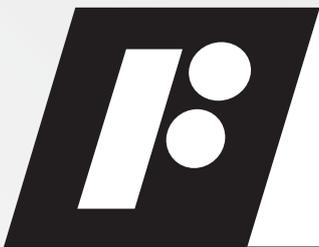


C

SECTION C



***PNEUMATIC
VOLUME BOOSTERS***

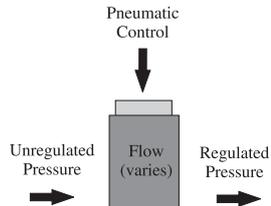
PRODUCT MATRIX

Pneumatic Volume Boosters

A pneumatic air volume booster reproduce a low flow control signal with a higher regulated flow output pressure. It uses an unregulated input pressure to maintain a regulated output pressure under flowing and non-flowing conditions.

Fairchild volume boosters meet all the requirements of a precision device including:

- Accuracy
- Sensitivity
- Fast response
- Stability
- Drift-free settings
- Low output droop
- Supply pressure immunity
- High forward and exhaust flow capacity



The regulated output of a pneumatic air volume booster can be any of the following:

- A direct reproduction of the pneumatic control signal
- A multiple of the pneumatic control signal
- A fraction of the pneumatic control signal

Our large selection of pressure ranges and flow capacities let you select the models that meet your needs for instrument or general industrial control applications.



	20 Precision Booster	200 High Flow Booster	200XLR High Forward & Exhaust Flow Booster	2000 No Bleed Design Booster	4500A High Flow No Bleed Design Booster
Flow Capacity: SCFM (m ³ /HR) Supply =100 psig	45 (76.5)	1500 (2550)	1500 (2550)	40 (68)	150 (255)
Exhaust Capacity: SCFM (m ³ /HR) Downstream pressure 5 psig above 20 psig set point	7.5 to 11 (12.8 and 18.7) Varies with ratio	65 (110.5)	325 (552.5)	16 (27.2)	40 (65.2)
Sensitivity: Inch/WC (cm)	.25 to 1.50 (.64 to 3.8) Varies with ratio	1.0 (2.54)	1.0 (2.54)	<1.0 (2.54)	1.0 to 3.0 (2.54 to 7.62) Varies with ratio
Supply Pressure Var: PSIG (kPa) For Supply Pressure Change = 100 psig	0.1 to 0.60 (0.7 to 4.0) Varies with ratio	<0.5 (<3.5)	<0.5 (<3.5)	<0.1 (<0.7)	<0.1 to 0.3 (0.7 to 2.1) Varies with ratio
Supply Pressure (Max): PSIG (kPa)	250 (1700)	250 (1700)	250 (1700)	250 (1700)	250 (1700)
Max Signal/Output Pressure: PSIG (kPa)	Varies (see Catalog)	150 (1000)	150 (1000)	150 (1000)	Varies (see Catalog)
Dimensions (Approx): Inches (mm)	Dia. 3 H 4 1/4 (Dia. 76 H 114)	Dia. 5 1/2 H 7 7/8 (Dia. 140 H 200)	9 1/2 x 5 1/2 x 9 3/4 (241 x 140 x 248)	2 x 2 x 3 1/4 (54 x 54 x 83)	Dia. 4 1/2 5 1/4 (Dia. 114 H 133)
Ratio Available	1:1, 1:2, 1:3, 2:1, 3:1 1:4, 4:1, 1:5, 5:1, 1:6	1:1	1:1	1:1, 1:1.6	1:1, 1:2, 1:3, 2:1, 3:1
Pipe Size	1/4", 3/8"	1", 1 1/2"	1 1/2"	1/4" 3/8"	3/8" 1/2" 3/4"

