Features

- Venturi aspiration compensates for downstream pressure losses
- Optional input and output biasing allows versatility in applications
- Adjustable from 30:1 dividing ratio to 1:30 multiplying ratio assures infinite pressure adjustments
- Floating seal ring isolates control chamber which increases stability by reducing effect of high flows.
- Panel or Line Mounting

Operating Principles

The Model 21 consists of a signal chamber lever arm, a Model 20 output valve body, and pivot assembly for lever arm adjustment. The ratio of output pressure to signal pressure is infinitely adjustable. The adjustment range permits signal amplification of 1:30 or signal reduction of 30:1 by rotation of the ratio adjustment knob.

The signal pressure acting on the signal chamber diaphragm transmits a force through a lever to the control diaphragm, thus setting output pressure. The lever fulcrum is adjustable.

Output pressure is a function of signal pressure times the ratio of lever arm lengths on either side of the fulcrum. A bias may be introduced by means of the set screws.

The Model 21D is available with both input and output adjustable bias. Maximum input bias is 3 psig, with a maximum output bias of 9 psig. The basic mathematical expression for the bias in this relay is:

\[ P_o = (P_s - K_1) R + K_2, \text{ where} \]

\[ P_o = \text{Output pressure} \]
\[ P_s = \text{Input signal} \]
\[ R = \text{Ratio of setting} \]
\[ K_1 = \text{Input bias, (-) only} \]
\[ K_2 = \text{Output bias, (+) only} \]
Technical Information

**Specifications**

**Flow Capacity**
40 SCFM (68 m³/HR) 100 psig, [7.0 BAR], (700 kPa) supply, 20 psig, [1.5 BAR], (150 kPa)

**Exhaust Capacity**
5.5 SCFM (9.4 m³/HR) (downstream pressure 5 psig, [.35 BAR], (35 kPa) above set pressure)

**Supply Pressure**
250 psig, [1.7 BAR], (1700 kPa) Maximum

**Supply Pressure Effect**
Less than .1 psig, [.007 BAR], (.7 kPa) for 100 psig, [7.0 BAR], (700 kPa) change

**Signal or Output Pressure**
150 psig, [1.0 BAR], (1000 kPa) Maximum

**Ratio Range**
30:1 through 1:30 (signal pressure: output pressure)

**Operating Pressure (minimum)**
0.5 psig, [0.03 BAR], (3.5 kPa)

**Sensitivity**
0.5” (1.27 cm) Water Column

**Ambient Temperature Limits**
-40°F to +200°F, (-40°C to +93.3°C)

**Materials of Construction**
Body and Housing.................................Aluminum
Trim........Stainless Steel, Brass, and Zine Plated Steel
Diaphragms.................................Buna N and Dacron
Lever and Fulcrum......................Hardened Steel

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Catalog Information

**Catalog Number**
2131

**Pipe Size**
1/4" NPT .................................................2
3/8" NPT .................................................3

**Options**
Bias......................................................D
Fluorocarbon Elastomers.........................J
Tamper Proof ............................................T
BSPT (Tapered) .........................................U

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Installation

A service kit is available for the Model 21. Refer to the Fairchild Model 21 Relay Installation, Operation and Maintenance Instructions, IS-10000021.