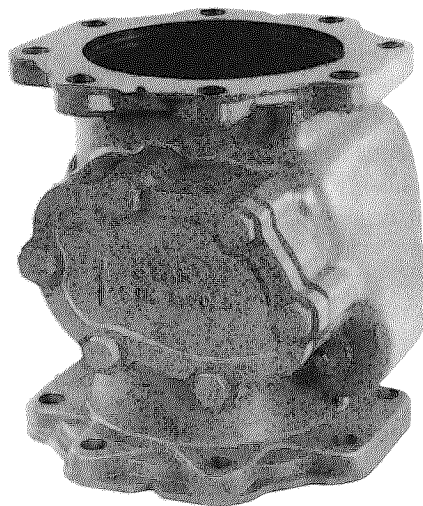


Product Data: MODEL E ALARM CHECK VALVE



FLANGED & FLANGED

8" Part No. 5900

DESCRIPTION

The Star Model E Alarm Check Valve is available in 8" pipe diameter and is used in a vertical position. It is with flanged ends. It is designed expressly for use in wet pipe sprinkler systems and can be installed in systems having variable or constant water pressure conditions.

The valve will open and allow pressurization of the alarm chamber upon the operation of one or more automatic fire sprinklers. The pressurization of the alarm chamber causes an alarm to sound mechanically through the use of a water motor alarm gong or through the use of a pressure switch, electrically connected to audible or visual signaling devices.

APPROVALS & LISTINGS

Model E Alarm Check Valves are approved by Factory Mutual Engineering Corporation, LPC approved, listed by Underwriters' Laboratories, and Underwriters' Laboratories of Canada.

Model E Alarm Check Valves are listed and approved with specific trim and accessories; therefore, no substitutions or omissions are allowed.

OPERATION

The Model E Alarm Check Valve utilizes a grooved seat ring and an external by-pass connection. The valve is fitted with special trim packages to satisfy valve installation in sprinkler systems having water supplies of variable or constant pressure conditions.

When the valve is in normal operating position, the main valve clapper rests firmly on the grooved seat ring which seals the alarm line ports. The operation of one or more sprinklers will cause the main clapper to raise off of the seat and allow pressurized water to enter the alarm line and activate alarm devices.

The external checked by-pass line allows slight changes

in pressure to occur without raising the main valve clapper; thereby, preventing false alarm.

Variable Pressure

In service, the pressure of the system will generally be greater than the water supply pressure. This condition occurs because excess pressure from surges and fluctuations in the water supply are allowed to pass through the external by-pass to be trapped in the system above the main valve clapper, which will normally remain closed.

Sudden surges of greater pressure may cause the main valve clapper to open momentarily, and then close. When the clapper is open, a limited amount of water will flow through the seat ring openings into the retard chamber. Water will accumulate in the retard chamber and automatically drain away without causing a false alarm.

The operation of a sprinkler will relieve the system pressure which then allows the greater supply pressure to raise the main clapper from the seat. Water now flows into the system as well as through the seat ring alarm ports, through the alarm line connection into the retard chamber. With the system operating, the main valve clapper remains open and allows a flow of water which cannot be offset through the retard chamber drain. As the retard chamber is pressurized, water will continue to flow to activate a mechanical water motor alarm gong or an electric pressure alarm switch.

Constant Pressure

Under normal conditions, the system and supply pressure will be the same; therefore, surges need not be considered and a retard chamber is not required.

As the main valve clapper opens, when a sprinkler operates, water is allowed to flow directly to activate the alarm devices.

GENERAL INFORMATION

INSTALLATION

All Model E Alarm Check Valves are provided with standard class 125 inlet flanges. Outlet connection is flanged.

Prior to mounting this valve on the water supply riser, care should be taken to assure that the water supply line is thoroughly cleansed of foreign particles and debris. This is usually accomplished by flushing. Refer to NFPA Standard 13 for flushing flow requirements.

Check the main valve clapper for freedom of movement prior to mounting the valve of the flanged water supply connection. Be sure the valve is mounted in the correct direction with arrow pointing in the direction of the water flow. This also applies to the check valve installed in the by-pass and retard chamber drain line connection.

Trim the valve in accordance with the appropriate trim diagram as shown on the following sheets.

Conduct all tests as described under the section entitled "Testing".

When the installation is made utilizing a pressure switch only, an air lock can occur in the retard chamber which causes the alarm to sound continuously. Under these conditions, special alarm air vent trim should be installed as shown on the trim diagram.

