



Automatic Residential Domestic Shut-Off Valve, 2 Inch (50 mm) Model S370

GENERAL DESCRIPTION

The Star 2 inch (50 mm) Model S370 Automatic Residential Domestic Shutoff Valve is intended for use in dual-purpose residential water supply piping that serves both domestic and NFPA 13D or 13R residential fire protection sprinkler system needs. When an automatic fire sprinkler operates, the S370 Valve will automatically shut off water flow to the domestic system and divert the available water supply to the fire sprinkler system. Consequently, when the S370 is utilized, the system designer need not add the domestic flow demand to the fire sprinkler system flow demand, as would otherwise be required by NFPA 13D or 13R.

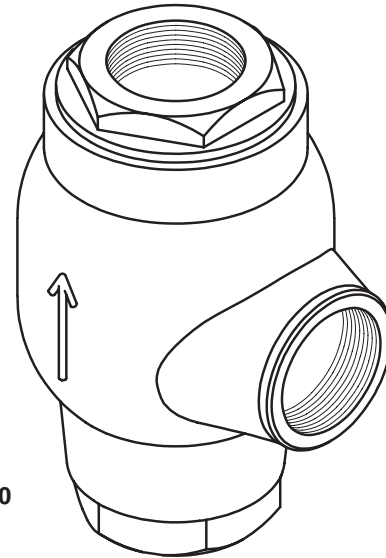
Use of the Model S370 Automatic Residential Domestic Shutoff Valve should be considered when either the water supply cannot adequately provide for both the domestic design demand and fire sprinkler flow demand, or it is desirable to increase the effectiveness of the fire sprinkler system by automatically shutting off domestic flow.

The S370 maximizes the effective use of a limited water supply. It may eliminate the need to add costly pumps, pressurized reservoirs, or electrically operated domestic shutoff valves. The S370 has a built-in check valve in the fire sprinkler system outlet that eliminates the need for a separate check valve. Also, the S370 automatically resets, thereby eliminating the need for valve disassembly after a fire sprinkler system test or operation.

WARNING

The Model S370 Automatic Residential Domestic Shut-Off Valve described herein must be installed and maintained in compliance with this document, as well as with the applicable standards of the National Fire Protection Association, in addition to the standards of any other authorities having jurisdiction. Failure to do so may impair the integrity of this device.

The owner is responsible for maintaining his fire protection system and devices in proper operating condition. The installing contractor or sprinkler manufacturer should be contacted relative to any questions.



#4200

TECHNICAL DATA

Approvals

UL and C-UL Listed.

Maximum Working Pressure

175 psi (12.1 bar).

End Connections

2 inch NPT

Friction Loss

Refer to Figure 4.

Physical Characteristics

The body, cover, and piston are bronze, and the piston is Teflon[®] coated. The fire sprinkler line seals and domestic line seal are silicone rubber, the spring is stainless steel, and the cover O-ring is Buna-N.

OPERATION

The design of the S370 Valve is such that if there is a fire sprinkler operation during domestic usage, the S370 Valve will automatically shut off flow to the domestic system and divert the available water supply to the fire sprinkler system. This eliminates the lower flow into the sprinkler system that might otherwise be caused by possible significant domestic water usage.

When the S370 Valve is in the normal standby position as shown in Figure 3, the Piston, assisted by the Spring, is in the down position. With the Piston in the down position, the Fire Sprinkler Seals permit the S370 to perform as a conventional check valve. Also, with the Piston in the down position, water is available on demand through the Domestic Flow Passage and out the Domestic Port.

