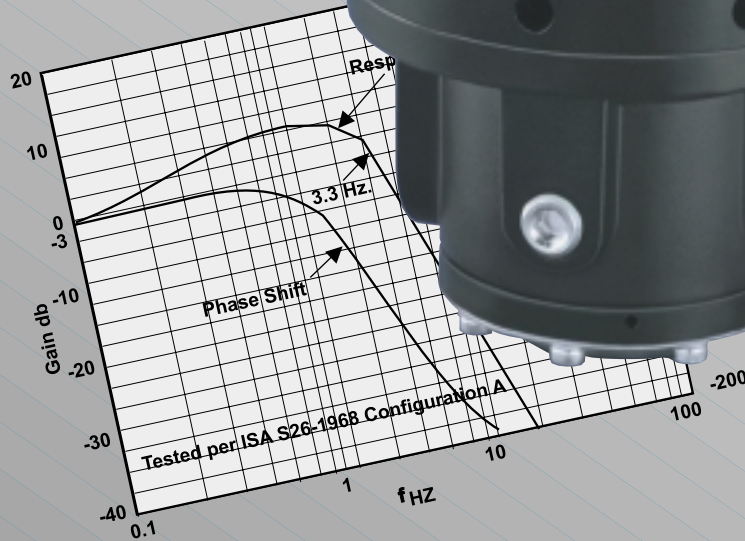
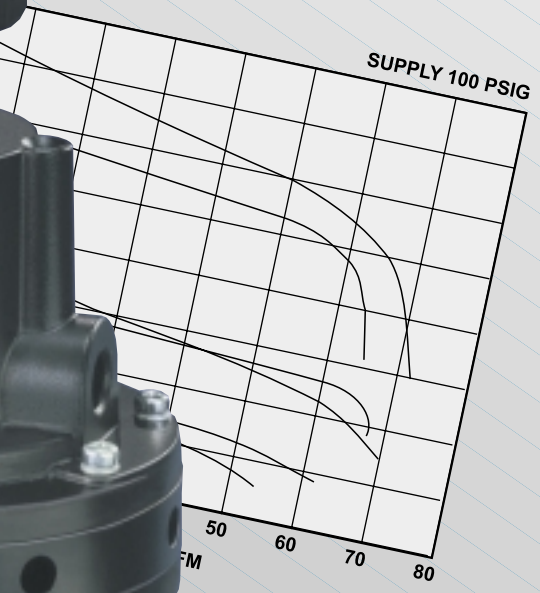
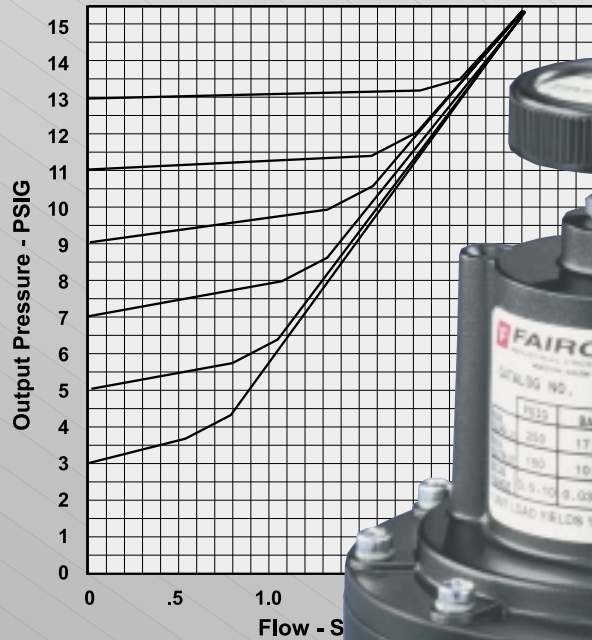


