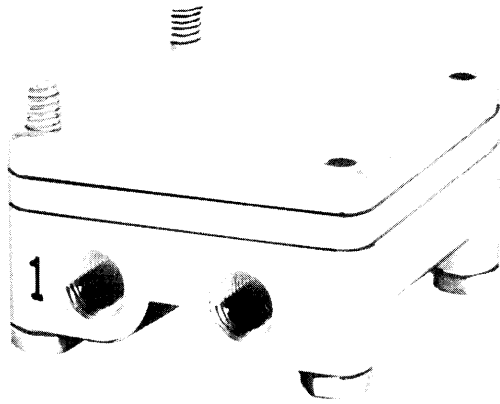


**INSTRUCTIONS
FOR
INSTALLATION AND OPERATION**

**Model No. CR100-A1
VOLUME BOOSTER
RELAY**



NOTE TO INSTALLER: Before installing, read instructions carefully, and record model number. After installing, give this folder to operating personnel or see that it is filed for future reference.

Section I — GENERAL INFORMATION

DESCRIPTION

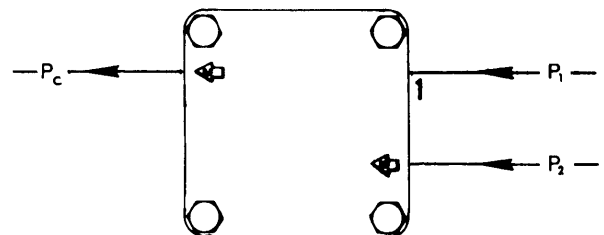
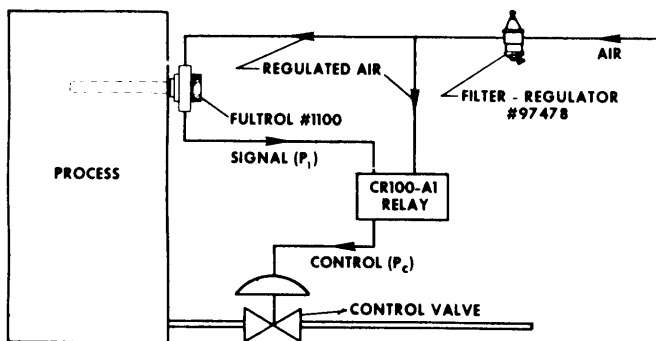
The Model CR100-A1 is a Pneumatic Volume Booster Relay designed to amplify the volume of the input signal air pressure (P_1).

$$P_c = P_1$$

TYPICAL APPLICATIONS

To improve the response time of a control circuit by increasing the air volume output from a simple "non-relay" controller to a control valve.

Connections used on CR100-A1 Relay when used as a low pressure selector.



SPECIFICATIONS

Design Data

Function: 1:1 relay within 1% of full range.

Input Pressure Range (P₁):

0 to 18 psig normal.

0 to 50 psig maximum.

Supply Pressure:

Normal — 30 psig.

Maximum — 60 psig (should always be at least 10 psi greater than P_c).

Ambient Temperature Limits: -40°F. to 180°F.

Ratio: Ratio of input (P₁) to output (P_c) — 1:1.

Action: Proportional.

Overload Protection: 100 psig will not damage unit.

Connections: 1/4" female NPT.

Weight: 1.0 pound.

Performance Data

Ultimate Sensitivity: .01 in H₂O.

Linearity: .3% full range.

Hysteresis: .3% full range.

Repeatability: .1% full range.

Supply Pressure Effect: Change in output pressure for 5 psig supply pressure change — 4 in. H₂O.

Ambient Temperature Effect: Change in output for a 75°F. rise in ambient temperature — 0.20% of full range.

Capacity: 4.0 SCFM.

Load Effect (air flow to cause 1 psig drop): 2.6 SCFM.

Consumption: Maximum — 6.0 SCFH.