Upon operation and a minimum 5 GPM (19 LPM) water flow to the automatic residential fire sprinkler system, the Piston moves upward. With the Piston in the up position,

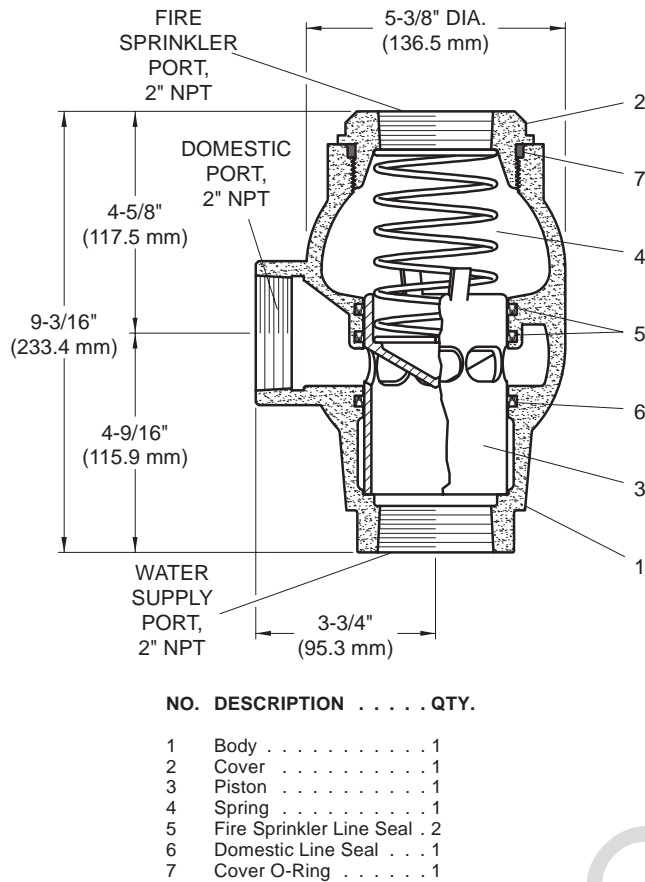


FIGURE 1
MODEL S370 AUTOMATIC RESIDENTIAL DOMESTIC SHUT-OFF VALVE

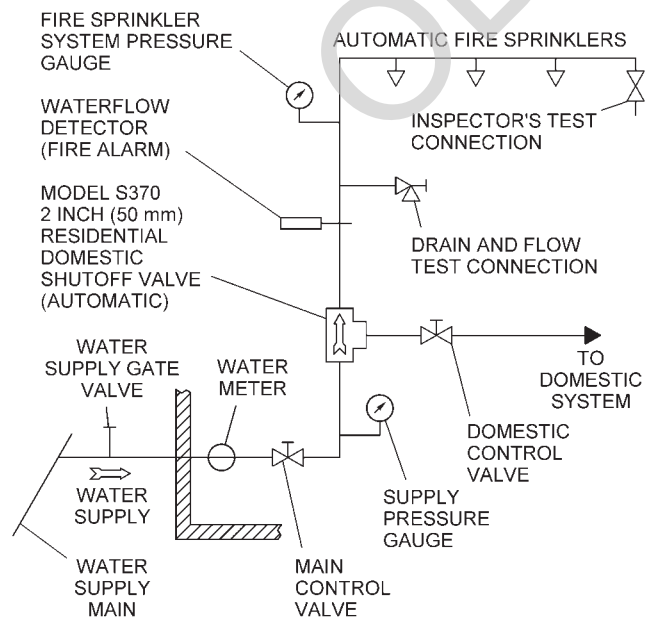


FIGURE 2
TYPICAL INSTALLATION

any water flow to the Domestic Flow Port is diverted to the Fire Sprinkler Flow Port.

The contours of the Piston have been specifically configured to minimize its upward movement except under the level of sustained fire sprinkler system flow resulting from operation of one or more fire sprinklers. However, because most fire sprinkler systems contain air pockets, the Piston will tend to move momentarily upward if there is a surge in supply pressure. The momentary opening and re-closing of the Piston at the Fire Sprinkler Line Seals will trap a portion of the pressure increase within the fire sprinkler system. The trapping of pressure increases within the fire sprinkler system will help to reduce the possibility of a subsequent surge in the supply pressure from causing the waterflow detector to signal a false alarm.