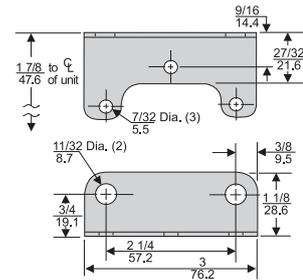
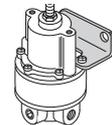
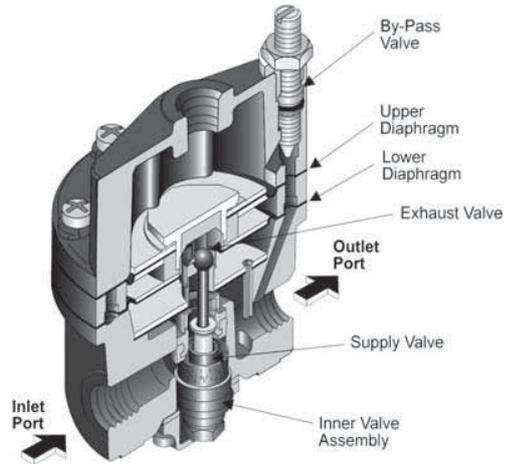
Model 20 Pneumatic Precision Booster



C
Model
20

Features

- The Model 20 Pneumatic High Capacity Volume Booster uses a pneumatic input signal to accurately control output pressure
- A balanced Supply Valve minimizes the effects of supply pressure variation
- Aspirator Tube compensates downstream pressure drop under flowing conditions
- Optional Adjustable By-Pass Needle Valve option includes bubble tight exhaust valve allows tuning for optimum dynamic response (1:1 ratio only) and cycle free operation with valve positioners
- Optional Fixed Negative Bias for pneumatic signal devices that cannot be adjusted to zero signal pressure
- A separate Control Chamber isolates the diaphragm from the main flow to eliminate hunting and buzzing
- Unit construction allows servicing without removal
- Mounting Bracket available
- Canadian Registration Number (CRN) Certification for all territories and provinces

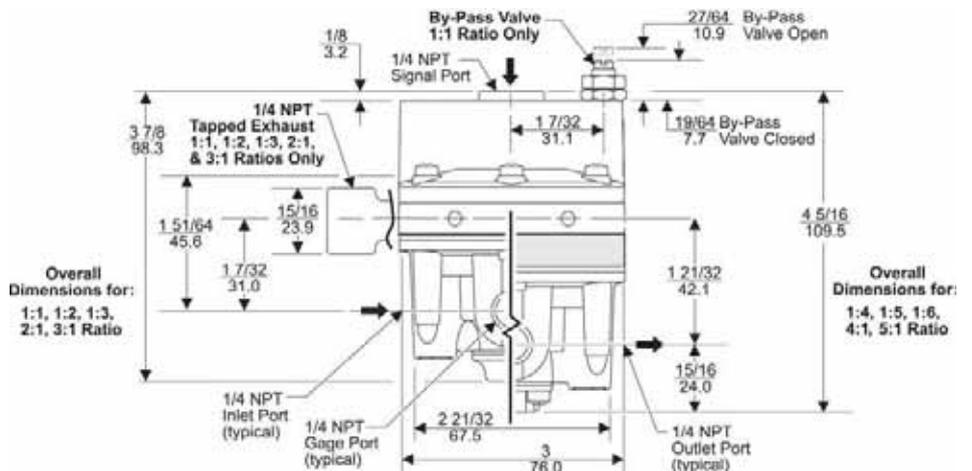


Operating Principles

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.

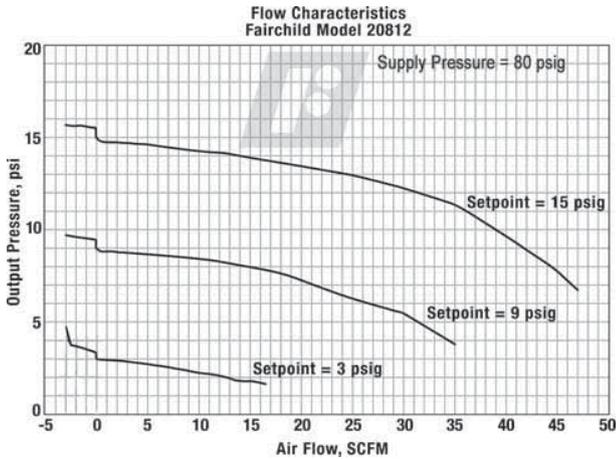
At set point, the force due to signal pressure that acts on the top of the Upper Diaphragm balances with the force due to output pressure acting on the bottom of the Lower Diaphragm.

