867-43T Pressure Relief Valve

HANG THESE INSTRUCTIONS ON THE INSTALLED VALVE FOR FUTURE REFERENCE





ictaulic

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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.

 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.

 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



property damage. Property damage. I. Read and understand all instructions before proceeding with the installation, operation, and maintenance of this valve. For proper operation and approval, the 867-43T 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 manual, contains trademarks, copyrights, and/or patented features that are the exclusive property of Victaulic.

The 867-43T is an elastomeric, pilot-operated, pressure relief valve that may be specified for fire protection systems.

The 867-43T reduces the risk of damage from over-pressure in piping systems, maintaining a preset upstream pressure limit regardless of pressure peaks and fluctuating conditions.

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.



PRESSURE AND FLOW RATINGS

The 867-43T pressure relief valve is rated for the flow capacities detailed in Table 1. Sizing shall not be less than indicated in table 1.

NOTE: Maximum differential pressure across the valve shall not exceed 175 psi (12 bar) during flow discharge.

Table 1: Relief Valve Sizing

| Relief Valve Size | Maximum Relief Valve Flow Capacity | | | |
|-------------------|------------------------------------|------|-------|--|
| in/mm | GPM | m³/h | L/min | |
| 1.5 40 | 106 | 24 | 400 | |
| 2 50 | 250 | 57 | 946 | |
| 3 80 | 500 | 114 | 1892 | |
| 4 100 | 1000 | 227 | 3785 | |
| 6 150 | 2500 | 568 | 9462 | |
| 8 200 | 4000 | 908 | 15140 | |
| 10 250 | 5700 | 1295 | 21580 | |

The 867-43T pressure relief valve is rated to the maximum set pressure as follows:

Class #150 / PN16: 60 – 235 psi (4 – 15 bar) Class #300 / PN25: 125 – 365 psi (8.6 – 25 bar)

Table 2: Operating Pressure Rating and Pilot Valve Types

| Valve Size in/mm | 3 80 | 4 100 | 6 150 | 8 200 | 10 250 |
|------------------------------|--|----------|----------|--|-----------|
| Class #150 / PN16 psi/bar | 3-PB-16 pilot valve set range: 60–235/ 4–15 | | | 3-UL-16 pilot valve set range: 60–235/ 4–15 | |
| Class #300 / PN25 psi/bar | 3-PB-25 pilot valve set range: 125–365/ 8.6–25 | | | 3-UL-30 pilot valve set range: 125–365/ 8.6–25 | |

Table 3: Discharge Chart Inlet Pressure as Function of Discharge Flow Capacity





INSTALLATION

A typical installation of the 867-43T features a pilot valve for the automatic maintenance of a constant preset maximum upstream pressure, regardless of fluctuating demand. This fast-opening valve relieves excess system pressure to sump or atmosphere, meeting NFPA, UL, and FM requirements for fire pump service. The actuator design ensures quick and smooth valve action.

Pressure Reducing Systems

- Rapid opening preempts pressure-reducing valve reaction, preventing overpressure peak damage to sensitive equipment
- Backup/redundancy for reducing valve to ensure pressure zone rating at all times
- Thermal relief: Relieves overpressure caused by pressure changes from increased temperatures.





Fire Pump Relief

- Relieves overpressure spikes on the starting sequence or on stopping of fire demand
- Reduces risk of surge damage on pump shutdown or sudden changes in flow

Figure 1 Installation Drawing



OPERATION

The 867-43T pressure control valve remains closed as long as system pressure remains lower than the preset value. The preset pressure can be adjusted with the pilot valve adjusting screw (Figure 2, call out 4). When the pilot valve (Figure 2, call out 1) senses upstream pressure (Figure 2, call out 2) higher than the preset value, it opens, releasing water pressure from the main valve control chamber (Figure 2, call out 3). This causes the 867-43T to open, thereby relieving excess system pressure to a reservoir or sump, preventing system overpressure.

When inlet pressure falls, the pilot valve throttles, enabling pressure to accumulate in the control chamber. This causes the main valve to close further and sustain upstream pressure.

An integral restrictor (Figure 2, call out 5A) controls the valve's closing speed. For valves 8 inches and larger, an adjustable needle valve (Figure 2, call out 5B) is provided.







START UP

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

READJUSTING

Tools required:

- Flat head screwdriver
- Adjustable wrench

The pressure relief 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. Ensure 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.
- By alternately turning the adjusting screw (Figure 2, call out 4) on the pilot valve (Figure 2, call out 1) 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.
- 5. Valve sizes 8-inch and 10-inch are equipped with adjustable needle valve to allow presetting of the valve closing speed. To adjust the valve response time, turn the needle valve screw (Figure 2, call out 5B) on the bottom of the pilot. Turn clockwise (while facing the screw) to decrease the closing speed of the main valve, or counterclockwise to increase the closing speed of the main valve.
- 6. Repeat the start up procedure in the previous section.



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 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 valve is to be inspected, tested, and maintained in accordance with this manual and with NFPA 25.

WEEKLY INSPECTION

- 1. The system should be inspected under flow conditions.
- 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 4) should 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

| Problem | Possible Cause | Solution | | |
|-------------------------------------|--------------------------------------|--|--|--|
| Valve fails to regulate. | Needle valve not properly adjusted. | Factory set at ½ or 1½ 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, | | |
| | Diaphragm in pilot valve is leaking. | replace. | | |

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, the manufacturer or an authorized representative should be contacted to determine if any field adjustment is to be made.



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