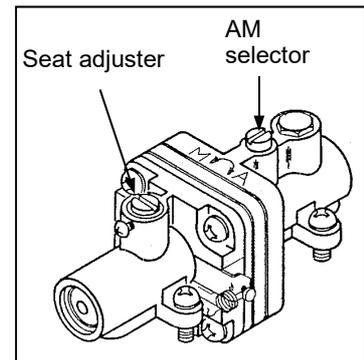
It is used to control according to Input Signal.

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

(2) Manual

It is used when you want output pressure to be output to OUT1 regardless of Input Signal.

To use in manual mode, turn AM Selector to M. (Counter clockwise, about one quarter to one and a half turns)



7-5. Linearity adjustment

Insufficient linearity can be caused by misalignment of cam position (pointers position) when positioning the closed valve.

When this occurs, carry out micro adjustments on the bracket and/or clamp while checking the positioning of the pointer.

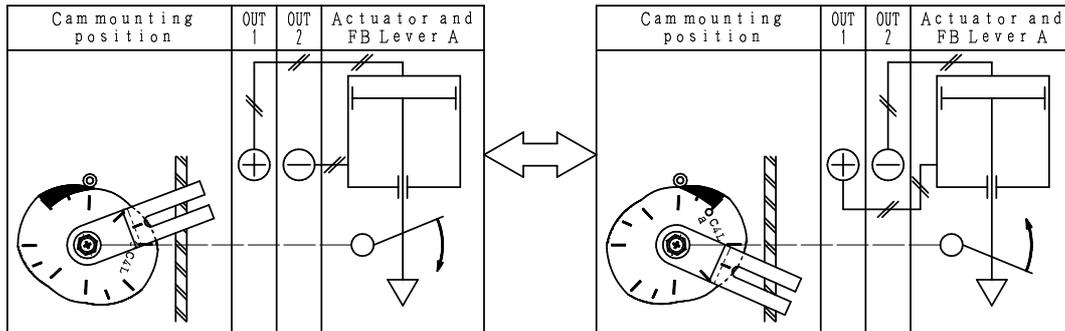
See clause [4-2. Adjusting the Installation position](#), for adjustment range.

8. Change of operation

To change DA and RA, follow the instructions below.

8-1. Double acting

- ① Flip the piping of OUT1 and OUT2.
- ② Remove the screw for fixing FB Lever A, and remove the lever from the Cam Shaft.
- ③ Flip FB Lever A in the direction as indicated on the Cam Shaft.
- ④ Adjust Zero and Range adjustments.

