December 2009

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.

W3141-1*

Figure 1. *Type 122A Three-Way Switching Valve*

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.

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,

D200075X012

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(1)
150 psig (10,3 bar)

Set Pressure Ranges
See Table 1

Maximum Control Pressure to Diaphragm(1)
150 psig (10,3 bar)

Temperature Capabilities(1)
-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_g(2)
Connection A to B: 138
Connection A to C: 131
C_1
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.

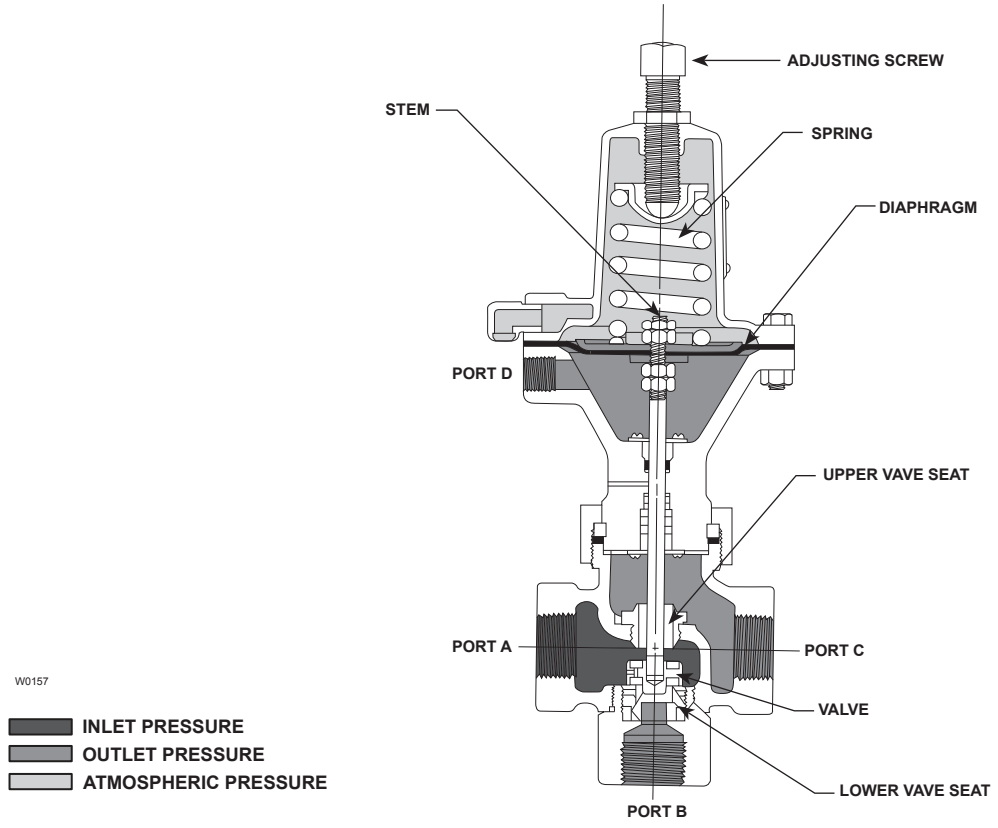

Figure 2. *Type 122A Three-Way Switching Valve Operational Schematic*

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 to15	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.

