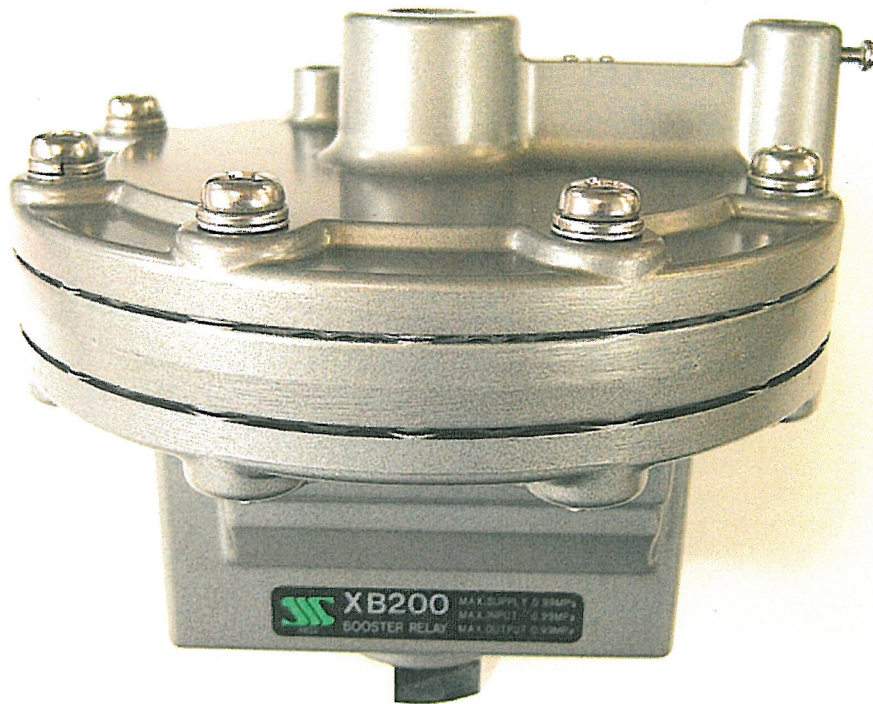


# INSTRUCTION MANUAL

## XB200 BOOSTER RELAY



**SSS Co., Ltd.**

# Safety Notice


Please use correctly and read all the supporting documents and this instruction manual, before installation of the equipment, operation, maintenance and inspection.

Please use this product after studying all of the precautions, safety information and usage of equipment.


This manual is using the icons listed in the following pictures below.

This is for using the equipment safely and preventing from damage to the property and harm to our customers.


The meanings of the icons are as follows. Please read and ensure that you understand the meaning.

 Attention	If handling is not correct ignoring this instruction, there will be the risk of the injury or destruction of equipment.
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## ■ Storage

 Attention	<ul style="list-style-type: none"><li>◇ Please keep from rainwater.</li><li>◇ Please keep this product in the place with less vibration and shock.</li><li>◇ Please keep this product in normal temperature and humidity. (23 °C, 65% RH or around)</li><li>◇ When you stock a used products, Please prevent from the contamination by masking the air connection with a cap.</li></ul>
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## ■ Installation

 Attention	<ul style="list-style-type: none"><li>◇ Do not remove the cap which is covering the air connection until just before installing. Contamination to the inside may cause malfunction.</li><li>◇ Instrument air shall be connected according to INS/OUT sign. If connected wrong, it may cause malfunction.</li></ul>
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## ■ Pneumatic piping

 Attention	<ul style="list-style-type: none"><li>◇ Please remove the foreign matter and chips with sufficient purge in the pipe.</li><li>◇ Please make sure the pipe is broad enough for the operation of the equipment.</li><li>◇ Leave the thread of 1 to 1.5 from the tip of the joint. Use Loctite577 or equivalent one. Do not use the sealing tape. It may cause malfunction due to clogging of the tape piece.</li></ul>
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## ■ Maintenance

 Attention	<ul style="list-style-type: none"><li>◇ If you remove the air pipe, please make sure that equipment such as a valve does not move suddenly even if the line is detached. Please maintain after cutting off the supply pressure.</li></ul>
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## 1. Introduction

The booster relay is installed with the control valve to boost its stroke speed when the required stroke speed is specially high or when the actuator capacity is large.

