



Operation Manual

PRODUCT NAME

PNEUMATIC-PNEUMATIC POSITIONER

MODEL / Series / Product Number

IP5000 Type
IP5100 Type

SMC Corporation

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Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “**Caution**,” “**Warning**” or “**Danger**.” They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)^{*1)}, and other safety regulations.

*1) ISO 4414: Pneumatic fluid power - General rules and safety requirements for systems and their components
 ISO 4413: Hydraulic fluid power - General rules and safety requirements for systems and their components
 IEC 60204-1: Safety of machinery - Electrical equipment of machines - Part 1: General requirements
 ISO 10218-1: Robots and robotic devices - Safety requirements for industrial robots - Part 1: Robots
 etc.



Danger

Danger indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.



Warning

Warning indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.



Caution

Caution indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.



Warning

1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment.

The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. Our products cannot be used beyond their specifications. Our products are not developed, designed, and manufactured to be used under the following conditions or environments. Use under such conditions or environments is not covered.

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Use for nuclear power, railways, aviation, space equipment, ships, vehicles, military application, equipment affecting human life, body, and property, fuel equipment, entertainment equipment, emergency shut-off circuits, press clutches, brake circuits, safety equipment, etc., and use for applications that do not conform to standard specifications such as catalogs and operation manuals.
3. Use for interlock circuits, except for use with double interlock such as installing a mechanical protection function in case of failure. Please periodically inspect the product to confirm that the product is operating properly.



Safety Instructions

Caution

We develop, design, and manufacture our products to be used for automatic control equipment, and provide them for peaceful use in manufacturing industries.

Use in non-manufacturing industries is not covered.

Products we manufacture and sell cannot be used for the purpose of transactions or certification specified in the Measurement Act.

The new Measurement Act prohibits use of any unit other than SI units in Japan.

Limited warranty and Disclaimer/Compliance Requirements

The product used is subject to the following “Limited warranty and Disclaimer” and “Compliance Requirements”.

Read and accept them before using the product.

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.*2)

Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.

2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.

This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.

3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

***2) Vacuum pads are excluded from this 1 year warranty.**

A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.

Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty

Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.

2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

Introduction

Pneumatic-Pneumatic positioner series IP5000 is to be mounted to pneumatic operated actuator. Pneumatic pilot valve is operated by the signal pressure from adjustment device and accurately control the motion of actuator.

1. Specofocations

Table 1 Specifications

Item	Type	IP5000		IP5100	
		Lever type lever		Rotary type cam	
		Single action	Double action	Single action	Double action
Supply pressure		0.14~0.7MPa			
Input pressure		0.02~0.1MPa			
Standard stroke		10~85mm		60°~100°	
Sensitivity		Within 0.1%F.S.	Within 0.5%F.S.		
Linearity		Within ±1%F.S.	Within ±2%F.S.		
Hysteresis		Within 0.75%F.S.	Within 1%F.S.		
Repeatability		Within ±0.5%F.S.			
Output flow rate	Note1	80 L /min (ANR) or more (SUP.=0.14MPa)			
		200 L /min(ANR) or more (SUP.=0.4MPa)			
Air consumption	Note2	Within 5 L /min (ANR) (SUP.=0.14MPa)			
		Within 11 L /min (ANR) (SUP.=0.4MPa)			
Ambient and using fluid Temperature		-20°C~80°C (Standard)			
Thermal coefficient		Within 0.1%F.S./°C			
Air connection port		Rc1/4 (Standard)			
Material		Aluminum diecast, Stainless steel, Brass, Nitrile rubber			
Mass		Approx. 1.4kg		Approx. 1.2kg	
Size		118 × 102 × 86(Body)		118 × 92 × 77.5(Body)	

Note1 : Refer to Fig. 1 for details of the output flow rate.

Note2 : Refer to Fig. 2 for details of the air consumption.

* Standard air temperature(JIS B0120) : 20° , Absolute pressure : 101.3KPa,Relative humidity : 65%

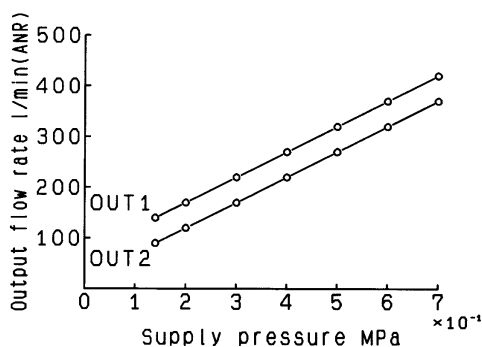


Fig.1 Output flow rate characteristic

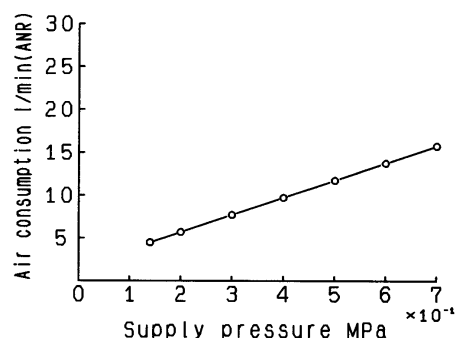


Fig.2 Air consumption characteristic

2.Operation Principle

2 - 1 Type IP5000

When the input pressure to SIG port of a positioner increase, bellows push balance-lever to the left. Since this movement moves flapper to the left via joint spring, there appear a gap between nozzle and flapper and nozzle back pressure of pilot valve drops. Consequently, the pressure balance of constant pressure chamber is destroyed and exhaust valve push supply valve B to the right, and then the supply valve B is opened. As a result of this function, the output pressure of OUT1 increase and then diaphragm moves downwards.

The motion of diaphragm make feedback arm wave to the right via feedback lever, transmission lever and roller. Because of this wave, the tension of feedback spring increase and work on balance lever. Since diaphragm keeps moving untill the tension of feedback spring and bellows become equal, it is constantly adjusted at the place where is proportioned to the input pressure.

When a signal air pressure decrease , the movement goes contrariwise.

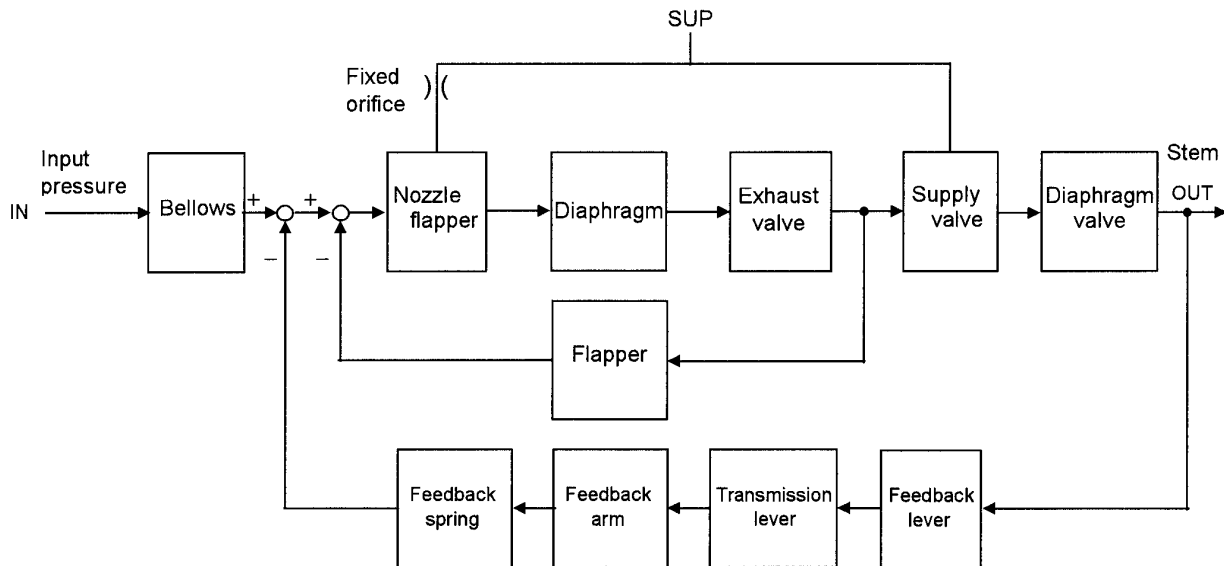


Fig. 3 Block diagram of Type IP5000

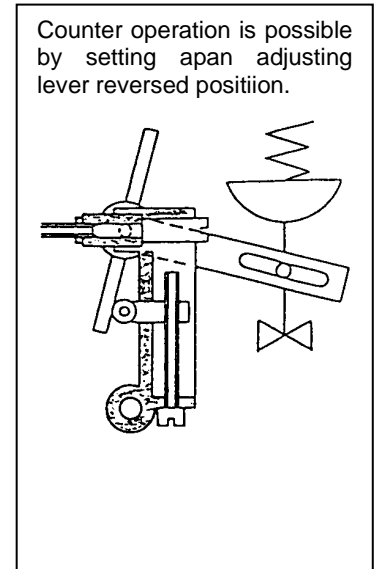
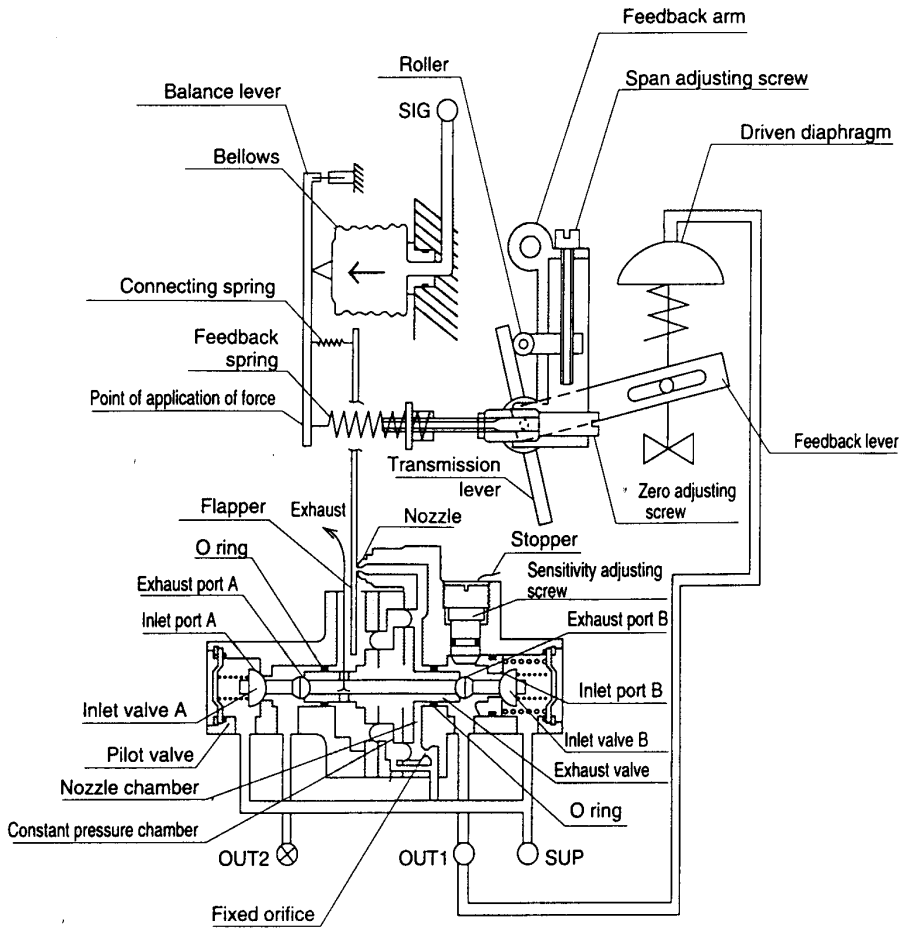


