

## 2625 and 2625NS Volume Boosters

A 2625 or 2625NS volume booster (figure 1) is used in conjunction with a positioner on a throttling control valve to increase stroking speed. The 2625NS is a nuclear-service version and uses elastomeric components that better withstand high temperature and radiation environments.

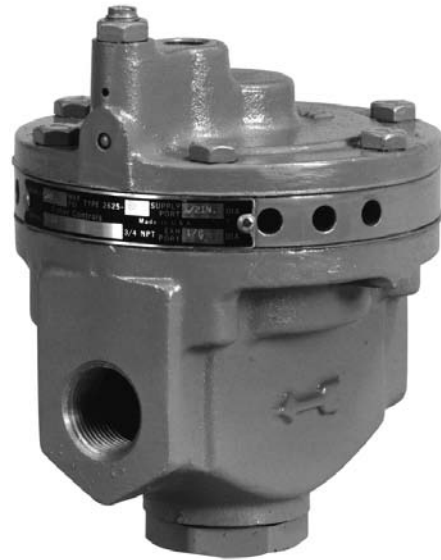
The booster incorporates fixed deadband, soft seat construction, and an integral bypass restriction to eliminate positioner saturation problems that can occur with volume boosters that do not have these features. Adjustment of the integral bypass restriction is necessary for system stability. This adjustment does not affect the deadband of the volume booster, but does permit the control valve to respond to small input signal changes without sacrificing steady-state accuracy. It also allows the booster to deliver high-volume output for fast stroking when large, rapid input signal changes occur.

The volume booster, when used in conjunction with a positioner/actuator, is used only to improve stroking speed. It is not recommended for other applications requiring a high-accuracy, instrument-type volume booster. If the volume booster is to be used only with an actuator, for on-off control, the integral bypass restriction on the booster must be closed (turned fully clockwise).

Connectors and piping can be installed with either 2625 or 2625NS volume booster for diagnostic testing.

### Features

- **Fast Response**—Booster delivers the volume needed for rapid actuator stroking when large input changes suddenly occur.



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Figure 1. 2625 Volume Booster

- **Adjustable Response**—Integral bypass restriction tunes the booster response so that smooth actuator motion follows the slow signal changes.
- **Efficient Operation**—Soft seats provide tight shutoff to reduce unnecessary air consumption and eliminate saturation of positioner relays.
- **Maintains Accuracy**—Booster permits high actuator stroking speeds upon demand without degrading the positioner steady-state accuracy.



## Specifications

### Supply Pressure Ranges

When used in conjunction with a positioner or other pneumatic accessory, always pipe the positioner and volume booster with one common supply through a 64 or 95H regulator (see figure 3). A high-capacity filter, such as the 262C, should be installed in the supply line to the regulator. Supply pressure also must not exceed the maximum pressure rating of the actuator. Constructions are available in two maximum supply ranges.

#### When Normally Used With Diaphragm

**Actuators:** Up to 2.8 bar (40 psig)

**When Normally Used With Piston Actuators:**  
Up to 10.3 bar (150 psig)

### Input Signal Pressure

Positioner output

### Maximum Input Signal Pressure

10.3 bar (150 psig)

### Fixed Input-to-Output Pressure Ratio

1 to 1

### Nominal Deadband

#### Percent of Positioner Output Span<sup>(1)</sup>:

2.4 mm (0.094 inch) exhaust port: 2%

9.5 mm (0.375 inch) exhaust port: 3.5%

12.7 mm (0.5 inch) exhaust port: 5%

### Construction Materials

**Body:** Aluminum

**Seat Ring:** Brass

### Diaphragms

2625: Nitrile/nylon

2625NS: EPDM/meta-aramid

#### Upper and Lower Valves:

2625: Nitrile-CSM rubber/aluminum/stainless steel

2625NS: EPDM/aluminum/stainless steel

#### O-Rings:

2625N: Nitrile

2625NS: EPDM

**Connectors for Diagnostic Testing:** ■ Stainless steel or ■ brass

### Operative Temperature Limits<sup>(2)</sup>

**2625:** -40 to 71°C (-40 to 160°F)

**2625NS:** -40 to 93°C (-40 to 200°F)

### Connections

**Input Signal:** 1/4 NPT

**Supply and Output:** 3/4 NPT

### Port Diameters<sup>(3)</sup>

**Supply Port:** ■ 9.5 mm (0.375 inch) or

■ 12.7 mm (0.5 inch)

