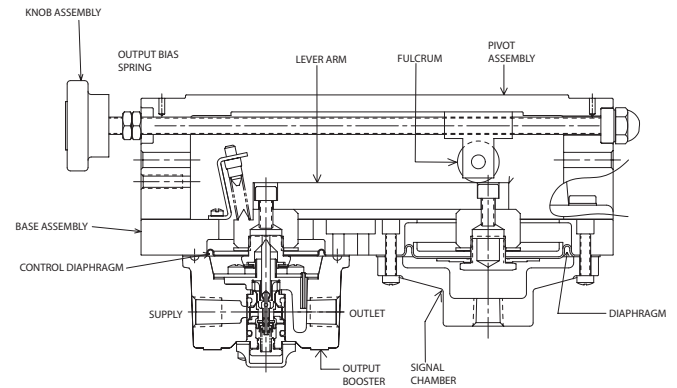
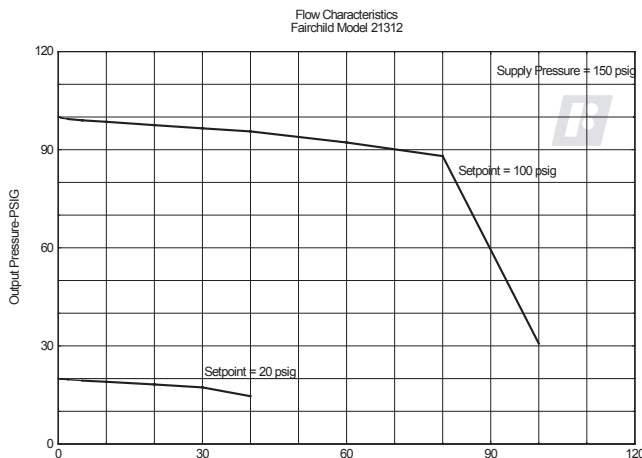


Model 21 Relay



Cross Section
Model 21 Detail Drawing



General Information

- Venturi aspiration
- Optional input and output biasing
- Adjustable from 30:1 dividing ratio to 1:30 multiplying ratio
- Floating seal ring isolates control chamber
- Compensates for downstream pressure losses
- Allows versatility in applications
- Assures infinite pressure adjustment
- 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 indefinitely adjustable; signal adjustment range permits signal amplification of 1:30 or signal reduction of 30:1 by rotation of the ratio adjustment knob. An infinite number of ratios can be obtained within this range.