As indicated above, domestic system usage may reduce the pressure available to the fire sprinkler system. However, when utilizing the S370 Valve, it is not necessary to take into account the complex hydraulic modeling of the domestic system that would otherwise be required to determine the minimum possible residual (flowing) pressure that would be available to the fire sprinkler system.

For operation of the S370 Valve, it is only necessary to design the fire sprinkler system, from the water supply main to the most hydraulically remote sprinkler, to provide a minimum single sprinkler flow of 5 GPM (19 LPM), when the supply pressure at the main is at its minimum expected value. Actual sprinkler demand for the most hydraulically remote fire sprinkler should be in accordance with the manufacturer's minimum acceptable flow and pressure, but the minimum flow must be at least 5 GPM (19 LPM).

DESIGN CRITERIA

In order for the S370 Valve to automatically operate once a fire sprinkler operates, the fire sprinkler system from the water supply main to the most hydraulically remote sprinkler must be designed to provide a minimum single sprinkler flow of 5 GPM (19 LPM), when the water supply pressure at the water supply main is at its minimum expected value.

NOTES

The minimum single sprinkler flow rate of 5 GPM (19 LPM), required for use with the S370 Valve, does not take precedence over any more hydraulically demanding single or multiple sprinkler flow rates specified for the residential sprinklers being utilized.

INSTALLATION

The Model S370 Automatic Residential Domestic Shut-Off Valve must be installed in accordance with the following instructions:

NOTE

A fire sprinkler water supply connection to a public water supply is usually subject to local regulations concerning metering and backflow prevention requirements. Consult with the local water authorities concerning local require-