Section II — INSTALLATION

GENERAL

Be sure that all pipe fittings used are clean, free of chips, dirt and moisture. If pipe compound or shellac is used, apply a small amount above the second or third thread.

CAUTION: Do not get pipe compound or shellac inside relay!

MOUNTING

When installing the relay, do not remove the "Caplugs" from the connections until ready to install fittings.

The relay may be mounted in any position. Due to its size and weight, it may be supported by the air lines. If more secure mounting is desired, use the mounting bracket furnished as shown in Figure 1. Use two 1/4" bolts, toggle bolts, or wood screws as required by the installation. Bracket may be removed or inverted by removing two nuts.

CONNECTIONS

All port openings are 1/4" female NPT. Make the air connections to the proper ports as shown in Figure 1. *The air supply must be clean and regulated (use filter-regulator #97478) and must not exceed 50 psi.*

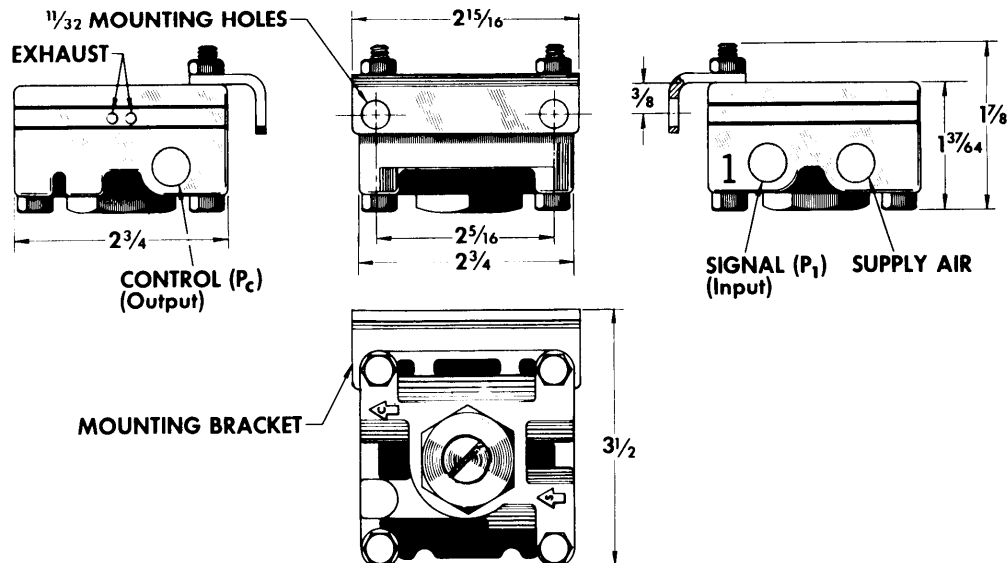


Figure 1

Section III — OPERATION

Air pressure in the signal chambers exerts a downward force on the input diaphragm. This force moves the center assembly down, closing the exhaust valve. Further movement opens the lower portion of the valve allowing the supply air pressure to enter the control chamber. This air acts on the control diaphragm and also passes out through the control air port. As the increasing control air pressure approaches the signal air pressure, the center assembly will rise, permitting the valve to close throttling the flow of supply air. When the control air pressure equals the signal air pressure both surfaces of the valve will be closed and the relay will be in balance.

A further increase in the signal pressure will cause the lower portion of the valve to open until the control air pressure again equals the signal air pressure. A decrease in signal air pressure will allow the control air pressure to force the center assembly upward, opening the exhaust valve until the control pressure is equal to the signal pressure.

