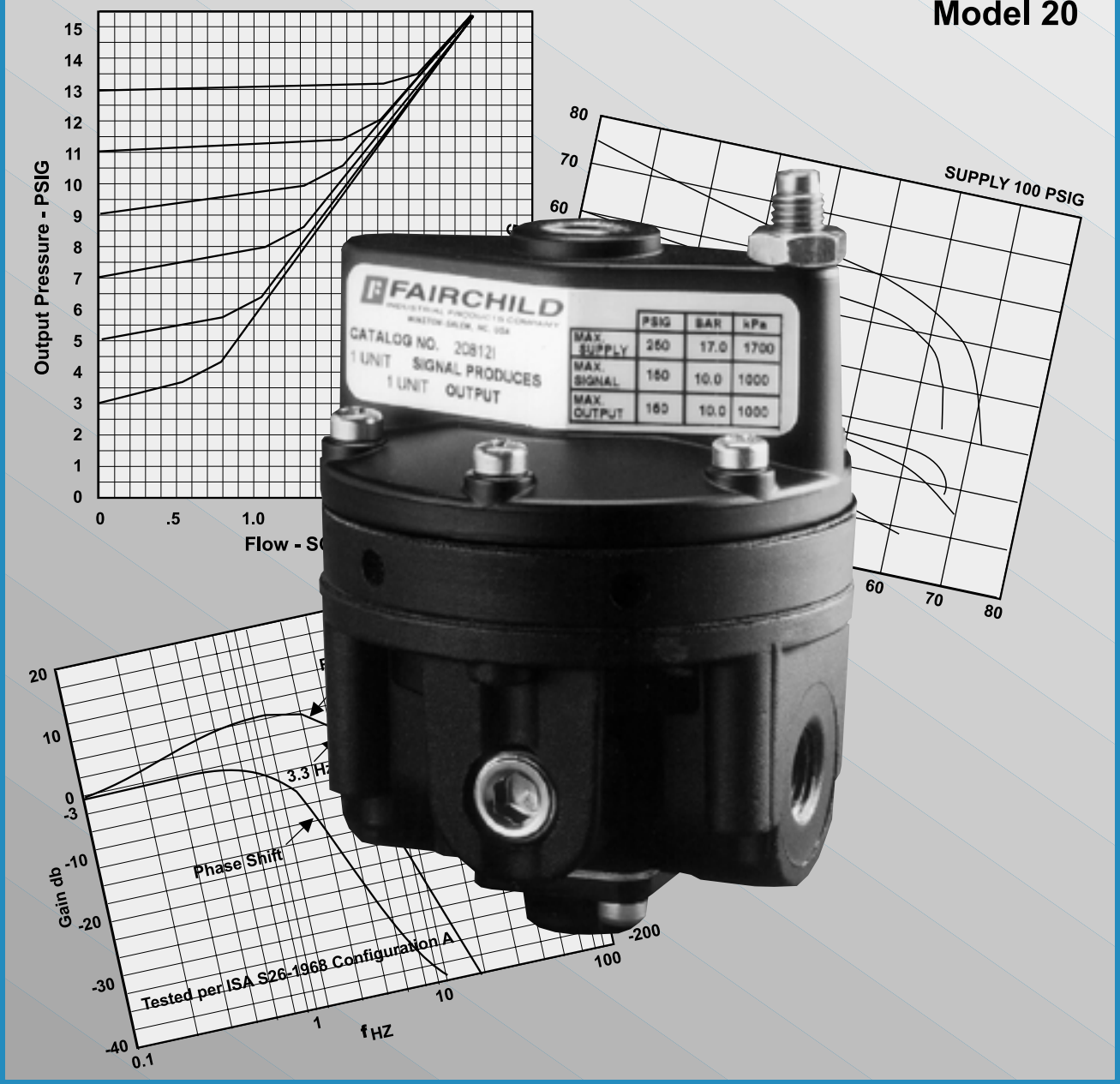
FAIRCHILD

PNEUMATIC HIGH CAPACITY VOLUME BOOSTER

Model 20



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GENERAL INFORMATION

Model 20 Pneumatic High Capacity Volume Booster

APPLICATIONS

The Model 20 Pneumatic High Capacity Volume Booster uses a pneumatic input signal to accurately control output pressure.

The Model 20 Booster is ideal for systems requiring the conversion of a low flow control signal to the higher flow requirements of an operating system.

The Model 20 Booster can be used in a variety of applications including: Volume Amplification, Web Tension, and Clutch and Brake Control Systems.

