

FAIRCHILD MODEL 4890A PNEUMATIC VOLUME BOOSTER

Installation, Operation and Maintenance Instructions

Introduction

The Fairchild Model 4890A volume booster is specifically designed to be used in conjunction with valve positioners on large control valve actuators to provide faster response than possible with the valve positioner alone. Deadband within the operation of the volume booster allows the positioner to make small incremental valve position changes in a highly stable manner without activating the volume booster valves. The integral bypass valve provides a means to control the response of the booster to match variations in valve positioner and actuator sizes.

The Model 4890A volume booster is a rugged precision instrument with key features providing reliable, efficient and stable operation. These include:

Features

- Fixed deadband between the operation of the supply valve and exhaust valve providing accurate and stable final positioning of the valve.
- Integral bypass needle valve to optimize response time and stability.
- Soft seat supply and exhaust valves provide efficient leak free operation and prevents hunting when used with modern electronic feed & bleed type positioners
- Pressure balanced supply valve maintains deadband specification preventing changes in control characteristics when supply pressure changes.
- Damped diaphragm control chamber protects valves from damaging oscillation under high flow conditions.
- Two accessory ports connected to the outlet chamber provide convenient access to the outlet for additional control accessories and pressure monitoring.
- Tapped exhaust port for collecting exhaust air or for incorporation of a silencer.

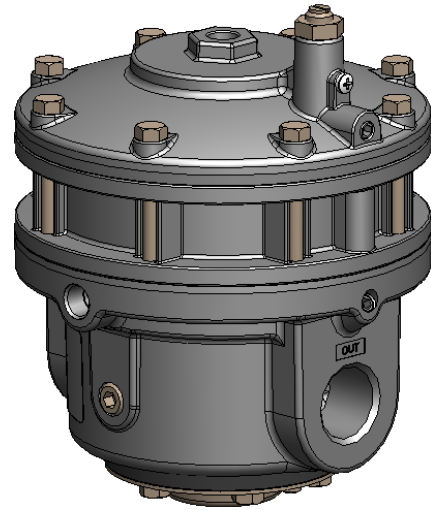


Table 1. Specifications & Limits

| | |
|----------------------------|---|
| Maximum Supply Pressure | 250 psig 17 Bar 1700 kPa |
| Maximum Signal Pressure | 150 psig 10 Bar 1000 kPa |
| Ambient Temperature Limits | -40 to 180°F -40 to 80°C |
| Nominal Deadband | 1.5 psig 0.1 bar 10 kPa |
| Connection Sizes | Signal - 1/4" Inlet & Outlet - 3/4", or 1" Exhaust - 3/4" Accessory - 1/4" |
| Connection Thread | NPT, BSPT or BSPP |
| Maximum Cv 4890A | Supply Valve - 9.0 Exhaust Valve - 9.0 Bypass Valve - 0.75 |
| Weight | 9.5 lb. 4.3 Kg |

