

Volume Booster - Small Capacity

Volume Booster is a high volume amplifier used to increase the operating speed of the actuator, preventing the time lags, in the systems where controller and the control valve are separated by extremely long piping runs. Volume Booster receives the low

volume signal from the controller and transmits from an auxiliary supply a high volume signal to the control valve actuator.

Volume Booster is specially recommended for the use with large capacity diaphragm actuator.

Specifications

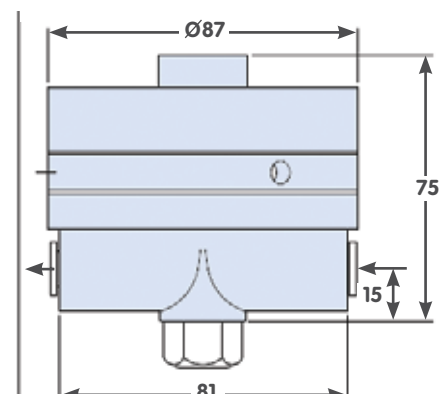
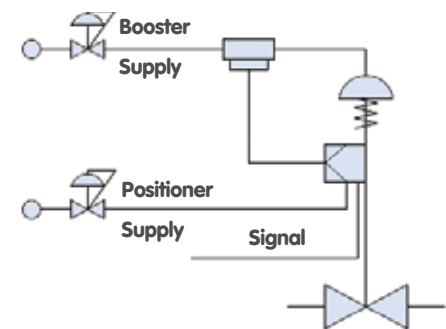
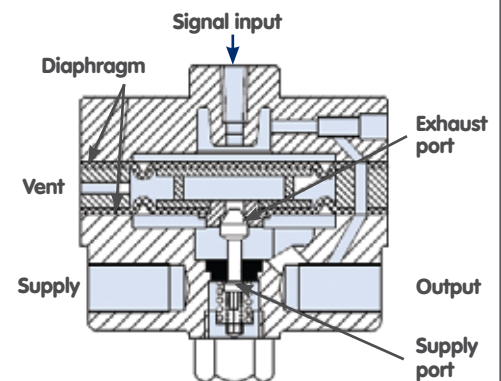
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|-----------------------------|---|------------------------|---------------------------------|
| Connections | 1 / 4" NPT (F) | Output Capacity | 13.5 SCFM |
| Max. Supply Pressure | Must be same as final control device. Up to 40 psig normally used with diaphragm actuators. Up to 150 Psig normally used with piston actuators. | Flow Capacity | (Cv) : 1.02 |
| Pressure Ratio | 1:1 | Reproducibility | 0.1 % |
| | | Temperature | -20° to 70° |
| | | MOC | Aluminum LM6 or Stainless steel |

Design and Performance Features

- Improves the stroking speed of large diaphragm actuated valves.
- Allows normally slow actuator response to the slow signal changes produced by usual process variations.
- Soft seat provides tight shut off to prevent unnecessary air consumption.

Principle of Operation

- 1) Input pressure acting upon the effective area of the upper diaphragm produces a force, which is opposed by the output pressure exerted upon the effective area of the lower diaphragm.
- 2) The opposing forces are in direct 1:1 ratio.
- 3) Hence any increase in the input pressure will cause the diaphragm assembly opening the pilot valve to admit a sufficient supply of air to the output to rebalance the input pressure.
- 4) A decrease in input pressure will cause the diaphragm assembly to lift off the exhaust port reducing the output and again rebalancing the input.
- 5) Equalising valve, by-passes slow small signal variations.



Volume Booster - Large Capacity

High Volume Booster with a fixed minimum deadband is designed to substantially increase stroking speeds of large actuators. Actuators retain their normal slow and stable responses as long as their signal

fluctuations remain within the deadband limits that can be set on the booster. Volume Booster is specially recommended for the use with large capacity diaphragm actuator.

Specifications

| | | | |
|-----------------------------|---|-----------------------|--|
| Connections | 1/2" or 3/4" NPT (F) | Pressure Ratio | 1:1 |
| Supply Port | 1/2" or 3/4" NPT (F) | Deadpan Width | 1psi or 5% of output span, whichever is greater. |
| Exhaust Port | 1/2" or 3/4" NPT (F) | Flow Capacity | 115 scfm (195.4m ³ / hr) |
| Max. Supply Pressure | Must be same as final control device. Up to 40 psig normally used with diaphragm actuators. Up to 150 Psig normally used with piston actuators. | Maximum Cv | 3.0 |
| | | Temperature | - 20° to 70° C |
| | | MOC | Aluminum LM6 or Stainless steel |

Design and Performance Features

Quick Response:

Provides large volume for rapid stroking of the actuator when confronted with input signals exceeding preset magnitude and rate capabilities. Stroking period can be reduced from one minute to less than three seconds using 3/4" High Volume Booster on 300 sq. inch diaphragm actuator having 3 1/2" stroke.

Greater Stability:

Allows normally slow actuator response to the small or slow signal changes produced by usual process variations.

Low Air Consumption:

Soft seats provide tight shutoff to prevent unnecessary air consumption.

Accuracy:

Maintains correct actuator position at high stroking speeds.

Principle of Operation

1) During steady process conditions when Controller output variations are small, the controller or valve positioner signal to the booster input will be registered through the bypass valve directly to the actuator.

2) Both booster ports remain tightly shut; soft seats preventing unnecessary air consumption.

3) Because of the bypass valve restriction, larger or faster signal changes will be registered sooner on the booster input than in the booster output chamber connected to the actuator.

4) When the differential pressure exceeds the dead-band value of the booster, the diaphragm assembly will move so as to open one, or the other, booster port and allow rapid actuator pressure change.

5) When the controller or positioner senses that the corrective action is completed, the booster closes and lets the actuator return to normal operation.

