

# Type 122A Three-Way Switching Valve

## Introduction

The Type 122A valve (see Figure 1) is a high-capacity, economical three-way pneumatic switching valve for on-off applications. This valve can be used for diverging or converging gaseous service, diverging liquid service with gas-loaded liquids, and converging liquid service. Six spring ranges are available for control pressures from 3 to 150 psig (0,21 to 10,3 bar).

## Features

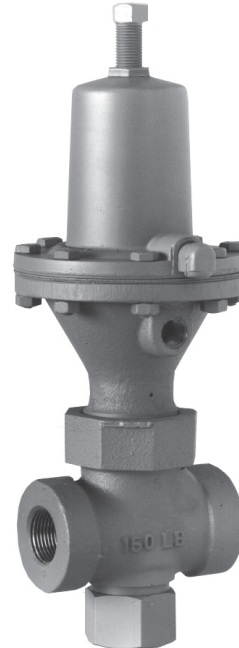
- **Convenient Installation**—Compact construction permits easy handling and installation.
- **Easy Leak Detection**—Vent hole between body and actuator stem seals allows rapid detection of body or actuator leakage.
- **Easy Maintenance**—With the bottom piping disconnected, the valve can be completely disassembled without removing it from the line.

## Principle of Operation

Refer to Figure 2. The flow through the Type 122A valve is normally from port A to C, with the spring force holding the valve plug down on port B (diverging service).

As the pressure under the diaphragm is increased through port D, it acts against the force of the spring. When the control pressure overcomes the force of the spring, the valve begins to stroke, opening port B. Once the pressure under the diaphragm reaches setpoint plus build-up, the valve completes its stroke and the port C seat ring is closed. The valve will only fully stroke when build-up above setpoint is achieved.

The point at which the valve completes its stroke and the pressure change necessary to do this are dependent on the spring rate and the setpoint chosen. The set pressure is easily changed by adjusting the screw at the top of the valve.



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Figure 1. Type 122A Three-Way Switching Valve

## Installation

The Type 122A valve may be installed in any position. Be certain the spring case vent opening is pointing down and is protected against the entrance of the moisture and any other material that may plug the vent. The Type 122A valve should not be used in installations where water hammer can be experienced. Dimensions are shown in Figure 3.

## Overpressure Protection

Type 122A Three-Way Switching Valves have maximum outlet pressure ratings that are lower than their maximum inlet pressure ratings. A pressure-relieving or pressure-limiting device is needed if inlet pressure can exceed the maximum outlet pressure rating. Overpressuring any portion of a switching valve or associated equipment may cause leakage,

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## Specifications

### Body Sizes and End Connection Styles

**Connections A and C:** Available in 3/4 or 1 body sizes with NPT end connections

**Connection B:** 3/4 NPT

### Maximum Inlet Pressure<sup>(1)</sup>

150 psig (10,3 bar)

### Set Pressure Ranges

See Table 1

### Maximum Control Pressure to Diaphragm<sup>(1)</sup>

150 psig (10,3 bar)

### Temperature Capabilities<sup>(1)</sup>

-20° to 150°F (-29° to 66°C)