Fig.4 Drawing for IP5000 operation principle

2 - 2 Type IP5100

When the input pressure to SIG port of a positioner increases, bellows push balance-lever to the left. Since this movement makes flapper move to the left via joint spring, there appear a gap between nozzle and flapper and nozzle backpressure of pilot valve drops.

Consequently, the pressure balance of constant pressure chamber is destroyed and an exhaust valve push supply valve B to the right, and then the supply valve B is opened. As a result of this function, the output pressure of OUT1 increase while the output pressure of OUT2 decreases by the fact that rightward movement of exhaust valve opens exhaust port A. Therefore, there occurs a difference between the pressure of pressure chamber 1 and pressure chamber 2 of vibrating actuator. This movement makes the actuator go round to the direction of the arrow in the drawing.

The motion of the main axis of actuator makes feedback arm wave to the right via feedback shaft, cam and bearing. Because of this wave, the tension of feedback spring increase and work on a balance lever.

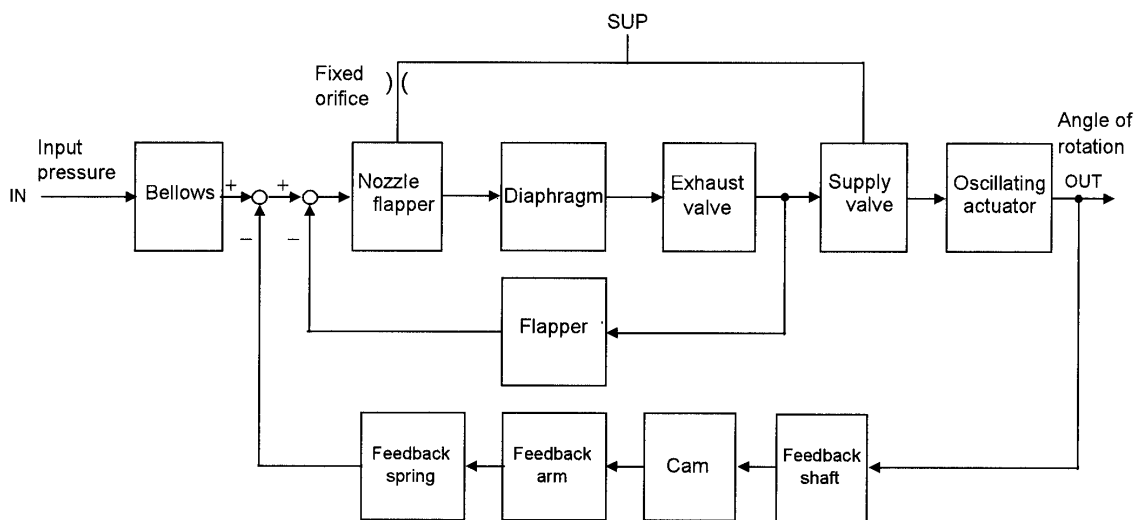
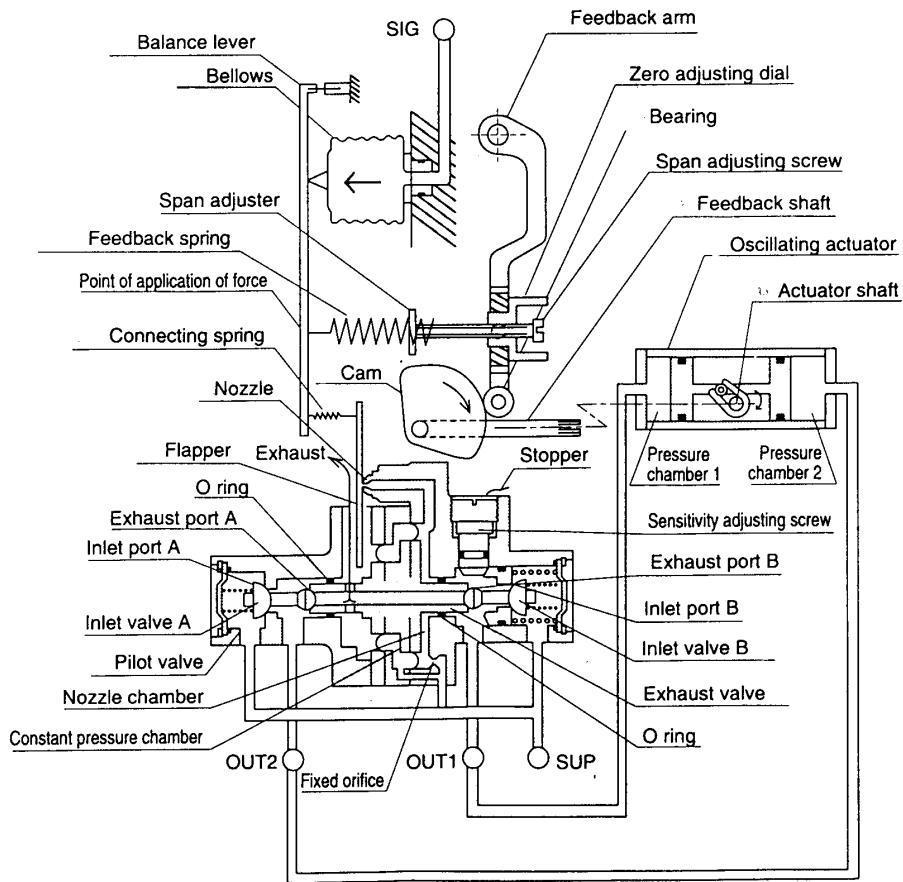


Fig.5 Block diagram of Type IP5100



Counter operation is available by setting the cam back to front and connect pipings of OUT1 and OUT2 contrariwise. (Use RA side for counter operation)

Fig.6 Drawing for IP5100 operation principle

3.Attaching

⚠ Warning

- (1) Make a space needed for maintenance on the setting area.
- (2) Care so that finger wouldn't be pinched during mounting and positioning cam.
Cut supply pressure and release compressed air in positioner and actuator in advance.

⚠ Caution

- (1) Confirm actuator and positioner are connected properly and tightly.

3 - 1 Type IP5000(Lever type lever feedback)

For positioner and diaphragm, brackets are to be manufactured according to the installation method. The unit should be attached using bolts firmly fixed through mounting holes on the side or back of the positioner.

For side installation, "P" mark attaching screw is interchangeable for IP300 and "E" mark mounting screw is interchangeable for IP600 and IP8000.

B

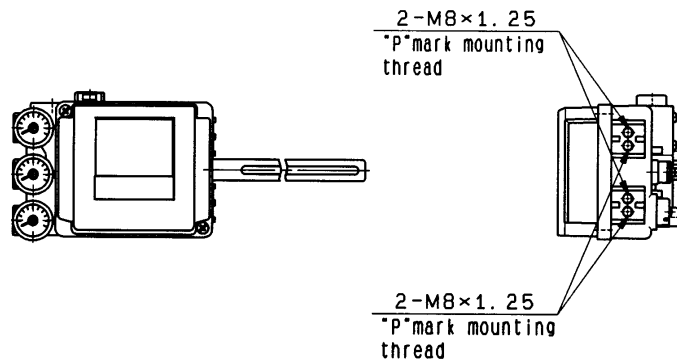


Fig.7 Mounting position of "P" mark and "E" mark

3-1-1 Example of installation to actuator

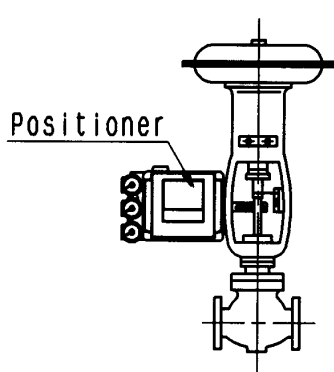


Fig.8 Direct mount to diaphragm valve
Attach directly by using screw hole.
At a side of the positioner and that of yoke side of diaphragm.

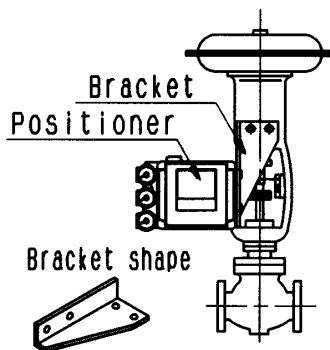


Fig.9 Lever type bracket
Attach by using screw hole at the side of positioner and that of front mount of diaphragm.

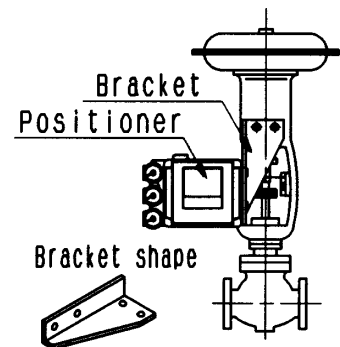


Fig.10 Front bracket
Attach by using screw hole of the back of positioner and that of front attach.

