

# 289 Series Relief Valves

## Introduction

### Scope of Manual

This instruction manual provides installation, maintenance, and parts ordering information for the 289 Series relief valves. Instructions for other equipment used with these relief valves can be found in separate instruction manuals.

### Description

The 289 Series pressure relief valves (see figure 1) are throttling relief valves used downstream of pressure regulators to protect the downstream system from overpressure. These relief valves can be used for natural gas, air, propane, or other noncorrosive, gas-flow service.

## Installation



### WARNING

Installing a 289 Series relief valve where its capabilities can be exceeded or where proper operation might be impaired may cause personal injury, property damage, or leakage due to bursting of pressure-containing parts or explosion of accumulated gas. To avoid such conditions, install a 289 Series relief valve where:

- Service conditions are within the unit capabilities specified in the Specifications section, and
- The relief valve is protected from exposure to physical damage and/or corrosive substances.

1. When installing a 289 Series relief valve, make sure that the installation of the system complies with applicable local, state, or federal codes or regulations.

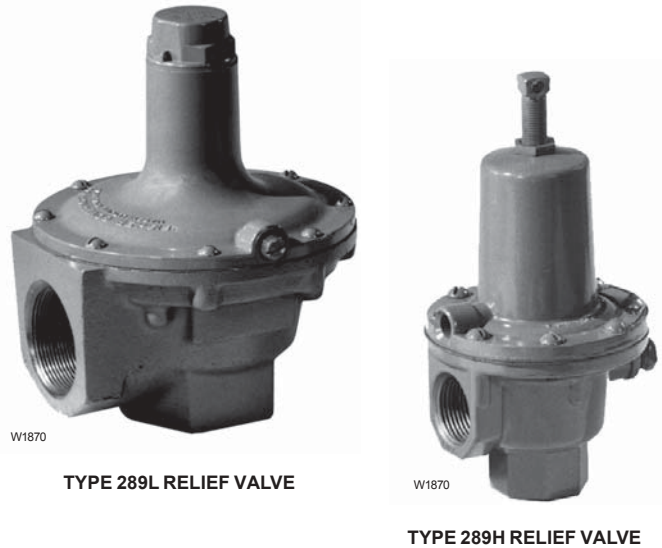


Figure 1. Typical 289 Series Relief Valves

2. Use qualified personnel when installing, operating, and maintaining a 289 Series relief valve. Before installation, make sure there is no damage to or foreign material in the relief valve and that all piping is clean and unobstructed.

3. For installation of Type 289H, 289HH, and 289L relief valves, the vent in the spring case must remain plugged or undrilled in order for the pitot tube to function properly.

4. The 289 Series relief valves may be installed in any orientation. However, if installing the relief valve at an outside location, adequate protection, such as raincaps or elbow piping (see figure 2), must be attached to the outlet to keep the relief valve from getting plugged or from collecting moisture, corrosive chemicals, or other foreign materials. If piping is to be attached to the valve outlet, the following parts (if they are connected to the valve outlet as shown in figures 4 through 8) must first be removed: the screen (key 9), the snap ring (key 13), and the gasket (key 15). A typical installation of a 289 Series relief valve is shown in figure 2.

# 289 Series

## Specifications

### Available Configurations

See table 1

### Body Sizes and Inlet Connections

**Type 289L:** 3/4 or 1-inch (DN 20 or 25) NPT

**Types 289A and 289U:** 1/4-inch (DN 6) NPT

**Type 289H:** 1 or 2-inch (DN 25 or 50) NPT

**Type 289HH:** 1-inch (DN 25) NPT

### Maximum Allowable Relief (Inlet) Pressure<sup>(1)</sup> and Maximum Relief Set Pressure

See table 1

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

**Nitrile and Neoprene:** -20 to 150° F (-29 to 66° C)

**Fluoroelastomers<sup>(2)</sup>:** 20 to 300° F (-7 to 149° C)

Available with Types 289H and 289HH only

### Pressure Setting Adjustment

Adjusting screw

### Pressure Registration

Internal

### Approximate Shipping Weight

**Types 289A and 289U:** 0.75 pounds (0,34 kg)

**Type 289H**

*1-inch Size:* 4 pounds (1,8 kg)

*2-inch Size:* 1.5 pounds (0,7 kg)

**Type 289HH:** 4 pounds (1,8 kg)

**Type 289L:** 1.5 pounds (0,7 kg)

### Additional Specifications

For construction materials, see parts list

1. The pressure/temperature limits in this instruction manual 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.



## WARNING

If using a 289 Series relief valve on hazardous or flammable gas service, personal injury and property damage could occur due to fire or explosion of vented gas that may have accumulated. To prevent such injury or damage, provide piping or tubing to vent the gas to a safe, well-ventilated area. Also, when venting a hazardous gas, the piping or tubing should be located far enough away from any buildings or windows so to not create a further hazard, and the vent opening should be protected against anything that could clog it.