Intermediate high pressure spikes can occur in wet systems caused by pressure or thermal expansion. Special pressure relief connections are available for such conditions. Refer to trim diagrams for installation information.

All sprinkler systems contain a certain amount of confined air. A pressure surge could compress this air and allow the main alarm valve clapper to raise off the seat ring. False alarm can be caused by this condition; therefore, it is important that the installer bleed off as much of the confined air as possible and fill the system to the fullest extent possible.

WHERE DIFFICULTY IN PERFORMANCE IS EXPERIENCED, THE MANUFACTURER OR HIS AUTHORIZED REPRESENTATIVE SHALL BE CONTACTED IF ANY FIELD ADJUSTMENT IS TO BE MADE.

MAINTENANCE

Alarm valves and their accessories should be examined periodically and tested to insure reliable and trouble-free service. Testing will reveal the valve's basic condition. However, there are several areas that should be routinely inspected as follows:

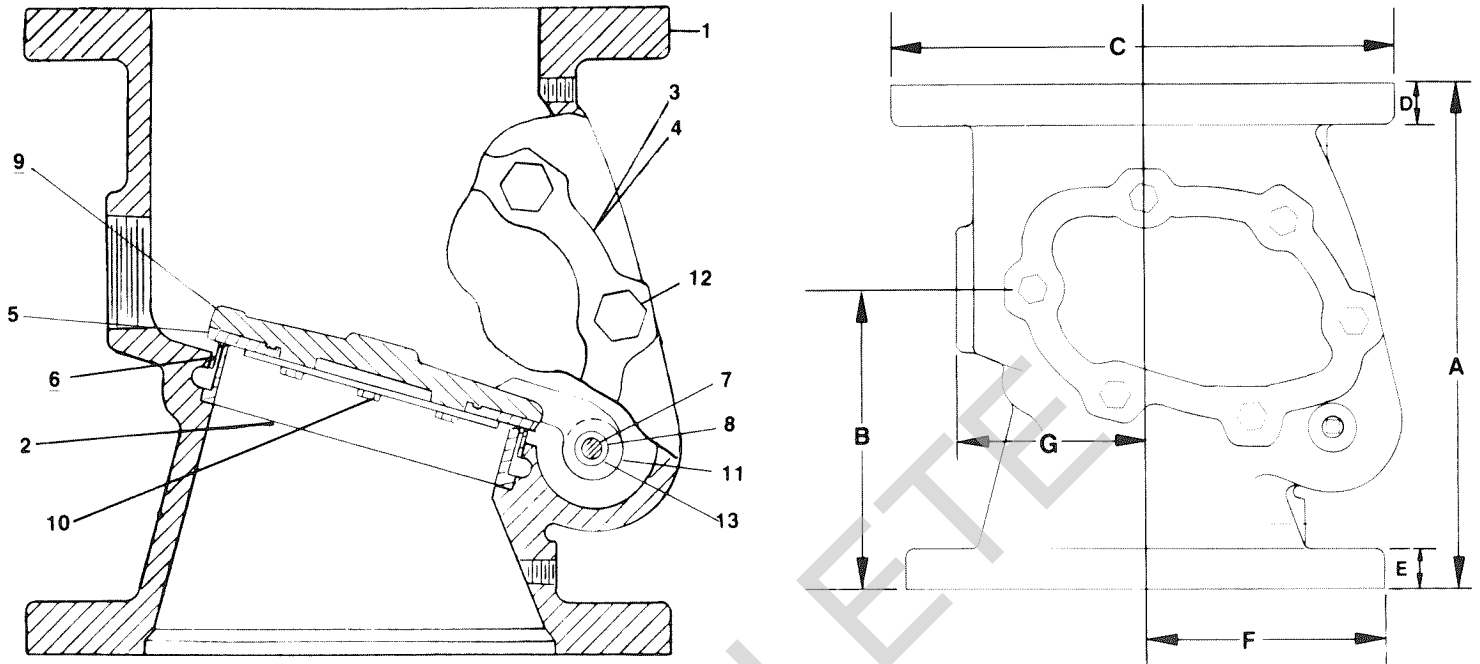
1. Inspect the valve rubber clapper facing. If worn or damaged, replace it with one obtained from Star Sprinkler. Be certain that dirt or other foreign substance has not accumulated under the rubber clapper facing. Clean thoroughly.
2. Inspect the clapper seat ring for stones, dirt or other foreign matter lodged in the grooves or holes. Clean thoroughly. If the seat ring surfaces are nicked or scored, it may be possible to repair those surfaces using lapping compound. If not, replace the complete valve or return it to the factory for possible rebuilding.
3. Inspect the $\frac{3}{4}$ " swing check valve clapper located in the $\frac{3}{4}$ " external by-pass, for clapper and seat condition.
4. Inspect the $\frac{1}{2}$ " alarm line ball valve for leaks. A flow of water through the drain outlet of the retard chamber to the main drain in, indicates a leaking ball valve or an alarm valve seat.
5. If the retard chamber and/or water motor alarm are malfunctioning, follow these basic maintenance steps:
 - a. Retard Chamber - Inspect inlet and outlet drain nozzles for foreign matter.
 - b. Water Motor Alarm - Inspect to determine if drive shaft and its connected propelling and striker sections are turning freely without any binding action. If not, inspect for foreign matter. Be sure $\frac{3}{4}$ " strainer in supply line is not clogged.