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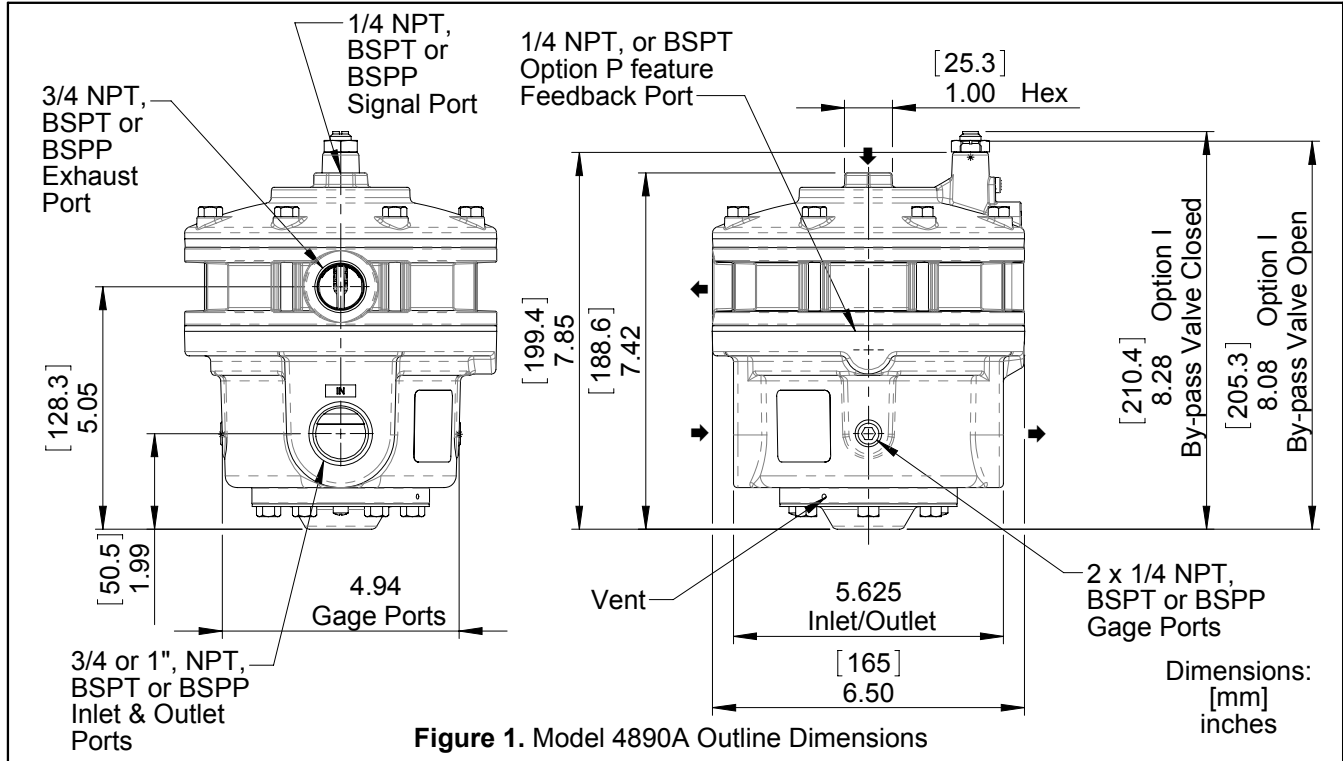


Table 2. Material of Construction

| | |
|-------------------------|--|
| Body | Die Cast Aluminum |
| Supply & Exhaust Valves | Aluminum/Nitrile Aluminum/Fluorocarbon (Optional) |
| Seal Plate | Zinc Plated Steel |
| Bypass Valve | Stainless Steel |
| Seats | Aluminum |
| Diaphragms | Nitrile on Polyester Fluorocarbon on Polyester (Optional) |
| Seals | Nitrile Fluorocarbon (Optional) |
| Springs | Stainless Steel |
| Fasteners | Zinc Plated Steel Stainless Steel (Optional) |
| External Finish | Polyester Powder Coating |

Installation

You can mount the booster in any position without affecting its operation.

Clean all pipelines to remove dirt and scale before installation.

Apply a minimum amount of pipe compound to the male threads of the fitting only. **Do Not use Teflon tape as a sealant.** Start with the third thread back and work away from the end of the fitting to avoid contaminating the booster. Install the booster in the air line.

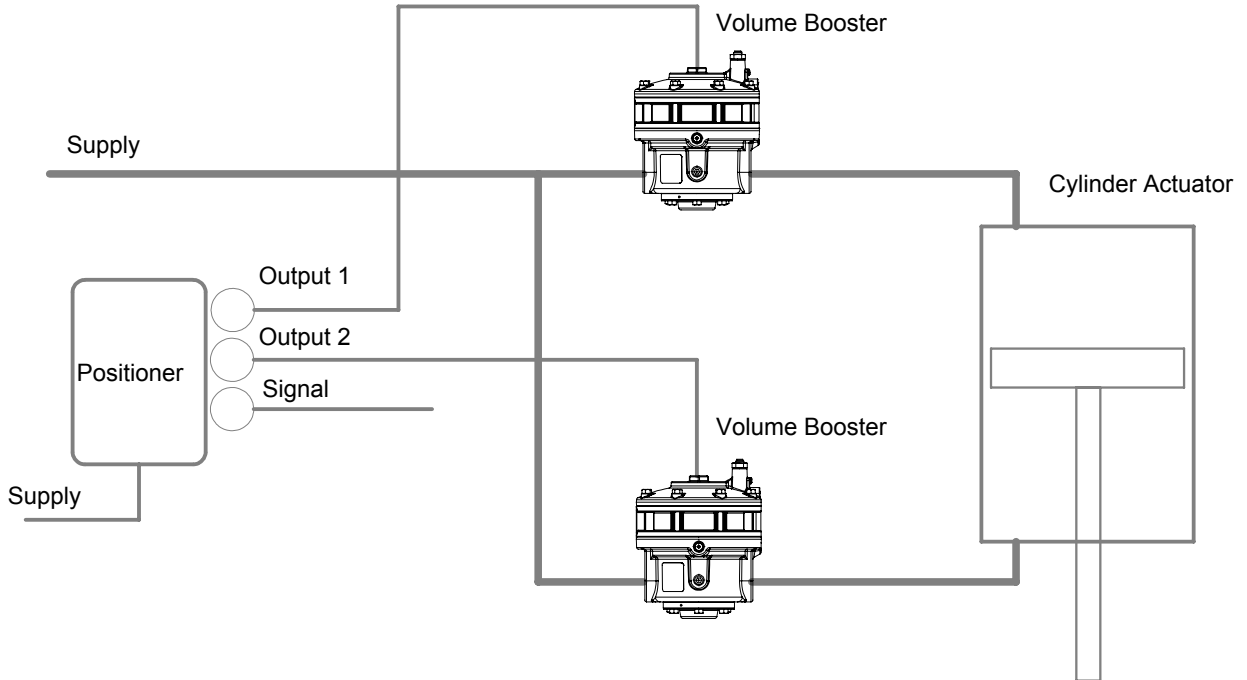
The Inlet and Outlet are labeled "IN" and "OUT". Tighten all connections securely. Avoid undersized fittings that will limit the flow through the booster. For more information, see Figure 1.

