

Volume Booster Relay Adjustable Bias CR-101-AI

GENERAL DESCRIPTION

The Model CR-101-AI Volume Booster Relay is a proportioning unit designed for use in pneumatic control systems where the application requires amplifying the volume of air or biasing the air pressure.

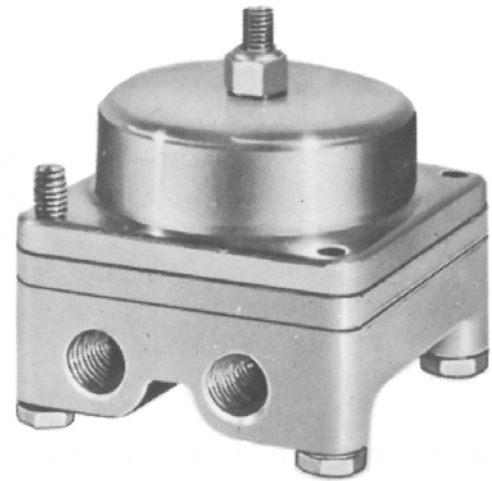
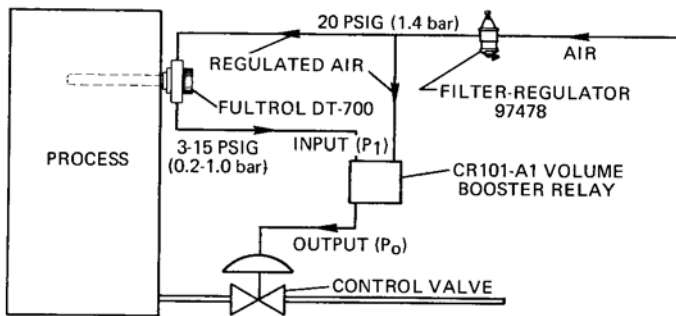
$$\text{Equation: } P_0 = P_1 \pm F_s$$

Where P_0 is the output pressure, P_1 is the input pressure and F_s is the bias.

The relay components are made of steel and aluminum and the diaphragms are Buna-N on nylon.

TYPICAL APPLICATION

Improves the response time of a control circuit by boosting the air volume from a simple "non-relay" controller to a control valve, and shifts ("biases") the signal range so as to get best control valve action under the conditions of pressure and pressure drop within the valve.



SPECIFICATIONS

DESIGN DATA

- Input Pressure Range (P_i):** 0-20 psig (0-1.4 bar) nominal
 0-50 psig (0-3.5 bar) maximum
- Supply Pressure:** 30 psig (2.1 bar) nominal
 50 psig (3.5 bar) maximum
- Biasing Adjustment (F_s):** \pm 18 psig (1.2 bar)
- Ambient Temperature Limits:** -40 to 180 F. (-40 to 82° C)
- Connections:** 1/4" female NPT.
 (Exhaust connection is 1/16" female NPT.)
- Weight:** 1.2 lbs. (0.54 Kg)

PERFORMANCE DATA

- Ultimate Sensitivity:**01 in. H₂O.
- Supply Pressure Effect:** Change in output pressure for a 5 psig (0.35 bar) supply pressure change: Less than 1% of full range.
- Ambient Temperature Effect:** Change in output for a 75 F. (24° C) change in ambient temperature - 0.5% of full range.
- Air Consumption: Maximum For Maximum Flow:** 3.0 SCFH
- Supply output capacity** 3.0 SCFM nominal
- Exhaust output capacity** 5.0 SCFM nominal

ORDERING INFORMATION

Specify: Model CR-101-AI

DIMENSIONS

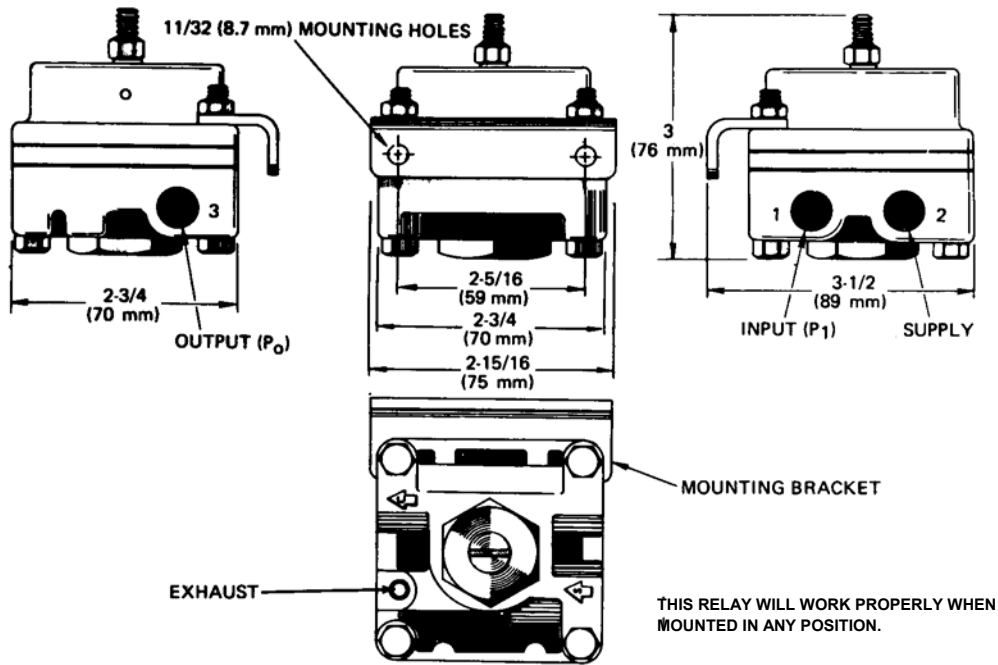


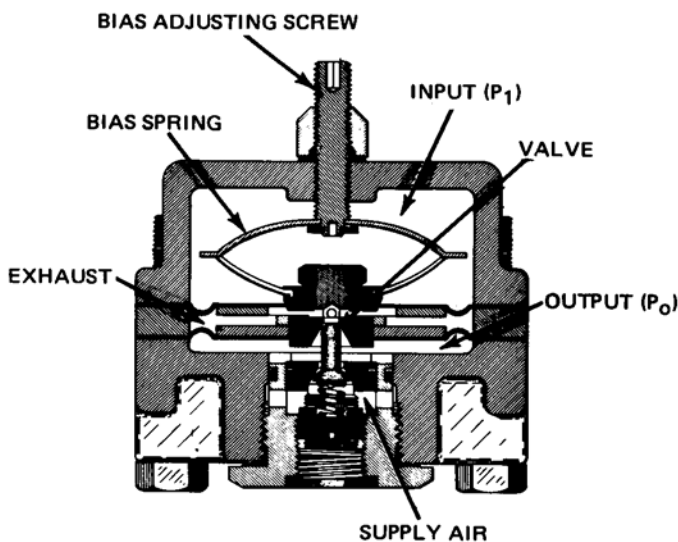
Figure 1

OPERATION

Air pressure in the input chamber exerts a downward force on the 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 output chamber. This air acts on the diaphragm and also passes out through the output port. As the increasing output pressure approaches the input pressure, the center assembly will rise, permitting the valve to close, throttling the flow of supply air. When the output

pressure equals the input pressure, both surfaces of the valve will be closed and the relay will be in balance.

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



Turning the adjusting screw clockwise or counterclockwise, respectively, provides advanced or retarded biasing of the output pressure.

Figure 2

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