Model 20 Mounting Bracket Kit
P/N 09921 (Zinc Plated Steel)
(sold separately)



Model 20 Pneumatic Precision Booster

Technical Information



Installation

For installation instructions, refer to the *Fairchild Model 20 High Capacity Volume Booster Installation, Operation and Maintenance Instructions*, IS-20000020.

¹ For 1:1, 1:2 & 2:1 Ratios Only.

² Maximum Supply Pressure – 75 psig, [5.0 BAR], (500 kPa). For 1:1 Ratio Only.

³ Negative Bias Fixed at 3.5 psig + 0.5 psig.

⁴ Not Available with Y Option. For 1:1 Ratio Only.

⁵ BSPP Threads in Inlet, Outlet, Bonnet & Exhaust Ports Only. Others BSPT.

Specifications

Ratio		SIGNAL:OUTPUT									
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)		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)		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)
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		1.0	1.0	1.0	2.0	2.0	2.0	-	-	-	-
	% of 100 psig, [7.0 BAR], (700 kPa) output span	-	-	-	-	-	-	2.0	2.0	2.0	2.0
	% of output span with 100 psig[7.0 BAR], (700 kPa) input span	-	-	-	-	-	-	2.0	2.0	2.0	2.0
Supply Pressure Effect	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 [.034] (3.4)	0.60 [.041] (4.1)	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									
Hazardous Locations		Acceptable for use in Zones 1 and 2 for gas atmosphere; Groups IIA and IIB and Zones 21 and 22 for dust atmospheres									

Catalog 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

Silicone Elastomers ²	A
Tapped Exhaust ¹	E
BSPP (Parallel) ⁵	H
By-Pass Valve ⁴	I
Viton Elastomers	J
Non-Relieving ¹	N
BSPT (Tapered)	U
Negative Bias ^{1,3}	Y



Model 200 Pneumatic Volume Booster



C

Model 200

The Model 200 Pneumatic Volume Booster reproduces a pneumatic signal in a 1:1 ratio. It is ideally suited for systems that require input isolation or increased forward flow capacity.

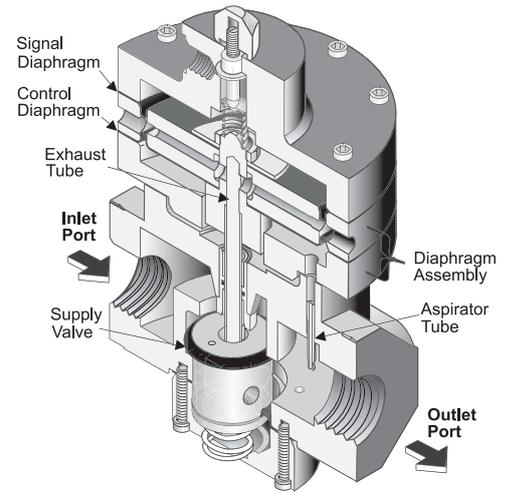
Features

- Control sensitivity to 1" water column variation.
- Large Supply and Exhaust Valves provide high forward and exhaust flows.
- A balanced Supply Valve minimizes the effect of supply pressure variation.
- An Aspirator Tube minimizes downstream pressure droop under flow conditions.
- A separate Control Chamber isolates the diaphragm from the main flow to eliminate hunting and buzzing.
- Optional Increased Sensitivity configuration with larger Control Diaphragm for more precision control at low setpoints.
- Unit construction lets you service the Model 200 without removing it from the line.
- Mounting Bracket is available

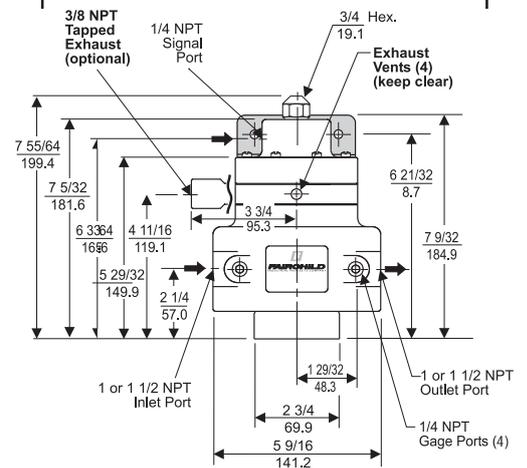
Operating Principles

When signal pressure on the top of the Signal Diaphragm creates a downward force on the Diaphragm Assembly, the Supply Valve opens. Output pressure flows through the Outlet Port and the Aspirator Tube to the Control Chamber to create an upward force on the bottom of the Control Diaphragm. When the setpoint is reached, the downward force of the signal pressure that acts on the top of the Signal Diaphragm balances with the upward force of the output pressure that acts on the bottom of the Control Diaphragm.