FEATURES

Performance

- Balanced Supply Valve minimizes the effects of supply pressure variation.
- Aspirator Tube minimizes downstream pressure droop under flowing conditions.
- Optional Adjustable By-Pass Needle Valve permits tuning for optimum dynamic response (1:1 Ratio Only).
- Optional Fixed Negative Bias allows operation with pneumatic devices that cannot be adjusted to zero input pressure.

Functional

- Ten Signal to Output Ratios meet most control element requirements.

Physical

- A Separate Control Chamber isolates the diaphragm from the main flow, eliminating hunting and buzzing.
- Construction with Standard Removable Components allows in-line servicing.
- Mounting Bracket available.

OUTLINE DIMENSIONS

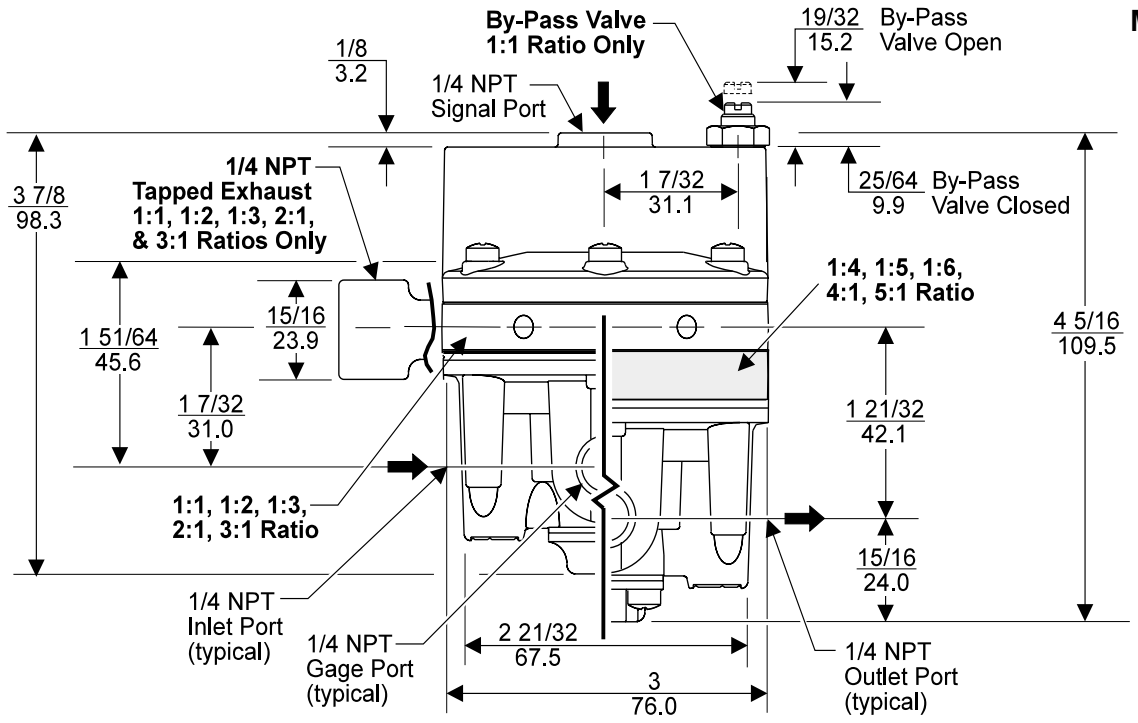

Figure 1. *Outline Dimensions*

SPECIFICATIONS

FUNCTIONAL SPECIFICATIONS

Ratio		1:1	1:2	1:3	1:4	1:5	1:6	2:1	3:1	4:1	5:1
Maximum Output Pressure	**psig [BAR] (kPa)**	150 [10.0] (1000)	150 [10.0] (1000)	150 [10.0] (1000)	150 [10.0] (1000)	150 [10.0] (1000)	150 [10.0] (1000)	75 [5.0] (500)	50 [3.5] (350)	37.5 [2.6] (260)	30 [2.0] (200)
Maximum Supply Pressure	**psig [BAR] (kPa)**	250 [17.0] (1700)	250 [17.0] (1700)	250 [17.0] (1700)	250 [17.0] (1700)	250 [17.0] (1700)	250 [17.0] (1700)	250 [17.0] (1700)	250 [17.0] (1700)	250 [17.0] (1700)	250 [17.0] (1700)
Flow Capacity SCFM, (m^3/HR) 100 psig, [7.0 BAR], (700kPa) supply, 20 psig, [1.5 BAR], (150 kPa) output.		45 (76.5)	45 (76.5)	45 (76.5)	45 (76.5)	45 (76.5)	45 (76.5)	45 (76.5)	45 (76.5)	45 (76.5)	45 (76.5)
Exhaust Capacity SCFM, (m^3/HR) Downstream Pressure 5 psig, [.35 BAR], (35 kPa) above output pressure set point of 20 psig, [1.5 BAR], (150 kPa).		11 (18.7)	11 (18.7)	11 (18.7)	7.5 (12.8)	7.5 (12.8)	7.5 (12.8)	11 (18.7)	11 (18.7)	7.5 (12.8)	7.5 (12.8)

