Jindun Fire fighting

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Model ZSFG/FM Deluge Valve, External Resetting 4 and 6 inch (100 and 150mm)

GENERAL DESCRIPTION

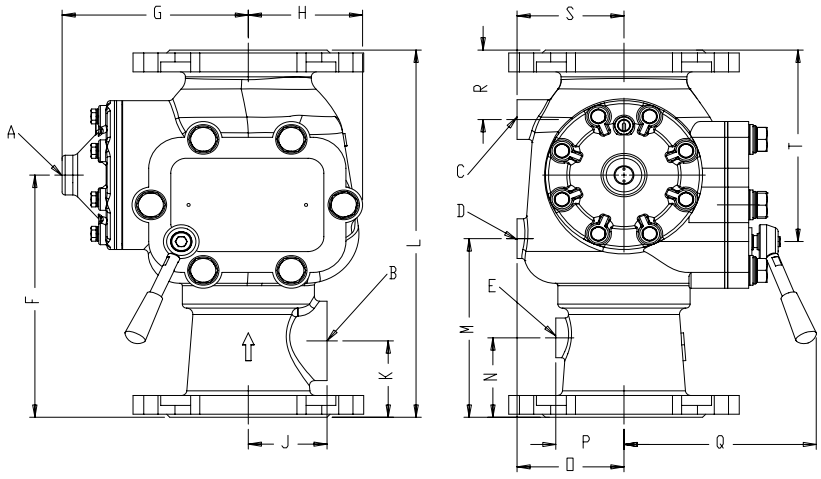
The 4 and 6 inch (100 and 150mm), Model ZSFG/FM External Resetting Deluge Valves are differential latch type valves designed for fire protection system service. They are used as "automatic water control valves" in deluge, preaction, and special types of fire protection systems such as foamwater and double interlock. The ZSFG/FM Valves also provide for actuation of fire alarms upon system operation.

The external resetting feature of the ZSFG/FM Valve provides for easy resetting of a deluge or preaction system, without having to open a valve handhole cover to manually reposition a clapper and latch mechanism.Simply depressing a plunger at the left side of the ZSFG/FM Valve allows the clapper and latch to reset.

Operation of an ZSFG/FM Valve is provided by an actuation (detection) system that is separate from the normally dry system piping. Trim configuration options for automatic operation of the ZSFG/FM include wet pilot actuation, dry pilot actuation, and electric actuation. Trim arrangements also provide for local emergency (manual) release of the ZSFG/FM Valves.

APPROVALS AND STANDARDS

The 4 and 6 inch (100 and 150mm), Model ZSFG/FM External Resetting Deluge Valves are approved by Factory Mutual Research Corporation.