3-1-2 Connection with external feed back lever

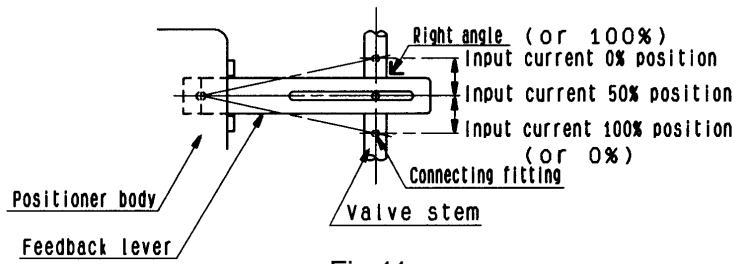


Fig.11

(1) Install the valve stem and feedback lever so that they cross at right angle when input signal is 50%.

(2) Fullscale should be at least 10% and at most 30%

3 - 2 Type IP5100

For positioner and rotary actuator, brackets should be manufactured according to the installation method. The unit should be attached using bolts firmly fixed through mounting holes on the side or back of the positioner.

For side installation, "E" mark mounting screw is interchangeable for IP610 and IP8100. Fork lever assembly M type is usable since it is interchangeable for serration fitting.

B

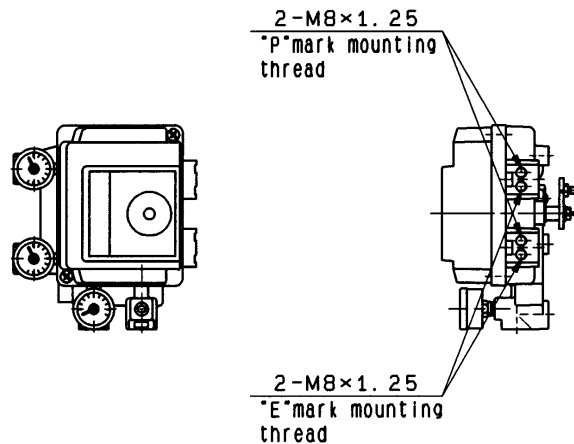


Fig.12 Mounting position of "P" mark & "E" mark

3-2-1 Installing actuator

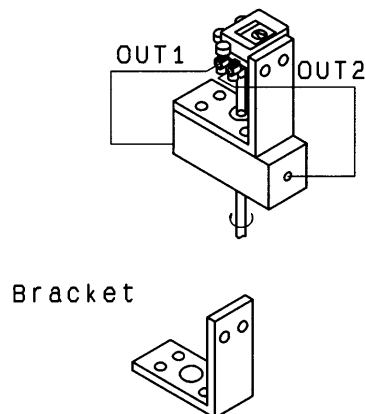


Fig.13 Mounting by positioner side screw

Install using screw hole of a side of positioner and the screw hole at actuator.

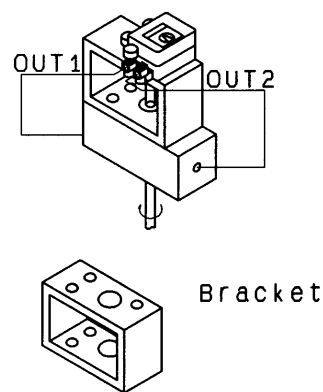
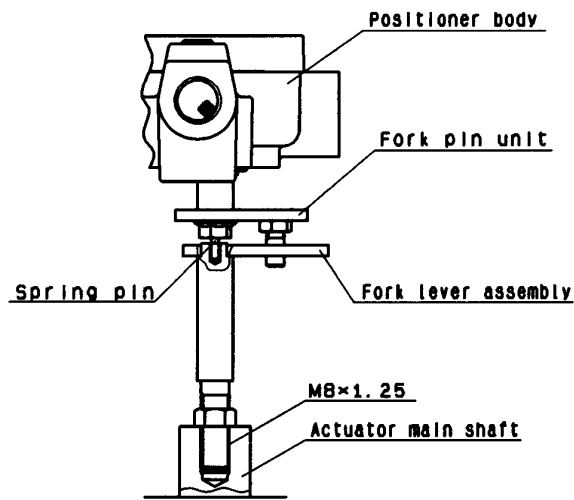


Fig.14 Mounting by positioner back screw

Install using screw hole at the positioner back and the screw hole at actuator top.

3 - 2 - 2 Feedback shaft connecting



- (1) Install positioner feedback shaft and rotary actuator main axis so that they are concentric. (so that spring pin of feedback shaft end can enter the end of fork lever assembly axis.)
- (2) Product for IP310 serration type is able to be supplied as a special order.

Fig.15 Example of attaching using fork lever type joint

3 - 2 - 3 Cam attaching procedure

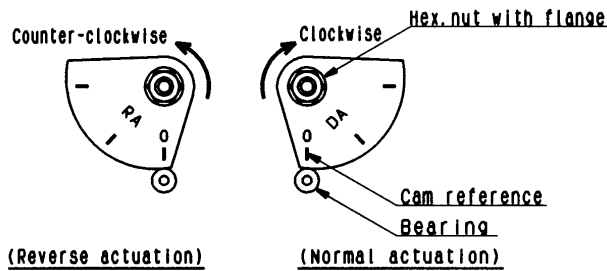


Fig.16 Mounting of cam

- (1) See actuator from the side of positioner front cover when input pressure increases. When the actuator main axis rounds clockwise, use DA surface of cam. When it rounds counterclockwise, use RA surface. Mount the cam properly to feedback shaft centering location.

(2) After loosening hexagonal nut with flange, set the actuator in starting condition. Afterwards, mount the cam making sure that the connecting point of cam and the bearing of feedback arm unit meet the zero-point of cam properly.

(3) Since mounting of cam is dangerous, this must be performed without supplying pressure.

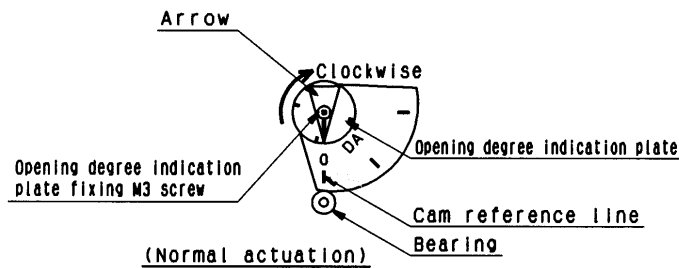
(4) Cam is tightened to the shaft temporarily when it is shipped from SMC. When it is operated, rock it firmly with lock nut.

(Tightening torque 3.6 to 4.1Nm)

B

3 - 2 - 4 Mounting procedure of opening degree indication plate

(1) Lock the cam and then adjust the zero-point and span (refer to Chapter 5). Then, fix the opening degree indication plate to the shaft using the M3 screw. At that moment, the end of the arrow of opening degree indication plate is to be pointing the center of the bearing as the figure 17. Please refer (I) and (II) in table 2. (for starting at the 0 position in the opening degree indication window)



(2) Mounting conditions of panel are shown in (III) and (IV) in table 2, when the panel is displayed in contrary way to (1). (for starting at the go degree position in the opening degree indication window) This panel should be used as a measure of valve lift.

Fig.17 Installing example of opening degree indication plate

Table 2 Attaching of opening degree indication plate

Indication method	0° → 90°		90° → 0°	
	Normal	Reverse	Normal	Reverse
Actuation form	A	A	B	C
Mounting cam and opening degree indication plate				
Opening degree indication window				
State	(I)	(II)	(III)	(IV)

4. Piping and Attaching of Internal Feed Back Unit

⚠ Caution

Prior to piping, flush enough and remove chip, cutting oil and dust in tube so that obstruction wouldn't intrude into positioner.

Table3 Piping (1)