### Construction Materials

**Valve Body:** Cast iron

**Bottom Connector:** Steel

**Spring Case:** Aluminum

**Lower Diaphragm Case:** Cast iron

**Disk and Disk Holder Assembly:** Nitrile (NBR) and Aluminum or Nitrile (NBR) and Stainless steel

**Orifice:** Aluminum or Stainless steel

**Diaphragm:** Neoprene (CR)

**Gaskets:** Composition

**O-Rings:** Nitrile (NBR)

**Washers:** Zinc-plated steel and 302 Stainless steel

**Spring:** Zinc-plated steel

### Flow Coefficients

**C<sub>g</sub><sup>(2)</sup>**

*Connection A to B:* 138

*Connection A to C:* 131

**C<sub>1</sub>**

*Connection A to B:* 28.0

*Connection A to C:* 32.5

### Control Connection

1/4 NPT internal

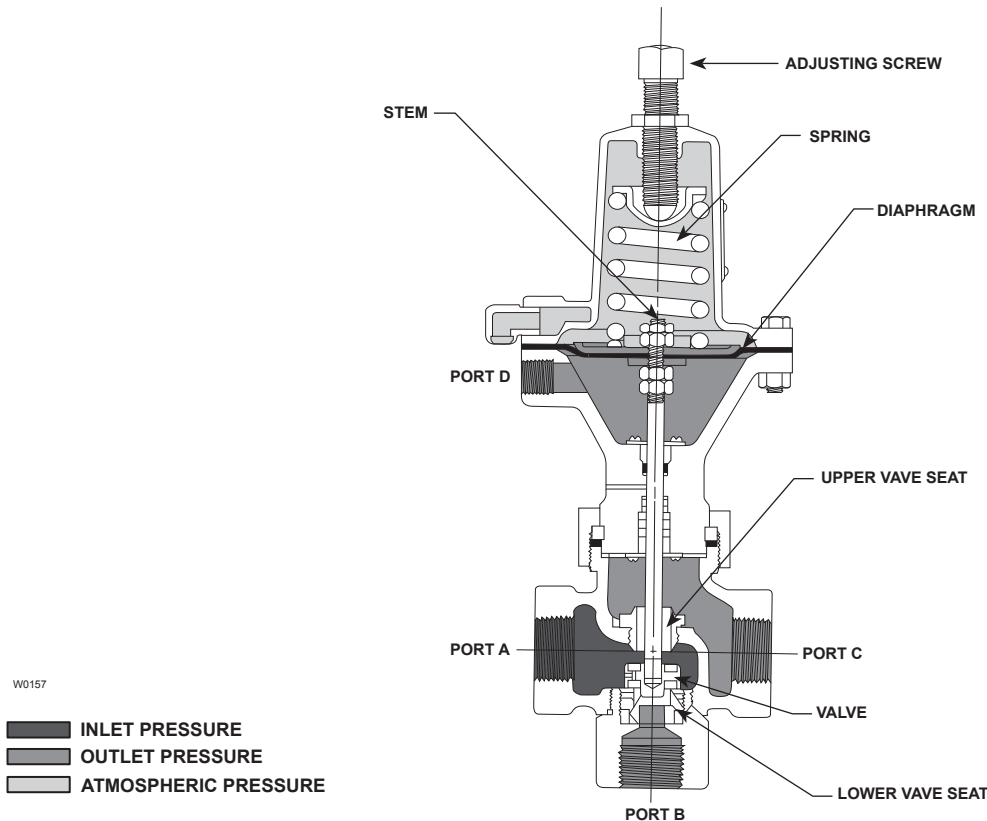
### Vent Connection

1/4 NPT internal with screen

### Approximate Weight

5 pounds (2 kg)

1. The pressure/temperature limits in this Bulletin and any applicable standard or code limitation should not be exceeded.
2. At an inlet pressure of 25 psig (1,7 bar) and with full pressure drop across the body.



