

Types 164 and 164A Switching Valves

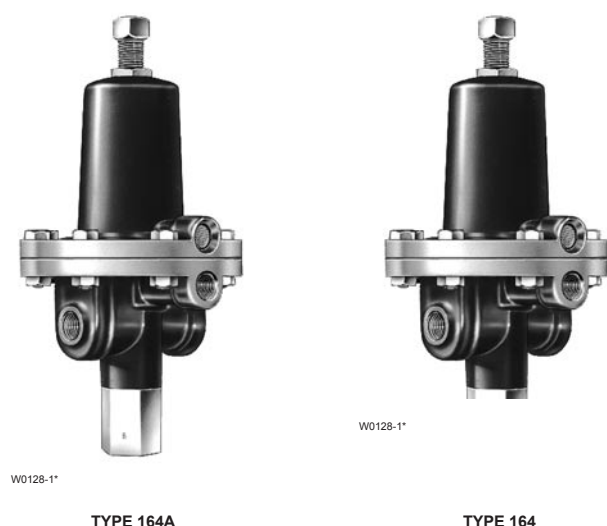


Figure 1. Switching Valve Constructions

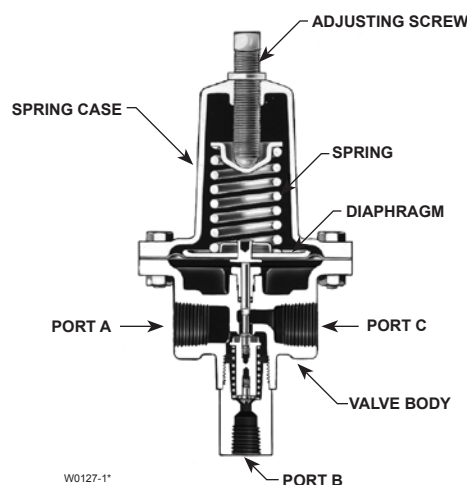


Figure 2. Sectional View of Type 164A Switching Valve

Introduction

The Types 164 and 164A switching valves are pneumatically operated and controlled units, built with a wide range of capabilities to handle those switching application that involve venting, on-off control, and failure modes.

Operation of either valve occurs when the pneumatic signal changes as indicated in table 1. With its two ports, the Type 164 switching valve is typically used as a normally open on-off switch, while the Type 164A switching valve directs flow through three ports. Additionally, the Type 164A provides on-off capability when one of its three port is plugged.

The Type 164 and 164A switching valves share the same basic construction (see figures 1 and 2), except that where the Type 164A switching valve has a part containing port B, the Type 164 switching valve has a plug.

Features

- **Versatile**—Constructions throughout the product line provide three-way or on-off pneumatic switching to suit a variety of applications.
- **Easy, Accurate Adjustment**—With a choice of springs for optimum resolution, the switching point is set to a specific requirement by an adjusting screw atop the spring case.
- **Rugged, Compact Construction**—The unit is small enough for easy installation in limited space, yet rugged enough to be mounted on the actuator.

Specifications

Available Configurations

Type 164: Two-way switching valve

Type 164A: Three-way switching valve

Maximum Valve Body Pressure

250 psig (17,2 bar)

Set Pressure Ranges

See table 1

Maximum Diaphragm Pressure

100 psig (6,90 bar)

Operative Temperature Limits*

–20 to 150°F (–29 to 66°C)

Flow Coefficients (C_g)

Depends on construction and flow path (see figure 2) as follows:

Type 164: 26.6 (Port A to Port C)

Type 164A: 15.0 (Port A to Port B)

or 26.6 (Port A to Port C)

Connections

Type 164: Ports A and C—1/4-inch NPT or 1/2-inch NPT; Vent and control pressure connection (Port D)—1/4-inch NPT

Type 164A: Ports A, B, and C—1/4-inch NPT or 1/2-inch NPT; Vent and control pressure connection (Port D)—1/4-inch NPT

Construction Materials

PART	MATERIAL
Spring case	Aluminum or; Cast Iron (Accepts optional closing cap)
Valve Body	Aluminum
Valve Disc	Brass and Synthetic Rubber
Diaphragm and O-rings	Nitrile
Spring	Steel
Closing Cap (Optional)	Brass

Approximate Weight

4 lbs (1,81 kg)

Options

Closing cap

* Defined in ISA Standard S51.1-1976.

Table 1. Spring Information

SPRING RANGE*		SPRING PART NUMBER	COLOR CODE	MAXIMUM PRESSURE CHANGE ON DIAPHRAGM FOR FULL STROKE	
Psig	bar			Psi	bar, Differential
Type 164 or Type 164A Switching Valve					
3 to 15	0,21 to 1,03	1D892327022	Red	2.25	0,16
5 to 20	0,34 to 1,38	1D751527022	Cadmium	2.5	0,17
5 to 35	0,34 to 2,41	1D665927022	Blue	4	0,28
30 to 60	2,07 to 4,14	1D745527142	Green	5.75	0,40
40 to 100	2,76 to 6,90	1E543627142	Yellow	11	0,76
Type 164 Switching Valve Only					
80 to 150	5,52 to 10,3	1P901327142	Brown	16	1,10
130 to 200†	8,96 to 13,8†	1P901327142	Brown	16	1,10
* Ranges shown are recommended for best performance. All springs listed can be adjusted to 0 psig. † Requires diaphragm head with part number 1P901425062.					