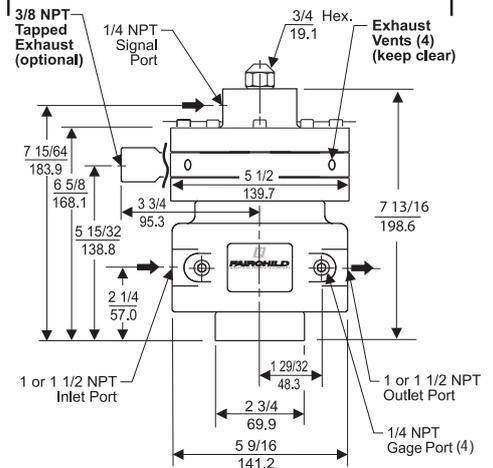
When the output pressure increases above the signal pressure, the Diaphragm Assembly moves upward to close the Supply Valve and open the Exhaust Valve. Excess output pressure exhausts through the Vents in the side of the unit until it reaches the setpoint.



Model 200 Standard Unit



Model 200 with Increased Sensitivity Option (L)



Model 200XLR Pneumatic Volume Booster



C
Model
200
XLR

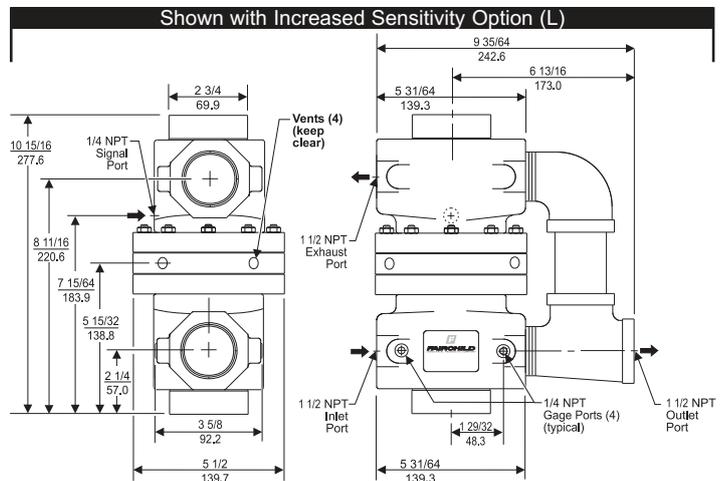
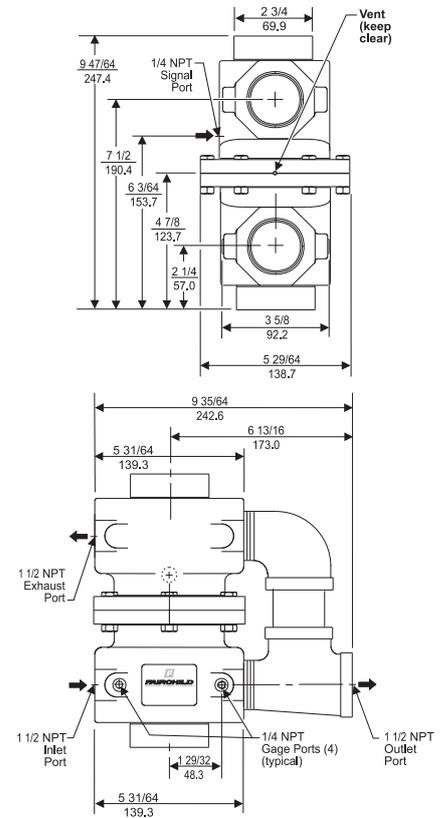
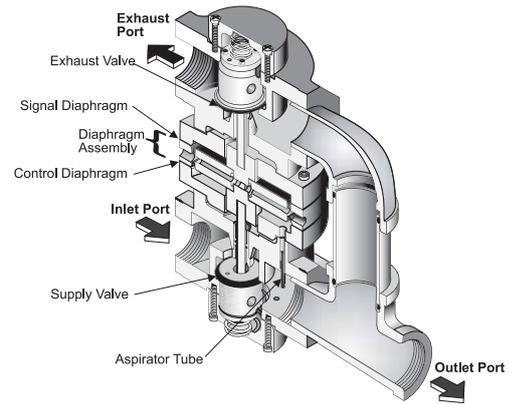
Features

