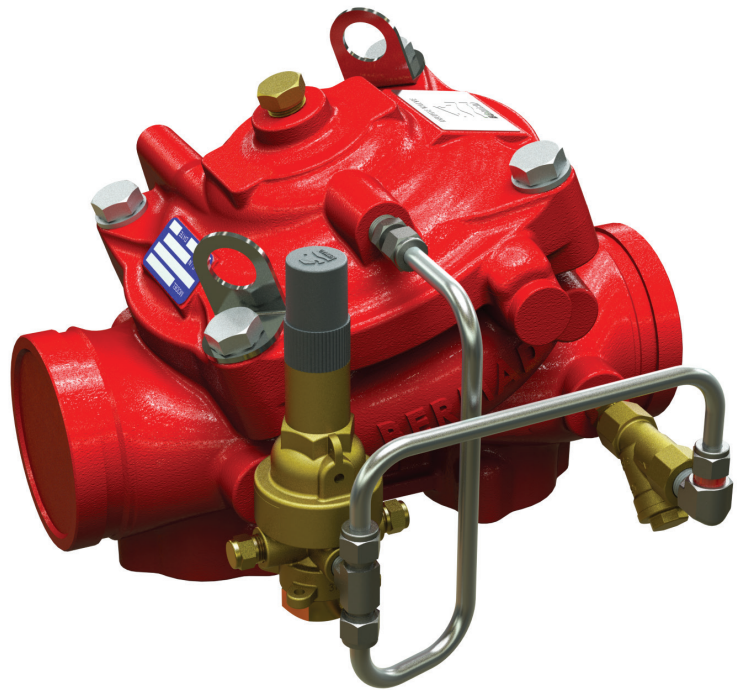


867-43T-PS Pump Suction Pressure Control Valve

HANG THESE INSTRUCTIONS ON THE INSTALLED VALVE FOR FUTURE REFERENCE



**⚠ WARNING**



- Read and understand all instructions before attempting to install any Victaulic products.
  - Always verify that the piping system has been completely depressurized and drained immediately prior to installation, removal, adjustment, or maintenance of any Victaulic products.
  - Wear safety glasses, hardhat, and foot protection.
- Failure to follow these instructions could result in death or serious personal injury and property damage.

- These products shall be used only in fire protection systems that are designed and installed in accordance with current, applicable National Fire Protection Association (NFPA) standards, or equivalent standards, and in accordance with applicable building and fire codes. These standards and codes contain important information regarding protection of systems from freezing temperatures, corrosion, mechanical damage, etc.
  - These installation instructions are intended for an experienced, trained installer. The installer shall understand the use of this product and why it was specified for the particular application.
  - The installer shall understand common industry safety standards and potential consequences of improper product installation.
- Failure to follow installation requirements and local and national codes and standards could compromise system integrity or 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 shall 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, operation, and maintenance of this valve.** For proper operation and approval, the 867-43T-PS valve and accessories shall 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, verify 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 manual, contains trademarks, copyrights, and/or patented features that are the exclusive property of Victaulic.

The 867-43T-PS is an elastomeric, line pressure-operated pump suction head control valve that may be specified for fire protection systems.

The 867-43T-PS is used to control and sustain pump suction pressure at the pump inlet at an adjustable preset minimum value. This ensures a continued pressure supply to systems sharing the same supply line, as well as reducing the risk of damage from cavitation.

The 867-43T is suitable for relief of fire pump discharge. It relieves excess system pressure to sump or atmosphere. This valve is also suitable for maintaining foam concentrate discharge pressure for a balanced proportioning system.

The 867-43T-PS can be equipped with an optional valve position indicator that can include a limit switch.