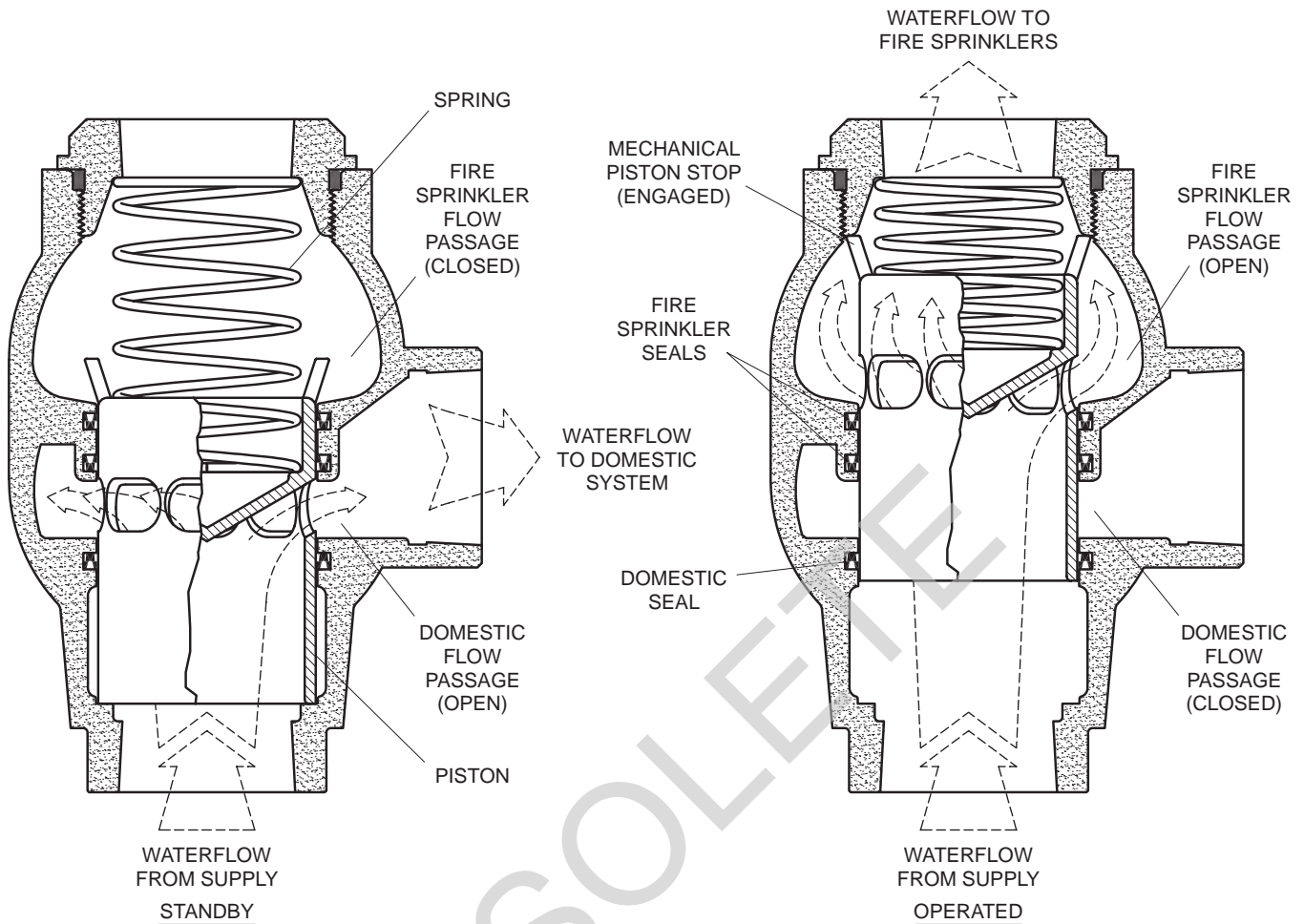


FIGURE 3
STANDBY AND OPERATED POSITIONS OF THE
2 INCH (50 mm) MODEL S370 AUTOMATIC RESIDENTIAL DOMESTIC SHUT-OFF VALVE

ments which may apply to the arrangement of these components in the fire sprinkler system water supply.

Figure 2 illustrates a typical arrangement using the Model S370 Automatic Residential Domestic Shutoff Valve. The arrangement may need to be modified to meet the requirements of the authority having jurisdiction; however, the Model S370 Automatic Residential Domestic Shutoff Valve must be installed in accordance with the following criteria:

1. The S370 Valve is to be installed vertically with the Supply Port at the bottom, the Fire Sprinkler Port at the top, and the Domestic Port at the side. It is recommended that a suitable clamp be installed along the water supply riser piping to provide support for the weight of the S370 Valve.
2. The water supply to the S370 Valve must be free of contaminants and particles of a size greater than 1/8 inch (3.2 mm).
3. The S370 is to be installed so that the arrows cast on the Body point in the direction of flow.
4. A Domestic Control Valve is to be located between the S370 Valve and the domestic system. The inlet to the Domestic Control Valve is to be located within 12 inches (300 mm) of the Domestic Port of the S370 Valve.
5. The Drain and Flow Test Connection (Ref. Figure A) must be minimum 1/2 inch for systems per NFPA 13D or minimum 1 inch size for systems per NFPA 13R.
6. An Inspector's Test Connection with a test orifice equal to the smallest K-factor sprinkler in the system is to be located at the most hydraulically demanding location in the system (usually adjacent to the highest and most remote sprinkler).
7. Apply pipe thread sealant sparingly only to the 2 inch NPT male pipe threads which are to be assembled to the three ports of the S370 Valve. The use of a Teflon based pipe thread sealant is recommended.