WARNING, DO NOT REMOVE ALL COVER BOLTS.

When servicing a sprinkler system valve, leave two (2) loose bolts in the cover assembly to guarantee no pressure is left in the system, and the cover will not fall and cause injury.

A sprinkler system installed shall be properly maintained for efficient service. The owner is responsible for the condition of his sprinkler system, and shall use due diligence in keeping the system in good operating condition.

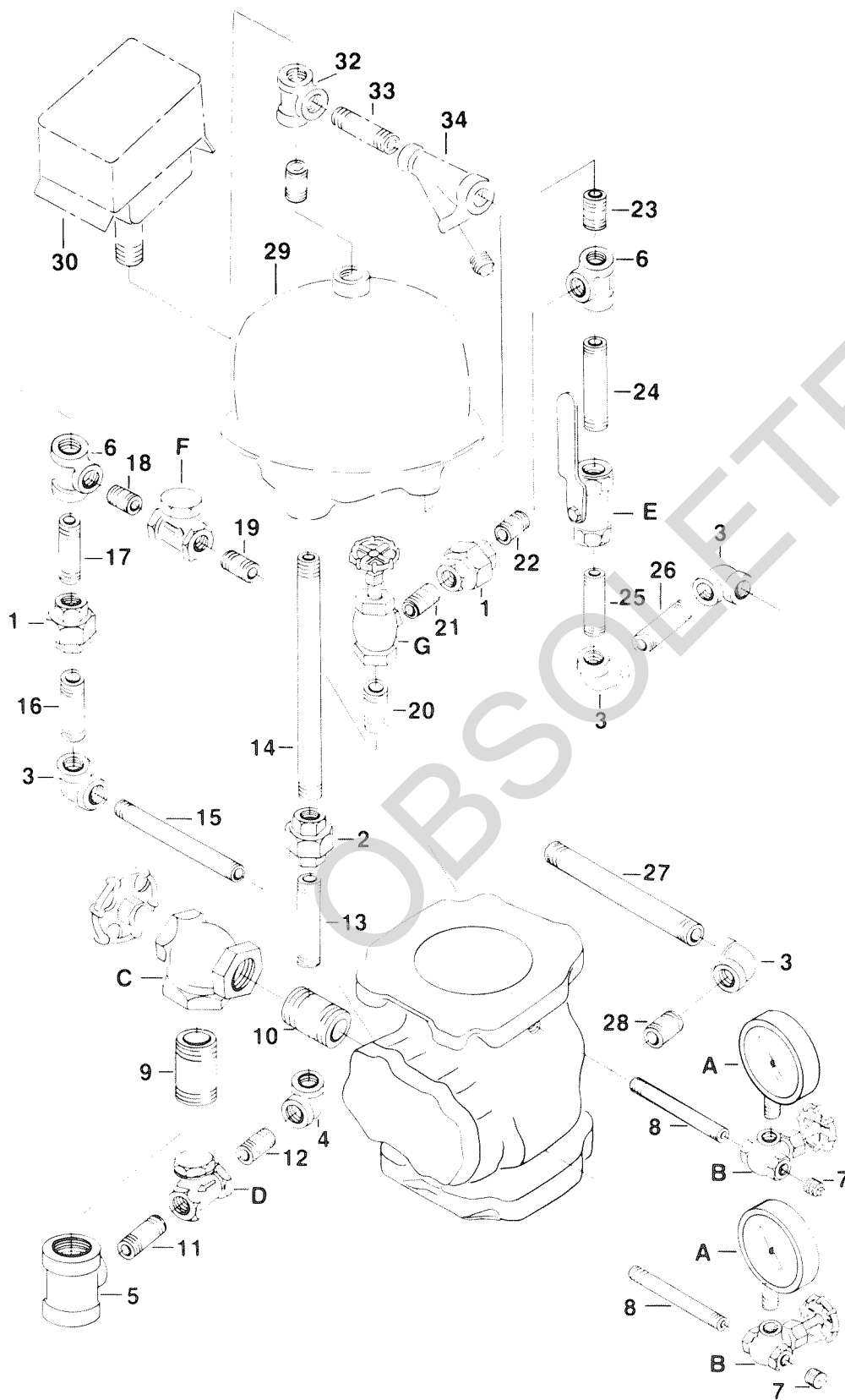
TECHNICAL DATA



DETAIL	PART NUMBER	QUANTITY	DESCRIPTION	MATERIAL
1	5900	1	Complete Assembly Body	—
2	5905	1	Seat Ring *	Brass
3	5903	1	Hand Hole Cover	C.I.
4	5904	1	Cover Gasket	Rubber
5	5906	1	Clapper Facing	Rubber
6	5907	1	Retaining Ring	Stn. Steel
7	5910	1	Hinge Pin	Stn. Steel
8	5911	2	Hinge Pin Bushing	Bronze
9	5908	1	Clapper	C.I.
10	1014-56	5	Retaining Screws	Stn. Steel
11	1203-6	2	Pipe Plug	Brass
12	5909	2	Clapper Bushing	Bronze
			* Not Field Replaceable	

DESCRIPTION	A	B	C	D	E	F	G	COMPANION FLANGE DIA.	BOLT CIRCLE DIA.	NO. BOLT SIZE	WEIGHT
8" Flange and Flange	13½"	8"	13½"	1⅜"	1⅜"	6¾"	5⅛"	13"	11¾"	8¾ x 3½	113.5

TRIM DIAGRAM

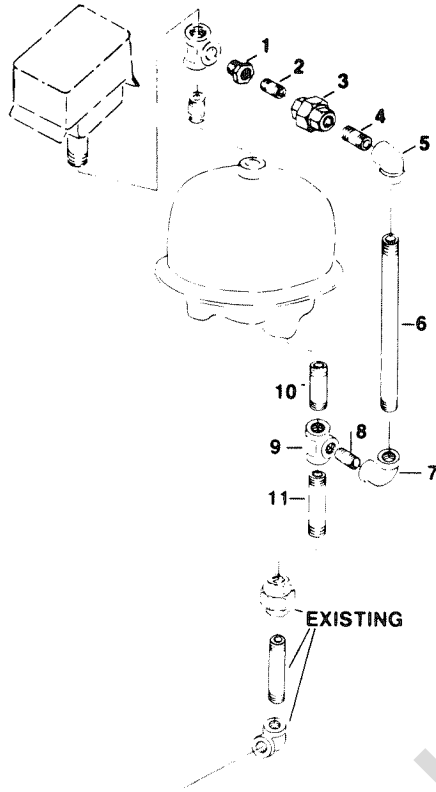


**8" Model E Alarm Check Valve
Trim Diagram
Part No. 5966**

Detail #	Part #	Qty.	Description