5. Apply pipe compound to the male pipeline threads only; do not apply pipe compound to the internal body threads. Then install the relief valve so that the flow through it will match the direction arrow or marking cast on the valve body.

## Startup

Key numbers are shown in figures 4 through 8.

With proper installation completed and system equipment properly adjusted, close any vent valves, and slowly open the upstream shutoff valve while using pressure gauges to monitor pressure.

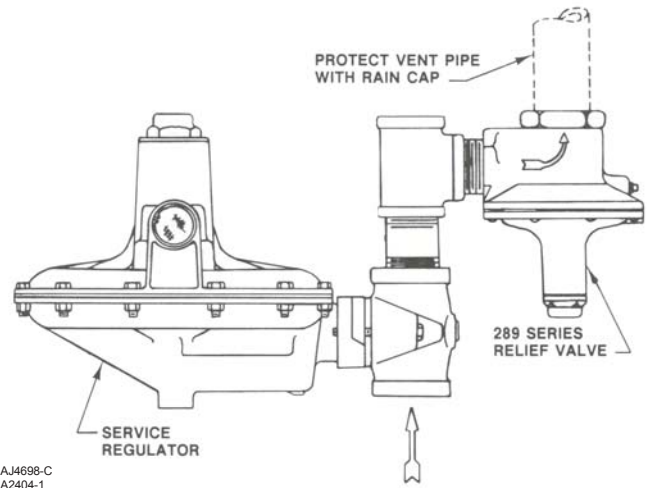


Figure 2. Typical Installation

## Note

To ensure proper operation of the pitot tube, if present, the spring case (key 2) must be tightly sealed. It is recommended that the gasket (key 15) be replaced whenever the closing cap (key 14) is removed. Antiseizing sealant should be applied to the adjusting screw (key 6) threads on valves without closing caps.

If set pressure adjustment is necessary, monitor the inlet pressure with a gauge during the adjustment procedure. Remove the closing cap (key 14), or loosen the hex nut (key 11), and turn the adjusting screw

Table 1. Maximum Allowable Relief (Inlet) Pressure

AVAILABLE CONFIGURATION	BODY SIZE, INCH (DN)	SPRING PART NUMBER	COLOR CODE	SPRING RANGE (RELIEF PRESSURE SETTINGS)	MAXIMUM ALLOWABLE RELIEF (INLET) PRESSURE <sup>(1)</sup>
289A	1/4 (6)	0Z056327022 1B268227022	Silver Silver	3 to 13 psig (0,2 to 0,9 bar) 11 to 22 psig (0,8 to 1,5 bar)	45 psig (3,1 bar)
289H	1 (25)	1F826927052 1D892327022 1D751527022 1D745527142	Pink Red Silver Green	1 to 4.5 psig (69 to 310 mbar) 4 to 15 psig (0,3 to 1,0 bar) 10 to 20 psig (0,7 to 1,4 bar) 15 to 50 psig (1,0 to 3,4 bar)	100 psig (6,9 bar)
	2 (50)	1B536527052 1B536627052 1B536827052 1B536927052	Dark blue Gray Dark green Red Stripe	7 to 18-inches w.c. (17 to 45 mbar) 0.5 to 2.25 psig (35 to 155 mbar) 1.75 to 7 psig (121 to 483 mbar) 4 to 10 psig (0,3 to 0,7 bar)	25 psig (1,7 bar)
289HH	1 (25)	1D745527142	Green	45 to 75 psig (3,1 to 5,2 bar)	100 psig (6,9 bar)
289L	3/4 or 1 (20 or 25)	1B413527222	White	3 to 8-inches w.c. (7 to 20 mbar)	7 psig (0,5 bar)
		1N3112X0012	Stainless steel	5 to 18-inches w.c. (12 to 45 mbar)	
		13A7917X012	Silver	10 to 18-inches w.c. (25 to 45 mbar)	
		13A7916X012	Red Stripe	12 to 40-inches w.c. (30 to 100 mbar)	
289U	1/4 (6)	0V060227022	Silver	5 to 25-inches w.c. (12 to 62 mbar)	10 psig (0,7 bar)
		0F058227022	Silver	20-inches w.c. to 3 psig (50 to 206 mbar)	

1. This value indicates the relief pressure setting plus pressure buildup.

(key 6) clockwise to increase or counterclockwise to decrease the relief pressure setting.