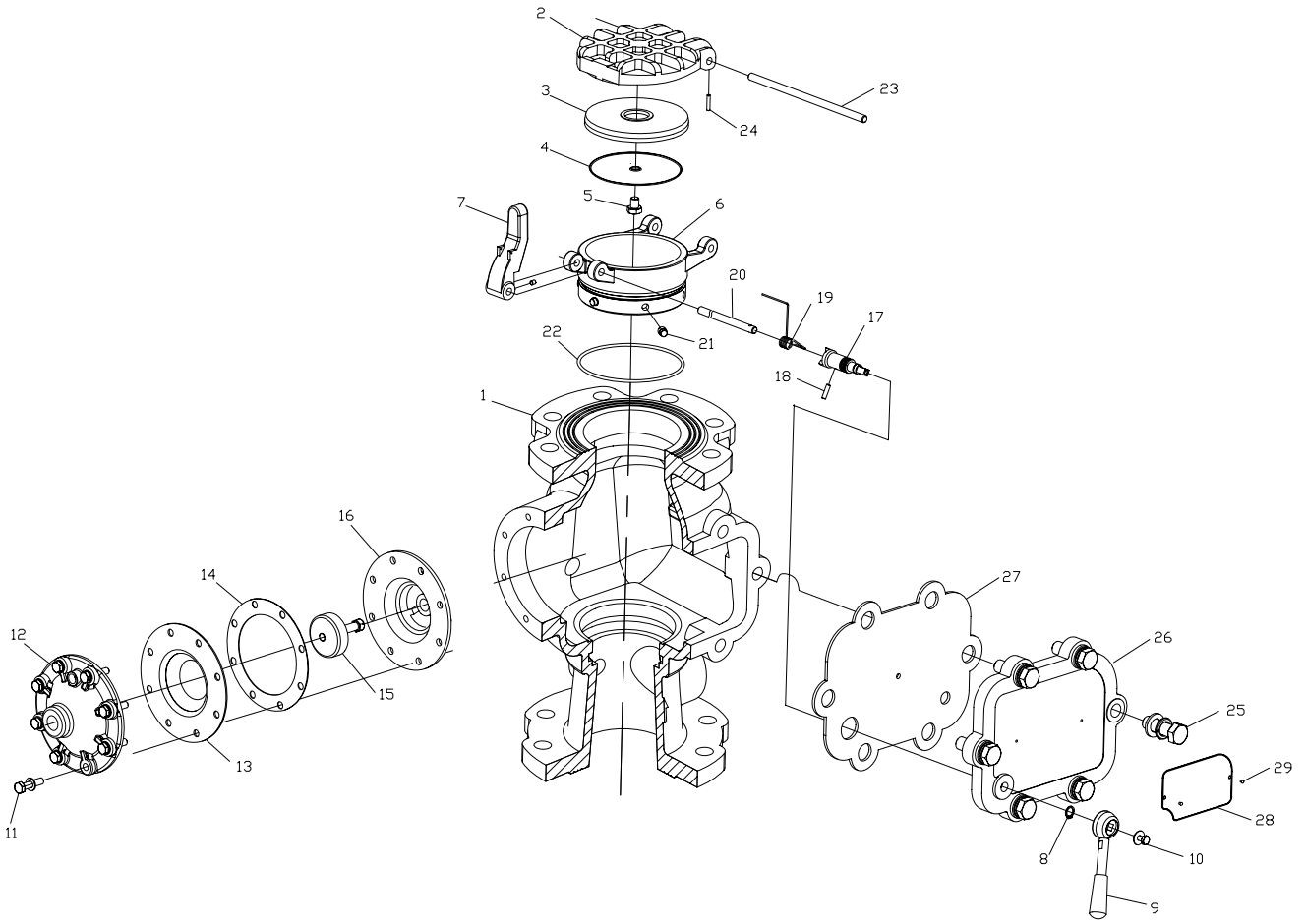
4 Inch (100mm) and 6 Inch (150mm) Valve

Nominal Dimensions in Inches and (mm)									
VALVE SIZE	A	B	C	D	E	F	G	H	J
4 (100)	1/2"	2"	1/2"	1/2"	1/2"	9.61 (244)	7 (178)	4.33 (110)	2.95 (75)
6 (150)	1/2"	2"	1/2"	1/2"	1/2"	10.31 (262)	7.86 (200)	5.5 (140)	3.6 (92)
VALVE SIZE	K	L	M	N	O	P	Q	R	S
4 (100)	3.03 (77)	14.5 (370)	7.09 (180)	3.15 (80)	4.02 (102)	2.56 (65)	7.2 (183)	2.76 (70)	4.02 (102)
6 (150)	2.76 (70)	15.75 (400)	6.69 (170)	2.76 (70)	5.08 (129)	3.74 (95)	8.1 (206)	3.54 (90)	5.08 (129)

FIGURE A

MODEL ZSFG/FM EXTERNAL RESETTING DELUGE VALVES

— DIMENSIONS AND PORT LOCATIONS —

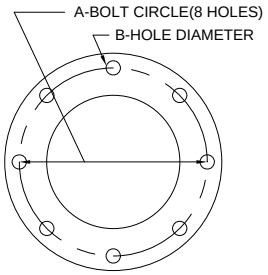


1 - Body	7 - Clapper Latch	13 - Diaphragm	19 - Reset Spindle Torsion Spring	24 - Pin
2 - Clapper	8 - Snap Ring	14 - Diaphragm Gasket		25 - Handhole Cover Bolt
3 - Clapper Facing Retainer	9 - Reset Handle	15 - Push Rod Assembly	20 - Latch Hinge Pin	26 - Handhole Cover
4 - Clapper Facing	10 - Handle Bolt	16 - Diaphragm Retainer	21 - Seat Ring Screw	27 - Handhole Cover Gasket
5 - Clapper Bolt	11 - Diaphragm Cover Bolt	17 - Reset Spindle	22 - Seat Ring O Ring	28 - Namplate
6 - Seat Ring	12 - Diaphragm Housing	18 - Pin	23 - Clapper Pin	29 - Nameplate Rivet