**Exhaust Port:** ■ 2.4 mm (0.945 inch),

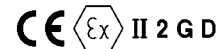
■ 9.5 mm (0.375 inch) or ■ 12.7 mm (0.5 inch)

### Maximum Flow Coefficients

See table 1

### Hazardous Area Classification

Complies with the requirements of ATEX Group II Category 2 Gas and Dust



### Approximate Weight

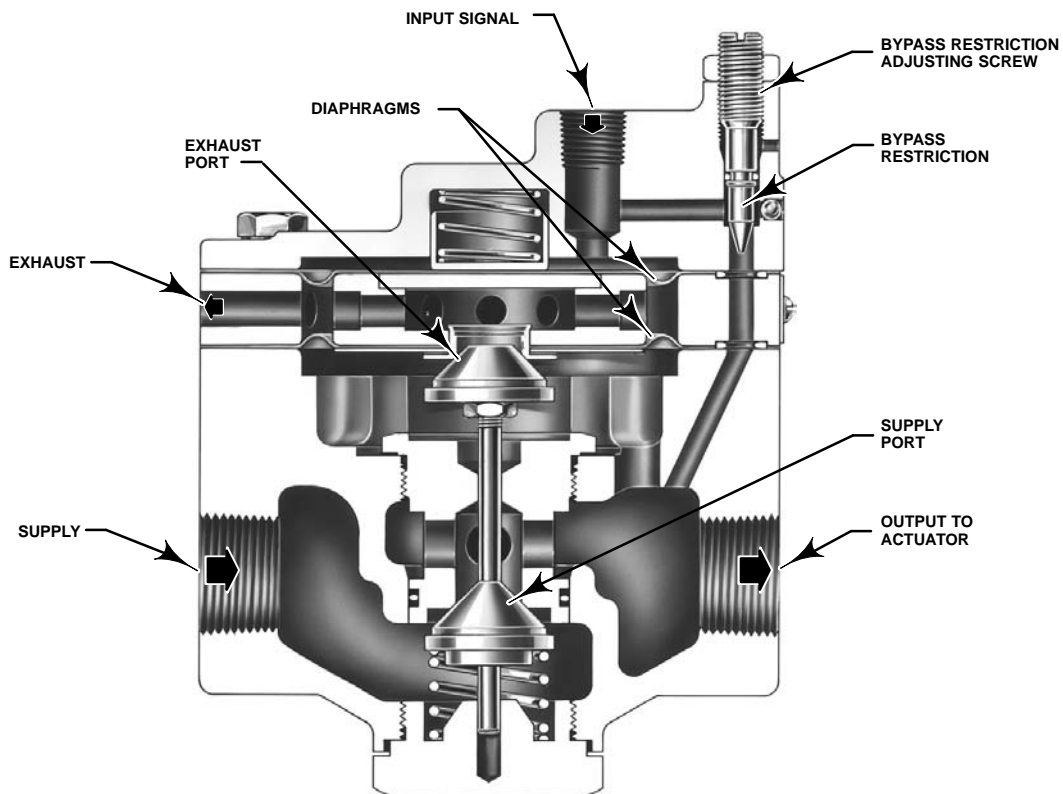
2.3 kg (5 lb)

NOTE: Specialized instrument terms are defined in ANSI/ISA Standard 51.1 – Process Instrument Terminology.