For 2-inch Type 289H relief valves, when changing from one spring range to another, it is recommended that a new spring case be used so that the travel stop drive screw will be positioned correctly for the corresponding spring range. Each spring range requires that the travel stop drive screw be positioned appropriately in the spring case to prevent setting the relief valve pressure too high. The location of the travel stop drive screw for each spring and spring range is shown in figure 3.

## Shutdown

Close the upstream shutoff valve, and release all pressure from the relief valve.

## Maintenance

Relief valve parts are subject to normal wear and should be inspected periodically for maintenance. The frequency of inspection and replacement of parts depends upon the severity of service conditions.

This section contains information for inspection and maintenance of 289 Series relief valves. Maintenance procedures are presented for relief valve configurations of similar construction. Refer to the appropriate procedure and figure for the particular relief valve configuration when changing the control spring to one of a different range or when inspecting, cleaning, or replacing any other relief valve parts. The screen (key 9, figures 4 through 7) and vent piping, if present, should be free of foreign material that might impair relief flow.

SPRING PART NUMBER	SPRING RANGE (RELIEF PRESSURE SETTING)	DIMENSION A, INCH (mm)
1B536527052	7 to 18-inches w.c. (17 to 45 mbar)	Drive screw not required
1B536627052	0.5 to 2.25 psig (35 to 155 mbar)	1-17/32 (39)
1B536827052	1.75 to 7 psig (121 to 483 mbar)	2-5/32 (55)
1B536927052	4 to 10 psig (0,3 to 0,7 bar)	2-5/16 (59)

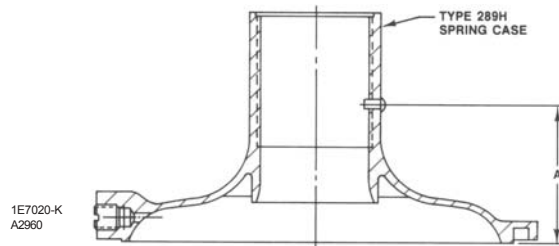


Figure 3. Location of Travel Stop Drive Screw for 2-Inch, Type 289H Relief Valve

### Note

The relief valve body (key 1, figures 4 through 8) may remain in the pipeline during maintenance unless replacement of the valve body is necessary.



## WARNING

Avoid personal injury or property damage from sudden release of pressure or explosion of accumulated gas. Before starting disassembly:

- Isolate the relief valve from line pressure, and
- Release trapped pressure from the valve body and pressure line.

# 289 Series

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## Type 289A

All key numbers are shown in figure 4.

1. Loosen the hex nut (key 11), and unscrew the adjusting screw (key 6) to relieve spring compression.
2. Unscrew the machine screws (key 8), and remove the spring case (key 2), the spring seat (key 4), the spring (key 7), the diaphragm head (key 3) and the diaphragm (key 5).
3. Inspect the diaphragm and seating surfaces for damage or wear, and replace parts as necessary. To remove the orifice (key 10) unscrew it from the body.
4. Reinstall the orifice, the diaphragm, the diaphragm head, the spring, and the spring seat.
5. Reattach the spring case using the machine screws.
6. If a new spring with a different range is installed, stamp the spring case with the new spring range.
7. Adjust the spring compression according to the procedures outlined in the Startup section.

## Type 289U

All key numbers are shown in figure 5.

1. Loosen the hex nut (key 11), and unscrew the adjusting screw (key 6) to relieve spring compression.
2. Unscrew the machine screws (key 8), and remove the spring case (key 2), the spring seat (key 4), the spring (key 7), and the diaphragm assembly (key 5).
3. Inspect the diaphragm assembly and seating surfaces for damage or wear, and replace parts as necessary.
4. Reinstall the diaphragm assembly, the spring, and the spring seat.
5. Reattach the spring case using the machine screws.
6. If a new spring with a different range is installed, stamp the spring case with the new spring range.
7. Adjust the spring compression according to the procedures outlined in the Startup section.