A	1192-1	2	Air-Water Pressure Gauge
B	1191-1	2	1/4" Bronze 3-Way Valve
C	1186-3	1	2" Angle Valve
D	1187-2	1	1/2" Swing Check Valve
E	1190-2	1	3/4" Ball Valve
F	1187-1	1	3/4" Swing Check Valve
G	1186-7	1	3/4" Angle Valve
1	1201-3	2	3/4" Union
2	1201-2	1	1/2" Union
3	1198-3	4	3/4" x 90° Elbow
4	1198-2	1	1/2" x 90° Elbow
5	1113-1	1	2" x 2" x 1/2" Red. Tee
6	1199-3	2	3/4" Tee
7	1203-11	2	1/4" Brass Plug
8	1197-6	2	1/4" x 5" Nipple
9	1194-28	1	2" x 3" Nipple
10	1194-28	1	2" x 3" Nipple
11	1196-1	1	1/2" x Close Nipple
12	1196-3	1	1/2" x 1 1/2" Nipple
13	1196-3	1	1/2" x 1 1/2" Nipple
14	1196-20	1	1/2" x 10 1/2" Nipple
15	1195-20	1	3/4" x 5" Nipple
16	1195-17	1	3/4" x 2" Nipple
17	1195-18	1	3/4" x 2 1/2" Nipple
18	1195-3	1	3/4" x Close Nipple
19	1195-3	1	3/4" x Close Nipple
20	1195-3	1	3/4" x Close Nipple
21	1195-3	1	3/4" x Close Nipple
22	1195-3	1	3/4" x Close Nipple
23	1195-17	1	3/4" x 2" Nipple
24	1195-17	1	3/4" x 2" Nipple
25	1195-11	1	3/4" x 3" Nipple
26	1195-14	1	3/4" x 4" Nipple
27	1195-23	1	3/4" x 9" Nipple
28	1195-19	1	3/4" x 3 1/2" Nipple
29	5420	1	Retard Chamber
30	1259-1	1	Pressure Switch
31	1195-9	1	3/4" x Close Galv. Nipple
32	1113-1	1	3/4" x 1/2" x 3/4" Galv. Nipple
33	1195-7	1	3/4" x 3" Galv. Nipple
34	1193-1	1	3/4" Y-Strainer
35	1203-1	1	1/4" Pipe Plug