## 2. Specifications

The specifications of the XB200 are shown below.

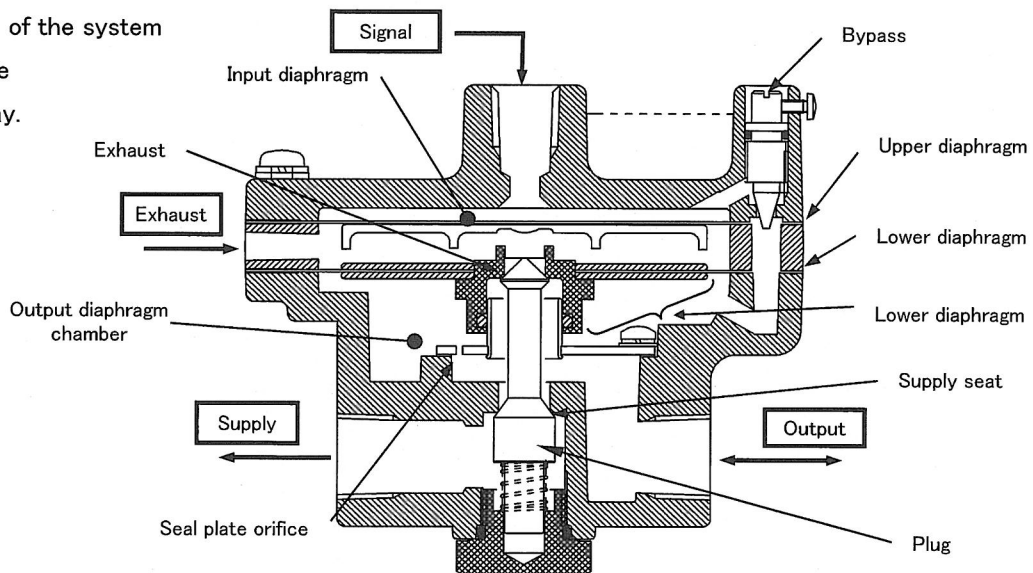
Model		Standard	
		XB201	XB202
Max supply pressure		0.99MPa	
Max singal pressure		0.99MPa	
Max Cv		2.6	
Ambiemt Temperature		-30~80°C	
Input-Output ratio		1:1	
Connections	Supply	Rc 1/2	NPT1/2
	Output	Rc 1/2	NPT1/2
	Signal	Rc 1/4	NPT1/4
Weight		approximately 1.5kg	

## 3. Operating Principles

The output pressure from the positioner is introduced to the input diaphragm chamber as a signal pressure to the booster relay and actuates the upper diaphragm. The booster relay output pressure enters the output diaphragm chamber through the seal plate orifice and actuates the lower diaphragm. Air supply and exhaust are performed so that the forces applied to the upper and lower diaphragms balance.