- The 200XLR Pneumatic Volume Booster produces a pneumatic signal in a 1:1 ratio, ideally suited for input isolation systems.
- Control sensitivity to 1" water column variation (Increased Sensitivity ("L") option for more precision control at low setpoints.)
- Large supply and Exhaust Valves provide high forward and exhaust flows
- An Aspirator Tube minimizes downstream pressure drop under flow conditions.
- Separate Control Chamber isolates the diaphragm from the main flow to eliminate hunting and buzzing
- Optional Adjustable By-Pass Needle Valve includes bubble tight exhaust valve allows tuning for optimum dynamic response and cycle free operation with valve positioners

Operating Principles

When signal pressure on the top of the signal Diaphragm creates a downward force on the Diaphragm Assembly, the Supply Valve opens. Output pressure flows through the Outlet Port and the Aspirator Tube to the Control Chamber to create an upward force on the bottom of the Control Diaphragm. When the setpoint is reached, the downward force of the signal pressure that acts on the top of the Signal Diaphragm balances with the upward force of the output pressure that acts on the bottom of the Control Diaphragm.

When the output pressure increases above the signal pressure, the Diaphragm Assembly moves upward to close the Supply Valve and open the Exhaust Valve. Excess output pressure exhausts through the Exhaust Port until it reaches the setpoint.



Model 200XLR Pneumatic Volume Booster

Specifications

Flow Capacity (SCFM)

In excess of 1500 (2550 m³/hr) @ 100 psig, [7.0 BAR], (700 kPa) supply and 20 psig, [1.5 BAR], (1500 kPa) setpoint

Exhaust Capacity (SCFM)

325 (552.5 m³/hr) where downstream pressure is 5 psig, [.35 BAR], (35 kPa) above 20 psig, [1.5 BAR], (150 kPa) setpoint

Supply Pressure

250 psig, [17.0 BAR], (1700 kPa) Maximum

Supply Pressure Effect

Less than 0.5 psig, [.03 BAR], (3.4 kPa) for 100 psig, [7.0 BAR], (700 kPa) change in supply pressure

Signal or Output Pressure

150 psig, [10.0 BAR], (1000 kPa) Maximum

Sensitivity

1" (2.54 cm) Water Column

Ambient Temperature

-40°F to +200° F, (-40°C to +93° C)

Materials of Construction

Body and Housing Die Cast Aluminum
 Trim Stainless Steel, Brass, Aluminum,
 and Zinc Plated Steel
 Diaphragms Nitrile on Dacron

Catalog Information

Catalog Number 2001 **XLR**

Pipe Size
 1 1/2" NPT. 12

Options

By Pass Valve I
 Fluorocarbon (Viton) Elastomers J
 Increased Sensitivity L

(for more precision control at low setpoints)

Installation

For installation instructions, refer to the *Fairchild Model 200XLR Pneumatic Volume Booster Installation, Operation and Maintenance Instructions, IS-20200XLR.*



