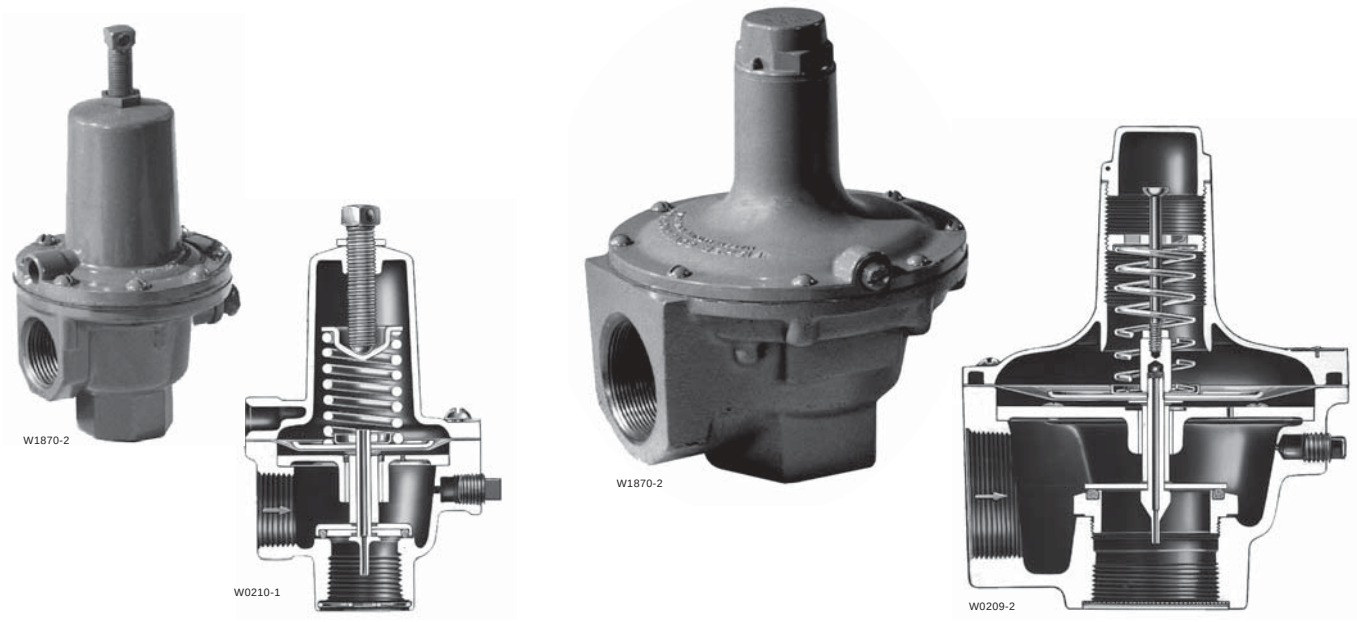
08/90

289 Series Spring-Loaded Relief Valves



1-INCH TYPE 289H AND 289HH **2-INCH TYPE 289H**

Figure 1. *Type 289H and 289HH Relief Valves*

The 289 Series relief valve is a throttling relief valve used downstream of pressure regulators to protect the downstream system from overpressure. A smooth throttling action minimizes pressure surges in the system during emergency operation. These relief valves are available in 1/4, 3/4, 1, or 2-inch sizes with spring ranges (relief pressure settings) from 5 inches w.c. to 75 psig (0.01 to 5.2 bar).

All sizes above 1/4-inch feature a pitot tube booster (figure 1) for achieving the highest possible relief capacity with a minimum buildup of system pressure. When the valve is opening, high gas velocity through the orifice creates an area of relatively low pressure near the end of the pitot tube. This pitot tube effect forms a partial vacuum above the diaphragm which helps to open the valve.

The relief valve diaphragm functions as a valve disk to control flow in all types except the 289H and 289HH, which use O-ring seats. The nitrile or neoprene seating surfaces provide tight shutoff. The 289 Series relief valves are ideal for low pressure settings due to the increased sensitivity provided by the large diaphragm area.