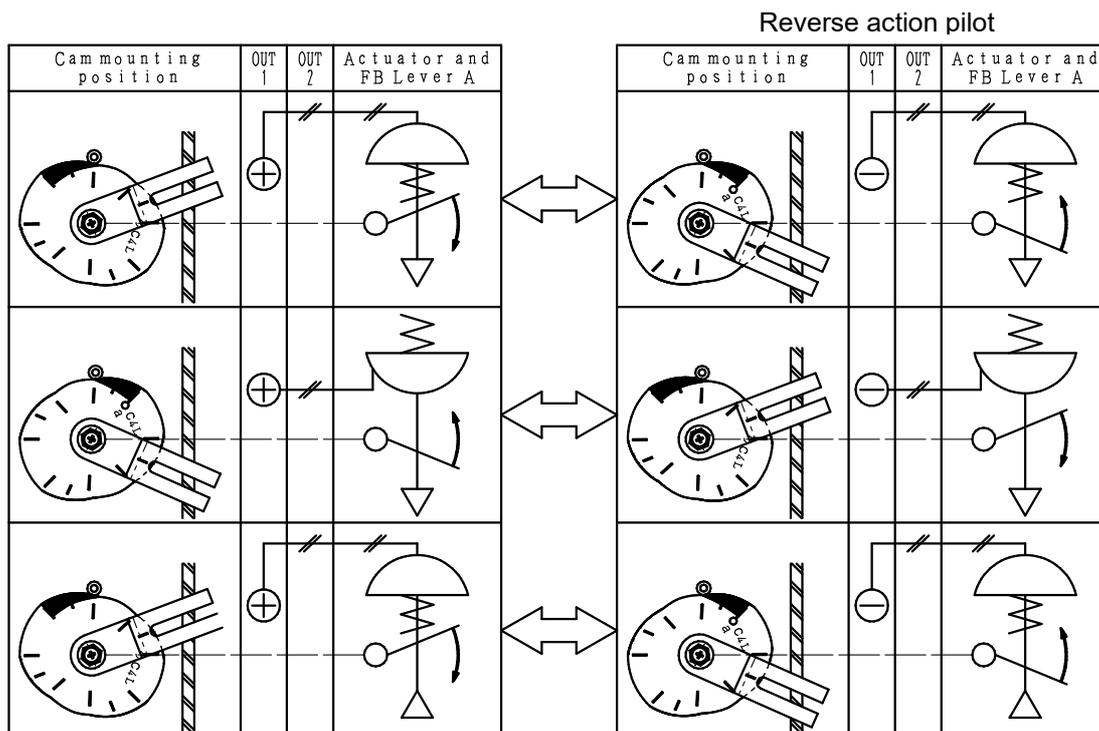


8-2. Single acting

- ① When using OUT1 as it is, replacement of piping is not necessary.

In order to make a reverse action pilot, attach piping and pressure gauge to OUT2 and close the air connection port on OUT1 side.

- ② Remove the screw for fixing FB Lever A, and remove the lever from Cam Shaft.
- ③ Flip FB Lever A in the direction as indicated on Cam Shaft.
- ④ Adjust Zero and Range adjustments.



9. Maintenance

9-1. Regular inspection

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

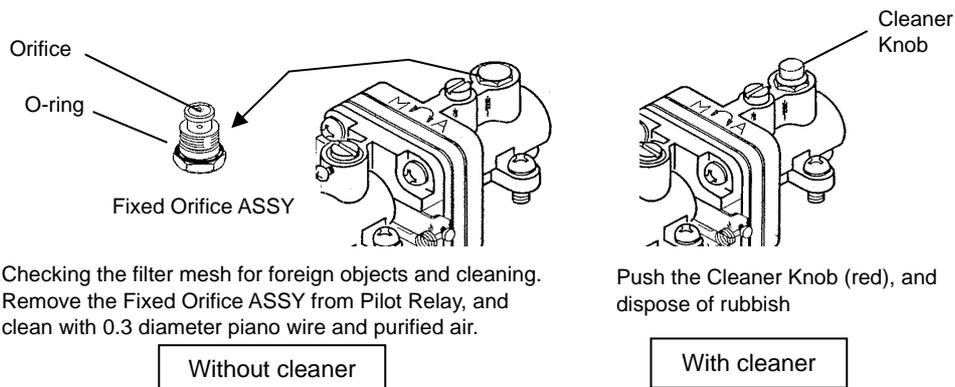
Regular Inspection Manual

○: Check (Replace defective parts) ◇: Checking and Cleaning

△: Checking and Greasing *1 ■: Replace

Unit	Check point	Check period (year)	Check contents
Base & Cover	·Sup. pressure filter	1	◇: Alien substance
	·Pressure gauge	1	○: Indication error
		5	■
	·Cover packing	3 5	○: Defects ■
Zero & Range Arm	·Rotating part	1	△: Wear or grease out
	·Ball bearing	3	○: Damage or grease out
	·Zero adjustment plate	5	○: Crack or damage
Cam & Lever	·Cam	5	○: Wear
	·Cam bearing	1	△: Wear or grease out
	·Spring	1	○: Damage
	·Transmission pin	1	△: Wear, alien substance or grease out
	·Cam shaft packing	5	■
Input Chamber	·Flexure spring	5	○: Loose screws
	·Nozzle, flapper	1	◇: Dirt, wear or tear
Pilot Relay	·Fixed orifice *2	1	○: Dirt or clogging
	·Filter mesh (For without cleaner)	1	○: Dirt or clogging
Others	·Packing (Rubber parts)	5	■

- Input chamber and Pilot Relay are disassembly prohibited. Reassembly can't guarantee performance.
- Change the pilot relay every 5years using the units provided.
- Determine the exchange period based on the conditions of use (frequency, opening and closing speed) and ambient range of temperature.
- *1: Grease up will be our internal work, please return.
- *2: Check that the supply air source is stopped and there is no residual pressure before cleaning Fixed Orifice.



