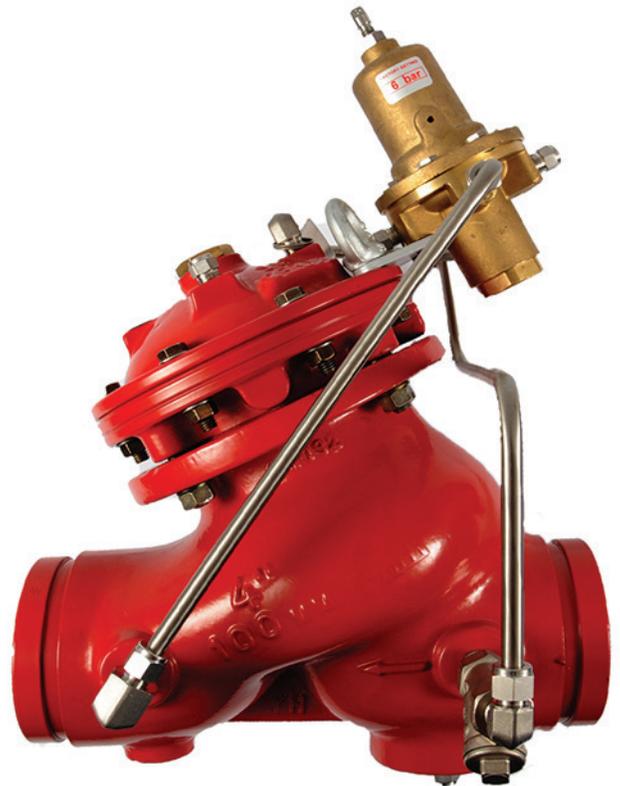


# 867-7UL Pressure Reducing Valve

HANG THESE INSTRUCTIONS ON THE INSTALLED VALVE FOR FUTURE REFERENCE



**⚠ WARNING**



- Read and understand all instructions before attempting to install, remove, adjust, or perform maintenance on any Victaulic piping products.
- Depressurize and drain piping systems before attempting to install, remove, adjust, or perform maintenance on any Victaulic piping products.
- Wear safety glasses, hardhat, and foot protection.
- Save this installation, maintenance, and testing manual for future reference.

Failure to follow instructions and warnings could cause system failure, resulting in death or serious personal injury and property damage.



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## HAZARD IDENTIFICATION

Definitions for identifying the various hazard levels are provided below.



This safety alert symbol indicates important safety messages. When you see this symbol, be alert to the possibility of personal injury. Carefully read and fully understand the message that follows.

### DANGER

- The use of the word “DANGER” identifies an immediate hazard with a likelihood of death or serious personal injury if instructions, including recommended precautions, are not followed.

### WARNING

- The use of the word “WARNING” identifies the presence of hazards or unsafe practices that could result in death or serious personal injury if instructions, including recommended precautions, are not followed.

### CAUTION

- The use of the word “CAUTION” identifies possible hazards or unsafe practices that could result in personal injury and product or property damage if instructions, including recommended precautions, are not followed.

### NOTICE

- The use of the word “NOTICE” identifies special instructions that are important but not related to hazards.

## SAFETY INSTRUCTIONS

### WARNING



- An experienced, trained installer must install this product in accordance with all instructions. These instructions contain important information.



- Depressurize and drain the piping system before attempting to install, remove, adjust, or maintain any Victaulic piping products.

Failure to follow these instructions can cause product failure, resulting in death or serious personal injury and property damage.