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Principle of Operation

Refer to figures 2 and 4. Control pressure enters the switching valve through port D and registers on the underside of the diaphragm. Control pressure overcomes the spring force and the diaphragm and the valve disc are raised, closing port C and opening port B of the Type 164A switching valve. In this condition the Type 164 construction is turned off and the Type 164A construction provides a flow path from A to B.

If, either intentionally or through pneumatic failure, the control pressure drops below the spring force the diaphragm and valve disc move downward, opening port C and closing port B of the Type 164A switching valve. Now both constructions provide a flow path from port A to port C.

The pressure change necessary to switch the valve depends on the spring used and the setting of the adjusting screw on the switching valve.

Installation

The switching valve can be mounted in any position, providing the vent in the spring case is free from obstruction. Connect the pneumatic control line to the port marked "D" on the valve body. Ports A and C (and B on the Type 164A valve) are connected for the desired switching valve response to loss or decrease in pneumatic pressure.

Figure 3 shows typical application of the Type 164A switching valve. If the control valve inlet pressure falls below a predetermined setting, the on-off controller turns off control pressure to the switching valve. This causes the switching valve to bleed the control valve diaphragm pressure to atmosphere, closing the control valve. The control valve remains closed until the inlet pressure is restored to the desired setting.

Dimensions are shown in figure 4.

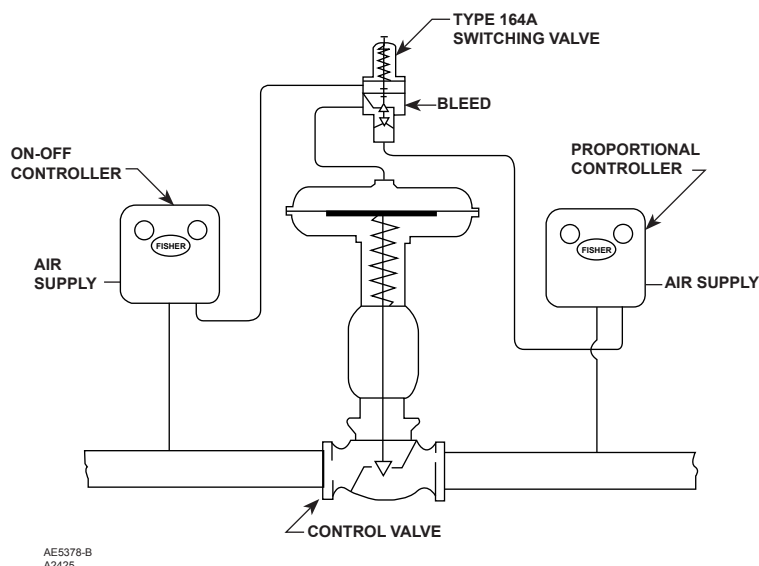


Figure 3. Typical Switching Valve Application

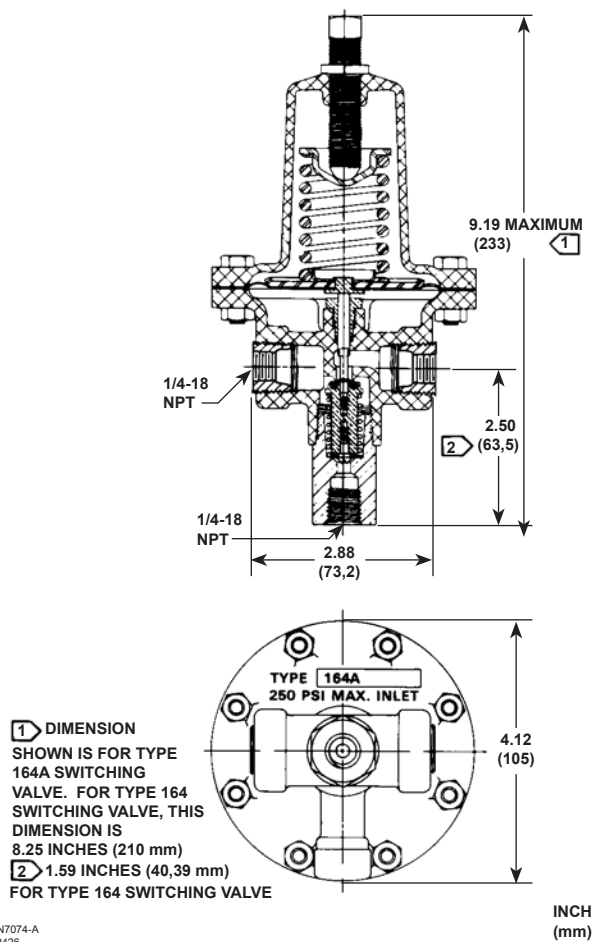


Figure 4. Dimensions

Ordering Information

When ordering, carefully review the “Specifications” table and specify your selection whenever a choice is offered, including the desired spring number.

In addition, specify:

1. Type number of switching valve.
2. Size and type number of actuator on which the switching valve is to be mounted.
3. Whether the switching valve is to be mounted on the actuator casing or on the actuator yoke.