9-2. Replacing or changing parts

9-2-1. Replacing Pilot Relay

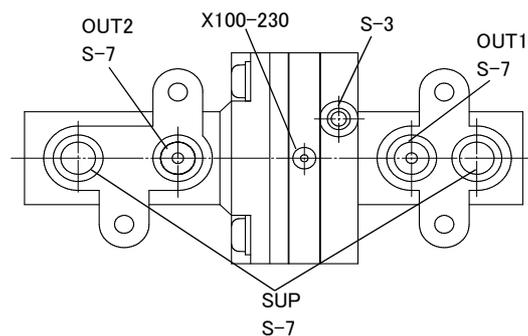
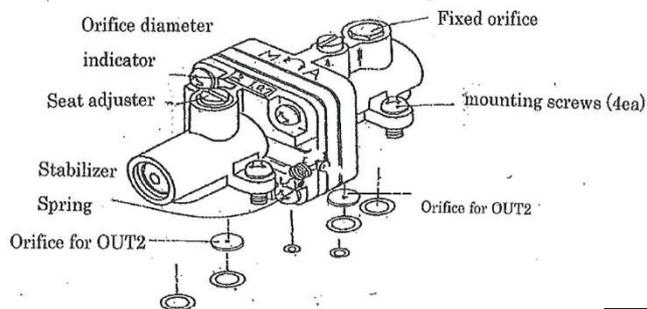
Before replacing parts, always cut-off the supply air pressure and check that no residual pressure remains.

(1) 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), and remove the Pilot Relay. 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.

(2) Installation/checking

- ① Before installing the new Pilot Relay, 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 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 breathe sound to indicate air release from the base of the Pilot Relay installation. A loud breathing sound could suggest major air release, in which case check that the O-rings are attached correctly.



9-2-2. Changing the Orifice

Select the orifice mounted on the output side of the Pilot Relay as a guideline.

For actuator with long stroke, such as cylinders, also refer to the table of rotary motion.

Orifice selection table for linear motion

Diaphragm diameter ϕD [mm]	Recommended orifice diameter [mm]
$\phi D < 150$	$\phi 0.45$
$150 \leq \phi D < 200$	$\phi 0.7$
$200 \leq \phi D$	$\phi 2.0$ or $\phi 1.0$
$400 \leq \phi D$	$\phi 2.0$ or $\phi 5.0$

Orifice selection table for rotary motion

Acting	Actuator capacity V [ℓ]	Recommended orifice diameter [mm]
Single	$V < 0.2$	$\phi 0.45$
	$0.2 \leq V < 0.4$	$\phi 0.7$
	$0.4 \leq V < 1$	$\phi 1.0$
	$1 \leq V$	$\phi 2.0$
	$3 \leq V$	$\phi 2.0$ or $\phi 5.0$
Double	$V < 0.2$	$\phi 0.45$
	$0.2 \leq V < 0.7$	$\phi 0.7$
	$0.7 \leq V < 2$	$\phi 1.0$
	$2 \leq V$	$\phi 2.0$
	$10 \leq V$	$\phi 2.0$ or $\phi 5.0$

* The actuator capacity of the double acting is the sum of the maximum capacity of both air chambers.

By exchanging the orifice, improvement of hunting and overshoot of the small capacity actuator, speed up of the large capacity actuator may be expected. When exchanging, follow below.