Features

- **Throttling Type Relief**—Smooth, sensitive throttling action minimizes pressure surges.
- **High Flow Rates**—As shown by the figure 4 capacity curves, high flow rates can be achieved with minimum pressure buildup due to the boosting system which increases the relief valve opening.
- **Small Size**—The 289 Series relief valves are small and compact, making them suitable for areas limited in space.
- **Reliability Due to Simplicity**—A single internal assembly decreases the possibility of mechanical failure.

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Specifications

Available Configurations

Type 289A (figure 2): 1/4-inch spring-loaded relief valve for relief pressure settings of 3 to 22 psig, (0.21 to 1.5 bar) two spring ranges

Type 289H (figure 1): 1 or 2-inch spring-loaded relief valve for relief pressure settings of 1 to 50 psig (0.07 to 3.5 bar) four spring ranges, in the 1-inch size and of 7-inches w.c. to 10 psig, (0.02 to 0.69 bar), four spring ranges, in the 2-inch size

Type 289HH (figure 1): 1-inch spring-loaded relief valve for relief pressure settings of 45 to 75 psig (3.1 to 5.2 bar)

Type 289L (figure 3): 3/4 or 1-inch spring-loaded relief valve for relief pressure settings of 10 to 40-inches w.c., (0.03 to 0.1 bar), two spring ranges

Type 289U (figure 2): 1/4-inch spring-loaded relief valve for relief pressure settings of 5-inches w.c. to 3 psig, (0.01 to 0.21 bar), two spring ranges

Inlet Connections

Type 289L: 3/4 or 1-inch NPT female
Types 289A and 289U: 1/4-inch NPT female
Type 289H: 1 or 2-inch NPT female
Type 289HH: 1-inch NPT female

Outlet (Vent) Connections

Same size as inlet connection

Maximum Allowable Relief (Inlet) Pressure(1) and Maximum Relief Set Pressure

See table 1

Capacity Data

See figure 4

Standard Construction Materials

Valve Body and Spring Case
Types 289A and 289U: Zinc
Type 289H (1-inch), 289HH, and 289L: Aluminum
Type 289H (2-inch): Cast iron body with aluminum spring case

Diaphragm
Type 289A: Neoprene
Types 289H and 289HH: Nitrile or fluoroelastomer
All Others: Nitrile

Orifice
Types 289A and 289L: Aluminum
Type 289H (2-inch Only): Brass or Stainless steel

O-Ring Seat (Types 289H and 289HH Only): Nitrile or Fluoroelastomer(2)

O-Ring Seat Holder and Washer (1-inch Types 289H and 289HH Only): Aluminum

Seat Washer (2-inch Type 289H Only): Stainless steel

Pitot Tube
Types 289H and 289HH (1-inch), and 289L: Aluminum
Type 289H (2-inch): Brass or Stainless steel

Gaskets
Type 289L: Neoprene
All Others: Composition

Spring: Zinc-plated steel

Diaphragm Plate
Types 289A and 289U: Zinc
All Others: Zinc-plated steel

Closing Cap
Type 289L: Plastic, Aluminum, or Zinc
Type 289H (2-inch): Zinc

Material Temperature Capabilities(1)

With Nitrile and Neoprene Elastomers: –20 to150°F (–29 to 66°C)
With Fluoroelastomers: 20 to 300°F (–7 to 149°C)
Available with Types 289H and 289HH only

Approximate Shipping Weight

Types 289A and 289U: 0.75 lb (0.34 kg)
Type 289H
1-inch Size: 4 lb (1.8 kg)
2-inch Size: 15 lb (6.8 kg)
Type 289HH: 4 lb (1.8 kg)
Type 289L: 1.5 lb (0.7 kg)

Options

- TFE diaphragm protector (Types 289A and 289U only)
- wire-seal on closing cap (1-inch Type 289L only)

1. The pressure/temperature limits in this bulletin and any applicable standard limitation should not be exceeded.
2. Bubble-tight shutoff can not be attained at settings below 5 psig with fluoroelastomer O-ring seat.