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 = Output pressure

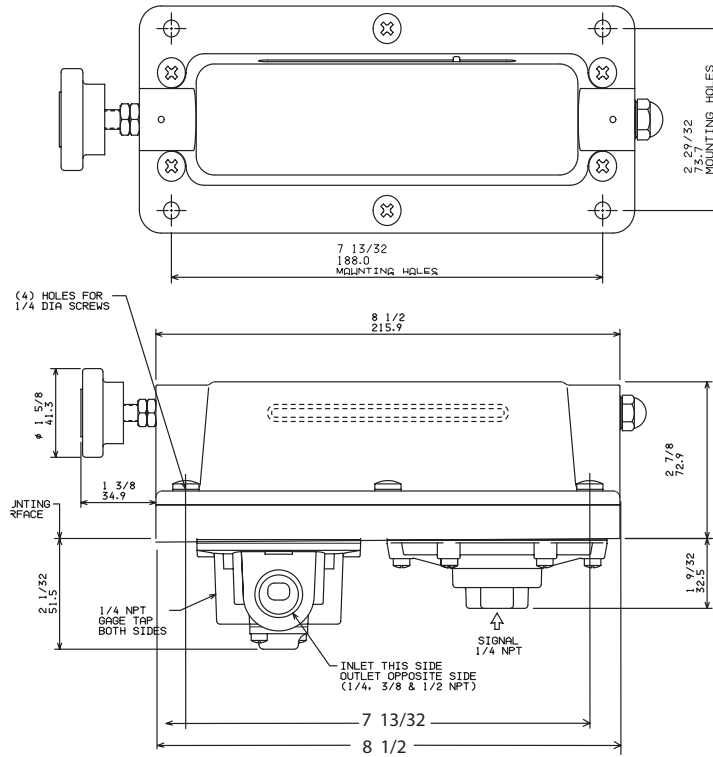
P_s = Input signal

R = Ratio setting

K_1 = Input bias, (-) only

K_2 = Output bias, (+) only

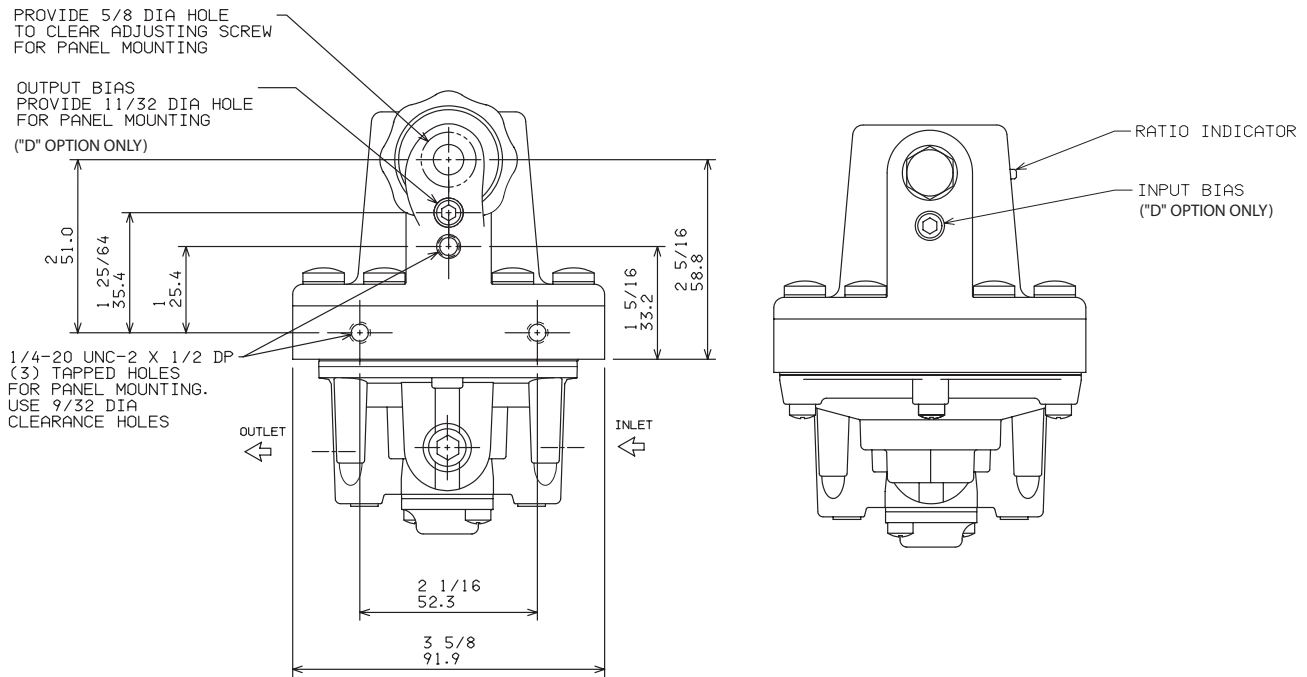
Outline Dimensions



Functional Specifications

Supply Pressure	250 psig, [1.7 BAR], (1700kPa) Maximum
Flow (SCFM) Capacity	40 SCFM (68 m ³ /HR) 100 psig, [7.0 BAR], (700 kPa) supply, 20 psig, [1.5 BAR], (150kPa)
Exhaust Capacity	5.5 SCFM (9.4 m ³ /HR) (downstream pressure 5 psig, [.35 BAR], (35kPa) above set pressure)
Signal or Outlet Pressure	150 psig, [1.0 BAR], (1000kPa) Maximum
Ratio Range	30:1 through 1:30 (signal pressure: output pressure)
Operating Pressure (minimum)	0.5 psig, [0.03 BAR], (3.5 kPa)

Outline Dimensions

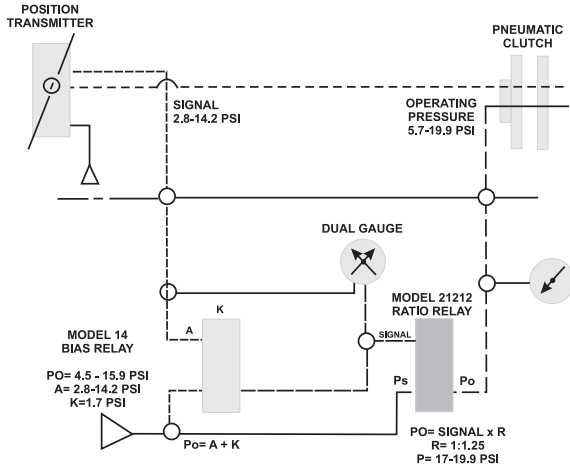


Performance Specifications

Sensitivity	0.5" (1.27 cm) Water Column
Supply Pressure Effect	Less than .1 psig, [.007 BAR], (.7kPa) for 100 psig, [7.0 BAR], (700kPa) change
Materials of Construction	Body and Housing Aluminum Trim Stainless Steel, Brass, and Zinc Plated Steel Diaphragms Buna N and Dacron Lever and Fulcrum Hardened Steel
Ambient Temperature limits	-40°F to +200°F (-40°C to +93°C)

Typical Application

The Model 21 may be used in a tension control system for paper machines.



Installation

A service kit is available for the Model 21. Please refer to the *Fairchild Model 21 Relay Installation, Operation and Maintenance Instructions*, IS-1000021.

Catalog Information

Catalog Number **2131**

Pipe Size

1/4" NPT 2
 3/8" NPT 3

Options

Bias¹ D
 Tamper Proof T
 BSPT (Tapered) U

¹ Maximum Input Bias - 3 psig, [0.2 BAR], (20kPa),
 Maximum Output Bias - 9.0 psig, [0.6 BAR], (60kPa)



Fairchild Industrial Products Company
 3920 West Point Boulevard • Winston-Salem, NC 27103
 phone: 336-659-3400 • fax: 336-659-9323
 sales@fairchildproducts.com • www.fairchildproducts.com

CS-10000021 Rev. H 03/05
 Litho in USA