① After removing the Pilot Relay following the replacement guidelines in [9-2-1. Replacing Pilot Relay](#), remove the O-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 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

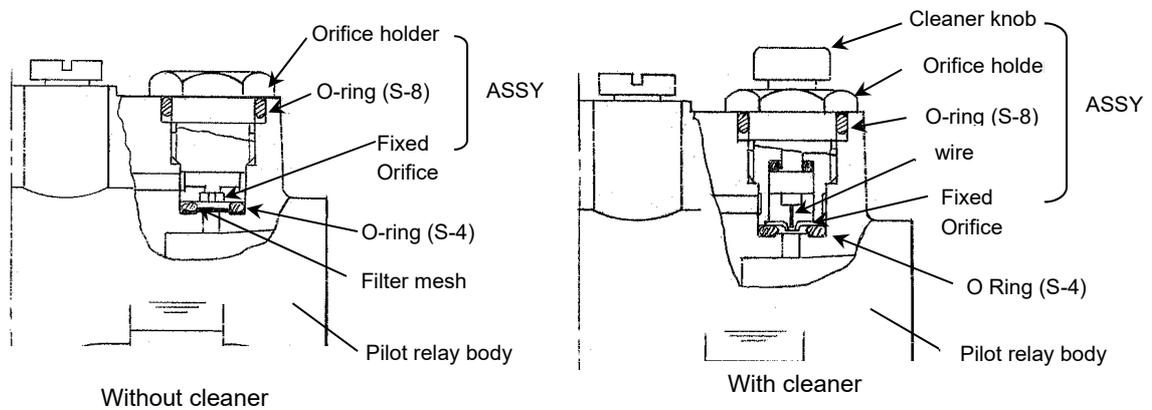
NOTE: Only when using an Orifice of $\phi 0.45$, it is necessary to incorporate another orifice.

• Orifice to be incorporated in OUT1 and 2 of Pilot Relay: $\phi 0.45$ and $\phi 2.0$

• Orifice to be incorporated in SUP. of Pilot Relay: Dedicated Orifice (thin $\phi 0.7$)

9-2-3. Replacing Fixed Orifice ASSY

Fixed Orifice ASSY comes in versions with cleaner attached and without cleaner. Internal construction differs. See diagram below. Shut off supply air and confirm that there is no residual pressure inside before proceeding.



When exchanging, use the new O ring. Make sure that the O ring is securely installed. Filter mesh is not used for Fixed Orifice ASSY with cleaner. When the installation hole of the Fixed Orifice ASSY is dirty, clean it by blowing clean air etc.

9-2-4. Changing to Cam

- ① After removing the positioner side FB Lever A, remove Adaptor mounted on the rear surface of the base.
- ② After converting for Cam ASSY (Cam and Cam Shaft) installed in the Adaptor, reassemble as per the original assembly.
Bearings may get off the side of the Cam. Assemble with sufficient care.
- ③ Adjust Zero and Range adjustments.

10. Troubleshooting

The following troubleshooting is based on the assumption that it was normal during installation.

(1) Not operated with Input Signal applied

Move the Flapper Holder with the Flapper lightly with hands to open and close the Nozzle and Flapper and check the output pressure.

Check result	Cause	Action
Output pressure changes.	Diaphragm damage of Input Chamber	Replace Input Chamber
	Loose or incorrectly mounted FB Lever	Tighten or re-mount.
When the Nozzle is closed, OUT1 remains elevated.	Clogging of Fixed Orifice	Clean the Fixed Orifice, push the Cleaner Knob or replace Input Chamber
	Incorrect replacement of AM selector	Tighten towards arrow A.
	Incorrect Flapper contact, broken Flapper	Replace Input Chamber
When Nozzle is opened, OUT1 does not rise.	Low or no supply pressure	Provide specified pressure.
	Jammed Nozzle	Replace Input Chamber
	Faulty Pilot Relay	Replace Pilot Relay

Adjust Zero and Range adjustments when re-mounting or tightening.

(2) Malfunction

When there is no margin in the size of the actuator with respect to the load, it may not move smoothly, such as new article, gland packing reinstalling of valve, exchange, etc. Try to confirm once again after letting the sliding part of the gland packing etc. become familiar, such as fully closing and repeating the full opening.