## Type 289L

All key numbers are shown in figure 6.

1. Remove the closing cap (key 14) and the gasket (key 15), and then unscrew the adjusting screw (key 6) to relieve spring compression.
2. Unscrew the machine screws (key 8), and then remove the spring case (key 2), the spring (key 7), and the diaphragm assembly (key 5).
3. Inspect the diaphragm and seating surfaces for damage or wear, and replace parts as necessary. To remove the orifice (key 10), unscrew it from the body.

Check the pitot tube in the diaphragm assembly for blockage, and remove any foreign material that might impair proper operation of the relief valve.

4. Reinstall the orifice, the diaphragm assembly, and the spring.
5. Reattach the spring case using the machine screws.
6. If a new spring with a different range is installed, stamp the closing cap with the new spring range.
7. Adjust the spring compression according to the procedures outlined in the Startup section, and then reinstall the closing cap and gasket.

## Type 289HH and 1-Inch Type 289H

All key numbers are shown in figure 7.

1. Loosen the hex nut (key 11), and then unscrew the adjusting screw (key 6) to relieve spring compression.
2. Unscrew the machine screws (key 8), and remove the spring case (key 2), the spring seat (key 4), and the spring (key 7).
3. Unscrew the hex nut (key 24), and remove the lower spring seat (key 17), the diaphragm head (key 3), and the diaphragm (key 5).
4. Unscrew the machine screws (key 29), and then remove the stem guide assembly (key 31) and attached parts from the valve body (key 1).
5. Slide the spacer (key 23) and the pitot tube (key 18) and attached parts from the valve body.
6. Remove the washer (key 27), the gasket (key 19), the spacer, the O-rings (key 30), the O-ring holder (key 21), the O-ring (key 20), and the O-ring washer (key 22) from the pitot tube.
7. Inspect the O-rings, the gaskets, the spacer, the orifice, and the seating surfaces for damage or wear, and replace parts as necessary.
8. Apply antiseizing sealant to the adjusting screw threads, and to the end of the adjusting screw that contacts the spring seat.
9. Slide the O-ring washer, the O-rings (keys 30 and 20), the O-ring holder, the O-ring (key 30), the spacer, the stem guide assembly, the gasket, and the washer (key 27) onto the pitot tube.
10. Reinstall the stem guide assembly with attached parts into the valve body, and then attach this assembly with the machine screws (key 29).
11. Replace the diaphragm, the diaphragm head, and the lower spring seat, and then secure these parts with the hex nut (key 24).
12. Reinstall the spring and the spring seat, and then attach the spring case to the valve body using the machine screws (key 8).

13. If a new spring with a different range is installed, stamp the spring case with the new spring range.

14. Adjust the spring compression according to the procedures outlined in the Startup section.

## 2-Inch Type 289H

All key numbers are shown in figure 8.

1. Remove the closing cap and the gasket (keys 14 and 15), and then unscrew the adjusting screw (key 6) to relieve spring compression.

2. Unscrew the machine screw (key 8), and remove the spring case (key 2), the washer (key 27), and the spring (key 7).

3. Unscrew the hex nut (key 24), unscrew the lifting stem (key 25), and then unscrew the hex nut (key 11).

4. Remove the lower spring seat (key 17), the diaphragm head (key 3), the diaphragm (key 5), the lower diaphragm head (key 26), and the gasket (key 19).

5. Unscrew the machine screws (key 29), and then remove the stem guide assembly (key 31) and attached parts.

6. Slide the spacer (key 23) and the pitot tube (key 18) and attached parts out of the stem guide assembly.

7. Remove the gaskets (key 19), the spacer (key 23), and the O-ring washer (key 22) from the pitot tube. Then remove the O-ring washer (key 20) and the orifice (key 10) from the valve body (key 1).

8. Inspect the O-rings, the gaskets, the spacer, the orifice, and the seating surfaces for damage or wear, and replace parts as necessary.

9. Apply antiseizing sealant to the orifice threads, and then to the adjusting screw threads.

10. Reinstall the orifice and the O-ring (key 20) into the valve body.

11. Slide the gasket, the O-ring washer, the gasket, the spacer, the stem guide assembly, and the gasket onto the pitot tube.