## PRESSURE AND FLOW RATINGS

**Table 1: Pressure and Recommended Flow Rates**

Valve Size inches (mm)	1.5" (40)	2-2.5" (50-65)	3" (80)	4" (100)	6" (150)	8" (200)	10" (250)	12" (300)	14" (350)	16" (400)
Valve Max. Inlet Pressure Bar (psi)	25 (365)	25 (365)	25 (365)	25 (365)	25 (365)	25 (365)	25 (365)	21 (300)	21 (300)	21 (300)
Pressure Setting Range Bar (psi)	0.35-1.7 (5-25)	0.35-1.7 (5-25)	0.35-1.7 (5-25)	0.35-1.7 (5-25)	0.35-1.7 (5-25)	0.35-1.7 (5-25)	0.35-1.7 (5-25)	0.35-1.7 (5-25)	0.35-1.7 (5-25)	0.35-1.7 (5-25)
Kv (Cv)	68 (79)	80-105 (92-121)	190 (219)	345 (398)	790 (912)	1160 (1340)	1355 (1652)	2370 (2737)	2850 (3292)	3254 (3758)
Leq m (ft) Note 1	2 (7)	4 (14)	7 (24)	8 (25)	8 (26)	13 (43)	27 (89)	55 (179)	38 (125)	66 (215)
Max. Recommended Flow m <sup>3</sup> /h (gpm)	24 (106)	56 (247)	82 (360)	145 (640)	330 (1450)	580 (2570)	910 (4000)	1360 (6000)	1635 (7198)	2170 (9555)
Pilot Valve Model	3-PB	3-PB	3-PB	3-PB	3-PB / 3-UL	3-UL	3-UL	3-HC	3-HC	3-HC

**Note 1:** Valve Equivalent Length Value (Steel Pipe), for use in hydraulically-calculated system.

## Optional Features/Accessories

### Large Control Filter - Code F

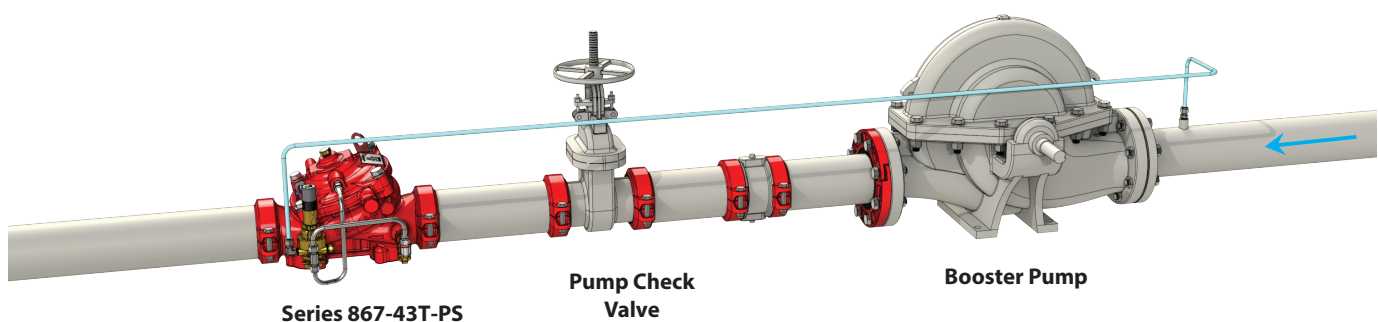
This option provides extra capacity means for filtering the water supplied to the control loop to achieve the essential level of debris-free water. This feature is recommended for cases where there are any doubts about the level of particulate matter in the water.

## INSTALLATION

A typical installation of the 867-43T-PS is where the valve is installed downstream of the pump with a pressure sensing line leading from the valve to the pump intake or suction pipe.

The 867-43T-PS is especially suited for this function, as it has an exceptionally high flow capacity. Therefore when pump suction pressure is available and above the pre-set minimum the 867-43T-PS will be fully open, presenting minimal pressure loss for delivering the maximum possible volume of water to the fire event.