CAUTION - Exhaust Port Restriction

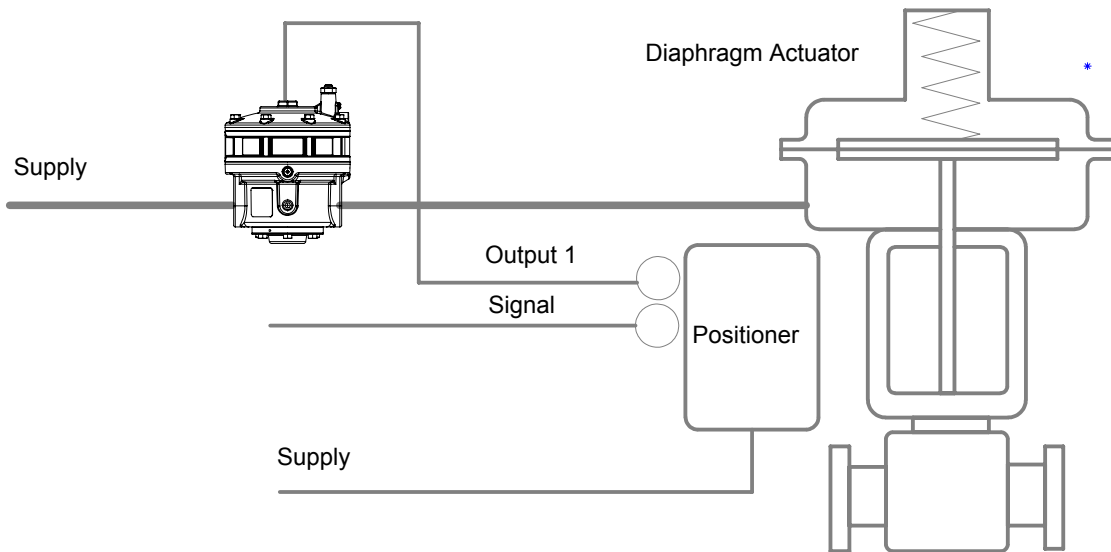
Excessive exhaust restriction can damage the diaphragms and valves within the volume booster. High flow capacity exhaust silencers and full size exhaust piping must be used to limit back pressure during the exhaust cycle operation.

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**Figure 2 Typical Volume Booster with
Double Acting Positioner and Cylinder Actuator**



**Figure 3 Typical Volume Booster with
Single Acting Positioner and Diaphragm Actuator**

MAINTENANCE

WARNING Shutting off air supply to the volume booster and adjacent equipment can create dangerous system conditions.

To clean the Model 4890A, use the following steps:

1. Shut off system pressure to the booster and carefully relieve the pressure in all connected lines. It is not necessary to remove the booster from the air line.
2. Remove the six Bolts from the bottom of the unit. For more information, see Figure 4.
3. Remove the Inner Valve Assembly. The Valve Assembly will extract freely for about 1". The Assembly must then be pulled out of the Valve Body to unseat the Valve Seat. For more information, see Figure 4.
4. Wash the Inner Valve Assembly with a solvent. Exercise care to prevent damage to diaphragms and valve facings. **Avoid solvents such as acetone, carbon tetrachloride and trichloroethylene.**
5. Lubricate the o-rings and replace the Valve Assembly carefully. Ensure that the Vent in the exterior part of the Inner Valve Assembly is clear. For more information, see Figure 4.