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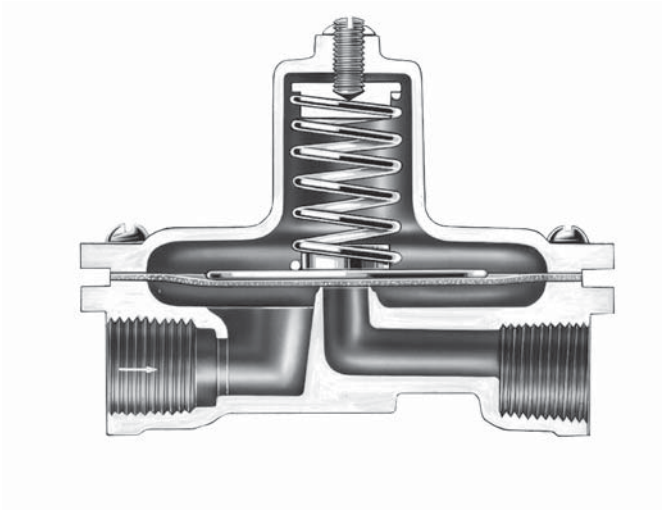

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Figure 2. *Type 289U Relief Valve (Also Typical of Type 289A Relief Valve)*

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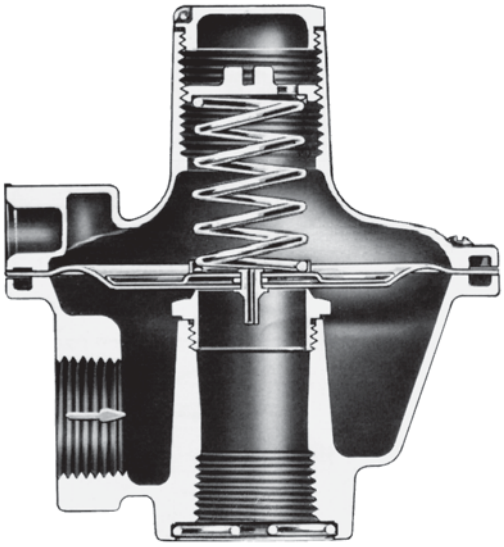