MOUNTING BRACKET

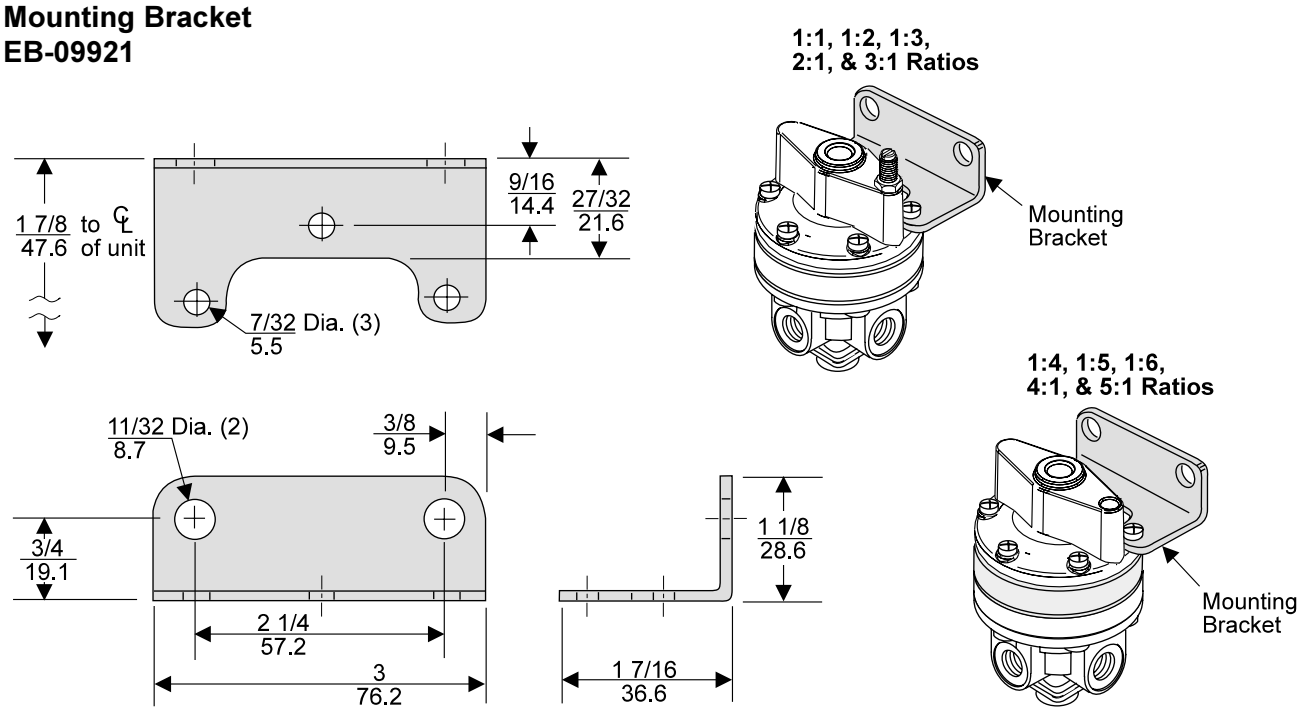

Figure 2. *Mounting Bracket EB-09921 shown with Model 20 Booster.* ***(Sold Separately)***