FIGURE B

MODEL ZSFG/FM EXTERNAL RESETTING DELUGE VALVE

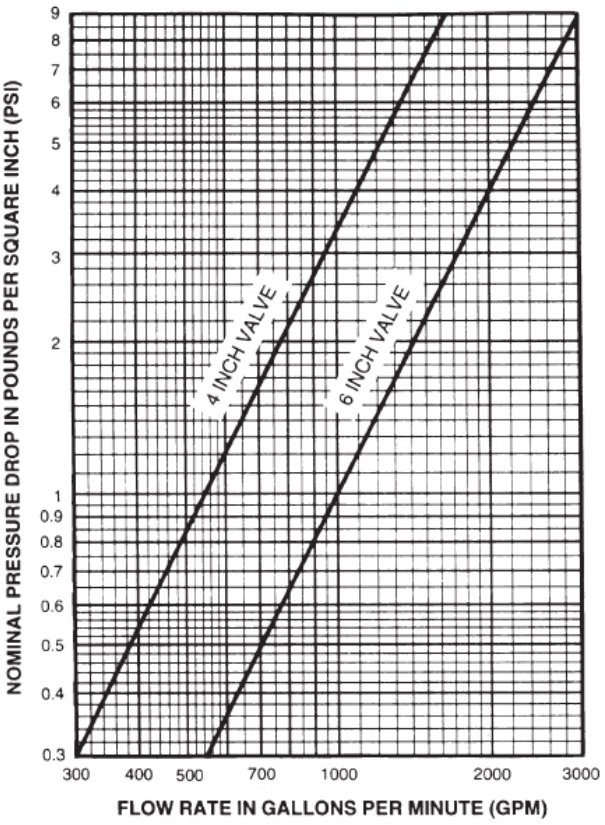
— ASSEMBLY —



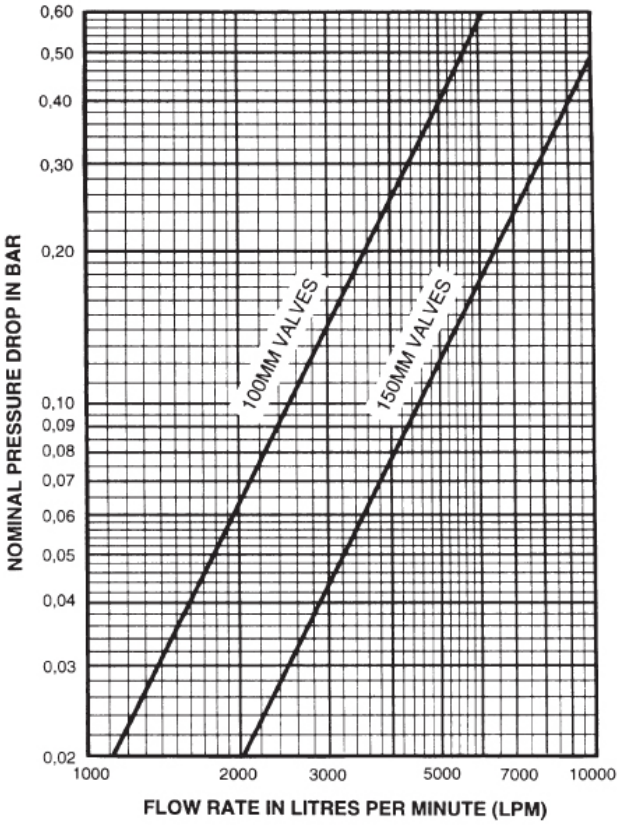
	Nominal Dimensions in Inches and (MM)			
	4" (100 mm) Valve Size		6" (150 mm) Valve Size	
	A	B	A	B
ANSI B16.1 (CLASS 150)	7.50 (190.5)	0.75 (19.1)	9.50 (241.3)	0.88 (22.2)
ISO 2084 (PN16)	7.09 (180.0)	0.71 (18.0)	9.45 (240.0)	0.87 (22.0)

TABLE A

DIMENSIONAL SPECIFICATIONS FOR SELECTION OF FLANGE DRILLING



GRAPH A -1



GRAPH A-2

GRAPHS A-1 and A-2

NOMINAL PRESSURE LOSS VERSUS FLOW

WARNING

The Model ZSFG/FM Deluge Valves 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 these devices.