1. **Read and understand all instructions before proceeding with the installation, maintenance, and testing of this valve.** For proper operation and approval, the 867-7UL pressure-reducing valve and accessories must be installed in accordance with the specific instructions included with the shipment.
2. **Use only recommended accessories.** Accessories and equipment that are not approved for use with this valve may cause improper system operation.
3. **Wear safety glasses, hardhat, foot protection, and hearing protection.** Wear hearing protection if you are exposed to long periods of noisy jobsite operations.
4. **Prevent back injury.** Large and pre-trimmed valves are heavy and require more than one person (or mechanical lifting equipment) to position and install the assembly. Always practice proper lifting techniques.
5. **Avoid using electrically powered tools in dangerous environments.** When using electrically powered tools for installation, ensure that the area is moisture-free. Keep the work area well lit, and allow enough space to accommodate proper installation of the valve, trim, and accessories.
6. **Watch for pinch points.** Do not place fingers under the valve body where they could be pinched by the weight of the valve. Use caution around spring-loaded components.
7. **Keep work areas clean.** Cluttered areas, benches, and slippery floors can create hazardous working conditions.

## INTRODUCTION

### NOTICE

- Drawings and/or pictures in this manual may be exaggerated for clarity.
- The valve, along with this operating and maintenance instructions manual, contains trademarks, copyrights, and/or patented features that are the exclusive property of Victaulic.

The model 867-7UL pressure-reducing valve is an automatic pressure control valve that reduces higher inlet pressure to lower constant outlet pressure, automatically adjusting for fluctuating flow-rates and/or varying inlet pressure. It is a pilot-operated, diaphragm-actuated, low pressure-loss valve. Valve differential pressure powers the diaphragm actuator open or closed. The double-chambered actuator design enables quick and smooth valve action

Models and sizes covered by this document include the 867-7UL pressure-reducing valve, sizes 1.5” through 20”, in both the globe “Y” and angle patterns.

**APPROVALS AND PRESSURE RATINGS**

Sizes 2", 2.5", 3", 4" and 6" are UL-Listed for maximum rated pressure of 300 psi (21 bar). Size 8" is UL-Listed for a maximum rated inlet pressure of 175 psi (12 bar), outlet pressure setting for all sizes is 30-165 psi.

Lloyd's Register approved sizes 1.5" through 20" for maximum rated pressure of 300 psi (21 bar), ABS type approved Sizes 1.5" through 12" for maximum rated pressure of 300 psi (21 bar) and DNV type approved sizes 1.5" through 10" for maximum rated pressure of 300 psi (21 bar).

When setting the outlet pressure, the inlet pressure should be at least 15 psi (1 bar) higher than the set outlet pressure.

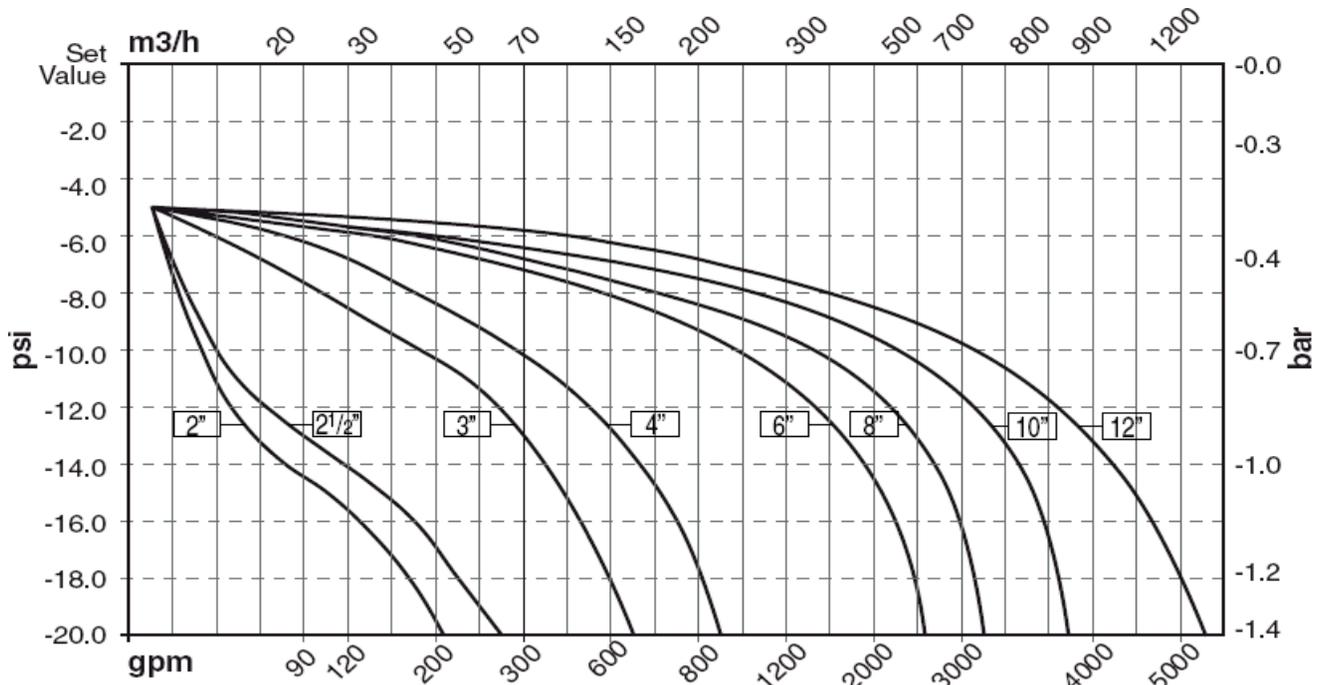
In cases where the inlet pressure falls below or is equal to the intended outlet pressure, the outlet pressure and flow will be as described in Table 2.