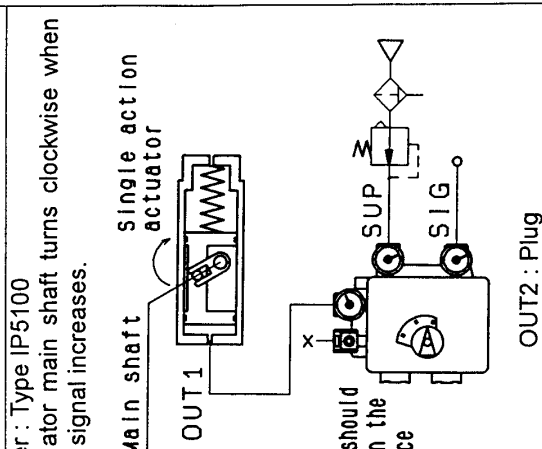
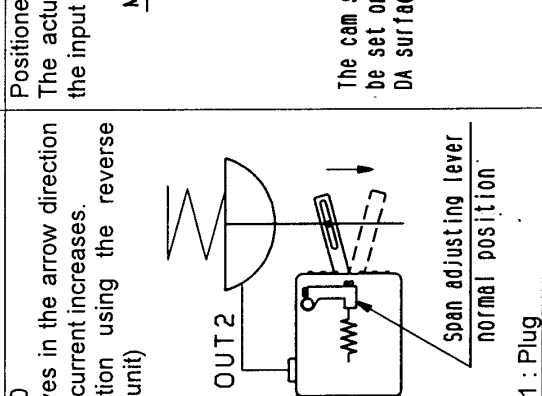
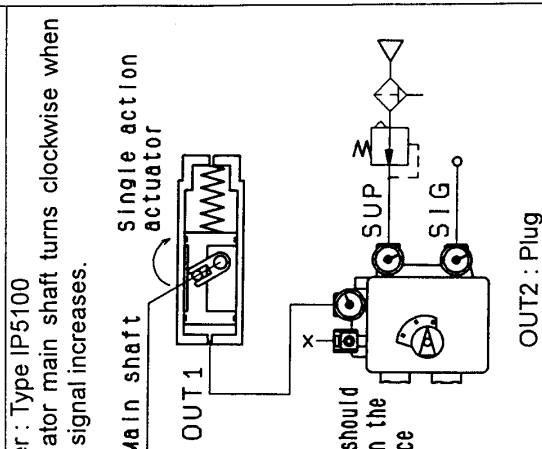
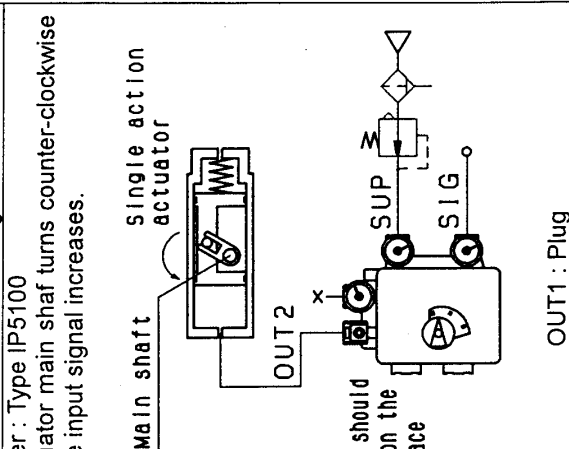
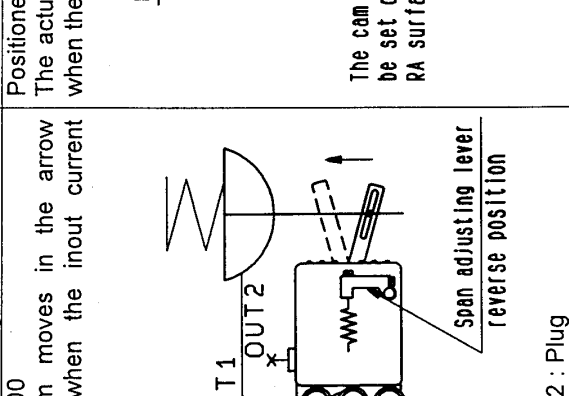
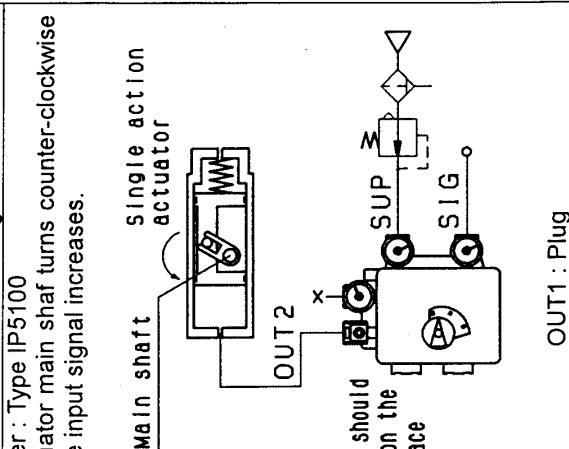
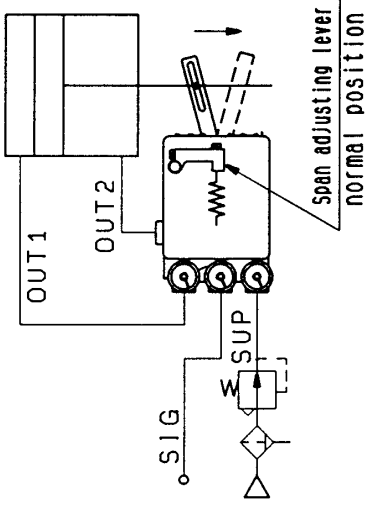
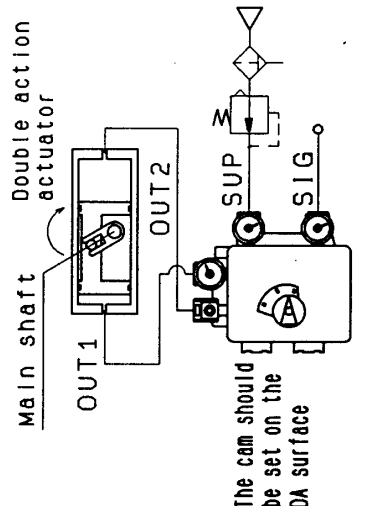
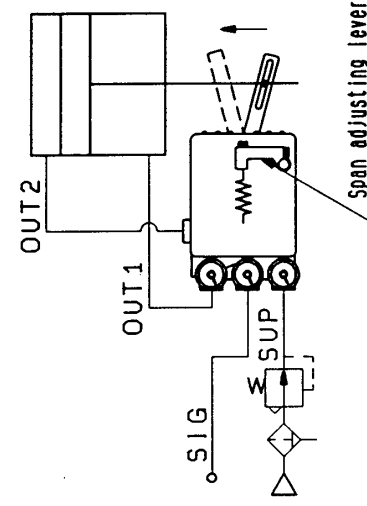
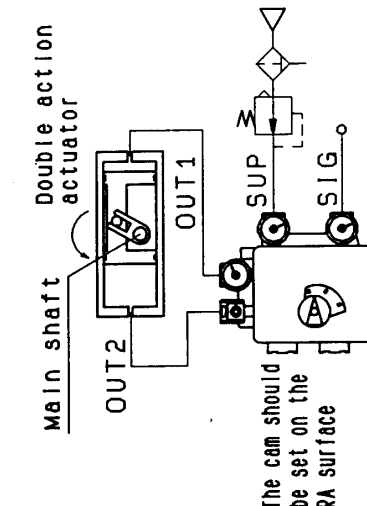
	<p>IP5000(Lever type)</p>	<p>IP5100(Rotary type)</p>
<p>Positioner : Type IP5000 Action : The stem moves in the arrow direction when the input current increases. (Normal actuation using the reverse actuation drive unit)</p> 	<p>Positioner : Type IP5000 Action : The stem moves in the arrow direction when the input current increases. (Normal actuation using the reverse actuation drive unit)</p> 	<p>Positioner : Type IP5100 The actuator main shaft turns clockwise when the input signal increases.</p> 
<p>Positioner : Type IP5000 Action : The stem moves in the arrow direction when the input current increases. (Reverse actuation using the normal actuation drive unit)</p> 	<p>Positioner : Type IP5000 Action : The stem moves in the arrow direction when the input current increases. (Reverse actuation using the normal actuation drive unit)</p> 	<p>Positioner : Type IP5100 The actuator main shaft turns counter-clockwise when the input signal increases.</p> 
<p>Single action</p>	<p>OUT2 : Plug</p>	<p>OUT2 : Plug</p>

Table4 Piping (2)

Single action	
<p>IP5000(Lever type)</p> <p>Positioner : Type IP5000 Actuation : The cylinder rod moves in the arrow direction when the input current increases.</p>  <p>Normal actuation</p>	<p>IP5100(Rotary type)</p> <p>Positioner : Type IP5100 The actuator main shaft turns clockwise when the input signal increases.</p>  <p>The cam should be set on the DA surface</p>
<p>IP5000(Lever type)</p> <p>Positioner : Type IP5000 Actuation : The cylinder rod moves in the arrow direction when the input current increases.</p>  <p>Reverse actuation</p>	<p>IP5100(Rotary type)</p> <p>Positioner : Type IP5100 The actuator main shaft turns counter-clockwise when the input signal increases.</p>  <p>The cam should be set on the RA surface</p>

Cautionary remarks on piping

- (1) Use deminified and dust-removed clear air as the supplying air source.
- (2) Before laying the pipes, flush the pipe inside sufficiently so as to eliminate foreign matter in the piping completely.

5. Adjustment

⚠ Caution

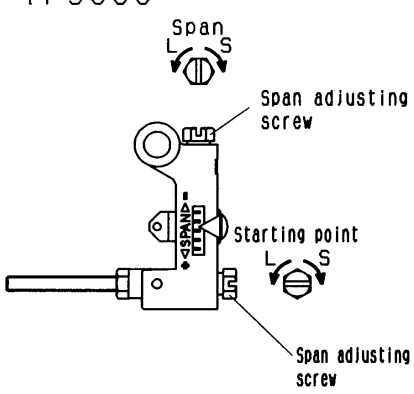
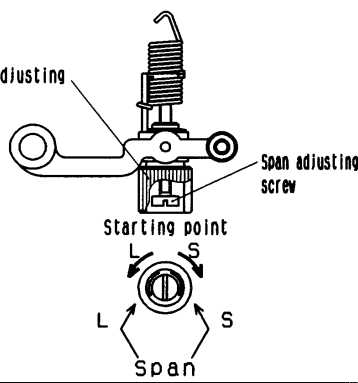
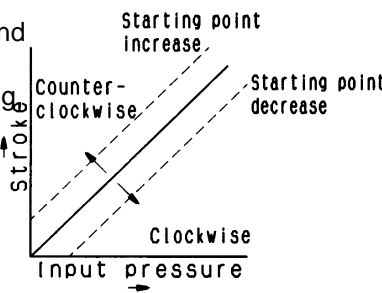
- (1) For this positioner, span and zero point adjustment of each actuator is necessary. Adjustment shall be done based on each actuator size.
- (2) Keep in mind that span and zero point adjustment interfere in each other.
- (3) Lock the zero-span lock nut after adjustment.
- (4) Characteristics changes due to change of mounting position, ambient temperature and supply pressure.
- (5) This positioner is force balanced type. Characteristic depends on the mounting direction. If the direction of initial adjustment and the final adjustment differ, please re-adjust it.
- (6) If it takes long time until operation after initial adjustment, check and adjust this product.

Check the following prior to start the adjustment.

- (1) Check that the pipeline is correctly connected with the pressure supply port and OUT1 and OUT2 ports.
- (2) Check that the actuator and positioner are sturdily connected.
- (3) Check that the feed back arm of internal feed back (Type IP5000) is attached to the correct (normal or reverse) position. (Refer to Tables 3 and 4.)
- (4) Check for correct use of the cam face (normal or reverse) in Type IP5100 and that the flange nut is firmly locked. (Refer to Table 2.)

5-1 Zero-point adjustment and span adjustment

Table 6 Adjustment procedure

	IP5000	IP5100
		
Adjusting procedure	<ol style="list-style-type: none"> (1) Set input pressure 0%, then set the actuator starting point by turning zero-adjustment screw. (2) Secondly, vary the input pressure and see the stroke of actuator. When span is not enough or too long adjust it according to the drawing. (3) Set input pressure 0%, and again adjust at zero-point like (1). (4) Repeat (1)~(3) until the stroke of actuator become proper stroke for input pressure. 	
		