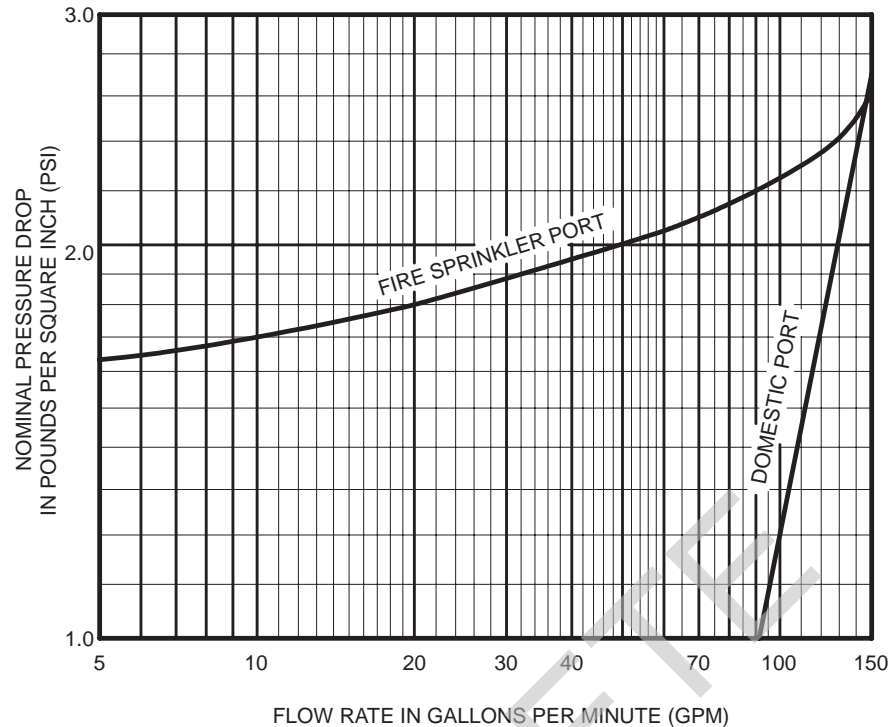


FIGURE 4
NOMINAL PRESSURE LOSS VERSUS FLOW

SETTING PROCEDURE

Steps 1 through 10 are to be performed when initially filling the fire sprinkler and domestic system piping with water or after a fire sprinkler operation (Ref. Figure 2).

1. Close the Main Control Valve.
2. Close the Domestic Control Valve, and all water outlets in the domestic piping system.
3. Close all drain valves in addition to the Drain and Flow Test Connection in the fire sprinkler system, and replace all operated sprinklers as necessary.
4. Partially open the Main Control Valve until the sound of flowing water just begins, and then leave the Main Control Valve in the partially open position.
5. After the fire sprinkler system pressure gauge indicates approximately the same pressure as the supply pressure gauge, fully open the Main Control Valve.
6. Open the Inspector's Test Connection. After trapped air has been relieved, close the Inspector's Test Connection.
7. Open the highest elevation outlet on the domestic system.
8. Partially open the Domestic Control Valve until the sound of flowing water begins. Allow the domestic piping to slowly fill with water.
9. Close the highest elevation water outlet on the domestic system when unaerated water begins to flow.

10. Completely open the Domestic Control Valve, and then check that the domestic system is properly pressurized by verifying that at least three water outlets in the domestic system can flow full at the same time.

If the water outlets flow full, the S370 Valve is set and ready for service and the water outlets on the domestic system may be closed.

If the water outlets do not flow full, reclose the Domestic Control Valve, wait a minimum of ten seconds, and ensure that there is no flow from the fire sprinkler system piping. Reopen the Domestic Control Valve and then recheck that the water outlets are flowing full.

MAINTENANCE AND SERVICE

The Model S370 Automatic Residential Domestic Shutoff Valve does not require any regularly scheduled maintenance. However, proper operation of the S370 Valve should be verified at least annually (preferably quarterly) during system alarm inspections. Any impairment must be immediately corrected.

It is also recommended that fire protection systems be inspected by a qualified Inspection Service.

NOTES

No attempt is to be made to repair any S370 Valve component in the field.