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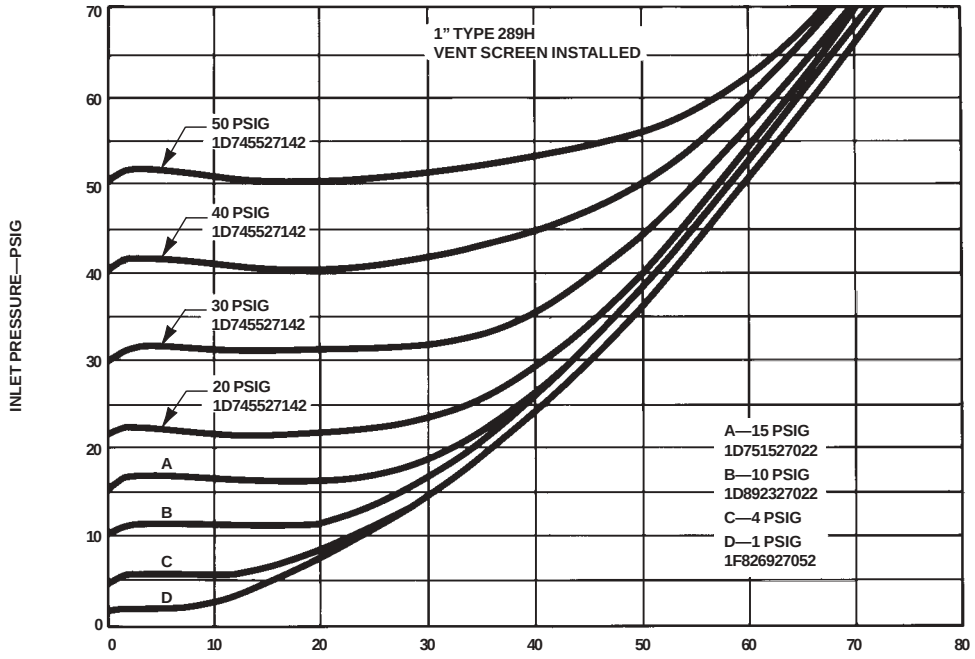
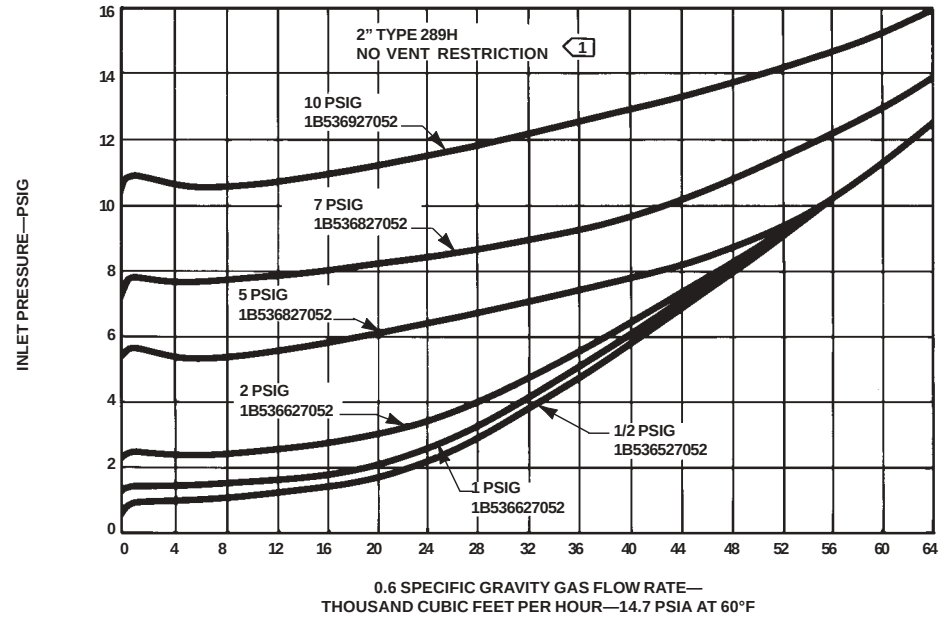
Figure 3. *Type 289L Relief Valve*





NOTE:
1 LESS THAN 5% CAPACITY LOSS CAN BE EXPECTED WITH THE VENT SCREEN INSTALLED ON THE 2-INCH TYPE 289H AT MAXIMU FLOW.
2. WHEN SELECTING ANY RELIEF VALVE FOR INSTALLATION DOWNATREAM OF A REGULATOR, THE CAPACITY OF THE RELIEF VALVE SHOULD BE COMPARED WITH THE WIDE-OPEN CAPACITY OF THE REGULATOR.
3. BUBBLE POINT RELIEF SETTING AND SPRING PART NUMBER ARE NOTED ON EACH CURVE.
4. TO CONVERT TO EQUIVALENT CAPACITIES OF OTHER GASES, MULTIPLY VALUES OBTAINED FROM CURVE BY THE FOLLOWING FACTORS: AIR–0.78, PROPANE–0.628, BUTANE–0.548, NITROGEN–0.789

