

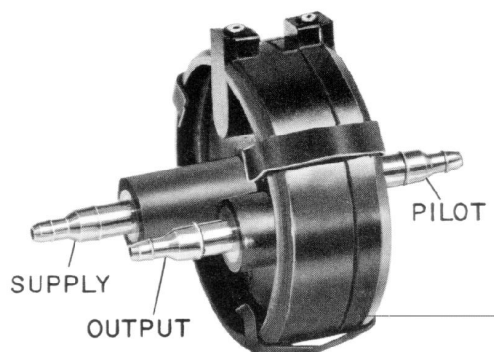
R-2080 1:1 Booster Relay

The R-2080 operates as a 1:1 pneumatic repeater and volume amplifier. The signal received at the R-2080 pilot is repeated at its output at a 1:1 ratio. The pilot signal may be from a non-relay (low volume) controller which is amplified to a high volume output signal to either improve the response time of a controlled device or for operation of additional controlled devices. Low volume (restrictor type) devices in control circuits reduce air flow to the controlled devices to 45 SCIM (12.28 mL/s) or less. To assure a good response time, the R-2080 should be installed as the final item in a control circuit ahead of the controlled device.

The R-2080 develops an accurate, direct acting 1:1 relationship between pilot and output pressure over its operating range. The offset, nonlinearity, and hysteresis are all minimal, enabling the R-2080 to be used in many applications including pneumatic transmission systems.

Operation

Pilot pressure to the R-2080 dead ends at a diaphragm. The diaphragm, through a plunger, exerts a force against a spring loaded ball valve in the supply chamber to allow the entry of supply air to the output chamber. A port in the output chamber allows the escape of large volume of output air to a dead ended controlled device until the pressure in the output lines, controlled device power chamber and the R-2080 output chamber increases to the same pressure as that of the pilot chamber. When equilibrium is reached in the two chambers, the spring will return the ball valve to the closed



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(Shown Actual Size)

position to close off supply pressure to the R-2080. A high degree of accuracy is achieved in attaining a 1:1 ratio because pilot and output air pressures are acting on a single diaphragm from chambers of equal diameter. The small amount of air leakage [maximum of 10 SCIM (2.73 mL/s)] around the ball valve will escape through the exhaust orifice.

On a decrease in pilot pressure, output chamber pressure will overcome pilot chamber

pressure and the diaphragm will retract from the exhaust orifice seat allowing air to escape from the output chamber. When the pilot and output air chambers are again equal in pressure, the diaphragm will return to a position to seat against the exhaust orifice. **Note: The R-2080 can be used with leak type devices, however, deviation of the output pressure from the pilot pressure may then exceed the 0.1 PSI (0.7 kPa) maximum deviation achieved with dead ended devices.**