Issue	Cause	Action
Incorrect zero position	Loose FB Lever connection	Tighten and readjust
	Misalignment of transmission pin	
	Misalignment of Cam	
	Loose Range Adjuster	
Operation is not smooth	Fluctuation in supply pressure	Confirmation of regulator and supply pressure
	Loose set or lock screws	Tighten and readjust
	Wear of Cam Shaft	Replace, when the play is large
	Actuator defective	Make AM selector, check operation (Actuator replacement if there is a problem)
	Displacement of balance pressure	Adjust Seat Adjuster ※
Wrong linearity	Lack of supply air	Clean mesh filter, check regulator
	Positioner setting is wrongly positioned	Correct setting
	FB Lever setting is wrongly positioned	Correct setting
Response time is slow.	Wear of Cam	Replace cam and readjust
	Supply port screen is clogged	Clean
Extremely slow response	Air filter is clogged	Replace air filter
	AM Selector not completely closed	Tighten towards arrow A.
	Clogged Fixed Orifice	Clean or replace
	Incorrect contact between Nozzle and Flapper	Replace Input Chamber

(Continued on next page)

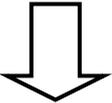
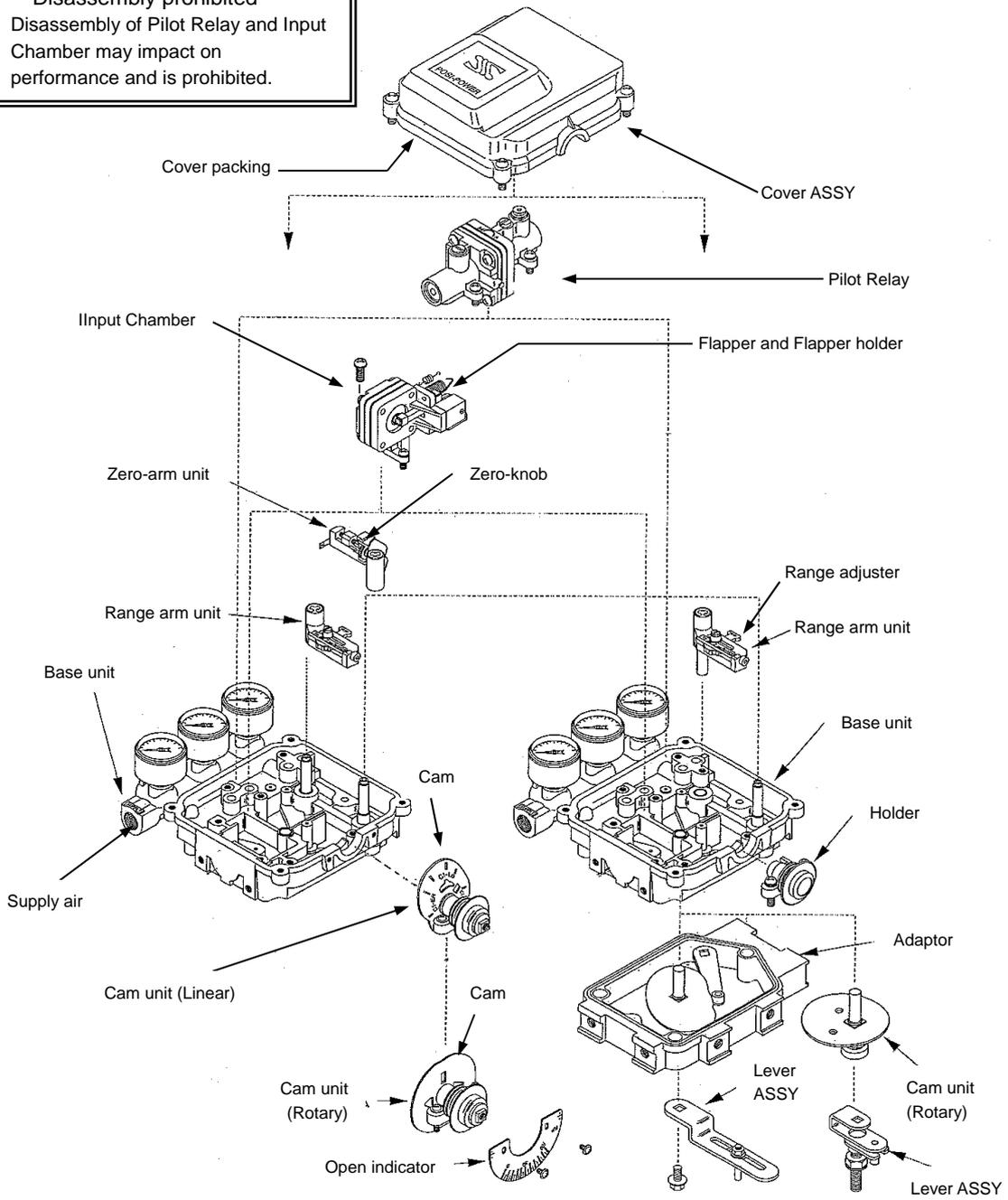
Issue	Cause	Action
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Short cycle hunting	Fixed Orifice becoming clogged	Clean or replace
Long cycle hunting	Grand packing worn out	Increase actuator size
	Pilot relay balance pressure too low	Adjust Seat Adjuster ※
Overshoot	Wear of sliding part	Replace
	Loose set or lock screws	Tighten and readjust
	Displacement of balance pressure	Adjust Seat Adjuster ※
Hysteresis	Wear of sliding part	Replace
	Loose set or lock screws	Tighten and readjust
	Displacement of balance pressure	Adjust Seat Adjuster ※
Sensitive	Damaged, dirty or mispositioned Nozzle or Flapper	Replace Input Chamber
	Displacement of balance pressure	Adjust Seat Adjuster ※