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

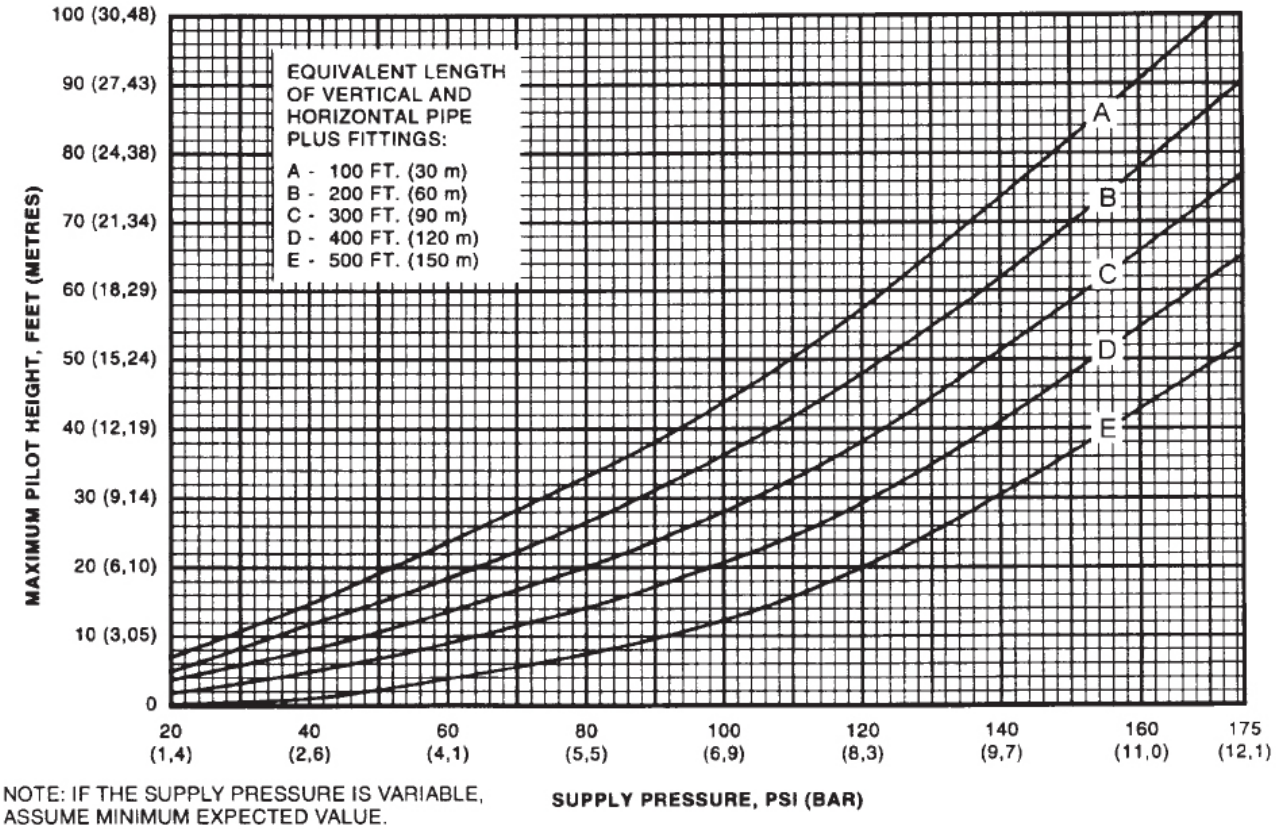
TECHNICAL DATA

Deluge Valve:

The 4 and 6 inch (100 and 150mm), Model ZSFG/FM External Resetting Deluge Valves are rated for use at a maximum service pressure of 232 psi (16 bar). The Valve dimensions are shown in Figure A, and all of the ports are NPT threaded per ANSI Standard B1.20.1. Flanged inlet and outlet connections are available drilled per ANSI and ISO specification options indicated in Table A. When the flange drilling is provided to ISO specifications, the nameplate located on the Handhole Cover indicates the specification to which the flange drilling has been provided.

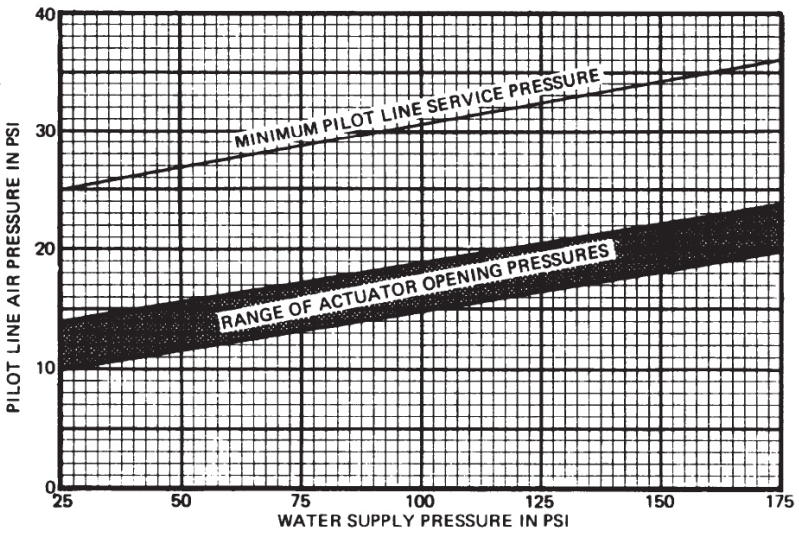
The ZSFG/FM Valve is to be installed vertically, as shown in Figure A. Exterior surfaces of the ZSFG/FM Valve are painted red, and the year of manufacture is indicated on the Handhole Cover.