**Model
200
XLR**

Model 2000 Pneumatic Volume Booster



C

Model 2000

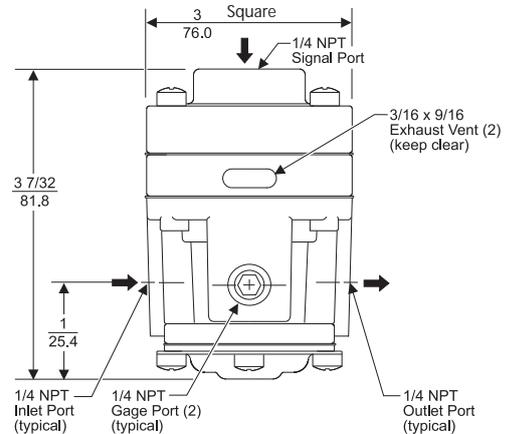
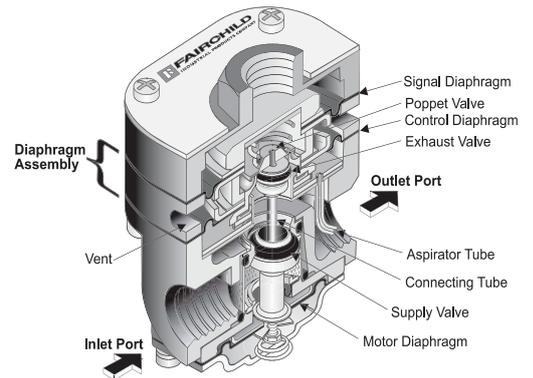
Features

- The Model 2000 Pneumatic Volume Booster converts a low flow signal to a high flow output. It is ideally suited for a variety of applications including the operation of air systems that require rapid valve or cylinder action.
- A balanced Supply Valve minimizes the effect of supply pressure variation.
- An Aspirator Tube minimizes downstream pressure drop under flow conditions.
- Large Supply and Exhaust Valves provide high forward and exhaust flows.
- Soft Supply and Exhaust Valve Seats minimize air consumption.
- Small signal volume assures rapid response to pressure variation.
- A separate Control Chamber isolates the Diaphragm from the main flow to eliminate hunting and buzzing.
- Unit construction lets you service the unit without removing it from the line.

Operating Principles

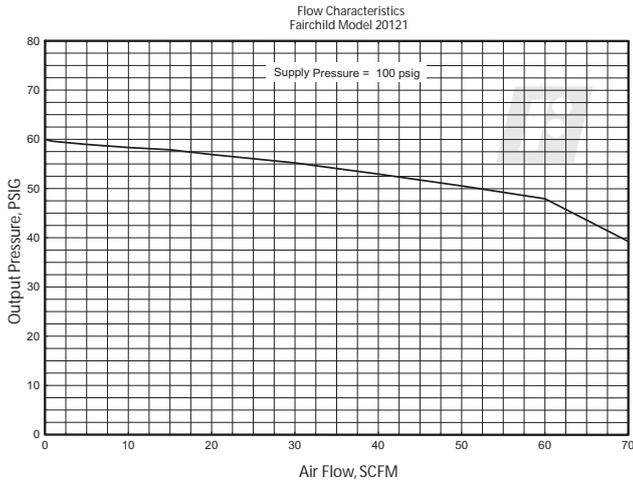
When signal pressure on the top of the Signal Diaphragm creates a downward force on the Diaphragm Assembly, the Supply Valve opens. Output pressure flows through the Outlet Port and the Aspirator Tube to the Control Chamber to create an upward force on the bottom of the Control Diaphragm. When the setpoint is reached, the force of the signal pressure that acts on the top of the Signal Diaphragm balances 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 signal pressure, 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 Connecting 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.



Model 2000 Pneumatic Volume Booster

Technical Information



Specifications

Maximum Supply Pressure

250 psig, [17.0 BAR], (1700 kPa)

Flow Capacity (SCFM)

40 (68 m³/HR) @ 100 psig, [7.0 BAR], (700 kPa) supply & 20 psig, [1.5 BAR], (150 kPa) setpoint

Exhaust Capacity (SCFM)

16 (27.2 m³/HR) where downstream pressure is 5 psig, [.35 BAR], (35 kPa) above 20 psig, 1.5 BAR], (150 kPa) setpoint

Maximum Signal or Output Pressure

150 psig, [10.0 BAR], (1000 kPa)

Supply Pressure Effect

Less than 0.1 psig, [.007 BAR], (.7 kPa) for 100 psig, [7.0 BAR], (700 kPa) change in supply pressure

Sensitivity

Less than 1" (2.54 cm) Water Column

Ambient Temperature

-40° F to +200°F, (-40° C to +93° C)

Materials of Construction

Body and HousingZinc
DiaphragmsNitrile on Dacron

Catalog Information

Catalog Number

2 0

Ratio

1:1 1
1:1.6 0

Pipe Size

1/4" 2
3/8" 3

Option

BSPT (Tapered) U

Installation

For installation instructions, refer to the *Fairchild Model 2000 Pneumatic Volume Booster Installation, Operation and Maintenance Instructions*, IS-20002000.