5-2 Sensitivity adjustment

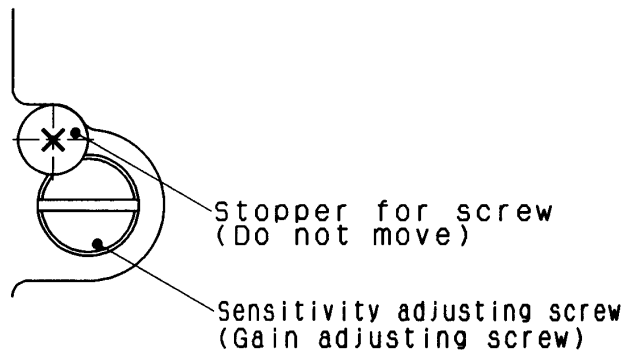


Fig.18 Pilot valve

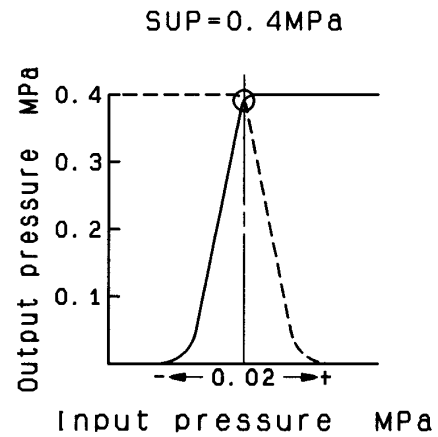


Fig.19 Input/output pressure characteristic

Fig.19 shows the input current –output pressure characteristics of OUT1 and OUT2 of the pilot valve. When the positioner is shipped out of our plant, the output pressure is set to the optimum state as shown in Fig.19 and this needs no adjustment ordinarily.

⚠ Caution

The sensitivity adjustment of pilot valve is effective to the actuator of double action type only. If the sensitivity is poor because of the actuator type of load condition, turn the sensitivity adjust screw clockwise. If hunting occurs, turn the sensitivity adjust screw counter-clockwise. (The amount of turning varies by actuators. Turn it by 1/16 to one turn. Do not loosen the stopper screw at this time since it is set to avoid the screw coming off.)

* If hunting occurs with an actuator of small capacity, refer to the description in 9-1 (for both single action and double action.)

6.Maintenance and Check

⚠ Warning

- (1) **After installation, repair or disassembly, connect compressed air and conduct tests to confirm appropriate function and leakage.**

Do not use the positioner when noise from the bleeder sounds louder compared with the initial state, or when it does not operate normally. If these occur, check immediately if assembled and mounted correctly.

⚠ Caution

- (1) Check if supply air is clean or not. Inspect compressed air cleaning system periodically and keep condition to be able to always get clean air so that dust, oil and humidity which cause malfunction and failure wouldn't include into the equipment.
- (2) If handled improperly, compressed air can be dangerous. Maintenance and replacement of unit parts should be performed only by trained and experienced personnel for instrumentation equipment as well as following the product specifications.
- (3) Perform an annual inspection of the positioner.
Zero point and span may have deviated. During regular maintenance, check for the following and replace any components as necessary.
When an excessively worn diaphragm, O-ring or other packing is found, or any unit has been damaged, replace with new ones. Treatment at an early stage is especially important if the positioner is used in a place of severe environments.
- (4) Before removing the positioner for maintenance or replacing unit parts after installation, make sure the supply pressure is shut off and all residual air pressure is released from piping.
- (5) When the fixed orifice is clogged with carbon particles or others, remove the pilot valve Auto/Manual changeover screw (built-in restrictor) and clean it by inserting a $\varnothing 0.2$ wire into the aperture.
- (6) It is recommended to replace the pilot valve unit every 3 years.
- (7) Check air leak from piping which compressed air flows. Air leak from air piping could deteriorate characteristics.
Air is normally discharged from a bleed port, but this is a necessary air consumption based on the construction of the positioner, and is not an abnormality if the air consumption is within the specified range.
- (8) When checking, remove the transmission lever and apply grease.
If the sliding parts are worn out or damaged, replace the parts.

Puroduct No. : 21050-219
Puroduct Name. : Grease pack

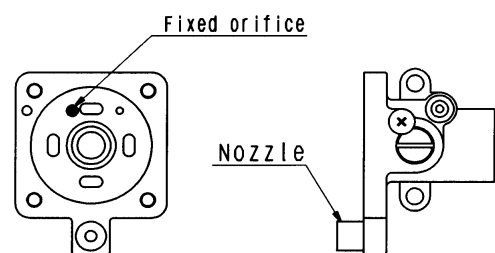


Fig.20 Fixed orifice position

7. Caution on Handling

■ Operation

Warning

- (1) Do not use this positioner out of the range of its specifications as this can cause failure. (Refer to 1. Specifications.)
- (2) If the system is supposed to be in danger because of failure of the positioner, prepare the system with a safety circuit to avoid danger.

Caution

- (1) Do not touch the actuator and operating part of the valve when they are pressurized. as this can be dangerous.
- (2) Take care not to get your fingers caught during mounting or positioning the cam. Stop supplying pressure beforehand to release compressed air in the positioner and actuator.
- (3) Be sure to operate the positioner with the body cover unit mounted.
- (4) Flush the inside of the piping while connecting it so that foreign matter such as cutting debris does not enter into the piping.
- (5) The opening degree of the actuator may be unstable if a booster relay is used.
- (6) When a pressure gauge is used with the positioner, use it as a reference only.
- (7) When frozen air is supplied to the internal mechanical parts of the positioner, the behaviour of the pressure gauge indicator will become unstable.
- (8) The positioner is a product that performs stationary control.
Do not use it with high frequency ON-OFF.

■ For operators

Caution

- (1) Read and understand the operation manual carefully before assembling, operating or providing maintenance to the product.

■ Handling

Warning


- (1) Avoid giving impact to the positioner force to leads to failure. Handle with care during transport and operation.
- (2) If the positioner is left unused at the operation site for an extended period, ensure the body cover unit is fitted, and mount a plug on the piping ports.
If the atmosphere is of high temperature or high humidity, take measures to avoid condensation. The condensation control measures must be taken thoroughly for exportshipment.
- (3) Since zero-point varies depend on mounting position , zero-point should be adjusted after installing.

■Air supply

 Warning

- (1) Use dehumidified and dust-removed clean air as the supplying air source.
- (2) Positioner has fine paths in it. Therefore, please use clean air which is dehydrated and filtered, and also avoid employing Lubricator which causes malfunction. In addition, it is recommended to use a mist separator as an air-cleaning equipment.
- (3) Avoid using compressed air compressed air containing chemicals, synthetic fluid including organic solvent, salinity, and corrosive gas as it may cause malfunction.
- (4) If atmosphere is below freezing point, take measure to avoid condensation.