*Not included in kit.

TRIM DIAGRAM



ELECTRIC ALARM AIR VENT TRIM Part No. 5967

8" Model E Alarm Check Valve

Detail #	Part #	Qty.	Description
1	1200-5	1	3/4" x 1/2" Hex Bushing
2	1196-1	1	1/2" x Close Nipple
3	5913	1	1/2" x 1/8" Orifice Union
4	1196-4	1	1/2" x 2" Nipple
5	1196-2	1	1/2" x 90° Elbow
6	1196-12	1	1/2" x 10" Nipple
7	1198-2	1	1/2" x 90° Elbow
8	1196-7	1	1/2" x 3" Nipple
9	1199-2	1	1/2" Tee
10	1196-4	1	1/2" x 2" Nipple
11	1196-8	1	1/2" x 7" Nipple

Excess pressure relief trim must be used where ever the system pressure exceeds 175 PSI and or as required by NFPA 13.

General – A number of conditions can cause high pressure in a wet system. STAR Pressure Relief Connections are designed to protect against only those that cause high pressure intermittently – for example, pressure increases due to water surges in the supply main or thermal expansion within the system. If high pressure is a constant condition, then other precautions must be taken to protect the system.

Pressure relief connections should be provided as original equipment when it is known at the time the system is installed that conditions warrant their use. If adverse conditions are found some time later on, however, the connections may be added to any STAR alarm valve.

Approvals – STAR Pressure Relief should be provided subject to the approval of the authority having jurisdiction (AHJ). While suitable for the intended service, the Circle Seal Relief Valve is not UL listed or FM approved.

Description/Operation – STAR Pressure Relief Connections connect to the alarm valve at the upper water pressure gage and relieve to atmosphere through the main drain pipe. A set of connections includes a Circle Seal Relief Valve set for a nominal cracking pressure of 166 psi. At this setting, the valve will open at a maximum of 174 psi (166 psi +5%) to keep the system below the required 175 psi WWP. The nominal reseal pressure is 160 psi, with 150 psi being the minimum.

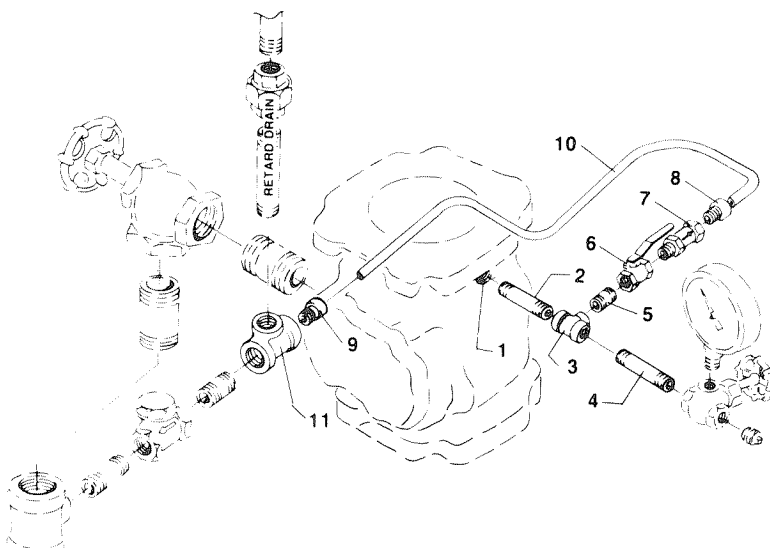
Installation – When making the installation, care must be taken to be sure that all pipe and fittings are clean and free of scale and burrs. Teflon tape is recommended to seal joints. If pipe compound is used, it should be applied sparingly and only to male threads.