12. Reinstall the stem guide assembly with attached parts into the valve body, and attach it with the machine screws (key 29).

13. Replace the lower diaphragm head, the diaphragm, the diaphragm head, and the lower spring seat; then secure these parts with the hex nut (key 11). Screw in the lifting stem, and lock it in place with the hex nut (key 24).

14. Reinstall the spring and the washer.

**another, use a new spring case to position the travel stop drive screw correctly for the corresponding spring range. Each spring range requires that the travel stop drive screw be positioned appropriately in the spring case to prevent setting the relief valve pressure too high. The location of the travel stop drive screw for each spring and spring range is shown in figure 3.**

15. Attach the spring case to the valve body using the machine screws (key 8).

16. If a new spring with a different range is installed, stamp the spring case with the new spring range.

17. Adjust the spring compression according to the procedures outlined in the Startup section. Then install the gasket and the closing cap.

## Parts Ordering

When corresponding with your Fisher Sales Office or Sales Representative about this equipment, always reference the equipment serial number stamped on the spring case (key 2) or the closing cap (key 14). When ordering replacement parts, specify the complete 11-character part number of each required part as found in the following parts list.

## Parts List

Key	Description	Part Number
	Parts Kit (included are keys 5, 9, 15, 19, 20, 30 and 38). Screen is stainless steel and gaskets are composition and neoprene.	
	289A (includes only keys 5 and 9) Neoprene diaphragm	R289AX00012
	289L (includes only keys 5, 9, and 15) Nitrile diaphragm and O-rings	
	3/4-inch body	R289LX00012
	1-inch body	R289LX00022
	289H (1-inch body) and 289HH Nitrile diaphragm and O-rings	R289HX00012
	Fluoroelastomer diaphragm and O-rings	R289HX00032
	289H, 2-inch body (includes keys 5, 9, 15, 19, 20, and 38) Nitrile diaphragm and O-rings	R289HX00022
	Fluoroelastomer diaphragm and O-rings	R289HX00042
	289U (includes only keys 5 and 9) Nitrile diaphragm	R289UX00012
1	Valve Body	
	289A, zinc	0Y071044022
	289U, zinc	1B043844012
	289H (1-inch body) and 289HH, aluminum	3U888208012
	289H (2-inch body), cast iron	31B1992X012
	289L, aluminum	
	3/4-inch body	3L407008012
	1-inch body	3L406908012

\*Recommended spare part.

### Note

**For 2-inch Type 289H relief valves, when changing from one spring range to**

# 289 Series

Key	Description	Part Number
2	Spring Case/Spring Case Assembly 289A, zinc 289H (1-inch body) and 289HH, aluminum 289H (2-inch body), zinc/steel 289L, aluminum 289U, zinc	1A505144022 1P901708012 1E7020000A2 3L3338X0012 0B061644022
3	Diaphragm Head 289A, zinc 289H, plated steel 1-inch body 2-inch body 289HH, zinc plated steel	0T022744022 1D666428982 0W020225072 1P901425062
4	Spring Seat 289A, brass 289U, zinc 289H (1-inch body) and 289HH, plated steel	0T022614012 1B372544022 1D667125072
5	Diaphragm/Diaphragm Assembly 289A, neoprene 289H (1-inch body) and 289HH Nitrile Fluoroelastomer 289H (2-inch body) Nitrile Fluoroelastomer 289L Nitrile <sup>(1)</sup> , 3/4 & 1-inch body, standard Fluoroelastomer <sup>(2)</sup> (1-inch body) 289U <sup>(3)</sup> , nitrile	1A505202102 1E606602052 1E606602342 1D780002052 1D780002332 AL4068000A2 1N3130X0012 18A2815X012
6	Adjusting Screw 289A, brass 289H (1-inch body) and 289HH, plated steel 289H (2-inch body) zinc 289L, Delrin <sup>(4)</sup> 289U, brass	1A568414012 1D995448702 1B537944012 T1007106642 0F058114012 See table 1
7	Spring	See table 1
8	Machine Screw, plated steel 289A (6 required) 289H and 289HH, 1-inch body, (8 required) 289H, 2-inch body (8 required) 289L (8 required without wire seal, 7 required with wire seal) 289L (1 required with wire seal) 289U (6 required)	1B777428982 1A391724052 1A407824052 1B285628982 1L927728982 1A345128982
9	Screen, stainless steel 289L 3/4-inch body 1-inch body 289A and 289U 289H and 289HH, 1-inch body 289H, 2-inch body	1B633538392 1E564843122 0L078343062 1E564843122 11B1994X012
10	Orifice 289A, aluminum 289H (2-inch body) Brass Stainless steel 289L, aluminum	0T022509012 1E702613012 1E702635072 1L406409012
11	Hex Nut 289A and 289U, brass 289H (1-inch body) and 289HH, plated steel 289H (2-inch body), plated steel	1A505418992 1D667728982 D780124272
13	Snap Ring 289L, stainless steel 3/4-inch body 1-inch body 289H and 289HH, 1-inch body, plated steel 289H, 2-inch body	1B633638992 1E564937022 13A9938X012 10B9241X012
14	Closing Cap 289H, 2-inch body, zinc 289L Without wire seal, plastic Without wire seal, zinc	1B541644012 T1007206992 1H9669X0012
15*	Gasket, neoprene 289H and 289HH, 1-inch body 289H, 2-inch body 289L	13A9929X012 1P753306992 1E105606992