FAIRCHILD

POSITIVE BIAS RELAY

Model 1500A



FAIRCHILD
INDUSTRIAL PRODUCTS COMPANY

CROSS SECTION

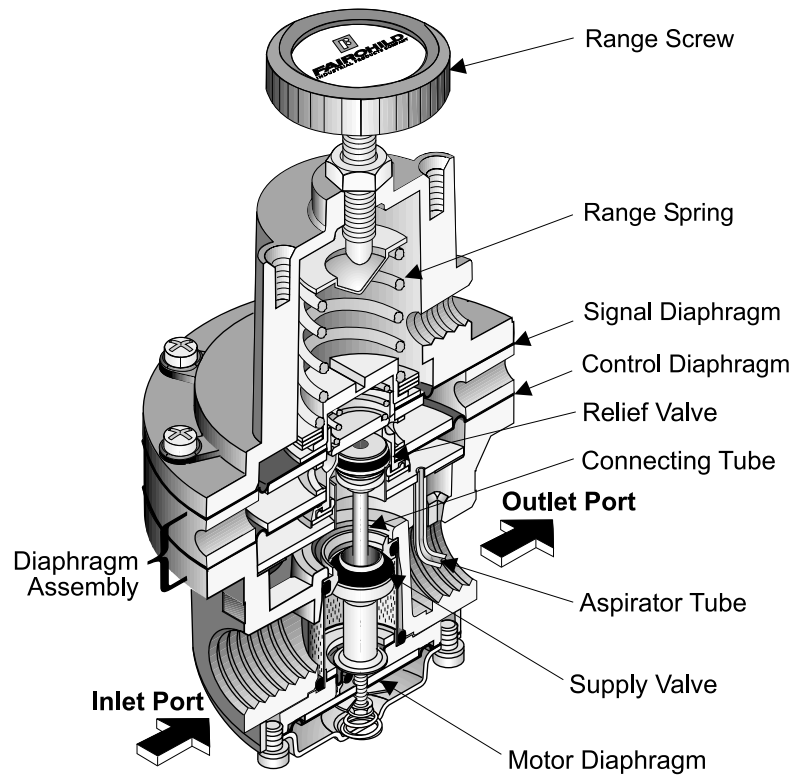


Figure 1. Model 1500A Detail Drawing

GENERAL INFORMATION

The Model 1500A Positive Bias Relay uses the control input signal and a fixed bias to control output pressure.

The Model 1500A has the following features:

- Control sensitivity of 1" water column allows use in precision applications.
- Large Supply and Exhaust Valves provide high forward and exhaust flows.
- Soft Supply and Exhaust Valve seats minimize air consumption.
- A balanced Supply Valve minimizes the effect of supply pressure variation.
- An Aspirator Tube compensates downstream pressure droop under flow conditions.
- A separate Control Chamber isolates the diaphragm from the main flow to eliminate hunting and buzzing.
- Unit construction lets you service the Model 1500A without removing it from the line.

OPERATING PRINCIPLES

The output of the relay is the sum of the spring bias, set with the Range Screw, plus a pneumatic input signal. ($P_o = P_s + K$); where P_o is output pressure, P_s is signal pressure, and K is the spring constant set by the Range Screw. The signal pressure exerts a force against the top of the Signal Diaphragm that creates a downward force on the Diaphragm Assembly and opens the Supply Valve. Output pressure flows through the Outlet Port and the Aspirator Tube to the Control Chamber where it creates an upward force on the bottom of the Control Diaphragm.

When the setpoint is reached, the forces of the signal pressure and the Range Spring that act on the top of the Signal Diaphragm, balance with the force of the output pressure that acts on the bottom of the Control Diaphragm to close the Supply Valve.

When the output pressure increases above the setpoint, the Diaphragm Assembly moves upward to close the Supply Valve and open the Exhaust Valve. Because the Poppet Valve is closed, pressure flows down the Control Tube to the bottom of the Motor Diaphragm. This pressure keeps the Supply Valve tightly closed while in the exhaust mode. The Poppet Valve opens and excess output pressure exhausts through the Vent in the side of the unit until it reaches the setpoint. For more information, see Figure 1.