1. Before the valve is installed, flush the pipeline to remove any dirt, scale, debris, etc. Not flushing the line might result in the valve being rendered inoperable.
2. Allow enough room around the valve assembly for any adjustments and future maintenance/disassembly work.
3. 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.
4. Verify that the valve is positioned so that the valve cover can be easily removed for future maintenance.
5. After installation, carefully inspect/correct any damaged accessories, piping, tubing, or fittings. Verify that there are no leaks.



**Figure 1: Installation Drawing**

## OPERATION

### Standby

The 867-43T-PS will remain fully open while the pump suction head or pressure level (Figure 2A, call out 4) at the pump inlet remains above the preset minimum.

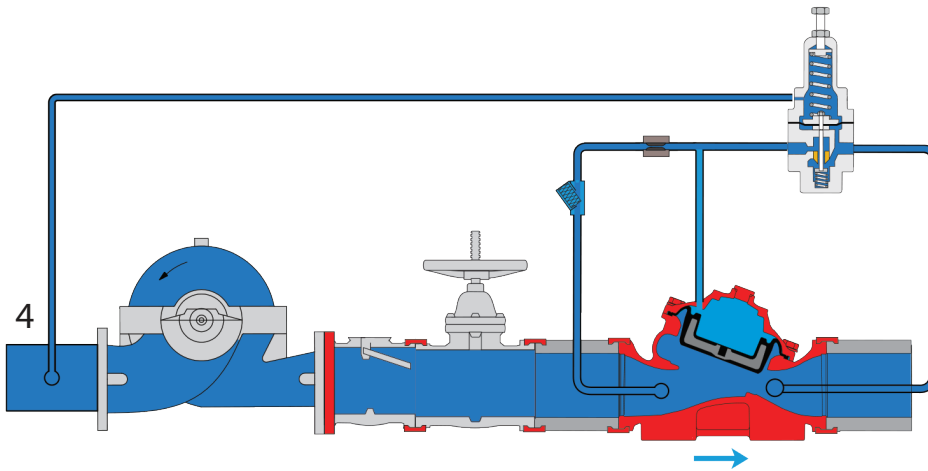


Figure 2A: Operation Drawing, Standby

### Modulating

If the suction head pressure level falls below the preset minimum, the pilot valve (Figure 2B, call out 2) will sense this via the sensing line (Figure 2B, call out 5) and will throttle, causing upstream pressure to accumulate in the valve control chamber (Figure 2B, call out 6) through a restrictor (Figure 2B, call out 3), thereby modulating the main valve (Figure 2B, call out 1).

As the valve starts to modulate, the pump suction pressure will increase. When the minimum suction pressure returns, the pilot will either cease to throttle further or modulate the main valve, maintaining suction head pressure above the preset minimum.