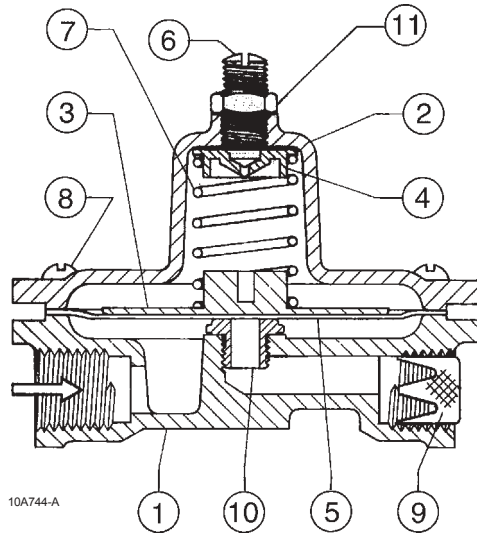
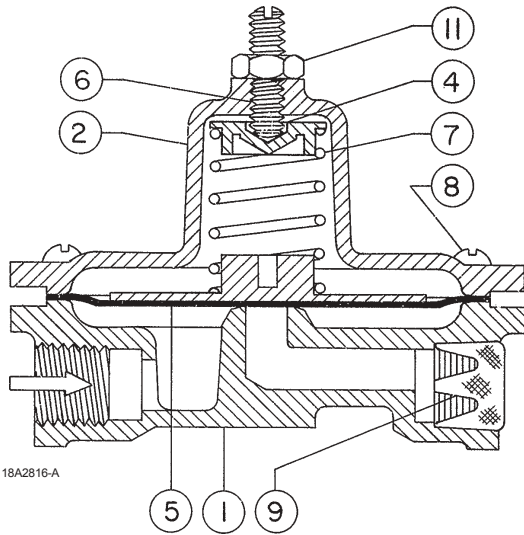


Figure 4. Typical Type 289A Relief Valve

Key	Description	Part Number
16	Nameplate, aluminum	-----
17	Lower Spring Seat, plated steel 289H and 289HH, 1-inch body 289H, 2-inch body	1D666625072 1D779925062
18	Pitot Tube 289H and 289HH, 1-inch body, aluminum 289H, 2-inch body Brass Stainless steel	1F826209012 1E701914012 1E701935032
19*	Gasket, composition 289HH, 1-inch body (1 required) 289H, 2-inch body (3 required)	1F826804022 1D779804022
20*	O-Ring 289H, 1-inch body Nitrile Fluoroelastomer 289H, 2-inch body Nitrile Fluoroelastomer 289HH Nitrile Fluoroelastomer	1F826606992 1F2692X0012 1P336106992 1V664606382 1F269206992 1F2692X0012
21	O-Ring Holder, aluminum 289H and 289HH, 1-inch body	1F826409012
22	O-Ring Washer 289H and 289HH, 1-inch body, aluminum 289H, 2-inch body, stainless steel	1F826509012 1E702136072
23	Spacer 289H and 289HH, 1-inch body, stainless steel 289H, 2-inch body Brass Stainless steel	1F826335242 1E702214172 1E702235162
24	Hex Nut, plated steel 289H and 289HH, 1-inch body 289H, 2-inch body	1A499724122 1B228228982
25	Lifting Stem, 289H, 2-inch body, plated steel	1D780224092
26	Lower Diaphragm Head, plated steel 289H, 2-inch body	1E703125072
27	Washer, aluminum 289H and 289HH, 1-inch body 289H, 2-inch body	1F826709012 1C680511032
28	Pipe Plug, 289H and 289HH, plated steel	1D754828982
29	Machine Screw, plated steel (not shown) 289H and 289HH, 1-inch body (2 required) 289H, 2-inch body (4 required)	1D386928982 1F386528992
30*	O-Ring, Types 289H and 289HH, 1 inch body (2 required) Nitrile Fluoroelastomer	1D687506992 1N430406382