1. Zero to maximum supply.

2. The pressure/temperature limits in this document and any applicable code or standard should not be exceeded.

3. May be used in any combination.



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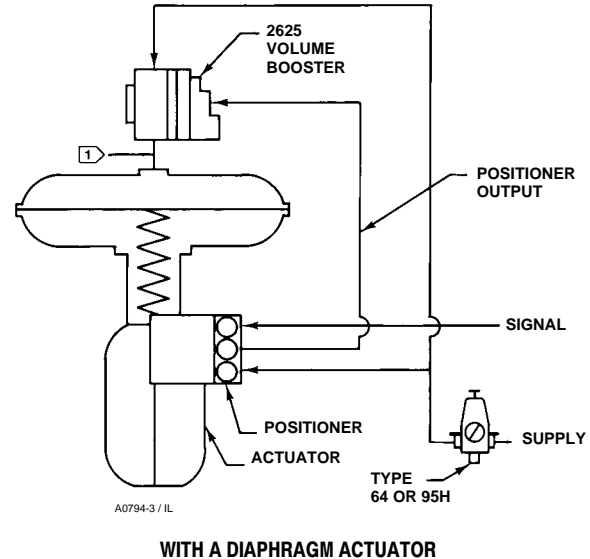
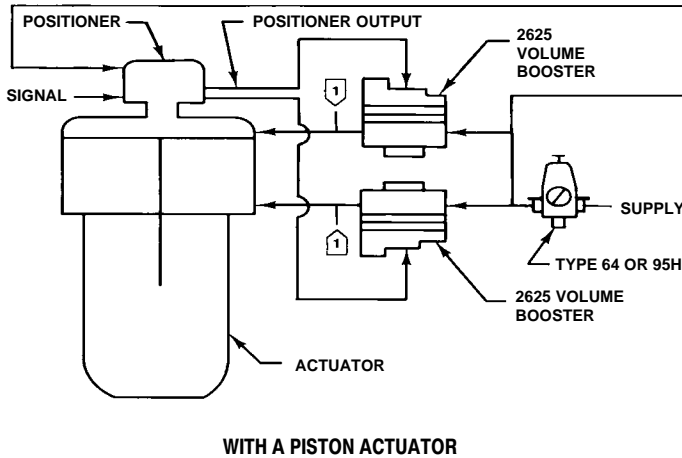
Figure 2. Sectional View of 2625 Volume Booster

## Principle of Operation

Refer to figures 2 and 3. Because of the bypass restriction, large input signal changes register on the booster input diaphragm sooner than in the actuator. A large, sudden change in input signal causes a pressure differential to exist between the input signal and the output of the booster. When this occurs, the diaphragms move to open either the supply port or the exhaust port, whichever action is required to reduce the differential. The port remains open until

the difference between the booster input and output pressures returns to within the deadband limit of the booster. With the bypass restriction adjusted for stable operation, a signal with small magnitude and rate changes passes through the bypass restriction and into the actuator without initiating booster operation.

Both supply and exhaust ports remain closed, preventing unnecessary air consumption and possible saturation of positioner relays.



**NOTE:**  
1 CONNECTION LOCATION FOR DIAGNOSTIC TESTING

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Figure 3. Typical Installations