Components of the ZSFG/FM Valve are shown in Figure B. The Body, Handhole Cover, and Diaphragm Cover are ductile iron. The Handhole Cover Gasket, Clapper Facing, Diaphragm Gasket, and O-Rings are NBR. Diaphragm is EPDM. The Seat Ring, Clapper, Diaphragm Retainer, Push Rod, Clapper Facing Retainer, Clapper Latch, Clapper Pin, Clapper Bolt, Reset Spindle, Reset Spindle Torsion Spring and Name Plate are fabricated



GRAPH B

WET PILOT LINE DESIGN CRITERIA



GRAPH C

DRY PILOT LINE PRESSURE REQUIREMENTS

from stainless steel. The Reset Handle is plastic. The Handhole Cover Bolts and Diaphragm Cover Bolts are carbon steel.

The nominal pressure losses versus flow are shown in Graphs A-1 and A-2. The approximate friction losses, based on the Hazen and Williams formula and expressed in equivalent length of Schedule 40 pipe with C = 120, is 12 feet for the 4 inch (100 mm) valve size and 30 feet for the 6 inch (150 mm) valve size. The equivalent length of pipe has been calculated on the basis of the flow rates typically used with each size valve.

Valve Trim:

The Wet Pilot Actuation Trim, Dry Pilot Actuation Trim, or Electric Actuation Trim illustrated in Figure F form a part of the laboratory listings

and approval of the ZSFG/FM Valves and are necessary for their proper operation. Each package of trim includes the followingitems:

- Water Supply Pressure Gauge
- Diaphragm Chamber Pressure Gauge
- Diaphragm Chamber Connections
- Actuation Devices (as applicable)
- Main Drain Valve
- Alarm Test Valve
- Alarm Control Valve
- Automatic Drain Valve
- Dry Pilot Line Pressure Gauge (as applicable)

Wet Pilot Actuation
(Figure F, Items 1 through 22)

The Wet Pilot Actuation Trim provides for connection of a detection system consisting of wet pilot sprinklers (heat detectors) and manual control stations interconnected with minimum 1/2 inch (15 mm) Schedule 40 steel pipe. The pilot line is connected to the “Wet Pilot Detection” connection shown in Figure F. Nominal installation dimensions for the Wet Pilot Actuation Trim are shown in Figure D.

Wet pilot sprinklers are to be minimum 1/2 inch (15 mm) orifice listed or approved automatic sprinklers.

The maximum height of a wet pilot line above the ZSFG/FM Valve must not exceed the limitations given in Graph B as a function of the minimum water supply pressure to the ZSFG/FM Valve and the length of the pilot line to the most remote pilot sprinkler.

Provision must be made for installing a 1/2 inch (15mm) orifice, Inspector’s Test Connection at the most hydraulically demanding location of a wet pilot line (usually adjacent to the highest and most remote wet pilot sprinkler or manual control station).

To determine the most hydraulically demanding location of a wet pilot line, when the choice between two or more locations is not readily apparent, determine for each location the elevation above the ZSFG/FM Valve and the equivalent length of fittings plus horizontal pipe from the ZSFG/FM Valve to the location. Then, using Graph B, determine the minimum system supply pressure required for the elevation and equivalent length of pipe at each location. Interpolate between the equivalent length plots as necessary.The location requiring the highest system supply pressure is the most hydraulically demanding location for the wet pilot line. (Reference: In no case should the required system supply pressure exceed the actual availableminimum expected system supply pressure.)

Operation of a pilot sprinkler or opening of a manual control station results in a rapid pressure drop in the Diaphragm Chamber of the ZSFG/FM Valve, and the force differential applied through the Clapper Latch which holds the Clapper down in the set position is reduced to below the valve trip point.