※ Refer to [7-3. Seat adjuster.](#)

11. Part names

— Disassembly prohibited —
 Disassembly of Pilot Relay and Input Chamber may impact on performance and is prohibited.



Linear motion
Side lever type

Rotary motion
Side lever type

Linear motion
Back lever type

Rotary motion
Back lever type

S1

S3

B4

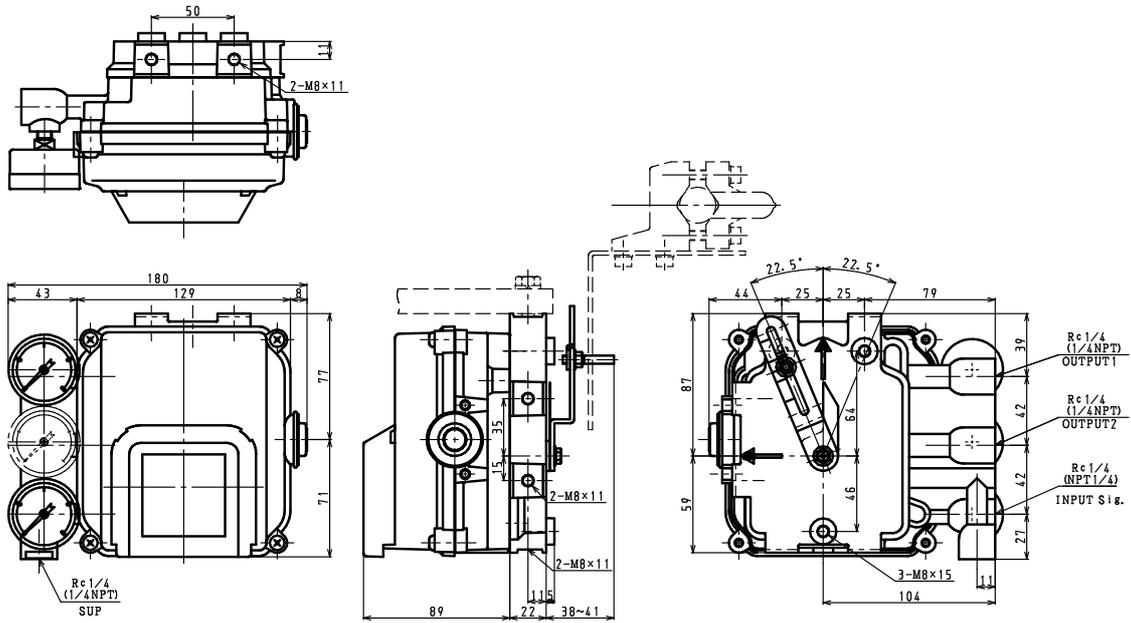
B7

12. Model notation

1	2	3	4	-	5a	5b	/	6	7	8	9

Specification	Definition	Code	
1	Basic code	P/P Positioner	XP
2	Series	100 series	1
3	Construction	Standard	0
4	Connection & acting	Rc1/4 & single acting	1
		Rc1/4 & double acting	2
		1/4NPT & single acting	3
		1/4NPT & double acting	4
5a	Ambient temp.	Standard temp. model: -20 to 83°C	S
		Low temp. model: -50 to 60°C	L
		High temp. model: 0 to 100°C	H
5b	Mount	Linear motion / side lever	S1
		Rotary motion / side lever (link lever)	S3
		Linear motion / back lever	B4
		Rotary motion / back lever	B7
6	Outlet pressure gage	0.2MPa, 0.4MPa, 1.0MPa	M2, M4, M0
		200kPa, 400kPa, 1000kPa	K2, K4, K0
		30psi, 60psi, 150psi	P2, P4, P0
		2bar, 4bar, 10bar	B2, B4, B0
7	Pilot Relay	Standard without cleaner (filter mesh protector)	F*
		Standard with cleaner	Q*
		Stable without cleaner (filter mesh protector)	G*
		Stable with cleaner	J*
		Quick speed without cleaner (filter mesh protector)	R1
		Quick speed with cleaner	T1
		* is orifice size code. 1 = ϕ 5.0, 2 = ϕ 2.0, 4 = ϕ 1.0, 5 = ϕ 0.7, 6 = ϕ 0.45	
8	Input signal	20 to 100kPa	B1
		20 to 60kPa	B2
		60 to 100kPa	B3
9	Cam	Linear and near equal% for linear motion / side lever (S1)	C1a
		Linear for rotary motion / side lever (linkage lever) (S3)	C3L
		Near equal% for rotary motion / side lever (linkage lever) (S3)	C3E