Model 4500A Pneumatic Volume Booster



C
Model
4500A

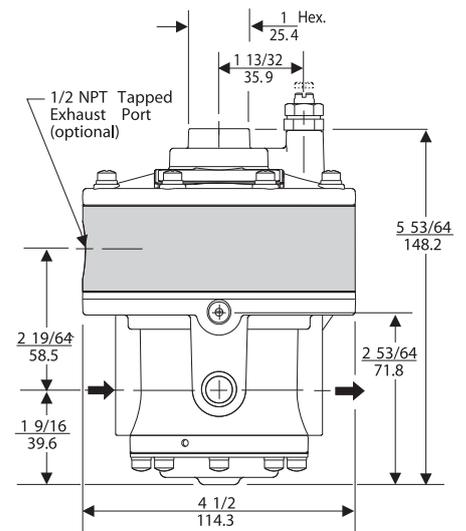
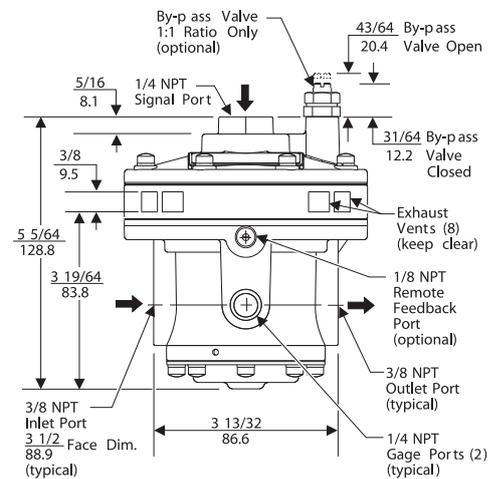
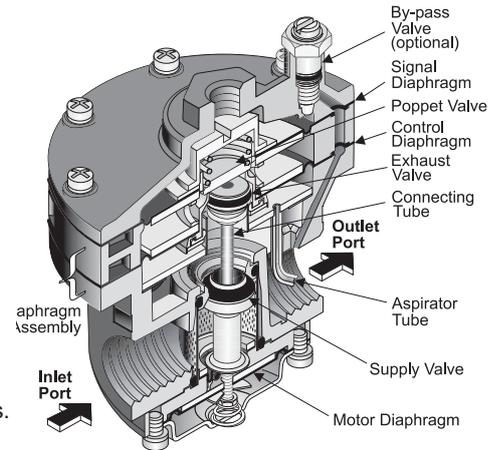
Features

- Five signal to output ratios meet most control element requirements.
- 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 down stream pressure droop under flow conditions.
- A separate Control Chamber isolates the diaphragm from the main flow to eliminate hunting and buzzing.
- Optional remote feedback port minimizes pressure drop at final control element under flow conditions.
- Optional Adjustable By-Pass Needle Valve option includes bubble tight exhaust valve allows tuning for optimum dynamic response (1:1 ratio only) and cycle free operation with valve positioners
- Unit construction lets you service the Model 4500A without removing it from the line.
- Canadian Registration Number (CRN) certification for all territories and provinces.

Operating Principles

When signal pressure on the top of the Signal Diaphragm creates a downward force on the Diaphragm Assembly, the Supply Valve opens. Output pressure flows through the Outlet Port and the Aspirator Tube to the Control Chamber to create an upward force on the bottom of the Control Diaphragm. When the setpoint is reached, the force of the signal pressure that acts on the top of the Signal Diaphragm balances with the force of the output pressure that acts on the bottom of the Control Diaphragm to close the Supply Valve.