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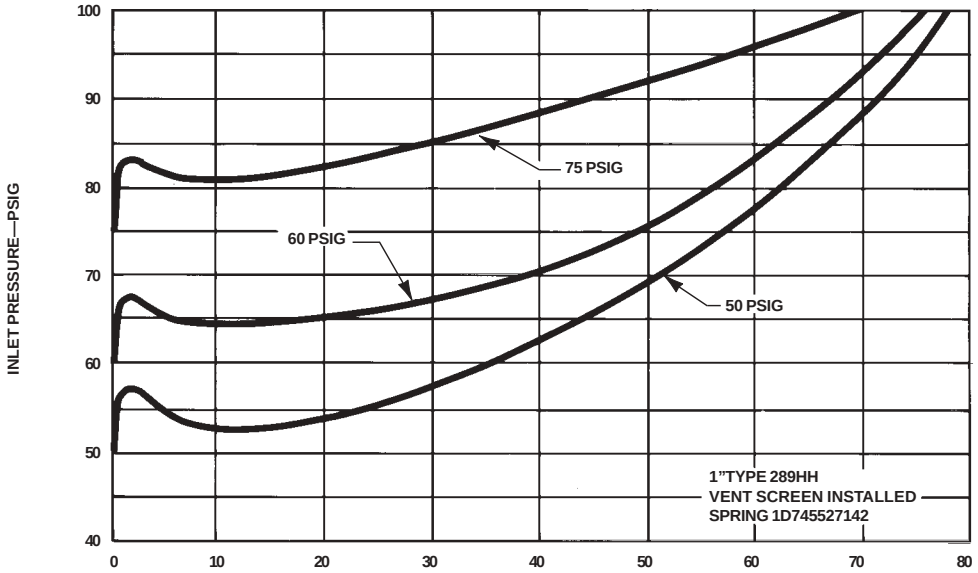
Figure 4. *Capacity for 0.6 Specific Gas at 14.7 Psia and 60° F*