■Environment

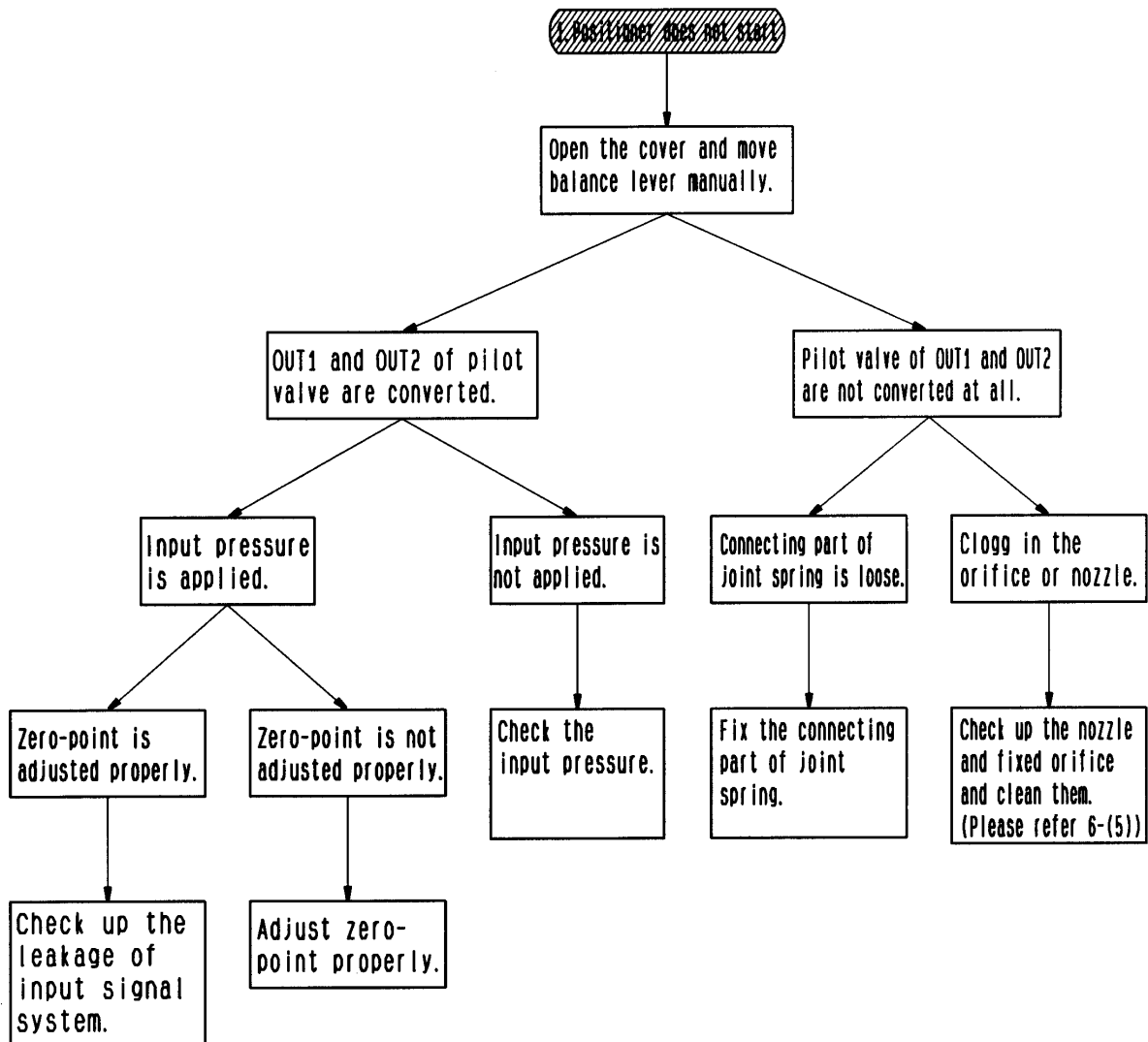
 Warning

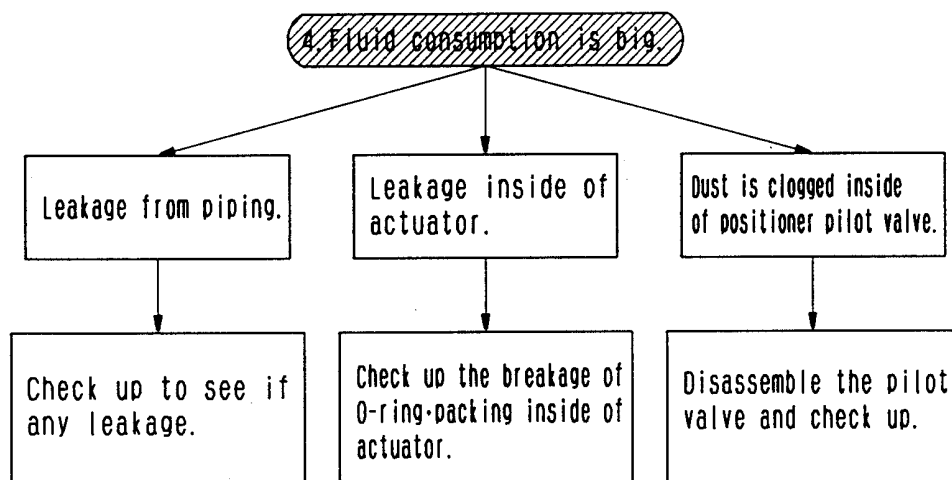
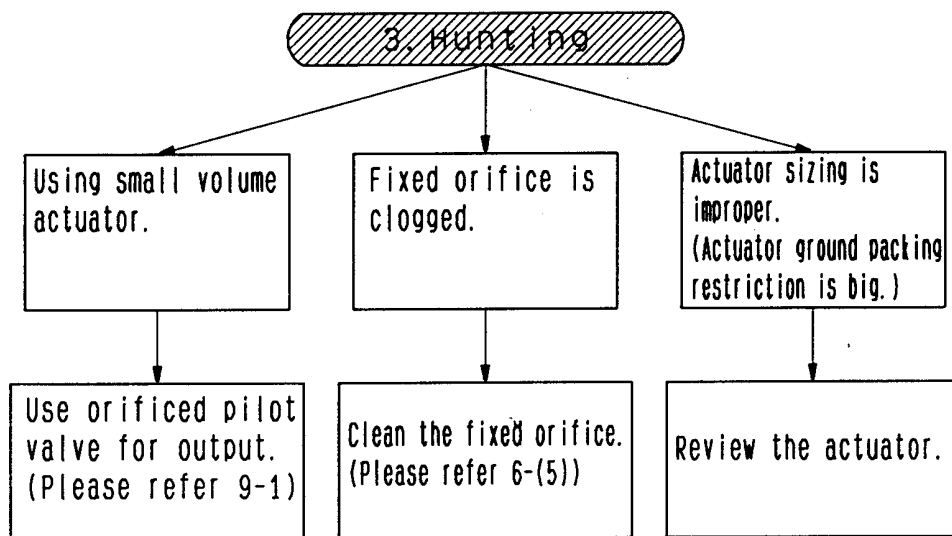
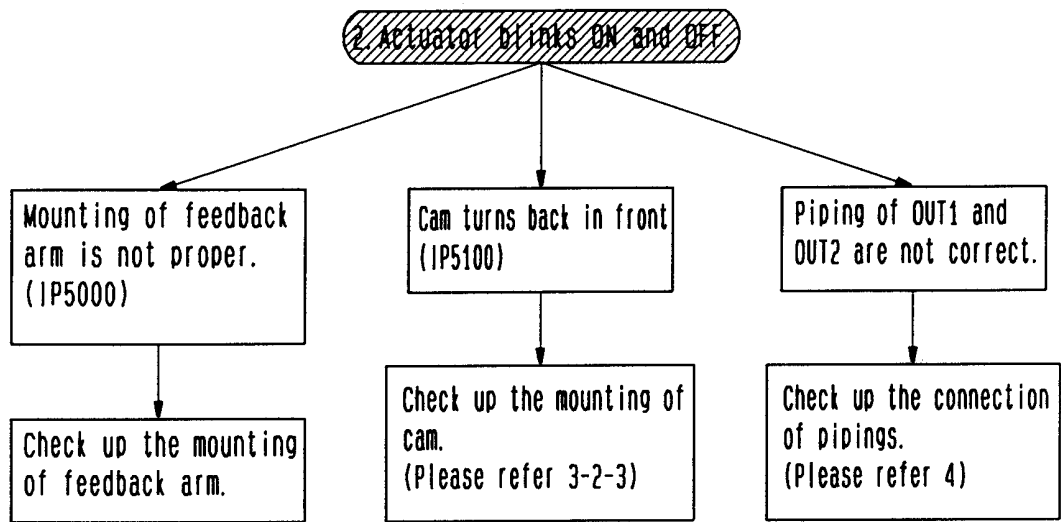
- (1) Do not use in an environment where the product is exposed to corrosive gas, chemicals, salt water, water or steam.
- (2) Do not operate the product in a location where it is subject to strong vibration and/or shock.
- (3) If the positioner is used under temperature outside of the specification, the sealing materials deteriorate quicker and also the positioner may not operate normally.

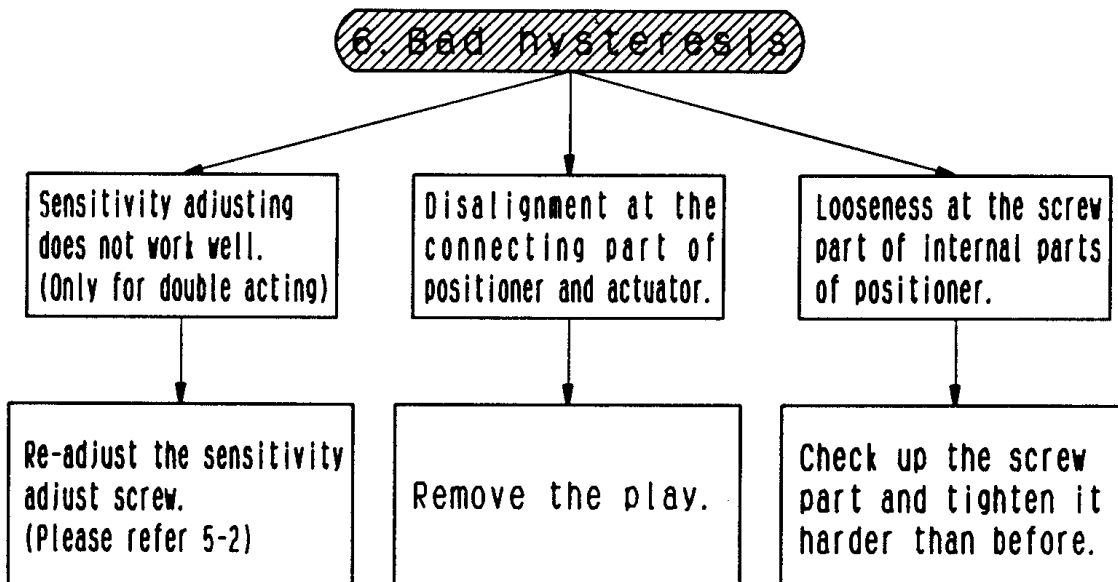
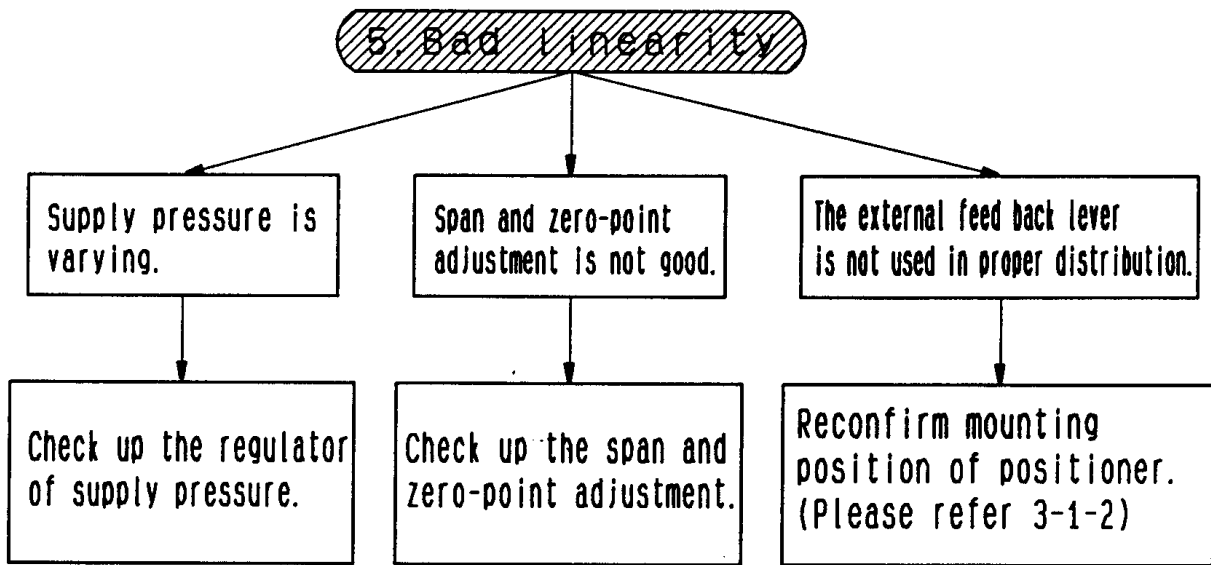
8.Troubleshooting

⚠ Warning

In case of not improving , stop use.







9. Accessory

9-1 Pilot valve with output throttle

Hunting may occur when the positioner is installed to a small capacity actuator. In such case, use a pilot valve having a throttle for OUT1 and OUT2.

The throttle is removable.

(Refer to Figs.21 and 22 for mounting and dismounting the throttle.)

Table 7 Throttle types

Throttling diameter	Part No.	Pilot valve unit No. having the throttle shown at left	
$\phi 0.7$	P36801080	P378010-51(IP5000)	P378020-61(IP5100)
$\phi 1$	P36801081	P378010-52(IP5000)	P378020-62(IP5100)

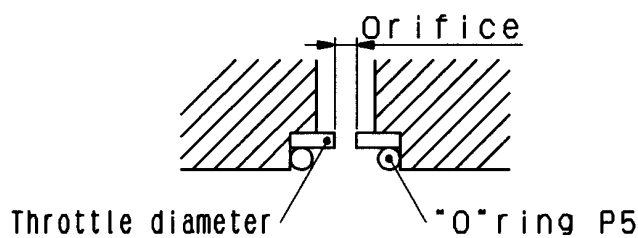


Fig. 21 Throttle mounting

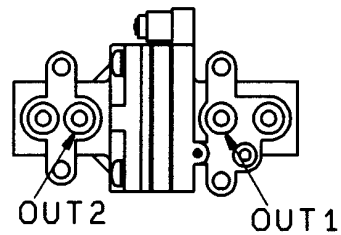


Fig. 22 Pilot valve bottom drawing

(Note 1) When mounting the throttle, pay attention not to let dust and others enter the port hole. Be sure to mount an O-ring after mounting the throttle.