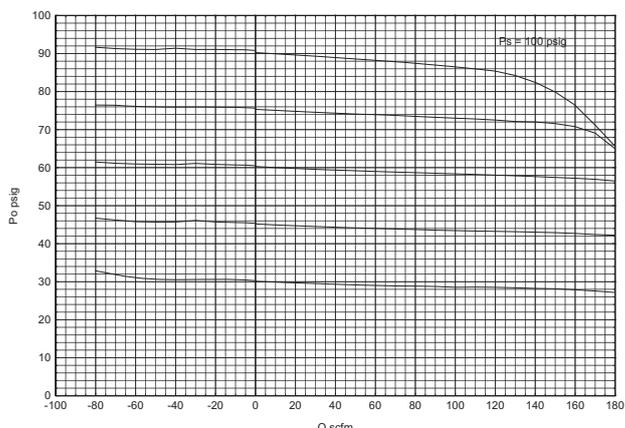
When the output pressure increases above the signal pressure, the Diaphragm Assembly moves upward to close the Supply Valve and open the Exhaust Valve. Because the Poppet Valve is closed, pressure flows down the Connecting Tube to the bottom of the Motor Diaphragm. This pressure keeps the Supply Valve 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.



Model 4500A Pneumatic Volume Booster

Technical Information

Forward & Exhaust Flow Characteristics
Fairchild Model 4514A



Specifications

	RATIO	1:1	1:2	1:3	2:1	3:1
Maximum Output Pressure	psig [BAR] (kPa)	150 [10.0] (1000)	150 [10.0] (1000)	150 [10.0] (1000)	75 [5.0] (500)	50 [3.5] (350)
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)
Flow Capacity 100 psig, [7.0 BAR], (700 kPa) supply, 20 psig, [1.5 BAR], (150 kPa) setpoint.	SCFM m ³ /HR	150 (255)	150 (255)	150 (255)	150 (255)	150 (255)
Exhaust Capacity Downstream Pressure 5 psig, [.35 BAR], (35 kPa) above 20 psig, [1.5 BAR], (150 kPa) setpoint.	SCFM m ³ /HR	40 (65.2)	40 (65.2)	40 (65.2)	40 (65.2)	40 (65.2)
Setpoint Water Column	(cm)	1" (2.54)	2" (5.08)	3" (7.62)	2" (5.08)	2" (5.08)
Ratio Accuracy % of 100 psig, [7.0 BAR], (700 kPa) output span.		3.0	3.0	3.0		
Supply Pressure Effect % of output span with 100 psig, [7.0 BAR], (700 kPa) input span					3.0	3.0
Supply Pressure Effect	psig [BAR] (kPa)	0.10 [.007] (0.7)	0.20 [.014] (1.4)	0.30 [.021] (2.1)	0.10 [.007] (0.7)	0.10 [.007] (0.7)

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

Hazardous Locations
Acceptable for use in Zones 1 and 2 for gas atmosphere; Groups IIA and IIB and Zones 21 and 22 for dust atmospheres

Materials of Construction
Body and Housing Aluminum
Trim Zinc Plated Steel, Brass
Diaphragm Nitrile on Dacron

Catalog Information

Catalog Number 4 5 A

Ratio
1:1 1
1:2 2
1:3 3
2:1 4
3:1 5

Pipe Size
3/8" NPT 3
1/2" NPT 4
3/4" NPT 6

Options
Tapped Exhaust E
By-pass Valve ¹ I
Feedback P
BSPT (Tapered) U
BSPP (Parallel) ² H
Viton Elastomers ³ J

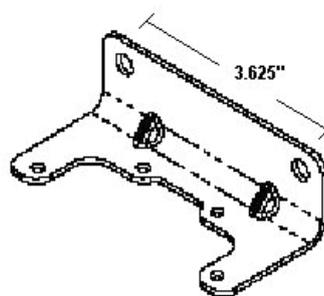
¹ For 1:1 Ratio Only

² BSPP Threads in Inlet, Outlet, Exhaust & Bonnet Ports Only. Others BSPT

³ Available on 1:1, 1:2 and 2:1 Only

Installation

For installations instructions, refer to the corresponding Fairchild Model 4500A Pneumatic Volume Booster Instruction, Operation and Maintenance Instructions, IS-2004500A.



Model 4500A Mounting Bracket Kit
P/N 20555-1 zinc plated (sold separately)