Maintenance – The water pressure gage on the system side of the alarm valve should be inspected frequently to be sure that the relief valve is operating properly. If the pressure is found to be in excess of 175 psi, the globe valve should be checked to see if it is open. If the valve is closed, opening it should correct the problem.

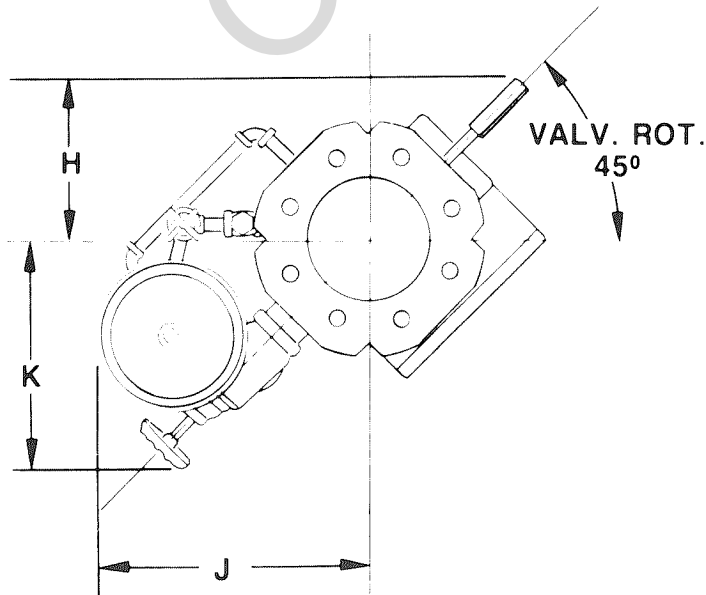
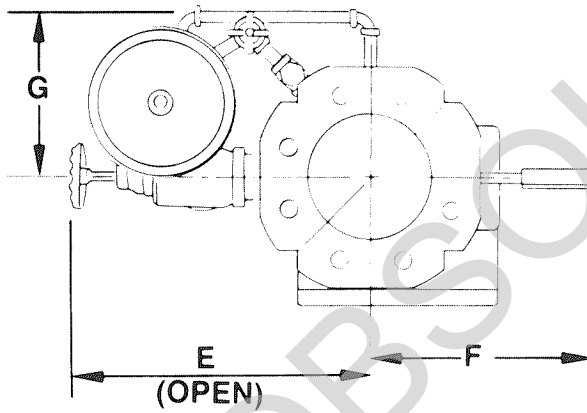
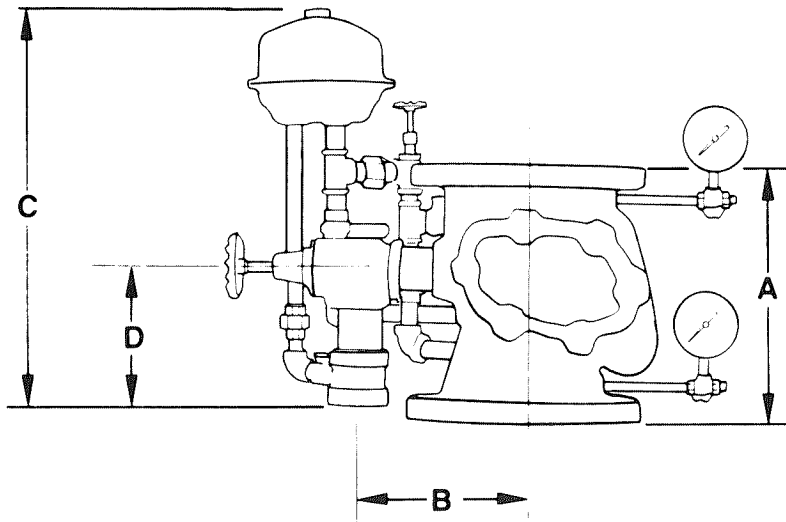
If the high pressure problem exists with the globe valve open, both the globe valve and the relief valve should be checked for obstructions. If no obstructions are found and the high pressure condition continues to exist, the relief valve should be replaced with a new one. No attempt should be made to reset or repair the relief valve.