**Figure 2.** Type 122A Three-Way Switching Valve Operational Schematic

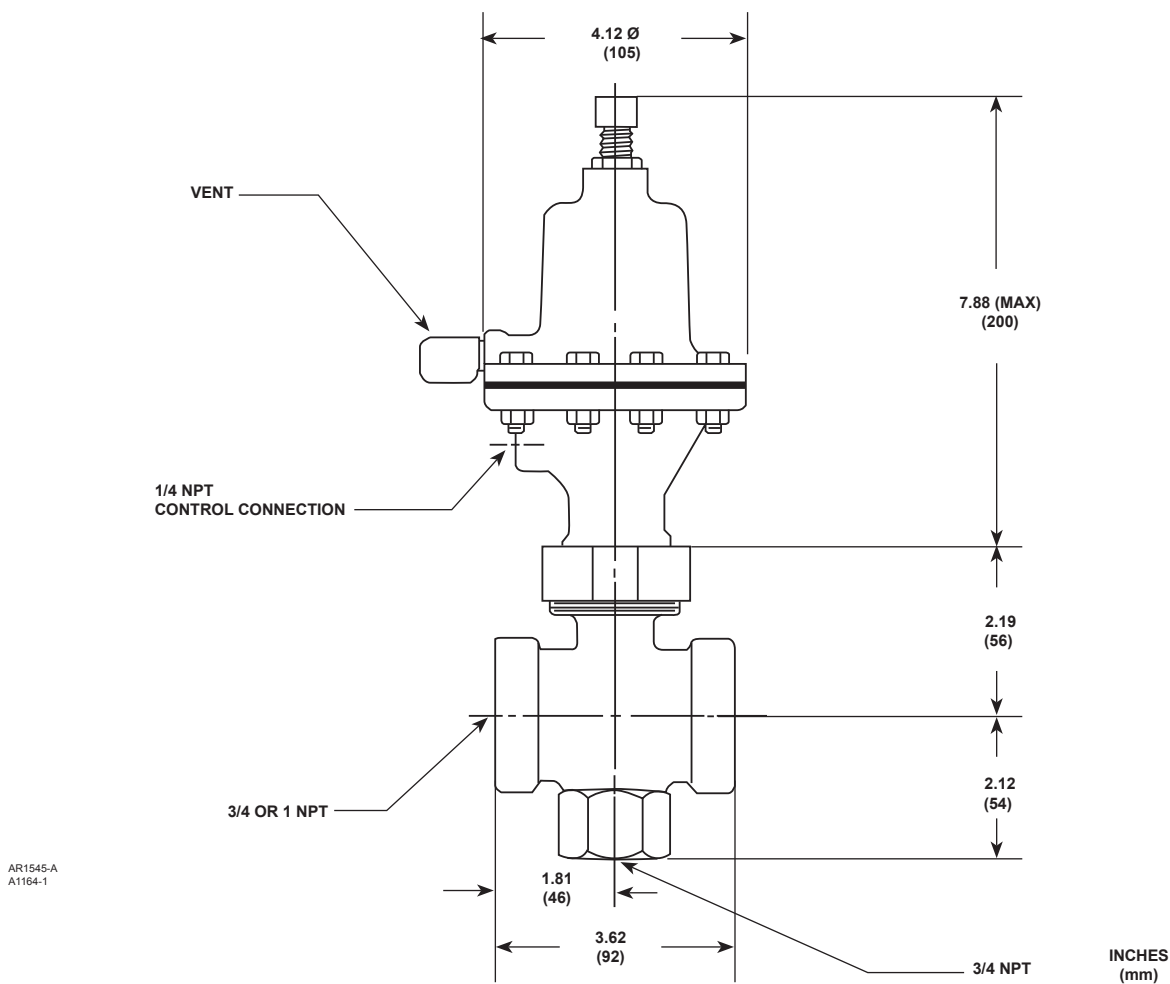
**Table 1. Set Pressure Ranges**

SET PRESSURE RANGES		PRESSURE BUILD-UP ABOVE SETPOINT REQUIRED FOR FULL STROKE		SPRING PART NUMBER	SPRING COLOR	SPRING WIRE DIAMETER		SPRING FREE LENGTH	
Psig	bar	Psig	bar			Inches	mm	Inches	mm
3 to 15	0,21 to 1,0	10	0,69	1D892327022	Red	0.168	4,27	2.94	74,7
5 to 20	0,34 to 1,4	13,5	0,93	1D751527022	Cadmium	0.187	4,75	2.81	71,4
5 to 35	0,34 to 2,4	22	1,5	1D665927022	Blue	0.218	5,54	2.50	63,5
30 to 60	2,1 to 4,1	30	2,1	1D7455T0012	Green	0.234	5,94	2.57	65,3
40 to 100	2,8 to 6,9	54	3,7	1E543627142	Yellow	0.283	7,19	2.31	58,7
60 to 150	4,1 to 10,3	66	4,6	1P901327142	Brown	0.240	6,10	2.63	66,8

parts damage, or personal injury due to bursting of pressure-containing parts or explosion of accumulated gas. Switching valve operation within ratings does not preclude the possibility of damage from external sources or from debris in the pipeline. A switching valve should be inspected for damage periodically and after any overpressure condition.

## Ordering Information

Refer to the Specifications section. Review the description to the right of each specification and in the referenced table and specify the desired choice wherever there is a selection to be made. Also be sure to specify the desired set pressure.



**Figure 3. Dimensions**

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## Ordering Guide

### Body Size (Connections A and C) (Select One)

- 3/4 NPT
- 1 NPT

### Quantity (Specify) \_\_\_\_\_

### Disk and Disk Holder Assembly (Select One)

- Nitrile (NBR) and Aluminum\*\*\*
- Nitrile (NBR) and Stainless steel\*\*\*

### Seat Rings (Select One)

- Aluminum\*\*\*
- Stainless steel\*\*\*

### Set Pressure Range (Select One)

- 3 to 15 psig (0,21 to 1,0 bar), Red\*\*\*
- 5 to 20 psig (0,34 to 1,4 bar), Cadmium\*\*\*
- 5 to 35 psig (0,34 to 2,4 bar), Blue\*\*\*
- 30 to 60 psig (2,1 to 4,1 bar), Green\*\*\*
- 40 to 100 psig (2,8 to 6,9 bar), Yellow\*\*\*
- 60 to 150 psig (4,1 to 10,3 bar), Brown\*\*\*

Regulators Quick Order Guide	
***	Readily Available for Shipment
**	Allow Additional Time for Shipment
*	Special Order, Constructed from Non-Stocked Parts. Consult Your local Sales Office for Availability.
Availability of the product being ordered is determined by the component with the longest shipping time for the requested construction.	

**Specification Worksheet**

**Application (Please designate units):**  
 Specific Use \_\_\_\_\_  
 Line Size \_\_\_\_\_  
 Gas Type and Specific Gravity \_\_\_\_\_  
 Gas Temperature \_\_\_\_\_  
 Does the Application Require Overpressure Protection?  
 Yes  No If yes, which is preferred:  
 Relief Valve  Monitor Regulator  Shutoff Device  
 Is overpressure protection equipment selection assistance desired? \_\_\_\_\_

**Pressure (Please designate units):**  
 Maximum Inlet Pressure ( $P_{1max}$ ) \_\_\_\_\_  
 Minimum Inlet Pressure ( $P_{1min}$ ) \_\_\_\_\_  
 Downstream Pressure Setting(s) ( $P_2$ ) \_\_\_\_\_  
 Maximum Flow ( $Q_{max}$ ) \_\_\_\_\_

**Performance Required:**  
 Accuracy Requirements? \_\_\_\_\_  
 Need for Extremely Fast Response? \_\_\_\_\_

**Other Requirements:** \_\_\_\_\_

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