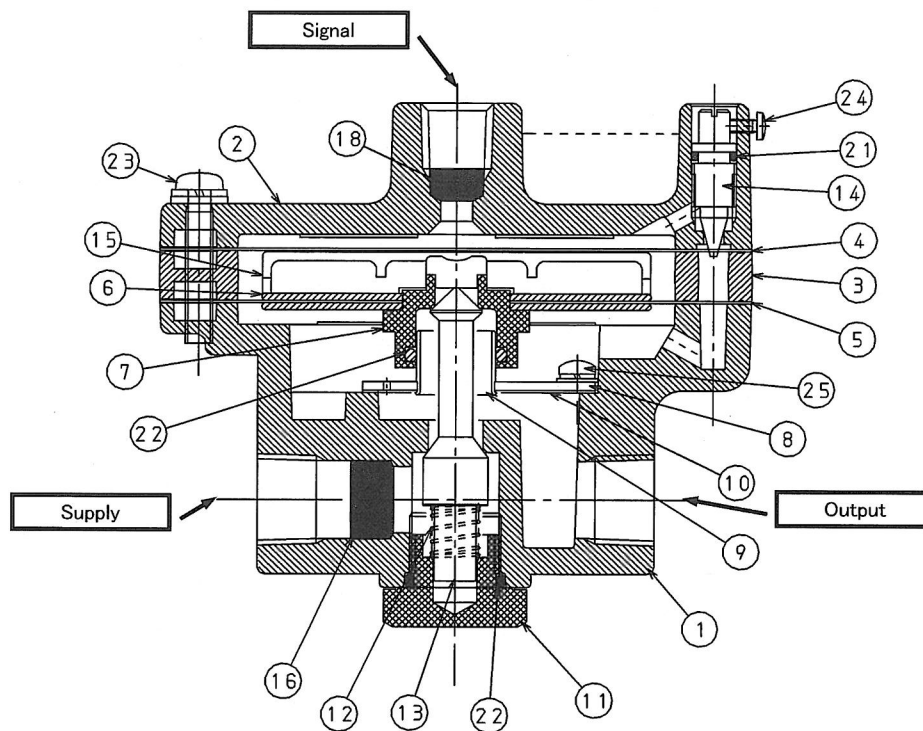
Through this actuation, the lower diaphragm assembly moves up when the signal pressure is ower than the output pressure, opening the exhaust seat to exhaust the output pressure. On the other hand, when the signal pressure is higher than the output pressure, the lower diaphragm assembly moves down, closing the exhaust seat and pushing down the plug to open the supply seat and to feed supply pressure to the output side.

The input and output sides can be connected by a bypass valve which is regulated to improve the stability of the system including the booster relay.



#### 4. Structure and Materials

##### (1) Structure



##### (2) Materials(Standard)

No.	Part name	Material	Qt'y	No.	Part name	Material	Qt'y
1	Body	ADC12	1	13	Plug	SUS303	1
2	Case	ADC12	1	14	Bypass valve	SUS303	1
3	Bleed ring	ADC12	1	15	Piston	PBT	1
4	Upper diaphragm	CR/Polyester	1	16	Filter	SUS304	1
5	Lower diaphragm	CR/Polyester	1	17	Name plate	Aluminum vapor deposited polyester	1
6	Diaphragm plate	A5052P	2	18	Filter	SUS304	1
7	Exhaust seat	C3601BD	1	21	"O" ring	NBR	1
8	Seal plate "O" ring	SUS304	1	22	"O" ring	NBR	2
9	Exhaust set guide	C2700T-1/2	1	23	Pan Head Screw with spring & plain washer	SUS304	8
10	Seal plate gasket	Non-asbestos sheet	1	24	Pan Head Screw	SUS304	1
11	Plug cap	C3604	1	25	Pan Head Screw with spring & plain washer	SUS304	4
12	Coil spring	SUS304-WPB	1				

#### 5. Carrying and Storage

(1) Handle the booster relay carefully.

(2) Please keep from rainwater.

(3) Store the booster relay in a place free of moisture and corrosive gases when storing it out of a box for a while. Although the booster relay delivered to the customer is painted and surface treated already, it may get rusty, if the storage environment is inappropriate.

## 6. Handling Precautions

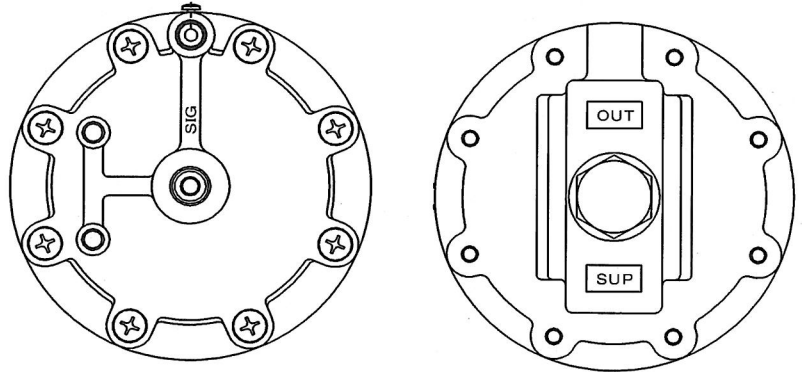
(1) Be sure to use a filter in the supply pressure pipe line.