9-2 Fork lever type joint (Type IP5100)

For the main axis joint of actuator and positioner, fork lever type joint, which has flexibility for disalignment of center, is standardized.

The case of positioner side attaching, fork lever assembly M type is interchangeable for former serration joint.

Table 8 Type of fork lever type joint

Part name	Part No.
Fork lever assembly M	P368010-24
Fork lever assembly S	P368010-25

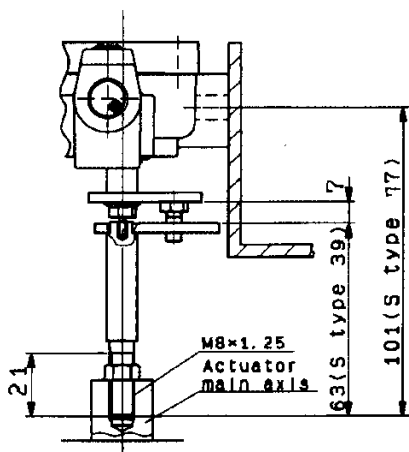


Fig.23 Example of side attaching using fork lever assembly M.

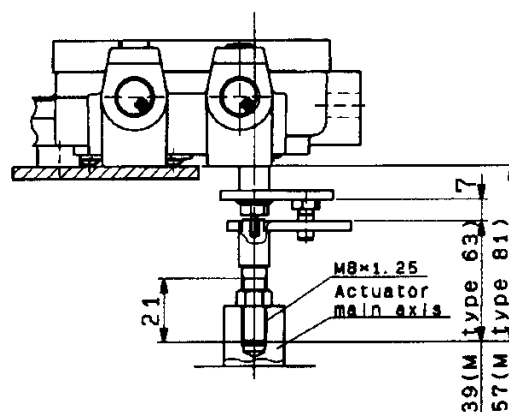


Fig.24 Example of backside attaching using fork lever assembly S.

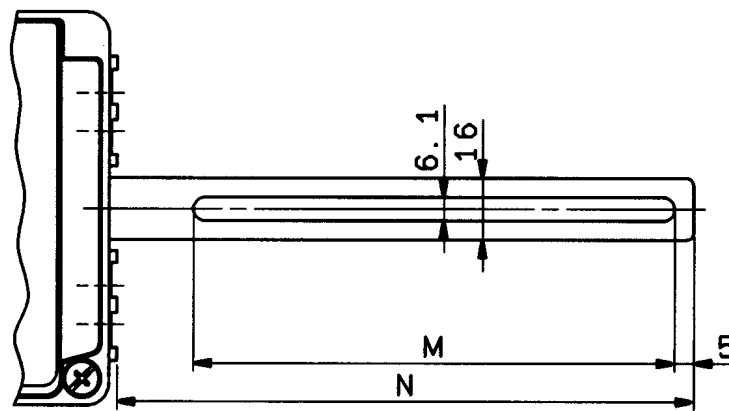
9-3 External feed back lever (Type IP5000)

Levers having different stroke sizes are available for the feed back lever of lever type IP5000.
Please order according to the stroke of the valve.

B

Table 9 Feed back lever types

Stroke	Unit No.	M size	N size
10~85mm(Standard accessory)	P378010-11	125	150
35~100mm(E type accessory)	P378010-12	110	195
50~140mm(F type accessory)	P378010-13	110	275



10.Options

- 10 - 1 Angle indicator equipped (IP5100 type)
Angle indicator enable valve angle to be seen on the case cover of positioner.
(Described in model No.)
- 10 - 2 Internal by-pass valve (IP5000 type)
Internal type by-pass valve <SIG-OUT1> enable diaphragm motor to be directly operated by signal output of automatic controller.
- 10 - 3 Internal equalizer valve (IP5100 type)
Internal equalizer valve <OUT1-OUT2> allows double acting actuator to be operated manually.
※ Please consult us about installation of by-pass valve and equalizer.

11. How to order

B

IP5 [] - [] [] [] [] - []

Type

000	Lever type
100	Rotary type

Input pressure classification

0	0.02~0.1MPa(Standard)
1	1/2 split 0.02~0.06, 0.06~0.1MPa

Pressure gauge (SUP. OUT1)

0	None
1	0.2MPa
2	0.3MPa
3	1.0MPa

Opening display

0	None
1	With

IP5000type-0 only

Ambient temperature

Nil	-20~80℃(Standard)
T	-5~100℃(for high temp.)
L	-30~60℃(for low temp.)

Accessories

Nil	None(Standard)	IP5000 has standard lever for stroke(10~85mm)
A	ø0.7 Output restriction with pilot valve	Accessory for IP5000, IP5100 small capacity actuator
B	ø1.0 Output restriction with pilot valve	
C	Fork lever Joint M	Accessory for IP5100
D	Fork lever Joint S	
E	For stroke 35~100mm with lever unit	Accessory for IP5000
F	For stroke 50~140mm with lever unit	

Pressure gauge, piping port

Nil	PT(Standard)
N	NPT
F	PF

Note 1) If two or more accessories are required, the part numbers should be made according to alphabetical order. (ex. IP5000-010-AD)

Note 2) The standard lever is not attached to accessories E and F.

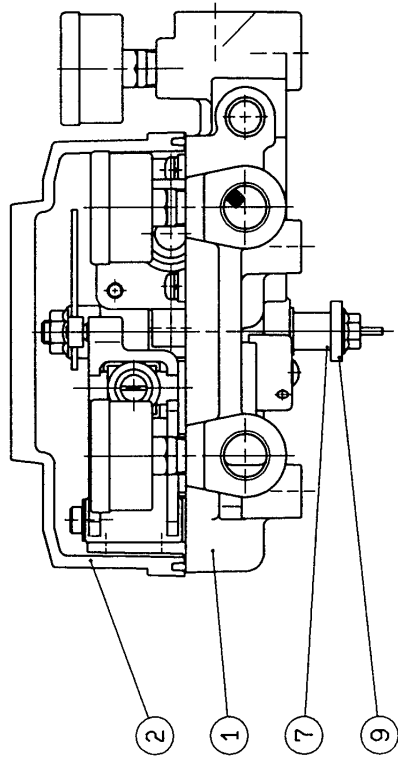
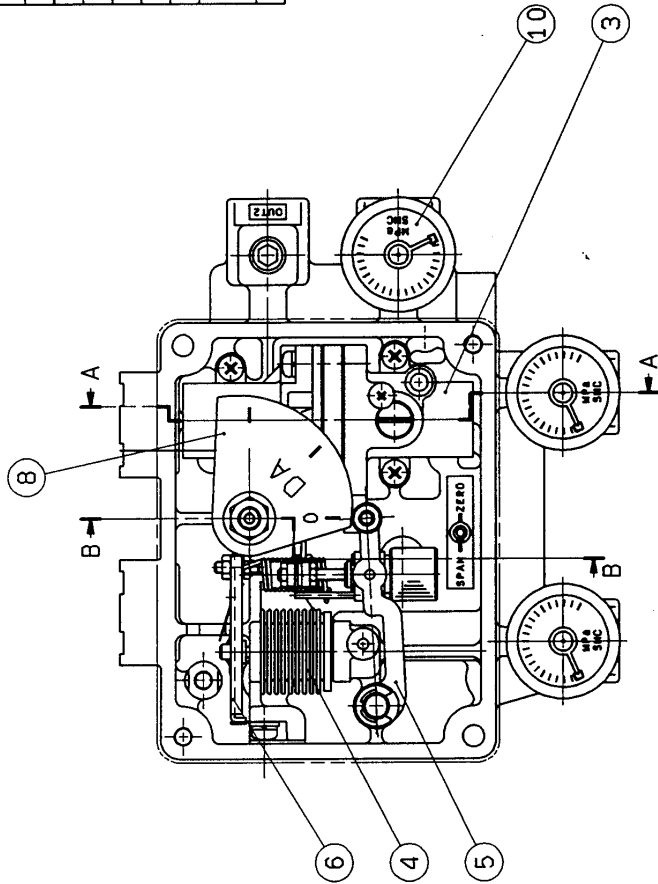
Note 3) Angle display type for IP5000 is 0 only. (No display)

12. Attached Drawing

10	G33-※-01	Pressure gauge	3
9	P378010-11	Feedback lever unit	1
8	P378010-8	Bellows assembly	1
7	P378010-10	Pilot valve unit	1
6	P378010-6	Balance lever unit	1
5	P378010-5	Feedback spring unit	1
4	P378010-4	Feedback shaft assembly	1
3	P378010-3	Feedback arm unit	1
2	P378010-2	Body cover unit	1
1	P378010-1	Body unit	1