In the case of zero (static) flow through the valve, the maximum increase in the downstream (outlet) pressure above the set pressure of the valve will not exceed 8 psi (0.5 bar).

Valve Size mm	1½" 40	2 50	2½" 65	3 80	4 100	6 150	8 200	10 250	12 300	14 350	16 400	18 450	20 500
#150 Pressure Rating psi/bar	250 17	250 17	250 17	250 17	250 17	250 17	250 17	250 17	250 17	250 17	250 17	250 17	250 17
#300 Pressure Rating psi/bar	300 21	300 21	300 21	300 21	300 21	300 21	300 21	300 21	300 21	300 21	300 21	300 21	300 21
Outlet Pressure Setting Range psi/bar	30-165 2-11.5												
Maximum FLOW GPM/LPM	80 300	150 568	150 568	500 1,892	800 3,028	1,800 6,813	4,000 15,140	6,000 22,700	8,500 32,000	8,500 32,000	15,000 57,000	15,000 57,000	19,000 71,923
Recommended* Relief Valve Size inch/mm	½ 12	½ 12	½ 12	1½ 40	2 50	2 50	3 80	4 100	2 X 4 2 X 100	2 X 4 2 X 100	2 X 6 2 X 150	2 X 6 2 X 150	2 X 6 2 X 150

\* NOTE: Relief valves are not included with valve.

**Table 1: Pressure And Flow Ratings And Recommended Relief Valve Size**



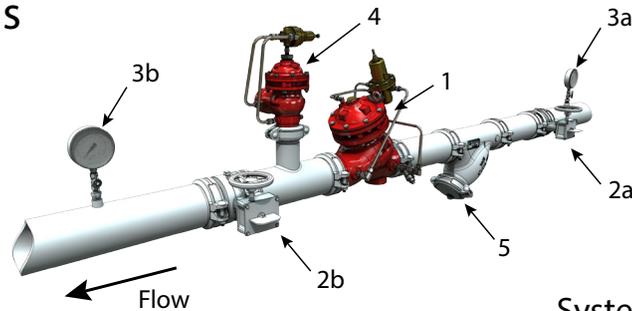
**Table 2: Valve Outlet Pressure Fall-Off Characteristics Below On Inlet Under Set Pressure**