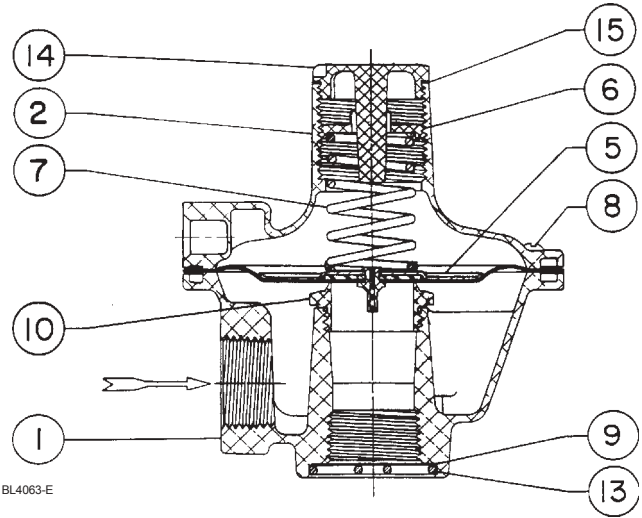
1. Assembly also includes an aluminum pitot tube and brushing, a zinc plated steel spring seat and diaphragm head, and a neoprene seat pad.  
2. Assembly also includes an aluminum pitot tube, bushing, and diaphragm head, a 302 stainless steel spring seat, and a neoprene seat pad.  
3. Assembly also includes a zinc diaphragm head.  
4. Trademark of E.I. du Pont de Nemours Co.

\*Recommended spare part.



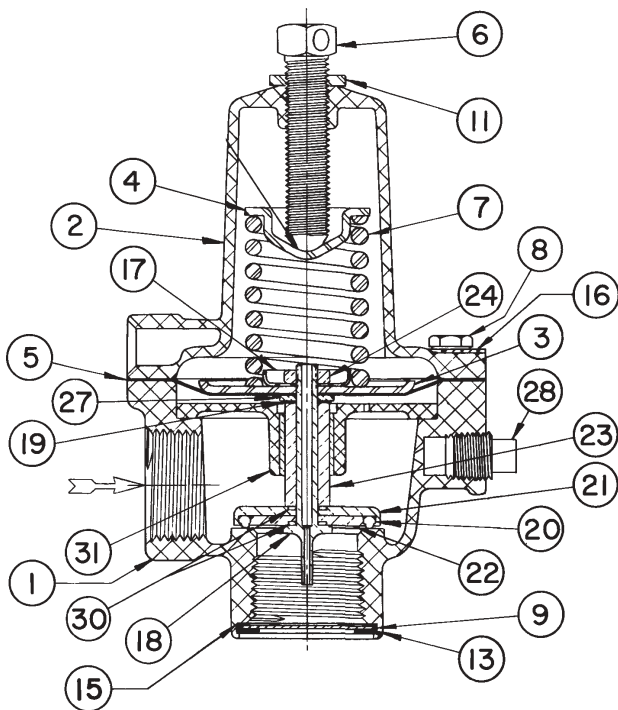
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Figure 5. Typical Type 289U Relief Valve