Lever type·construction
 IP5000-※※0

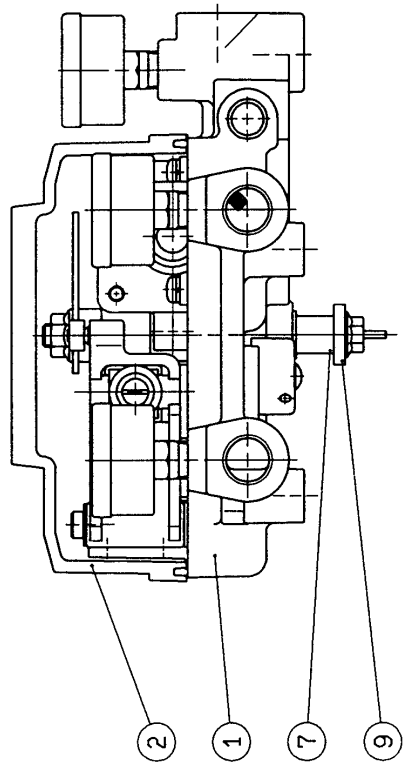
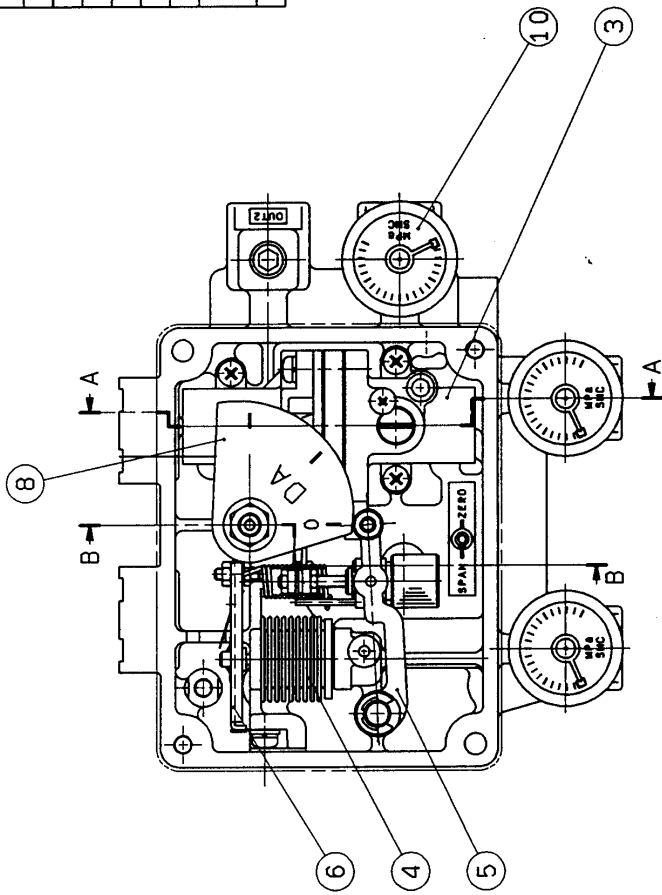
10	G33-※-01	Pressure gauge	—	3
9	P368010-23	Fork pin unit	—	1
8	P368010-18	Cam unit	—	1
7	P378020-6	Feedback shaft assembly	—	1
6	P378020-5	Balance lever unit	—	1
5	P378020-4	Feedback arm unit	—	1
4	P378010-8	Bellows assembly	—	1
3	P378020-11	Pilot valve unit	—	1
2	P378020-2	Body cover unit	—	1
1	P378020-1	Body unit	—	1



Rotary type (NO opening indication panel)
construction

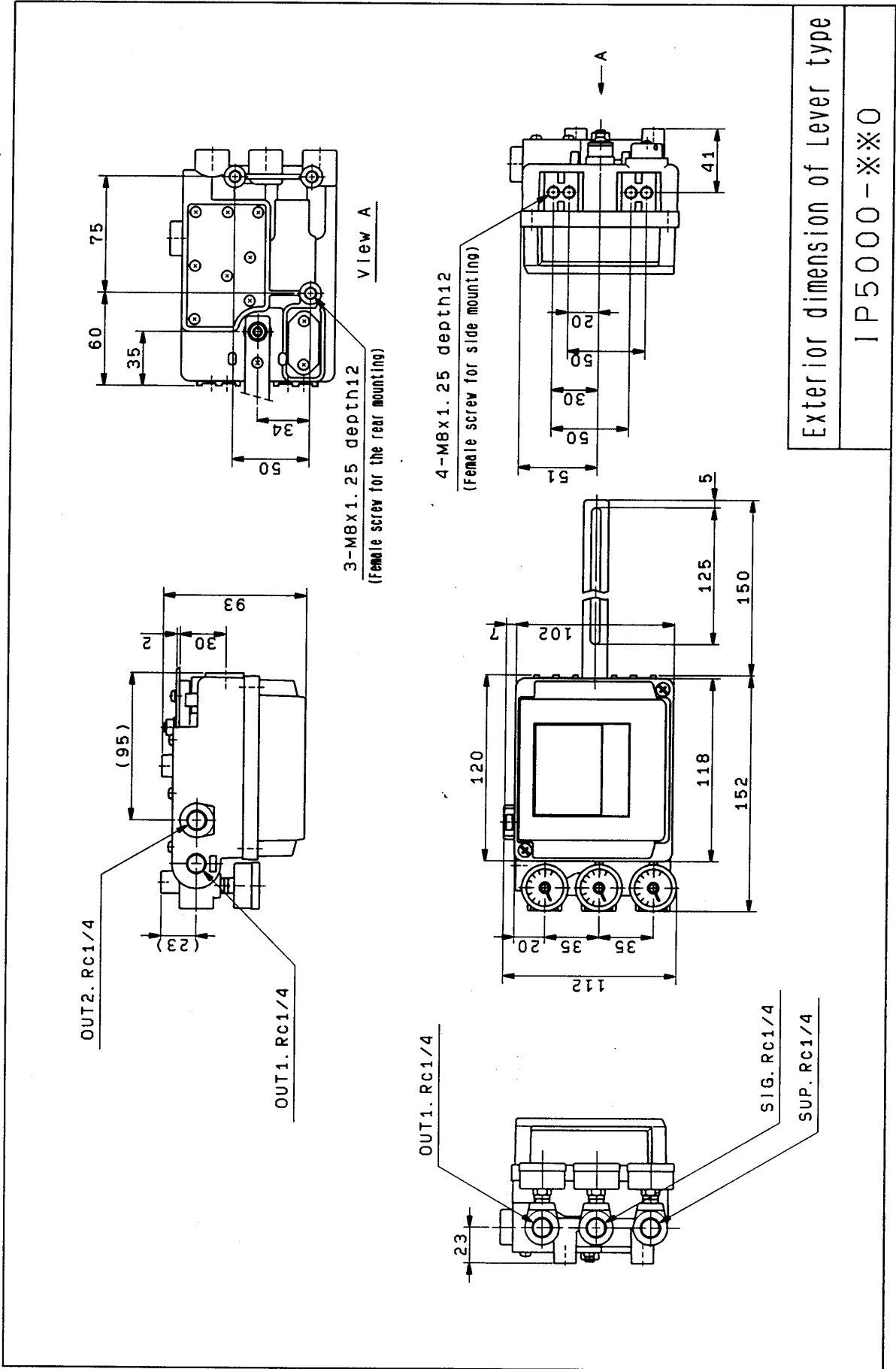
I P5100-※※0

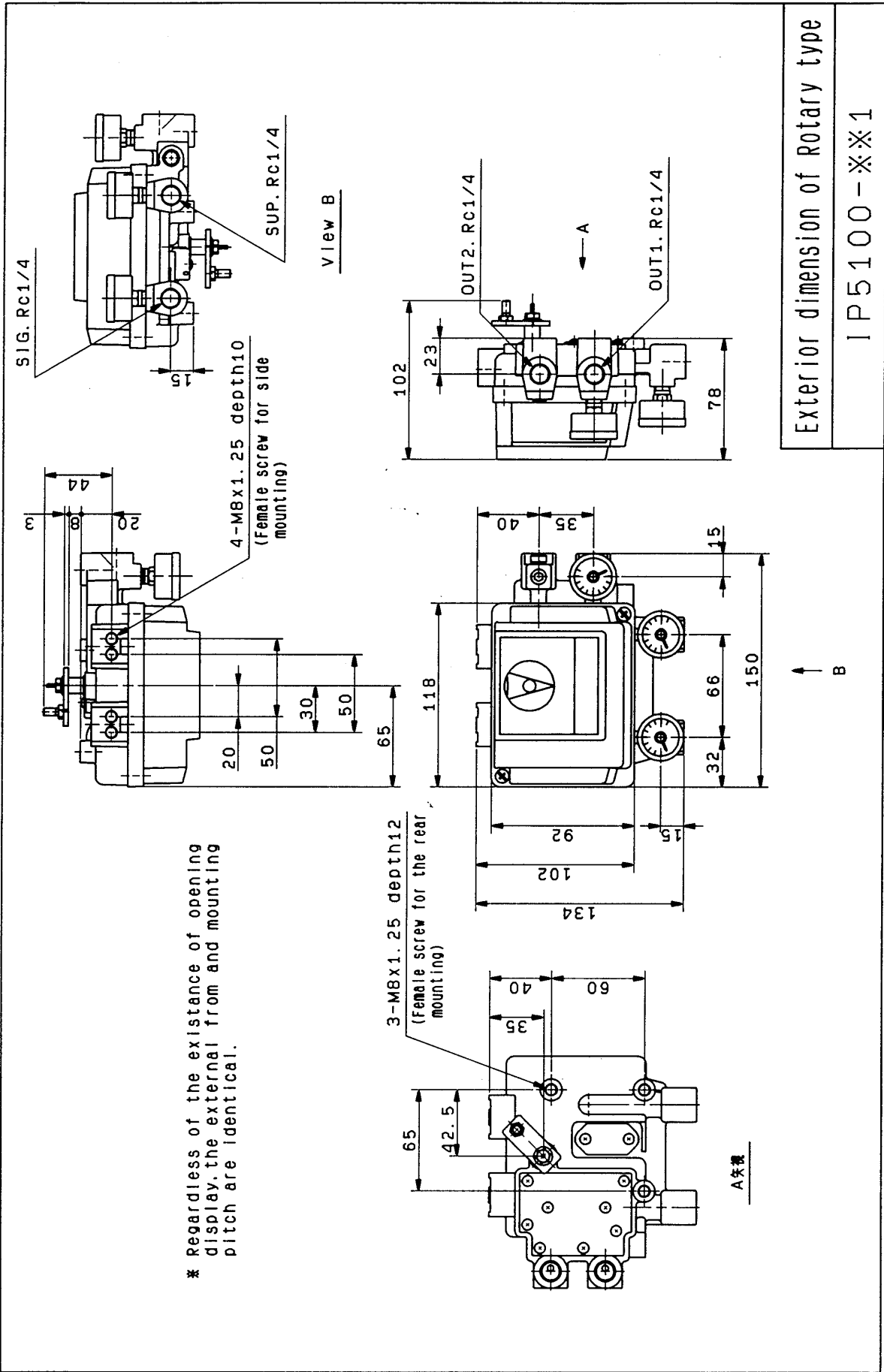
10	G33-※-01	Pressure gauge	—	3
9	P368010-23	Fork pin unit	—	1
8	P368010-18	Cam Unit	—	1
7	P378020-6	feedback shaft assembly	—	1
6	P378020-5	Balance lever unit	—	1
5	P378020-4	Feedback arm unit	—	1
4	P378010-8	Bellows assembly	—	1
3	P378020-11	Pilot valve unit	—	1
2	P378020-2	Body cover unit	—	1
1	P378020-1	Body unit	—	1



Rotary type (No opening indication panel)
construction

I P5100-※※0





Revision history
B 8.11.2021 Change of Contents 6 and 7 etc.
C 24.5.2024 Change of Safety Instructions

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Note: Specifications are subject to change without prior notice and any obligation on the part of the manufacturer.
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