		Square law for rotary motion / side lever (linkage lever) (S3)	C3B
		Reverse equal% for rotary motion / side lever (linkage lever) (S3)	C3P
		Linear for linear motion / back lever (B4)	C4La
		Near equal% for linear motion / back lever (B4)	C4E
Linear for rotary motion / back lever (B7)	C7L		

13. Dimensions



Clamp and lever depend on actuator.

Annex A. Pilot Relay

(1) Type of Pilot Relay

There are 3 types of XP100 series Pilot Relay. It will explain about each feature.

① Standard

It is the standard type recommended by us.

By changing Orifice, it is possible to properly control various large and small actuators.

② Stable

To shorten the stabilization time, it is the type that changed parts of Pilot Relay.

Slow movements before stabilization are eliminated, but as a disadvantage, the consumption flow rate will rise.

As with the standard type, it is possible to change Orifice.

③ Quick speed

It is a type that changed parts of Pilot Relay and increased air capacity.

Although the operating speed increases when Input Signal changes significantly, air consumption increases. Moreover, hunting tends to occur easily in the small capacity actuator.

Orifice is only $\phi 5.0$.

(2) Other

Although it is possible to install Pilot Relay of Electropneumatic Positioner XE100 series, the used parts are different. When installing Pilot Relay of XE100 series, operation, adjustment, performance etc. cannot be guaranteed.

How to distinguish

Specification	XE100	XP100
Without Cleaner	No groove in Fixed Orifice Holder 	Groove in Fixed Orifice Holder 
With Cleaner	Fixed Orifice Holder is colorless (Aluminum color)	Fixed Orifice Holder is yellow