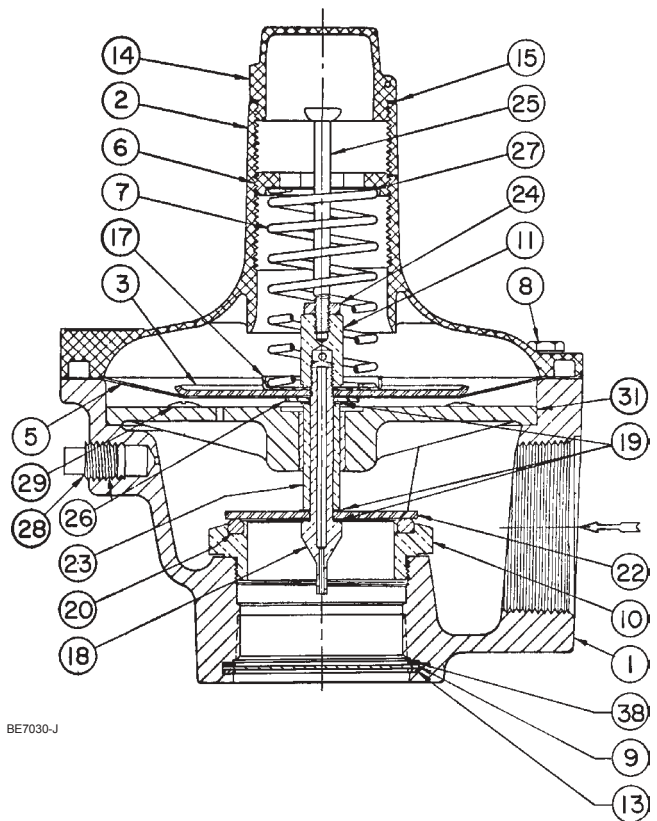
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Figure 6. Typical Type 289L Relief Valve



AF8260-F

Figure 7. Typical of Type 289HH and 1-Inch Type 289H Relief Valve



BE7030-J

Figure 8. 2-Inch Type 289H Relief Valves

Key	Description	Part Number
31	Stem Guide Assembly	
	289HH, 1-inch body	
	Zinc/brass	1F8272000A2
	Zinc/303 stainless steel	1F8272X0012
	289H, 2 inch body	
	Cast iron/brass	1E7028000A2
	Cast iron/303 stainless steel	1E7028X00A2

Key	Description	Part Number
32	Lifting Lever (not shown), 289H, 2-inch body	OR061725092
33	Wire Seal (not shown), 289L, 1-inch body	1D884799012
34	Diaphragm Protector (not shown), 289A & 289U	10A5116X012
38*	Gasket, 289H, 2-inch body	11B1993X012

\*Recommended spare part.

## Errata Sheet

for

289 Series Relief Valves  
Form 1724, August 1990

When installing the molded diaphragm in the 289 Series Relief Valves, make sure the diaphragm convolutions is installed in the down position as shown in figure 1.

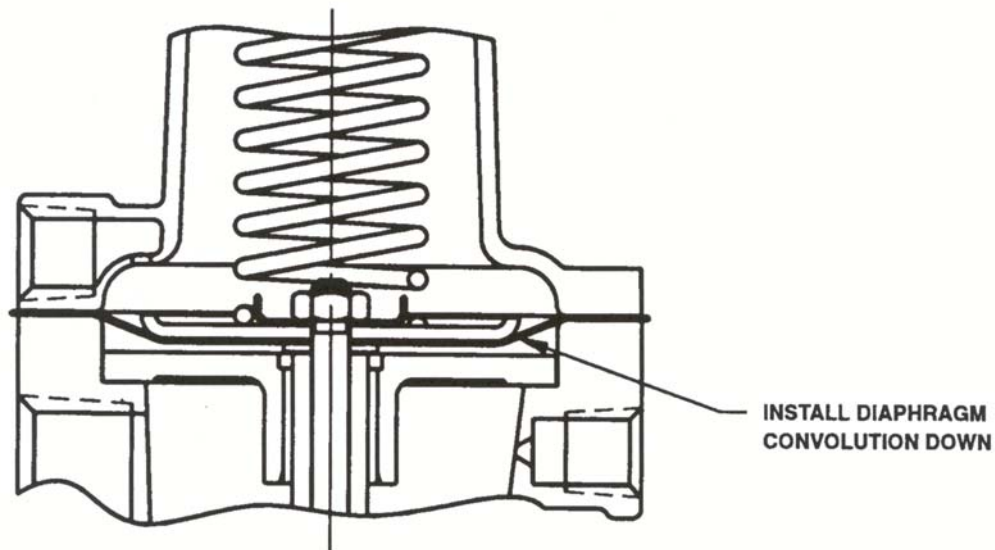


Figure 1. Installation of Diaphragm

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