SPECIFICATIONS

PERFORMANCE SPECIFICATIONS

Ratio	1:1	1:2	1:3	1:4	1:5	1:6	2:1	3:1	4:1	5:1
Sensitivity (water column)	1/4" (.64 cm)	1/2" (1.27 cm)	3/4" (1.9 cm)	1" (2.54 cm)	1 1/4" (3.18 cm)	1 1/2" (3.8 cm)	1/2" (1.27 cm)	1/2" (1.27 cm)	3/4" (1.9 cm)	3/4" (1.9 cm)
Ratio Accuracy										
% of 100 psig, [7.0 BAR], (700kPa) output span.	1.0	1.0	1.0	2.0	2.0	2.0				
% of output span with 100 psig, [7.0 BAR], (700kPa) input span.							2.0	2.0	2.0	2.0
Supply Pressure Effect for change of 100 psig, [7.0 BAR], (700kPa). **psig [BAR] (kPa)**	0.10 [.007] (0.7)	0.20 [.014] (1.4)	0.30 [.021] (2.1)	0.40 [.028] (2.8)	0.50 [.030] (3.0)	0.60 [.040] (4.0)	0.10 [.007] (0.7)	0.10 [.007] (0.7)	0.10 [.007] (0.7)	0.10 [.007] (0.7)
Ambient Temperature **°F**	-40 to 200	-40 to 200	-40 to 200	-40 to 200	-40 to 200	-40 to 200	-40 to 200	-40 to 200	-40 to 200	-40 to 200
(°C)	(-40 to 93.3)	(-40 to 93.3)	(-40 to 93.3)	(-40 to 93.3)	(-40 to 93.3)	(-40 to 93.3)	(-40 to 93.3)	(-40 to 93.3)	(-40 to 93.3)	(-40 to 93.3)

Materials of Construction

Body & Housing	Aluminum
Trim	Zinc Plated Steel, Brass
Diaphragm	Nitrile on Dacron Fabric

CROSS SECTION

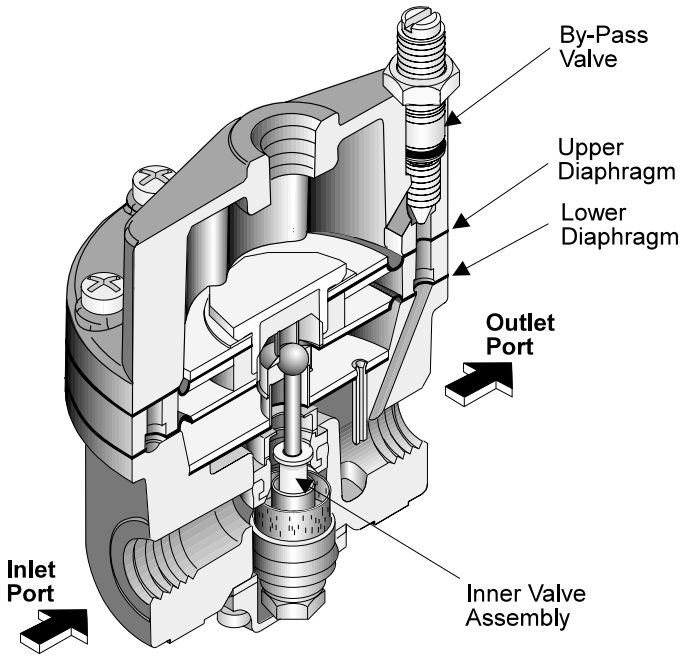

Figure 3. *Model 20 Detail Drawing.*

OPERATING PRINCIPLES

The Model 20 Booster is a pneumatic device capable of high flow and exhaust capacity. This device uses a force balance system to control the movement of the supply and exhaust valves.

At set point, the force due to signal pressure acting on the top of the Upper Diaphragm is balanced by the force due to output pressure acting on the underside of the Lower Diaphragm. For more information, see Figure 3. "Model 20 Detail Drawing" above.

INSTALLATION

For Installation Instructions refer to *Model 20 High Capacity Volume Booster IOM,* **IS-20000020.**

ORDERING INFORMATION

Catalog Number **208** ☐ ☐ ☐

Ratio

1:1	(1)
1:2	(2)
1:3	(3)
2:1	(4)
3:1	(5)
1:4	(6)
4:1	(7)
1:5	(8)
5:1	(9)
1:6	(10)

Pipe Size

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

Options

Tapped Exhaust [1]	(E)
Silicone Diaphragm & Seat Ring [2]	(A)
Viton Diaphragm & Seat Ring [3]	(J)
Negative Bias [1, 4]	(Y)
Non-Relieving [1]	(N)
By-Pass Valve [5]	(I)
BSPT (Tapered)	(U)
BSPP (Parallel) [6]	(H)

[1] *For 1:1, 1:2, 1:3, 2:1, & 3:1 Ratios Only.*
[2] *Maximim Supply Pressure - 75 psig,[5.0 BAR],(500 kPa) For 1:1 Ratio Only.*
[3] *For 1:1, 1:2, & 2:1 Ratios Only*
[4] *Negative Bias Fixed at 3.5 psig ± 0.5 psig.*
[5] *Not Available with Y Option. For 1:1 Ratio Only.*
[6] *BSPP Threads in Inlet & Outlet Ports Only. Others BSPT.*