Excess Pressure Relief Trim Part No. 5969

Item No.	Qty.	Part #	Description
1	—	—	Upper Gauge Port
2	1	1197-9	1/4" x 2 1/2" Nipple
3	1	1199-1	1/4" Tee
4	1	1197-16	1/4" x 1 1/2" Nipple
5	1	1197-4	1/4" x Cls. Nipple
6	1	1188-1	1/4" Globe Valve
7	1	1185	Circle Seal Relief Valve # 5159B-2MPL-166
8	1	1944-01	1/4" Comp. Adaptor
9	1	1944-01	1/4" Comp. Adaptor
10	1	1945-01	1/4" Copper Tube x 24" Lg.
11	1	1113-5	1/2" x 1/4" x 1/2" Tee



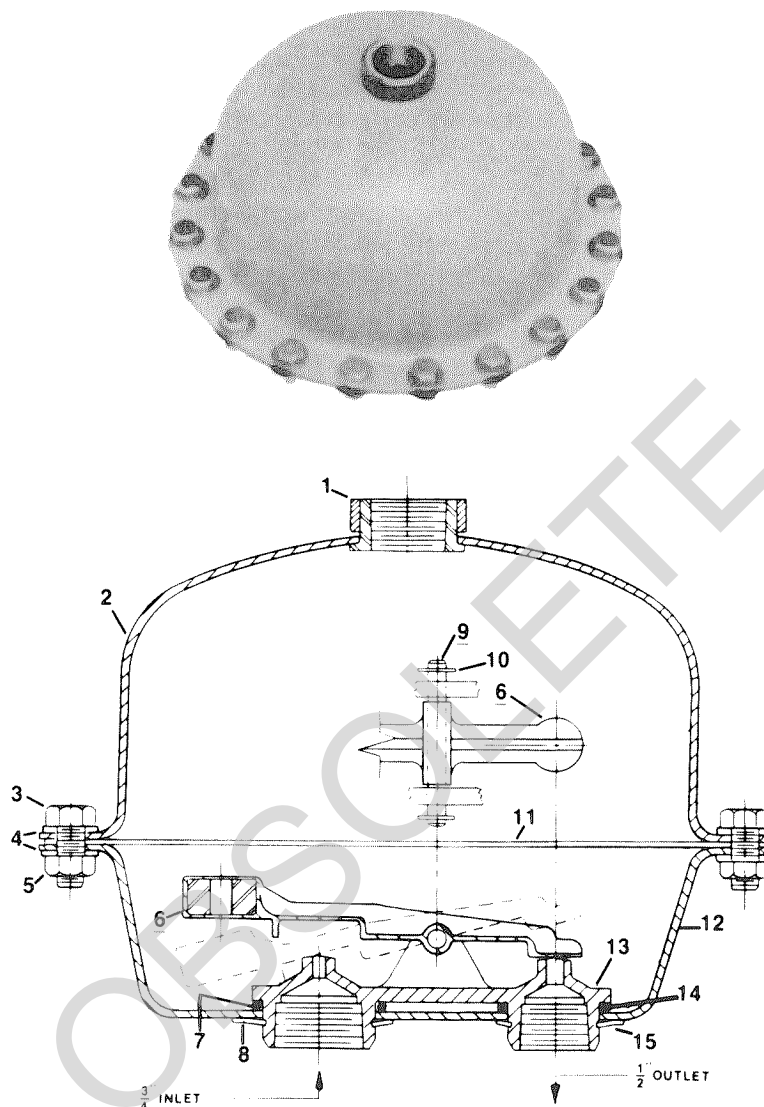
DIMENSION DATA



	8"	
A	13½"	343 mm
B	9½"	241 mm
C	22½"	572 mm
D	8"	203 mm
E	16½"	419 mm
F	12"	305 mm
G	10"	254 mm
H	8½"	216 mm
J	15"	581 mm
K	12½"	318 mm

MODEL D RETARD CHAMBER

FOR USE WITH ALARM VALVES UNDER VARIABLE WATER PRESSURE SERVICE



ITEM NO.	NO. REQ.	PART NO.	DESCRIPTION
15	1	1130-4	Retaining Ring
14	1	1147-2	Seal
13	1	5422	Nozzle Bracket
12	1	5425	Base
11	1	5423	Gasket
10	2	1130-6	Retaining Ring
9	1	5426	Hinge Pin
8	1	1130-5	Retaining Ring
7	1	1147-4	Seal
6	1	5424	Clapper
5	20	1108-01	5/16-18 NC Hex Nut - Stl. Cad. Pl.
4	40	1891-01	5/16 Stl. Washer - Cad. Pl. AM Std Type A Plain, Series N
3	20	1883-01	5/16-18 NC HHCS-Stl. Cad. Pl.
2	1	5421	Body
1	1	5427	Adapter Bushing

CAUTIONS AND TESTING

CAUTION

Star Alarm Check Valves require minimal service and attention; however, like any other mechanical appliance, certain precautions must be taken to assure proper operation.