## INSTALLATION

1. Allow enough room around the valve assembly for any adjustments and future maintenance or disassembly work.
2. Before the valve is installed, flush the pipeline to remove any dirt, scale, debris, etc. Failure to flush the line may render the valve inoperable.
3. Listed isolating valves should be installed upstream and downstream of the model 867-7UL valve to allow future maintenance. See Figure 1.
4. Install the valve in the pipeline with the valve flow arrow on the body casting in the proper direction. Use the lifting eye provided on the main valve cover for lifting and lowering the valve.
5. The standard model 867-7UL is intended for horizontal installation only. Other installation orientations may be approved only upon request. Contact Victaulic.
6. Ensure that the valve is positioned so that the actuator can be easily removed for future maintenance.
7. After installation, carefully inspect/correct any damaged accessories, piping, tubing, or fittings.
8. Install a UL listed sprinkler system pressure relief valve sized in accordance with NFPA 13.
9. Install a UL listed pressure gauge on both the upstream and downstream of the pressure reducing control valve. See Figure 1 for indicated installation.
10. Install the model 867-7UL valve in accordance with the Standard for Installation of Fire Sprinkler Systems, NFPA 13, or the Standard for Installation of Standpipe and Hose Systems, NFPA 14, as appropriate. The model 867-7UL valve is to be tested after installation in accordance with NFPA 13.
11. The model 867-7UL valve is to be inspected, tested, and maintained in accordance with the Standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection Systems, NFPA 25.

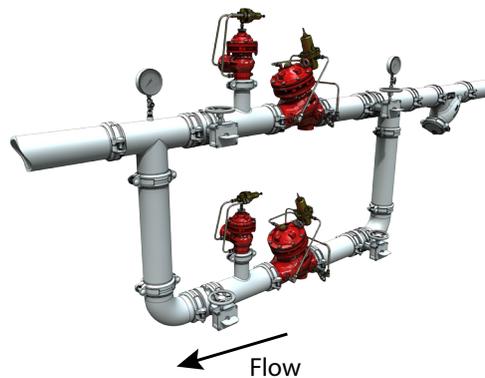
## Typical Installations

### Standard Pressure Reducing System



### Parallel Pressure Reducing System

- Wide flow range
- Redundant safety
- Serviceable with zero down time



### System Components

- 1 Model 867-7UL
- 2a Upstream isolating valve
- 2b Downstream isolating valve
- 3a Upstream pressure gauge
- 3b Downstream pressure gauge
- 4 Pressure relief valve
- 5 Strainer

### Two-Stage Pressure Reducing System

- High pressure differential
- Added reduced pressure zone protection

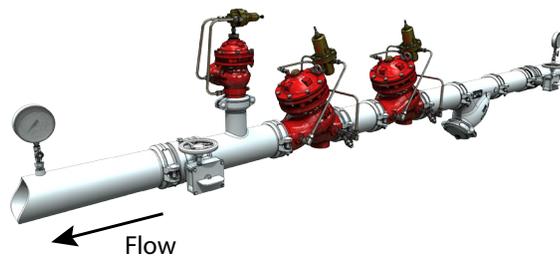


Figure 1: Installation Drawing

## OPERATION

The pressure-regulating pilot senses downstream pressure and modulates the upper control chamber causing the main valve to throttle, thus maintaining constant downstream pressure. When the downstream pressure falls below the pilot setting, the pilot opens, pressure in the upper control chamber decreases, and the main valve modulates open to increase downstream pressure and maintain pilot setting.

If the downstream pressure rises above the pilot setting, the pilot closes, pressure in the upper chamber increases and the main valve throttles close to decrease downstream pressure to the pilot setting.

The pressure-reducing pilot is equipped with an adjusting screw to preset the desired downstream pressure and an internal adjustable needle valve to control the closing speed.

### START UP

When performing this procedure, refer to Figure 1.

1. Open a hydrant, relief valve, drain valve, or other flow-consuming device downstream of the model 867-7UL pressure-reducing valve, creating a system demand.
2. Fully open upstream isolating valve (call out 2a).
3. Gradually open downstream isolating valve (call out 2b) to fully open, allowing flow through the model 867-7UL valve (call out 1).
4. Wait for downstream pressure stability.
5. Slowly close the device that was opened in step #1 until it is fully closed. There is no flow; the pressure on the downstream side of the system as measured by the downstream pressure gauge (call out 3b) should fall within the factory pre-set adjusted pressure. Up to an additional 10% of pressure is acceptable.