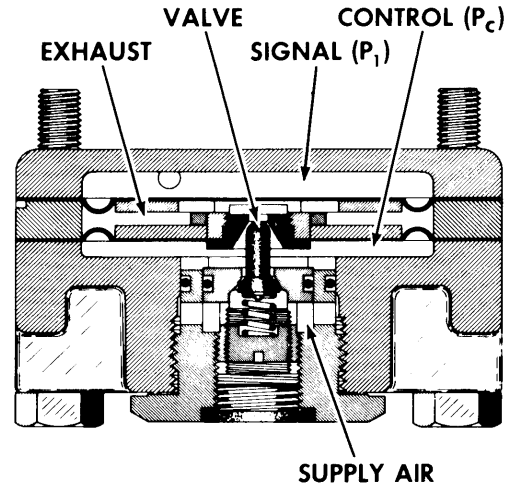


Figure 2

Section IV — ADJUSTMENT

The ratio of signal to control pressure may be adjusted by adjusting Valve Seat (17) as follows (see Figure 3):

1. Apply a supply pressure of 30 psig. Apply a signal pressure of 3 psig, and note control pressure.
2. Increase the signal to 15 psig, and again note control pressure.
3. The difference between the control pressure noted in

Step 1 and Step 2 should be 12 psig \pm .2 psig.

4. If necessary, remove Cap (13) and adjust Valve Seat (17).
5. Repeat Steps 1, 2 and 4 until the correct ratio is obtained. The unit may be adjusted while operating with the Cap removed, but the final setting must be checked after the Cap (13) has been replaced.

Section IV — MAINTENANCE

The simplified design of the relay makes routine maintenance unnecessary. However, should the air or the air lines be dirty, it may be necessary to clean the surfaces of the valve and the valve seats. If continued difficulty is experienced from dirt, moisture, oil, etc., suitable filters should be provided in the supply lines.

If the control pressure does not go to zero, or if the exhaust appears to be leaking: See Figure 3.

1. Remove the Cover (12) by unscrewing from the Relay Base (8).
2. Disassemble the cover assembly as shown in Figure 3.
3. Using a CLEAN soft brush, cloth, or paper, wipe off Valve Seats A and B.
4. Inspect both Hemispherical Surfaces (C) of Valve (10) for dirt, chips, etc. If any scars or imperfections are apparent, the Valve (10) should be replaced.
5. Reassembly the cover assembly as in Figure 3. Be sure the Valve Cover (12) is tight. Following the procedure outlined in Section IV, adjust the Valve Seat (17), replace the Cap (13) and check the Cap (13) and Cover (12) for leakage.

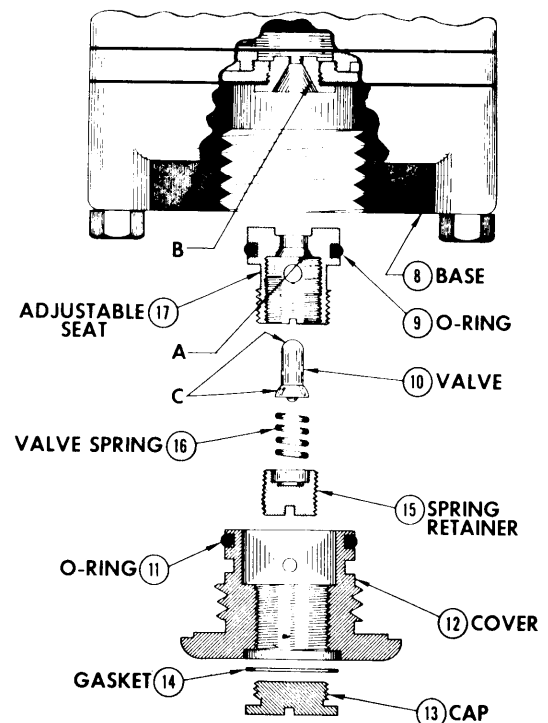


Figure 3

Do not use any gasket shellac, pipe compound or other sealant.

Section VI — REPAIR

If the procedure outlined in Section V fails to restore proper operation, disassemble the relay as shown in Figure 4.