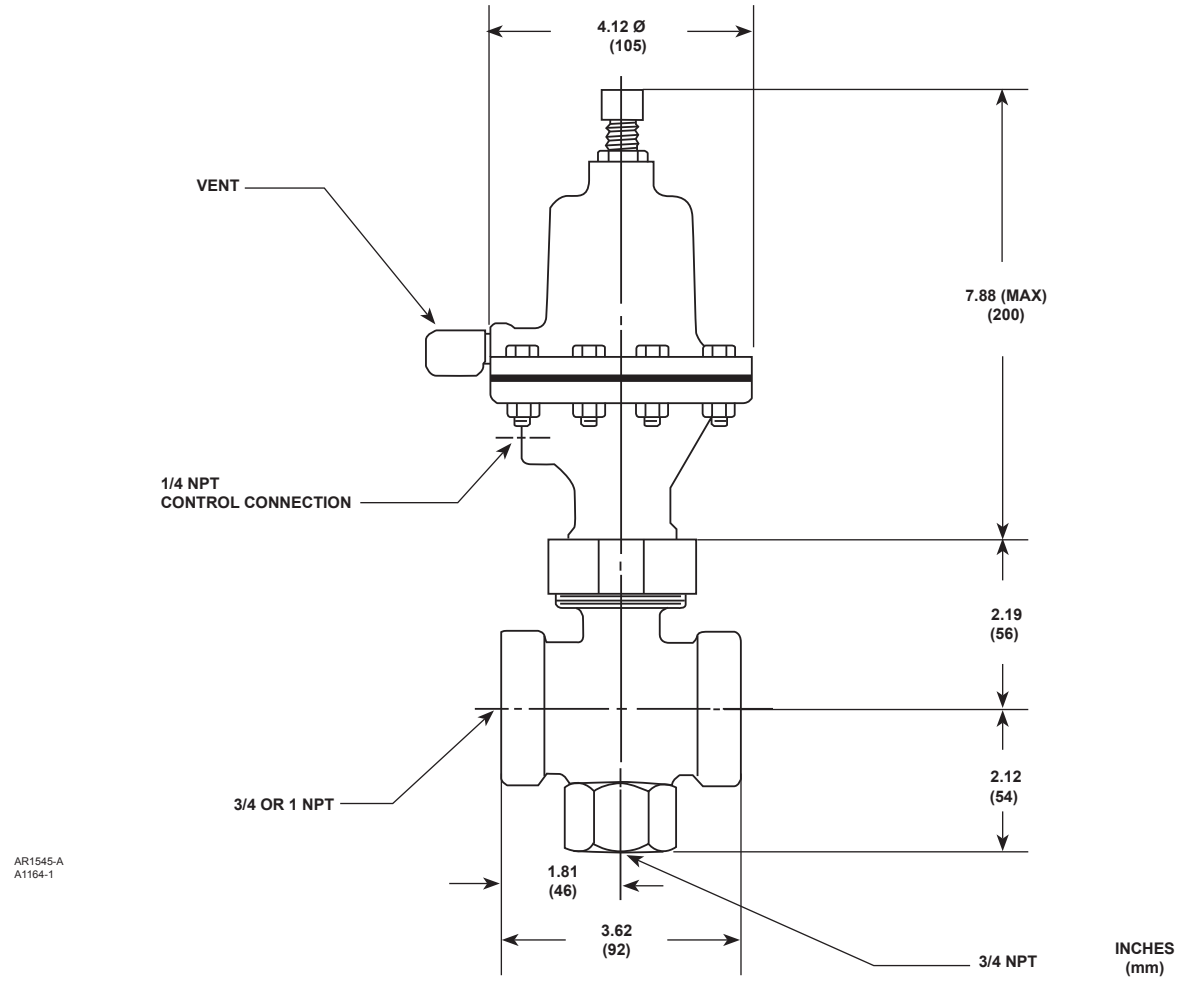

Figure 3. *Dimensions*

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: _____
_____

Industrial Regulators

Emerson Process Management
Regulator Technologies, Inc.

USA - Headquarters
McKinney, Texas 75069-1872 USA
Tel: 1-800-558-5853
Outside U.S. 1-972-548-3574

Asia-Pacific
Shanghai, China 201206
Tel: +86 21 2892 9000

Europe
Bologna, Italy 40013
Tel: +39 051 4190611

Middle East and Africa
Dubai, United Arab Emirates
Tel: +971 4811 8100

Natural Gas Technologies

Emerson Process Management
Regulator Technologies, Inc.

USA - Headquarters
McKinney, Texas 75069-1872 USA
Tel: 1-800-558-5853
Outside U.S. 1-972-548-3574

Asia-Pacific
Singapore, Singapore 128461
Tel: +65 6777 8211

Europe
Bologna, Italy 40013
Tel: +39 051 4190611
Gallardon, France 28320
Tel: +33 (0)2 37 33 47 00

TESCOM

Emerson Process Management
Tescom Corporation

USA - Headquarters
Elk River, Minnesota 55330-2445 USA
Tel: 1-763-241-3238

Europe
Selmsdorf, Germany 23923
Tel: +49 (0) 38823 31 0

For further information visit www.fisherregulators.com