### CAUTION

**Small changes in the adjustment of the needle valve have great impact on the valve performance. The needle valve is factory set at one-half turn open to one and one-half turns open.**

**The maximum number of turns is three, from fully closed to fully open. More than three turns toward open might cause the valve to react at less than optimal performance. Perform step 5 with this in mind.**

## READJUSTMENT

The pilot valve is factory pre-set according to the stated demands of the system designer. The pre-set is clearly indicated on the pilot valve tag. If readjustment to either the pressure or valve response is required, follow the following steps.

6. Ensure that there is minimum flow through the main valve.
7. Free the tension between the pressure adjusting screw on the pilot valve (Figure 2, call out 1) and the fastening nut by turning the fastening nut counterclockwise.
8. Gradually adjust the pressure by alternately turning the pressure adjusting screw on the pilot valve a half turn and then reading the downstream pressure. Adjust the pressure counterclockwise to decrease the downstream pressure, or clockwise to increase the downstream pressure.
9. Repeat the Start Up procedure, steps 1 through 5.
10. By turning the needle valve screw (see Figure 2, call out 5) on the pilot valve bottom, adjust the valve response. Turn clockwise to decrease the closing speed of the main valve or counterclockwise to increase the closing speed of the main valve.
11. Repeat the Start Up procedure, steps 1 through 5.

**NOTE:** Valve response adjustment affects pressure adjustment. Any adjustment to valve response requires rechecking pressure adjustment. See steps 1 through 6.