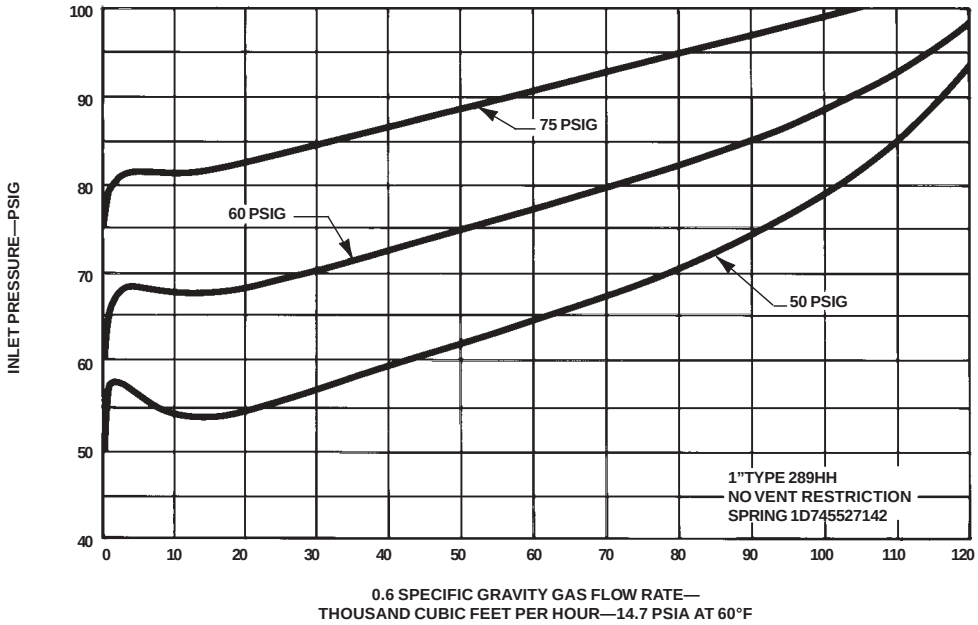


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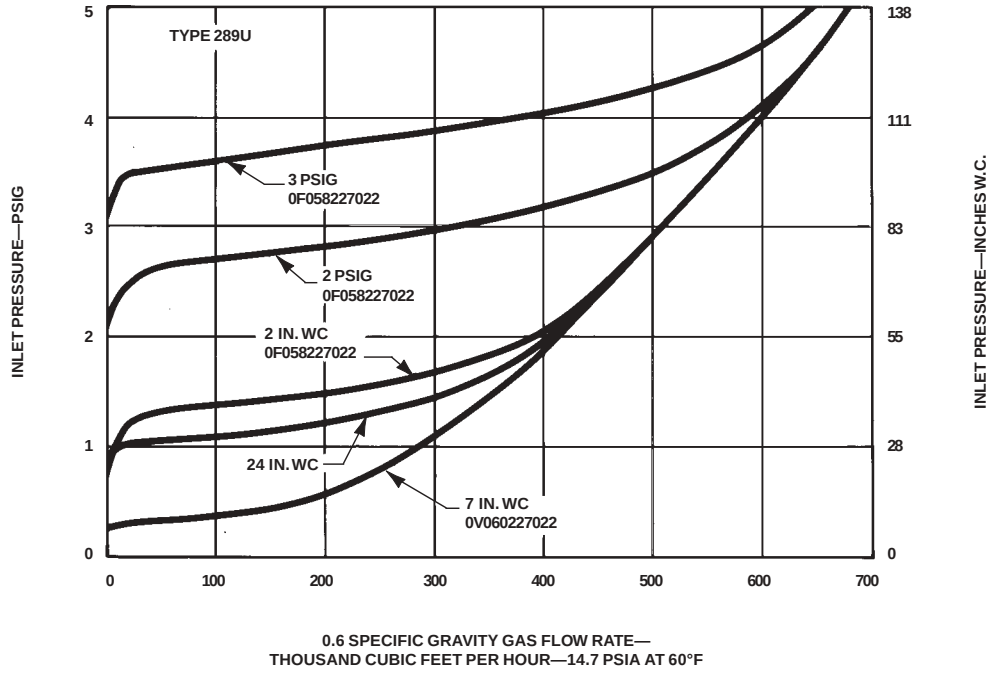
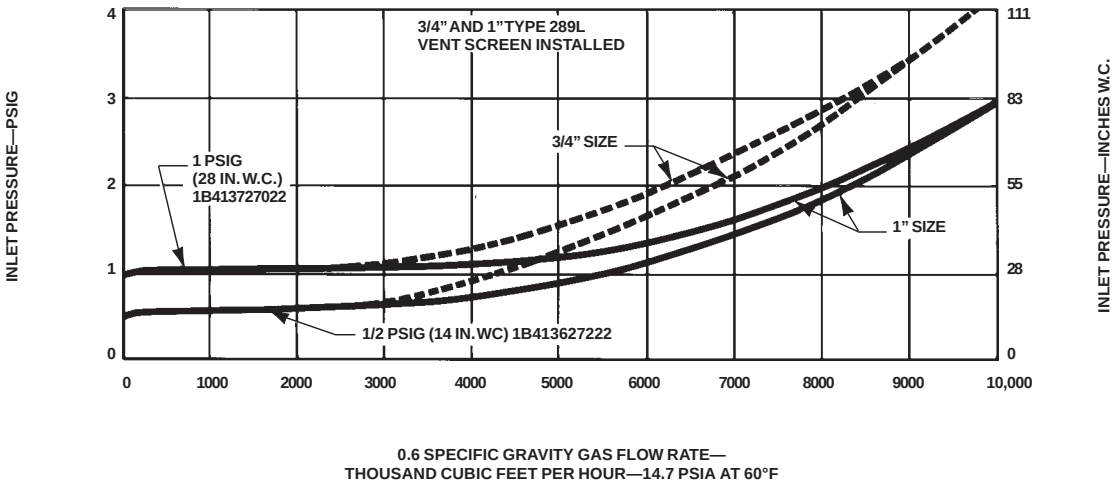
Figure 4. *Capacity for 0.6 Specific Gas at 14.7 Psia and 60° F (Continued)*