Trouble shooting

| Problem | Source | Solution |
|------------|---|---|
| Leakage | Body Bolts | Tighten the Body Bolts |
| High Bleed | <ul style="list-style-type: none"> • Relief Valve • Supply Valve • Supply Seat | <ul style="list-style-type: none"> • If contaminated, clean the source and Body. |
| | <ul style="list-style-type: none"> • Diaphragm Assembly | <ul style="list-style-type: none"> • If damaged, install the service kit. |

NOTE: If the standard maintenance procedure does not correct the problem, install the appropriate service kit.

- 21151-NF Nitrile Elastomer, Zinc/Steel Trim
- 21151-NS Nitrile Elastomer, Stainless Trim
- 21151-JF Fluorocarbon Elastomer, Zinc/Steel Trim
- 21151-JS Fluorocarbon Elastomer, Stainless Trim

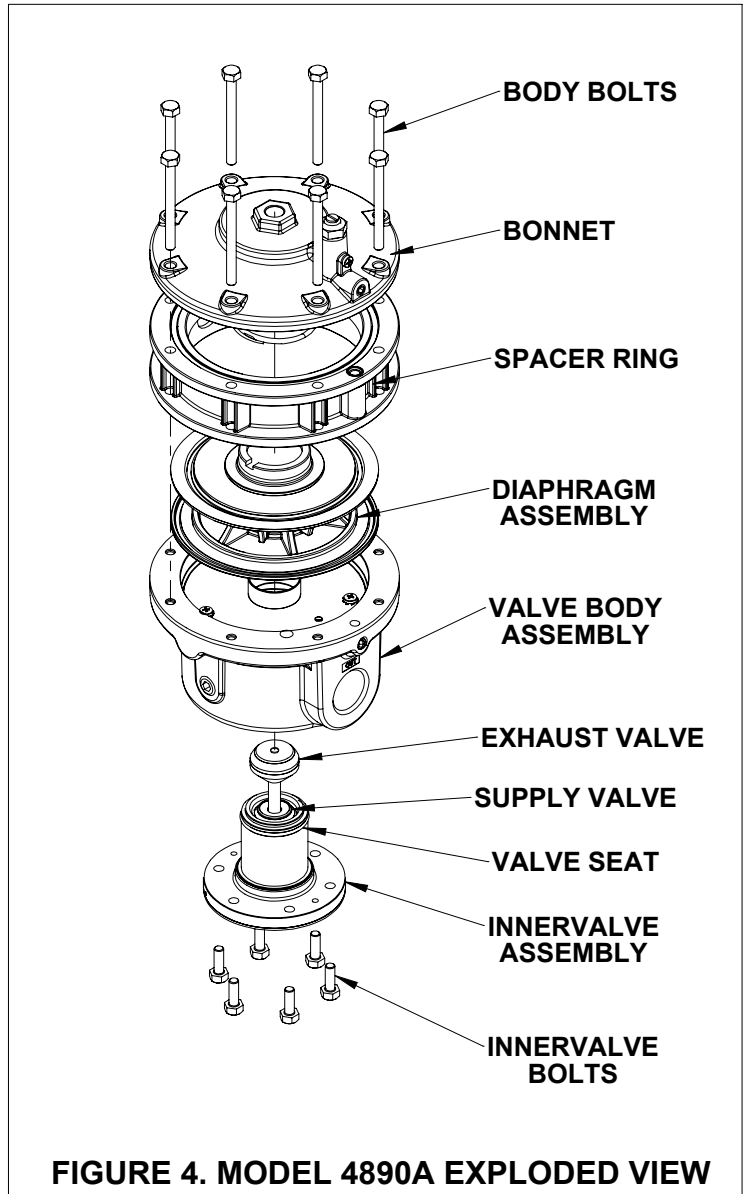


FIGURE 4. MODEL 4890A EXPLODED VIEW

LEGAL NOTICE:

The information set forth in the foregoing Installation, Operation and Maintenance Instructions shall not be modified or amended in any respect without prior written consent of Fairchild Industrial Products Company. In addition, the information set forth herein shall be furnished with each product sold incorporating Fairchild's unit as a component thereof.



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