1. Inspect air passages for dirt.
2. Inspect the Valve (10) surfaces for bumps, scars or other irregularities. The hemispherical surfaces must be smooth and regular.
3. Inspect the valve seats (A and B in Figure 3). These surfaces must be clean and smooth with no scars or surface irregularities.
4. Inspect Diaphragms (2) and (7) for holes or worn spots which might permit air leakage.
5. Install the complete Cover assembly in the Base (8) and make sure that the Valve Spring (16) is seating the valve properly.
6. Replace any worn or defective parts and reassemble the relay. **DO NOT USE ANY GASKET SHELLAC, PIPE COMPOUND, OR SEALANT!**
7. With Supply and Signal air pressures connected, check the unit for external leakage.

CAUTION: If cleaning is required, do not subject the diaphragms to cleaning fluids or solvents.

ORDERING INFORMATION

1. Identify your relay by Model or Catalog No. and description.
2. Order replacement parts by name and number from:

Robertshaw Industrial Products Division
 1602 Mustang Drive
 Maryville, TN 37801
 Phone: (865) 981-3100 Fax: (865) 981-3168

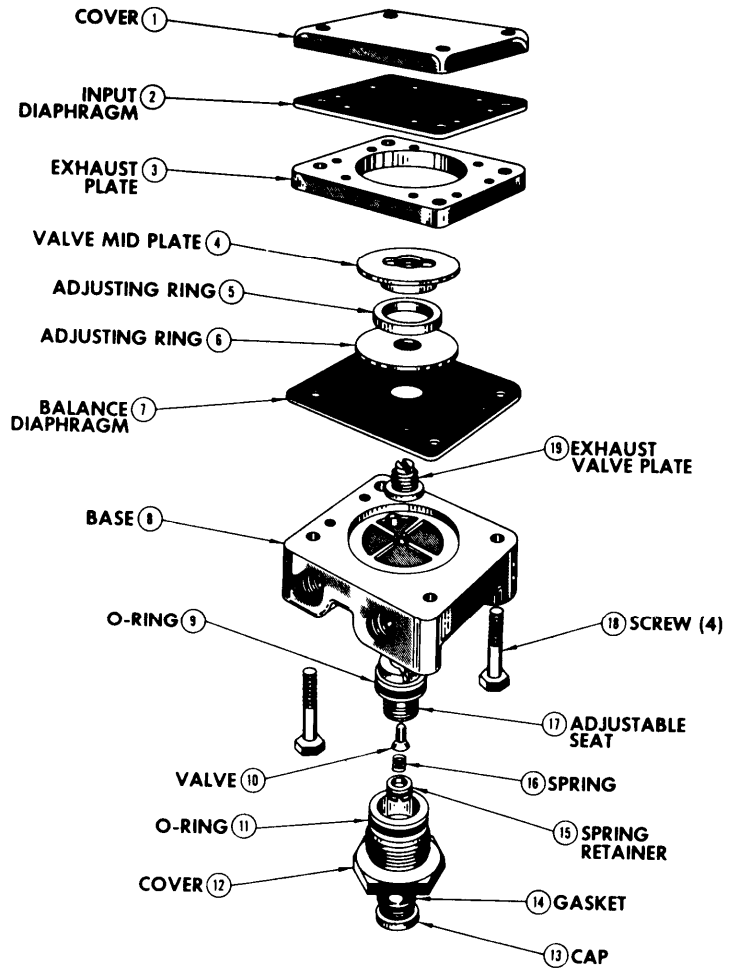


Figure 4

Robertshaw

Industrial Products Division

U.S.A. and Canada

Robertshaw Industrial Products Division
 1602 Mustang Drive
 Maryville, TN 37801
 Telephone: (865) 981-3100 Fax: (865) 981-3168
<http://www.robertshaw.thomasregister.com>
<http://www.robertshawindustrial.com>

Exports

Invensys Appliance Controls
 2809 Emerywood Parkway
 P.O. Box 26544
 Richmond, Virginia 23261-6544
 Telephone: (804) 756-6500 Fax: (804) 756-6561