Install a mist separator, if the supply air contains oil mist, carbon or other substances.

(2) Connect the booster relay after flushing the air pipe.

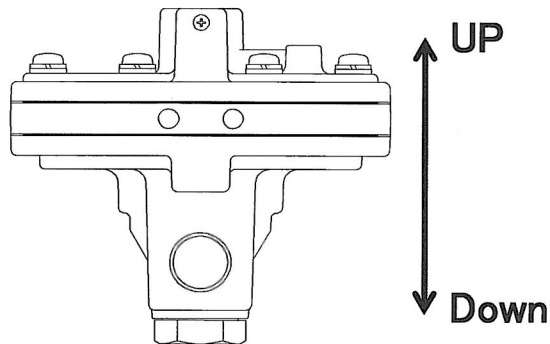
(3) Please refer to "SUP", "OUT" and "SIG" indication below when installing the pipes.

Connection	On display
Supply	SUP
Output	OUT
Signal	SIG



Be sure to use the  $\phi 6 \times 4$  pipe for piping of signal line for booster relay.

(4) Install the booster relay vertically  
figure shown right.



(5) The relay response will be slow when the bypass valve is opened and will be fast when it is closed.

Be sure to lock the bypass valve using the lock screw after finishing adjustment.



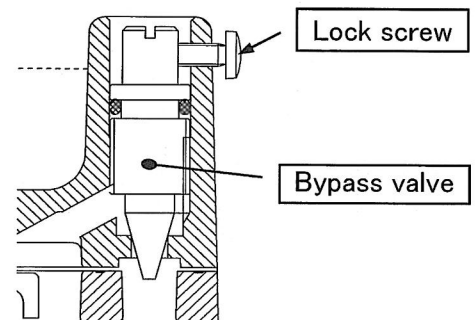
The structure of bypass valve is shown right.

To adjust the bypass valve, please loose the screw.

The screw is function of stopper of the bypass valve.

Please start adjusting at the lock screw half turned from full-close position.

If bypass valve is adjusted when lock screw is loose it is dangerous because the plug can pop out pushed by the inner pressure.



## 7. Maintenance

### Checking Procedures

#### (1)Checking Diaphragm Seal Leak

Leak must be less than crab spittle(2ml/min)when checked using a leak detection liquid.  
Retighten the diaphragm clamping bolt at 4.5N/m if leak is more than crab spittle.  
If leak does not stop, some trouble is suspected.

#### (2)Checking Leak from Bypass Valve Seal, Plug cap Seal and Outer Surfaces

Leak must not be detected when checked using a leak detection liquid on condition that  
bypass valve is opened less than 4 turns from its fully closed position with the plug tightend.  
Some trouble is suspected if leak is found.

#### (3)Checking Action

- ① The valve opening must follow and must not become unstable when the positioner is supplied with signals from fully closed to fully open positions.
- ② The opelating speed of the contrlo valve must not be slow extremely compared with the time XB200 was installed initially.  
Adjust the bypass valve of the booster relay if a trouble is detected in ①and ②.  
If the action cannot still be improved, some trouble with the booster relay is suspected.

Replacement of the assmble is recommended, if a trouble is detected in(1)~(3)above.  
The XB200 booster relay is recommended to be replaced periodically every 5 years.

## 8. Troubleshooting

Phenomenon	Cause	Troublshooting
Output pressure is not produced while impressing input signal.	Screw on the air pipe is loosened and pressure is leaking.	Tighten the screw.
	Bypass valve opening is too large.	Decrease the bypass valve opening and lock it.
Hunting phenomenon	Bypass valve opening is too small.	Increase the bypass vlave opening and lock it.



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