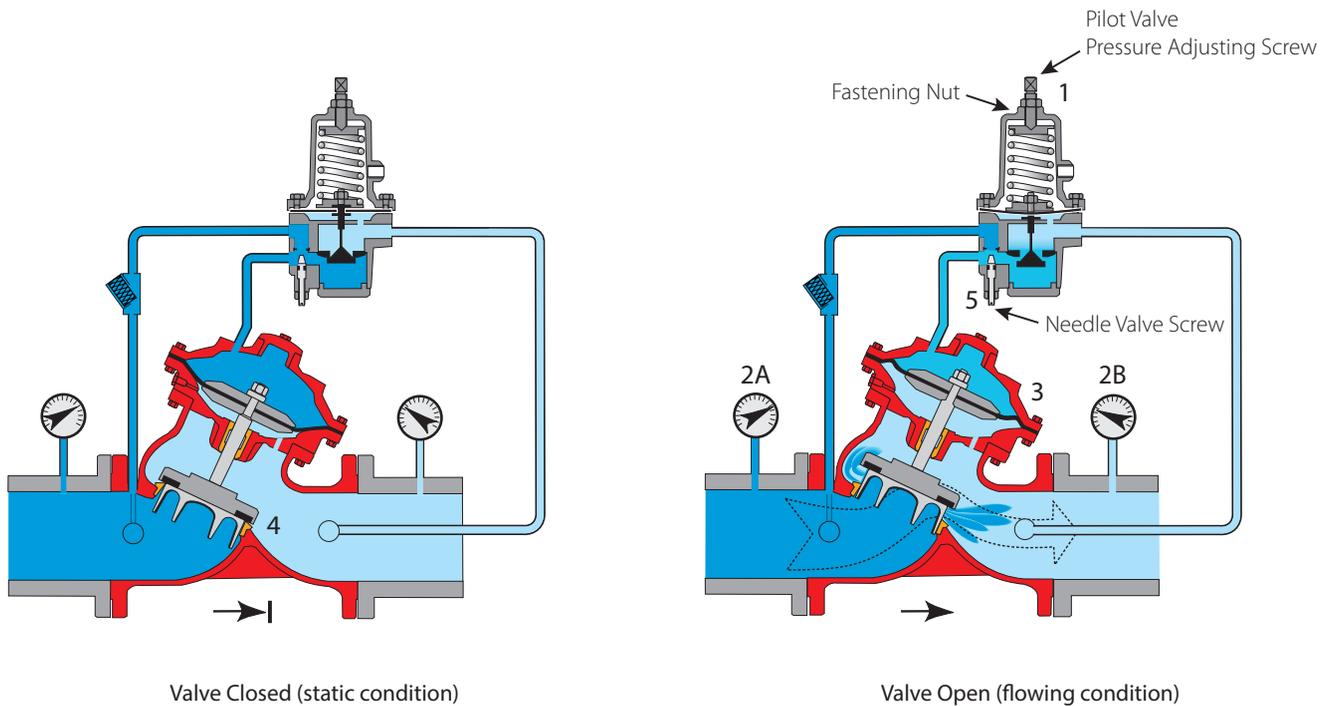


Figure 2: Operation Drawing

## MAINTENANCE AND INSPECTION TESTS

### NOTICE

- Any activities that require taking the valve out of service may eliminate the fire protection provided.
- Consideration of a fire patrol should be given for the affected areas.
- Before servicing or testing the system, notify the authority having jurisdiction.

Prior to turning off any valves, notify local security guards.

In any of the following inspections or testing procedures, if an abnormal condition exists, see the “Abnormal Conditions” section for possible cause and corrective action.

The model 867-7UL valve is to be inspected, tested, and maintained in accordance with the Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems, NFPA 25.

### NORMAL CONDITIONS

All main isolating valves should indicate a fully open position.

Upstream pressure gauge (Figure 2, call out 2a) should reflect the upstream pressure supplied to the valve.

Downstream pressure gauge (Figure 2, call out 2b) should be according to the system design criteria.

### QUARTERLY INSPECTION

The system should be checked for normal condition.

Check that the main valve, pilot system, accessories, tubing, and fittings are all in good condition, undamaged, and are not leaking.

The fastening nut of the pilot valve pressure adjusting screw (Figure 2, call out 1), should be fastened tightly.

### ANNUAL INSPECTION AND TEST

Complete quarterly inspection.

Conduct a flow test in system nominal flow. The downstream pressure gauge should show the adjusted downstream pressure. According to the system design criteria, this pressure should be stable.

If readjusting is needed, it should be performed according to the “Readjustment” section.

**TROUBLESHOOTING**

<b>Problem</b>	<b>Possible Cause</b>	<b>Solution</b>
Valve fails to regulate.	Needle valve not properly adjusted.	Factory set at 1/2 or 1 1/2 open. Adjust.
	Pulsates or hunts.	Slowly adjust needle valve until pulsation stops.
	Air trapped in main valve cover.	Loosen cover tube fitting at the highest point, allow the air to escape, and re-tighten.
	Filter screen blocked.	Remove filter's cap and screen to clean.
Valve fails to open.	Insufficient inlet pressure.	Check/create inlet pressure.
	No downstream demand.	Create demand/flow.
	Insufficient pilot spring compression.	Turn adjusting screw CW open.
	Isolating valves closed.	Open.
Valve fails to hold set static outlet pressure.	Filter screen blocked.	Remove filter's cap and screen to clean.
	Debris trapped in main valve.	Remove and inspect actuator assembly. Check seat and disc seal.
	Diaphragm in main valve is leaking.	Caution: This test will cause the valve to go fully open. Close downstream isolating valve or omit this test if this may cause damage.  Test for leakage. Close isolating valves and remove the plug in the main valve cover. If a continuous flow exists, the diaphragm is damaged or loose.

**NOTE:** Mark "F" – Large Filter

In cases where the filter screen frequently becomes blocked, install a filter with filtration capacity of at least 80 mesh / 250 µm. Victaulic recommends replacing the standard filter with the Large Filter Mark "F".

**DIFFICULTY IN PERFORMANCE**

Where difficulty in performance is experienced, the manufacturer or an authorized representative should be contacted if any field adjustment is to be made.

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## I-867-7UL Pressure Reducing Valve

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For complete contact information, visit [victaulic.com](http://victaulic.com)

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