Therefore, it is recommended that the following test and maintenance procedures be performed by a qualified mechanic who is thoroughly familiar with sprinkler systems.

Only authorized personnel should be responsible for conducting tests and the opening and closing of the sprinkler control valves.

Proper authorities must be notified prior to shutting down any sprinkler system for maintenance or modification purposes:

Insurance carriers
Plant and/or Municipal Fire Departments
Plant Security Officer

When sprinkler systems are equipped with remote or central station supervisory alarm systems, notification must be given to the alarm system monitoring office of any work or testing that is to be conducted, FIRE DEPARTMENT WILL RESPOND IF NOTIFICATION IS NOT GIVEN.

Be certain that all sprinkler system control valves are open and all other trim valves are left in normal operating position when systems are restored to service and testing has been completed.

Testing should not be done during freezing weather when the system is equipped with a Water Motor Alarm.

ORDERING INSTRUCTIONS

Please specify:

Quantity	Retard Chamber
Part Number	Water Motor Gong
Size	Pressure Switch
Flange and Flange	Water Flow Switch
Flange and Groove	Electric Bells
Trim	Signs
Pressure Switch Trim	Spare Head Cabinet

TESTING

Valve and Alarm Equipment

Open the 1" Inspector's Test Connection on the remote system piping to simulate the opening of one sprinkler. This should activate the water motor and/or electric alarm.

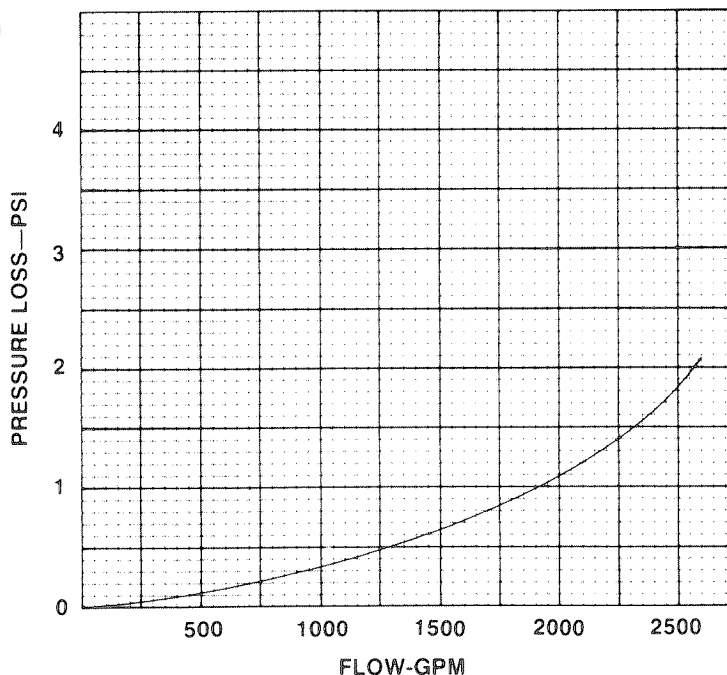
Alarm Equipment Only

Close the $\frac{3}{4}$ " ball valve (letter E, trim diagram) and open $\frac{1}{2}$ " ball valve (letter G, trim diagram). This allows water to flow directly to the alarm devices and does not cause the valve clapper to lift. After testing has been completed, close $\frac{1}{2}$ " ball valve and open $\frac{3}{4}$ " ball valve.

Supply Piping Only

1. Close $\frac{3}{4}$ " ball valve (letter E, trim diagram).
2. Open main drain angle valve (letter C, trim diagram).
A full flow of water indicates a clear supply line and also verifies that the alarm valve clapper has lifted from its normal seated position.
3. Close main drain angle valve (letter C, trim diagram).
Allow system piping to fill completely with water.
4. Open $\frac{3}{4}$ " ball valve (letter E, trim diagram).

FRICTION LOSS CURVE



7071 S 13th Street • Suite 103
Oak Creek, WI 53154-1466
414-570-5000 • 800-558-5236

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