TYPICAL APPLICATION

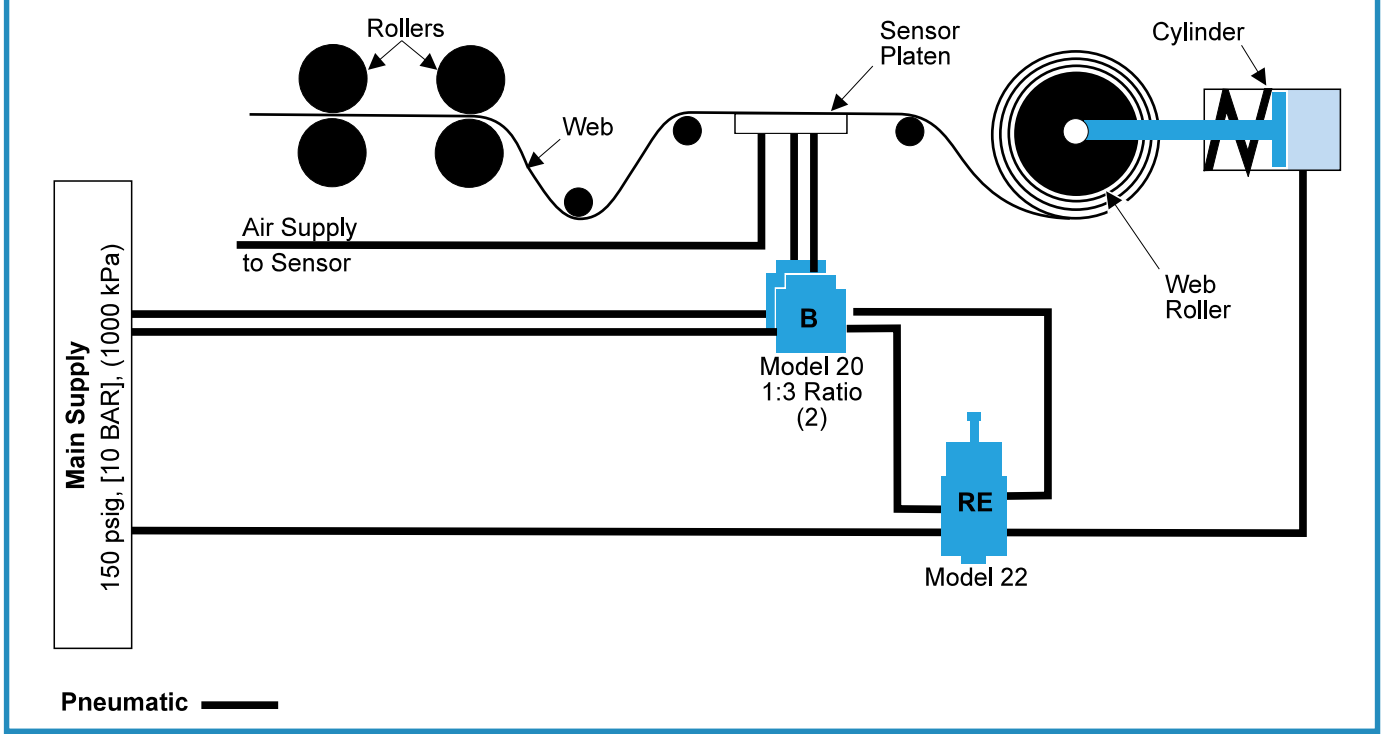

Figure 4. *Web Guide Application for the Model 20 Booster.*

TYPICAL APPLICATIONS

The Model 20 Booster is used to sense the position of the Web and keep it running correctly on the Rollers. A Spring Return Cylinder is connected to the output of the Model 22 Pneumatic Relay. The Cylinder is attached to the Web Roller and can move it laterally to center the Web

The Model 20 Boosters are located below a Sensor Platen which is connected to an Air Supply. The Sensor Platen supplies air to the inputs of the Model 20 Boosters. The outputs of the Model 20 Boosters are connected to the input ports of a Model 22 Relay.

If the Web moves off center, signal air input to one of the Model 20 Boosters will be reduced. The computing relay, Model 22, will sense the difference in the outputs of the Model 20 Boosters and will transmit a signal to the Cylinder to move the Web Roller in a direction to center the Web over the Sensor Platen.

For more information, see Figure 4. “Web Guide Application for the Model 20 Booster” above.

ISO 9002 Certified

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