OUTLINE DIMENSIONS

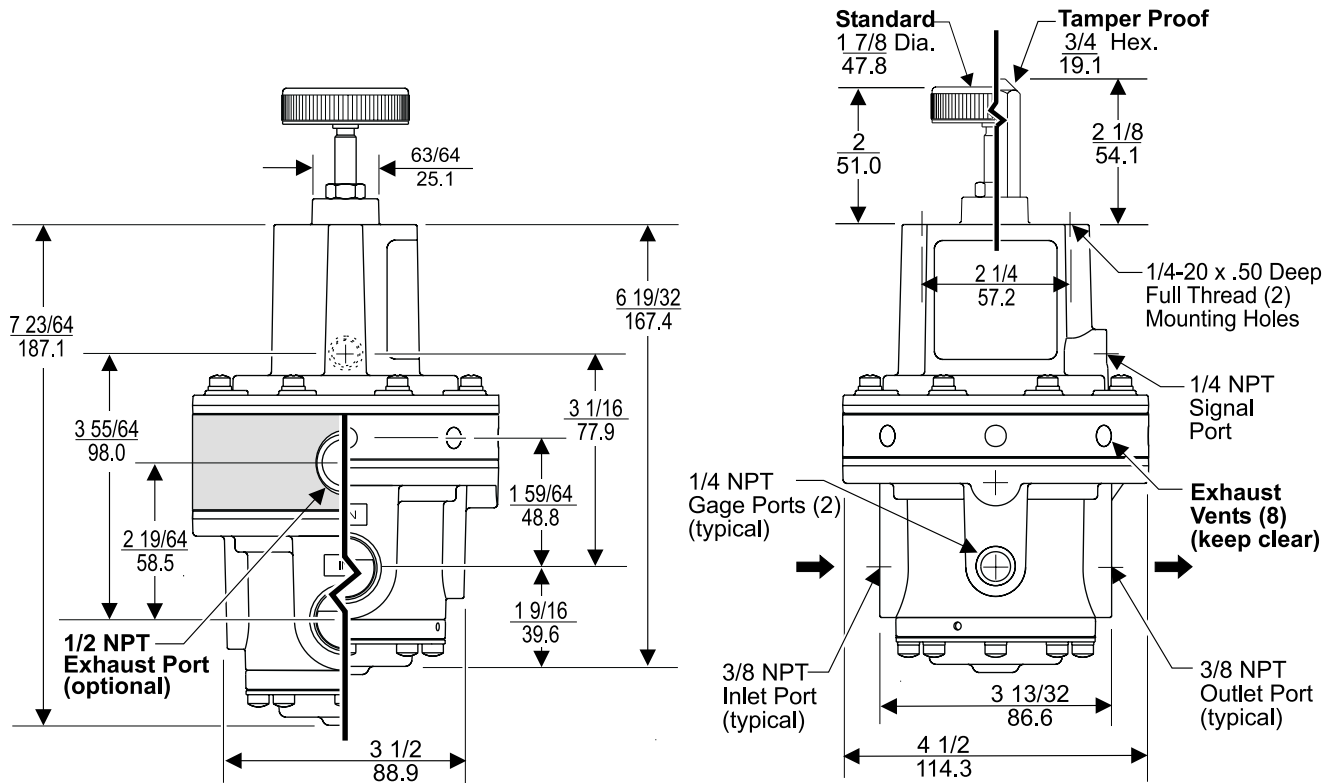


Figure 2. Model 1500A Outline Dimensions

SPECIFICATIONS

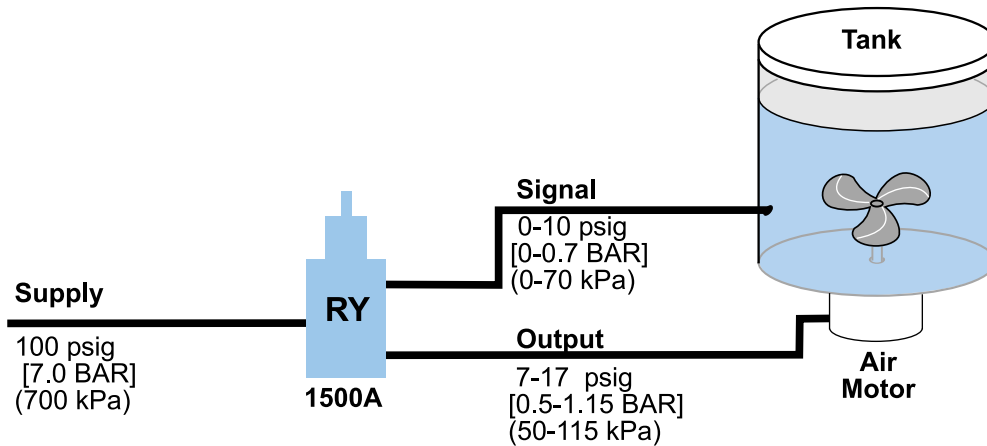
FUNCTIONAL SPECIFICATIONS

Supply Pressure	250 psig, [17.0 BAR] (1700 kPa) Maximum.
Signal or Output Pressure	150 psig, [10.0 BAR], (1000 kPa) Maximum
Flow Capacity (SCFM)	150 (255 m ³ /HR) @ 100 psig, [7.0 BAR], (700 kPa) supply & 20 psig, [1.5 BAR], (150 kPa) setpt.
Exhaust Capacity (SCFM)	40 (68 m ³ /HR) where down- stream pressure is 5 psig, [.35 BAR], (35 kPa) above 20 psig, [1.5 BAR], (150 kPa) setpt.
Ambient Temperature	-40° F to +200° F (-40° C to +93° C)

PERFORMANCE SPECIFICATIONS

Sensitivity	1" (2.54 cm) Water Column.
Supply Pressure Effect	Less than 0.1 psig, [.007 BAR], (0.7 kPa) for 100 psig, [7.0 BAR], (700 kPa) change in supply pressure.
Materials of Construction	
Body and Housing	Aluminum
Trim	Zinc Plated Steel, Brass
Diaphragms	Nitrile on Dacron

TYPICAL APPLICATION



Pneumatic

Figure 3. Model 1500A Mixing Speed Control Application

TYPICAL APPLICATION

The Model 1500A Positive Bias Relay maintains a constant mixing speed in a large tank.

When the tank is full, a higher pressure is needed to maintain the mixer speed. As the liquid level in the tank decreases, the head pressure in the tank decreases and the mixing speed increases.

To prevent the increase in mixing speed, the Range Spring in the Model 1500A is set to the pressure required to run the mixer at minimum speed. The liquid head pressure, measured at the level of the mixing blade, is piped to the Signal Port. This pressure added to the fixed Range Spring pressure provides the output required to maintain a constant mixing speed. For more information, see Figure 3.

INSTALLATION

For installation instructions, see the *Model 1500A Positive Bias Relay IOM, IS-3001500A*.

ORDERING INFORMATION

Catalog Number

15

Pressure Range

psig	[BAR]	(kPa)	
0.5-10	[0.03-0.7]	(3-0.7)	(2)
0.5-30	[0.03-2]	(3-200)	(3)
1-60	[0.1-4]	(10-400)	(4)
2-150	[0.15-10]	(15-1000)	(6)

Pipe Size

3/8" NPT	(3)
1/2" NPT	(4)
3/4" NPT	(6)

Options

Tamper Proof	(T)
Tapped Exhaust	(E)
BSPT (Tapered)	(U)



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