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3. TO CONVERT TO EQUIVALENT CAPACITIES OF OTHER GASES, MULTIPLY VALUES OBTAINED FROM CURVE BY THE FOLLOWING FACTORS: AIR–0.78, PROPANE–0.628, BUTANE–0.548, NITROGEN–0.789

B2311

Figure 4. *Capacity for 0.6 Specific Gas at 14.7 Psia and 60° F (Continued)*

Table 1. *Spring Ranges and Maximum Allowable Relief (Inlet) Pressures*

BODY SIZES, INCHES	TYPE	SPRING RANGE (RELIEF PRESSURE SETTINGS)	SPRING PART NUMBER	MAXIMUM ALLOWABLE RELIEF SETTING(1)	MAXIMUM ALLOWABLE RELIEF (INLET) PRESSURE(2)
1/4	289U	5 to 25-inches w.c. (12 to 62 mbar) 20-inches w.c. to 3 psig (50 mbar to 0.21 bar)	0V060227022 0F058227022	3 psig (0.21 bar)	10 psig (0.69 bar)
	289A	3 to 13 psig (0.21 to 0.9 bar) 11 to 22 psig (0.76 to 1.5 bar)	0Z056327022 1B268227022	22 psig (1.52 bar)	45 psig (3.1 bar)
3/4 or 1	289L	3 to 8-inches w.c. (7 to 20 mbar) 5 to 18-inches w.c. (12 to 45 mbar) 10 to 18-inches w.c. (25 to 45 mbar) 12 to 40-inches w.c. (30 to 99 mbar)	1B413527022 1N3112X0012 13A7917X012 13A7916X012	40-inches w.c. (99 mbar)	7 psig (0.52 bar)
1	289H	1 to 4.5 psig (0.069 to 0.3 bar) 4 to 15 psig (0.28 to 1.0 bar) 10 to 20 psig (0.69 to 1.4 bar) 15 to 50 psig (1.0 to 3.4 bar)	1F826927052 1D892327022 1D751527022 1D745527142	50 psig (3.4 bar)	100 psig (6.9 bar)
2	289H	7 to 18-inches w.c. (17 to 45 mbar) 0.5 to 2.25 psig (0.034 to 0.16 bar) 1.75 to 7 psig (0.12 to 0.52 bar) 4 to 10 psig (0.28 to 0.69 bar)	1B536527052 1B536627052 1B536827052 1B536927052	10 psig (0.69 bar)	25 psig (1.7 bar)
1	289HH	45 to 75 psig (3.1 to 5.2 bar)	1D745527142	75 psig (5.2 bar)	100 psig (6.9 bar)

1. With highest spring range available.
2. Maximum relief pressure setting plus buildup.

Installation

The 289 Series relief valves may be installed in any position. However, the outlet connection must be protected against the entrance of rain, snow, insects, or any other foreign material that may plug the outlet or affect the opening and closing of the valve (see figure 5). If it is necessary to pipe away the outlet, remove the outlet screen (if one is present).

Flow through the valve must be as indicated by the flow direction arrow on the body (inlet connection is marked on some sizes).

The spring case vent on the 2-inch Type 289H is tapped and plugged. This vent opening must remain plugged to allow the pitot tube booster to function.

Overpressure

Overpressure conditions in a regulating system may cause personal injury or equipment damage due to bursting of pressure-containing parts or explosion of accumulated gas. Check the system for damage if any of the maximum allowable relief (inlet) pressure ratings in table 1 are exceeded.