Table 1. Maximum Flow Coefficients<sup>(1)</sup>

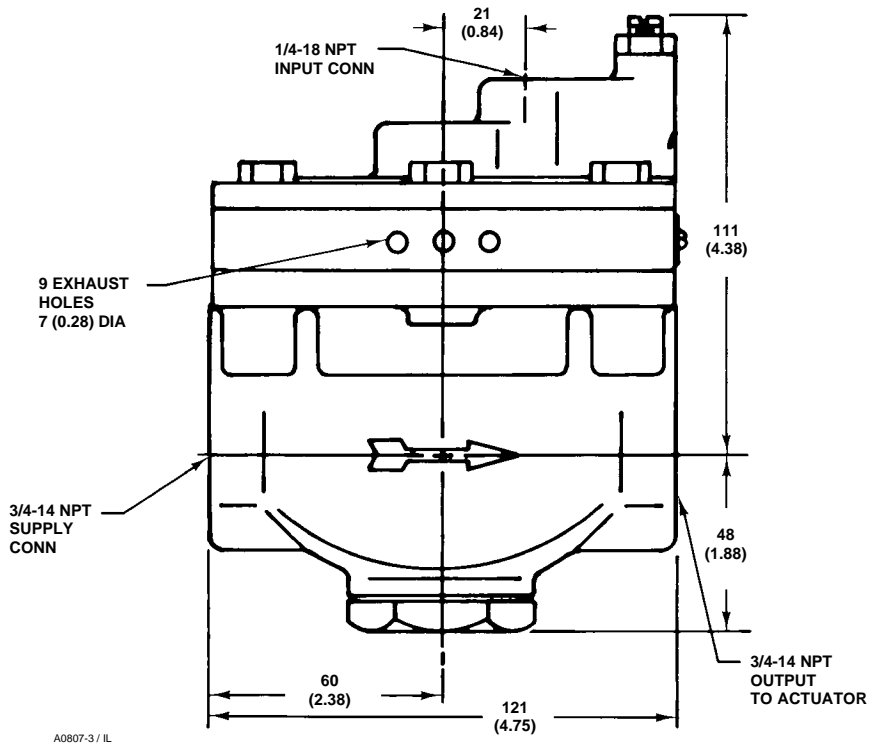
PORT SIZE COMBINATIONS				COEFFICIENTS	
Supply Port		Exhaust Port		Supply Port	Exhaust Port
mm	Inch	mm	Inch	C <sub>v</sub>	C <sub>v</sub>
9.5	3/8	2.4	3/32	3.74	0.23
		9.5	3/8	3.74	2.29
		12.7	1/2	3.74	2.52
12.7	1/2	2.4	3/32	4.98	0.24
		9.5	3/8	4.98	2.30
		12.7	1/2	4.98	2.72
3570 valve positioner				0.25	0.25
3582 valve positioner				0.17	0.19
3610J, 3610JP, 3611JP, 3620J, 3620JP, 3621JP valve positioners				0.37	0.30
DVC5000, DVC5000f digital valve controllers				0.24	0.27
DVC6000, DVC6000f digital valve controllers				0.37	0.31

1. Consult your Emerson Process Management sales office for special stroking speed requirements.

## 2625NS for Nuclear-Service Applications

The 2625NS volume booster uses EPDM (ethylene-propylene) elastomeric parts. These parts have superior resistance to degradation at elevated temperature and radiation levels. This version is designed for nuclear service applications where oil-free supply air is available.

Both the 2625 and 2625NS are available as safety-related items when processed using the commercial grade dedication section of the 10CFR50, Appendix B, quality assurance program. 10CFR21 reporting is also part of the safety related processing program. Seismic operability testing has been done to qualify both versions as rigid items at levels up to 9g's uniaxial (in each axis). Further nuclear service qualification data is available on request.



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mm  
(INCH)

Figure 4. Dimensions

### Installation

Figure 3 shows typical installations for the 2625 or 2625NS volume booster on piston and diaphragm actuators. A single regulator that supplies both the positioner and booster (or boosters) is recommended. The supply medium must be clean, dry, oil-free air or non-corrosive gas.

#### Note

**Use a clean, dry, oil-free air supply with instruments containing EPDM components. EPDM is subject to degradation when exposed to petroleum-base lubricants.**

Keep in mind that many actuators require larger casing or cylinder connections to take full advantage of the booster's ability to deliver its high-volume

output. Dimensions are shown in figure 4. Ensure that the supply pressure is connected to correspond with the flow arrow on the booster.

### Ordering Information

When ordering, specify:

1. Supply and exhaust port sizes. See table 1 for Cv values.
2. Supply pressure range of up to 2.8 bar (40 psig) or up to 10.3 bar (150 psig).

3. Stroking speed information when being mounted at the factory, for proper tuning of the instruments. Specify either critical or non-critical stroke speed time.

4. Nuclear service, if applicable. Consult factory for ordering assistance.

**Note**

**Critical stroke speed time example:**  
Valve to stroke in both directions in 4 seconds or less.

**Non-critical stroke speed time example:** Valve to stroke in approximately 4 seconds in both directions.

**Note**

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