The operational test and flow test procedures will result in operation of the associated alarms, as well as an interruption of the domestic water supply service. Consequently, notification must be given to the owner and the fire depart-

ment, central station, or other signal station to which the alarms are connected, and notification must be given to the building occupants.

Before closing a fire protection system main control valve for maintenance work on the fire protection system that it controls, advise all occupants of the residence that the fire protection system is being disabled.

Operation Test Procedure

1. Fully open any three water outlets in the domestic piping system.
2. Open the Inspector's Test Connection of the fire sprinkler system to simulate a sprinkler operation.
3. Verify that the alarms are operating and that the flow from the domestic water outlets has decreased to a trickle.
4. Close the Inspector's Test Connection to allow the S370 Valve to automatically reset. Automatic resetting occurs within ten seconds, after which the previously opened three domestic system water outlets will once again flow full. In which case, the S370 Valve is set and ready for service and the water outlets on the domestic system may be closed.

If the water outlets do not flow full, close the Domestic Control Valve, wait a minimum of ten seconds, and ensure that there is no flow from the fire sprinkler system piping. Reopen the Domestic Control Valve and then recheck that the domestic system water outlets are flowing full.

Flow Test Procedure

1. Completely open the Drain and Flow Test Connection.
2. While water is flowing, record the pressure reading on the fire sprinkler system pressure gauge and then compare this reading to previous readings. If there is a significant decrease in pressure since the last time the pressure reading was taken which is not due to a normally expected drop in the water supply pressure, there may be an impairment that should be immediately identified and corrected.
3. Close the Drain and Flow Test Connection to allow the S370 Valve to automatically reset. Automatic resetting will occur within ten seconds.
4. After waiting ten seconds, completely open at least three water outlets in the domestic system and allow them to simultaneously flow.

If the water outlets flow full, the S370 Valve is set and ready for service and the water outlets on the domestic system may be closed.

If the water outlets do not flow full, close the Domestic Control Valve and verify that there is no flow from the fire sprinkler system piping (such as at the Inspector's Test Connection). Wait a minimum of ten seconds. Reopen the Domestic Control Valve and then recheck that the domestic system water outlets are flowing full.

NOTE

After returning a fire protection system to service, notify the proper authorities and advise those responsible for monitoring proprietary and/or central station alarms.

ORDERING PROCEDURE

Please Specify:

2 Inch Model S370 Automatic Residential Domestic Shut-Off Valve (#4200).

AVAILABILITY AND SERVICE

Star Sprinkler Inc. products and devices are available worldwide through a network of independent distributors. Please contact Star Sprinkler Inc. for information and the name and address of the Star distributor in your area.

LIMITED WARRANTY

The manufacturer warrants for a period of one year from the date of sale (warranty period) that the product(s) sold hereunder are free from defects in material and workmanship. Our obligation under this warranty is limited to repair or replacement, or, at our option, we will repay the price paid for the product(s), plus any transportation charge paid by the purchaser. In the case of replacement, we will pay the transportation charges to the location of the defective product. We must be given the opportunity to inspect any product you believe to be defective. To make a claim under this limited warranty, you should contact our Sales Services Manager at (800) 558-5236.

THERE ARE NO OTHER WRITTEN OR ORAL WARRANTIES. ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE LIMITED IN DURATION TO THE DURATION OF THE LIMITED WARRANTY SET FORTH ABOVE.

The manufacturer does not assume any other obligation in connection with the sale of the product(s) by purchaser.

This warranty shall not apply to any product(s) which have been installed in violation of written instructions furnished by the manufacturer, repaired or altered, misused or damaged, or not properly maintained.

The manufacturer is not liable for indirect, incidental or consequential damages in connection with the use of the product(s).

Some states do not allow limitations on how long an implied warranty lasts, or exclusion or limitation of incidental or consequential damages, so the above limitations or exclusion may not apply to you.

THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE.

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