Ordering Information

When ordering, specify:

1. Type number and size
2. Relief pressure range and setting desired
3. Type of gas (natural gas, air, etc.); list any factors such as impurities in the gas that may affect compatibility of the gas with valve trim parts
4. Temperature and specific gravity of the gas
5. Maximum relief (inlet) pressure and flow rate desired
6. Line size and end connection size of adjacent piping
7. For Types 289H and 289HH, specify material of diaphragm and O-ring seat; for 2-inch Type 289H, specify material of orifice and pitot tube
8. Options desired, if any

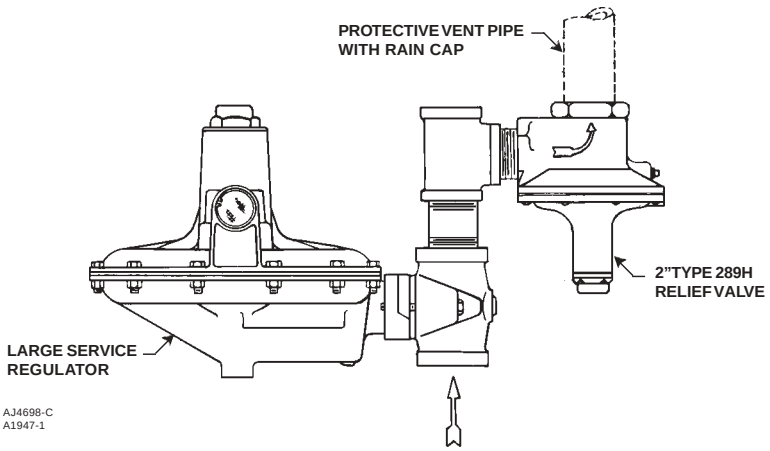

Figure 5. *Typical Installation of a 289 Series Relief Valve*

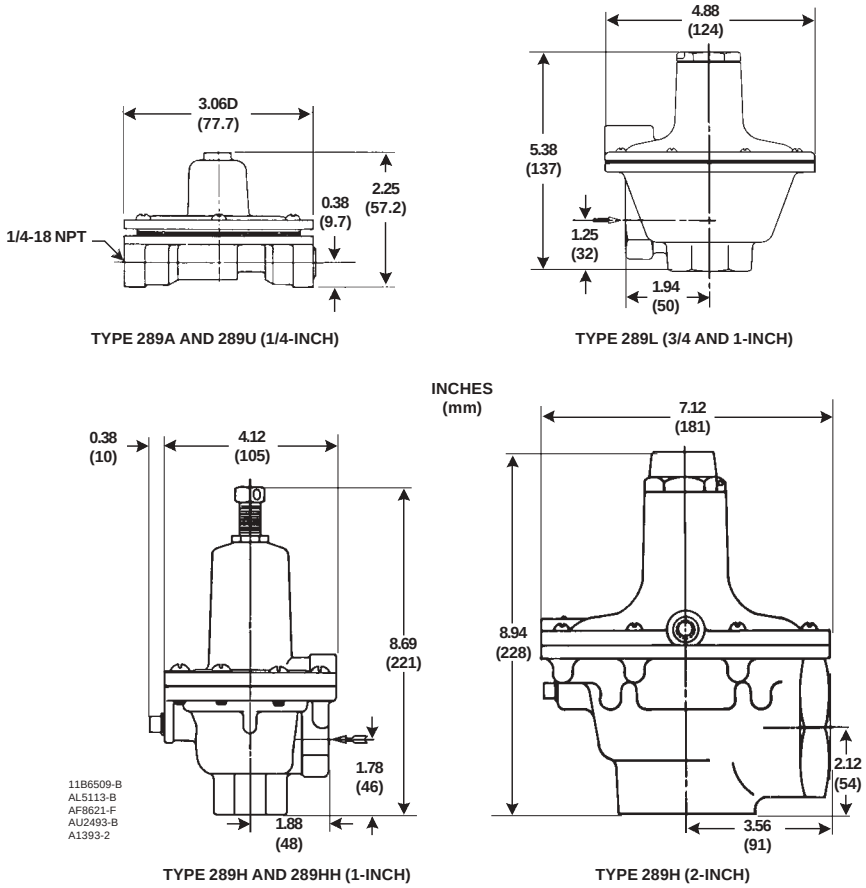

Figure 6. *Dimensions*

For information, contact Fisher Controls:
Marshalltown, Iowa 50158 USA
28320 Gallardon, France
Sao Paulo 05424 Brazil
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