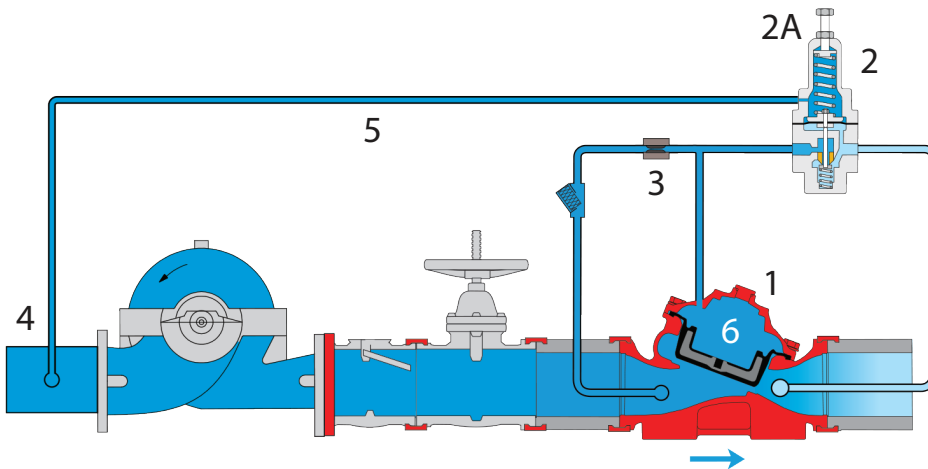


Figure 2B: Operation Drawing, Modulating

## START UP

1. Provide pump shut-off pressure to the 867-43T-PS pressure control valve inlet and allow no system demand.
2. Create sufficient pressure (higher than the valve set pressure) to allow flow through the control valve.
3. While control valve is operating, wait for the valve inlet pressure to stabilize. The pressure on the inlet side of the control valve shall be in accordance with the factory pre-set adjusted pressure.
4. Slowly allow system flow so that system pressure falls below the control valve adjusted pressure. The control valve should slowly shut to drip-tight.

## READJUSTING

An adjustable wrench is required to perform the following procedure.

The pressure control valve is factory pre-set. The pre-set is clearly indicated on the valve data plate. If readjustment to either the pressure or the valve response is required, complete the following steps.

1. Verify that there is nominal flow through the valve.
2. Release the tension between the adjusting screw on the pilot and the fastening nut by turning the fastening nut counterclockwise.
3. By alternately turning the adjusting screw (Figure 2, call out 2A) on the pilot valve (Figure 2, call out 2) by one-half turn and then reading the outlet pressure, gradually adjust the pressure counterclockwise to decrease the inlet pressure, or clockwise to increase the inlet pressure.

**NOTE:** Valve response adjustment affects pre-set pressure. Any adjustment to valve response requires rechecking pre-set pressure. See the start up procedure in the previous section, steps 1–4.

4. Repeat the start up procedure in the previous section.

## MAINTENANCE AND INSPECTION TESTS

NOTICE
<ul style="list-style-type: none"><li>• Any activities that require taking the valve out of service may eliminate the fire protection provided.</li><li>• Consideration of a fire patrol shall be given for the affected areas.</li><li>• Before servicing or testing the system, notify the authority having jurisdiction.</li></ul>



Prior to turning off any valves or activating any alarms, notify local security guards and the central alarm station, if used, so that a false alarm will not be signaled.

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

The 867-43T-PS valve is to be inspected, tested, and maintained in accordance with this manual and with NFPA 25.

### WEEKLY INSPECTION

1. The system shall be inspected under flow conditions.
2. Check that the main valve, pilot system, accessories, tubing, and fittings are all in good condition, are free of damage, and are not leaking.
3. The fastening nut of the pilot valve adjusting screw (Figure 2, call out 2A) shall be fastened tightly.
4. For circulation-type installations, verify that sufficient water is flowing through the valve when fire pump is operating at shut-off pressure (churn) to prevent the pump from overheating.
5. Verify that the pressure upstream of the relief valve fittings in the fire pump discharge piping does not exceed the pressure for which the system components are rated.

### MONTHLY INSPECTION AND TEST

1. Complete weekly inspection.
2. During the monthly fire pump flow test, verify that the pressure relief valve is correctly set to relieve at the appropriate pressure and to close below the pressure setting.

**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. Filter might be insufficient. See note below.
Valve fails to open.	Insufficient inlet pressure.	Check/create inlet pressure.
	Pilot is adjusted too high.	Turn adjusting screw CCW on pilot.
Valve fails to seal inlet pressure.	Filter screen blocked.	Remove filter's cap and screen to clean. Filter might be insufficient. See note below.
	Debris trapped in main valve.	Remove and inspect actuator assembly. Check seat. Check for foreign bodies. Rinse at high flow rate.
	Diaphragm in main valve is leaking.	Open the valve cover and inspect diaphragm. If damaged, replace.
	Diaphragm in pilot valve is leaking.	

**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.

**DIFFICULTY IN PERFORMANCE**

Where difficulty in performance is experienced, contact Victaulic Fire Protection Application Engineering at 610-559-3300.

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# 867-43T-PS Pump Suction Pressure Control Valve

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