NOTES

Wet Pilot Linesmust bemaintained at a minimumtemperature of 40°F/4°C. It is recommended that internally galvanized pipe and cast iron fittings be used for wet pilot lines.

Dry Pilot Actuation
(Figure F, Items 1 through 22 plus Items D1 through D12)

The Dry Pilot Actuation Trim provides for installation of a detection system consisting of dry pilot sprinklers (heat detectors) and manual control stations interconnected with minimum 1/2 inch (15 mm) steel pipe. The pilot line, which is to be pressurized with air or nitrogen, is connected to the “Dry Pilot Detection” connection shown in Figure F. Provision must be made for a 1/2 inch (15 mm) orifice, Inspector’s Test Connection at the most remote location from the ZSFG/FM Valve. Nominal installation dimensions for Dry Pilot Actuation Trim are shown in Figure E.

The Dry Pilot Actuation Trim is provided with a listed and approved Model ZSFQD15 Dry Pilot Actuator. The Actuator is rated for use at a maximum pilot service pressure of 67 psi (4,6 bar) and a maximum watersupply service pressure of 232 psi(16bar).

Operation of a pilot sprinkler or opening of a manual control station, releases pneumatic pressure from the pilot line. In turn, the Dry Pilot Actuator opens resulting in a rapid pressure drop in the Diaphragm Chamber of the ZSFG/FM Valve, and the force differential applied through the Clapper Latch which holds the Clapper down in the set position is reduced to below the valve trip point.

Dry pilot sprinklers are to be minimum 1/2 inch (15 mm) orifice listed or approved automatic sprinklers.

Graph C shows the “minimum pilot line service pressure” as a function of the water supply pressure.The pressure in the dry pilot actuation system must be automatically maintained using one of the following maintenance devices, as appropriate.

Electric Actuation Trim
(Figure F, Items 1 through 22 plus Items E1 through E2)

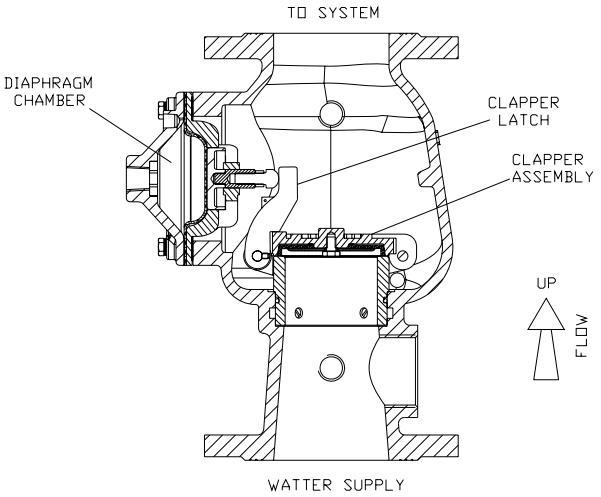
The Electric Actuation Trim is required for electric operation of the ZSFG/FM Valve by a detection system consisting of electrical devices such as heat sensitive thermostats, smoke detectors, and/or electric manual pull stations. A listed and approved, 24VDC Solenoid Valve for non-hazardous locations is supplied as standard. Nominal installation dimensions for the Electric Actuation Trim are shown in Figure D.

NOTE

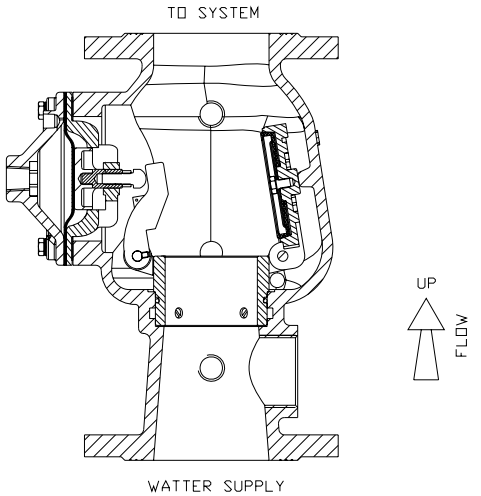
Approval by Factory Mutual is contingent on the use of an FM Approved 24VDC Solenoid Valve. FM only approves solenoid valves for use in nonhazardous locations.

The Electric Actuation Trim is only to be used in conjunction with an electric deluge valve releasing panel (automatic control unit) that is listed or approved (as appropriate) for fire protection system releasing service. In addition, the deluge valve releasing panel is only to be operated by listed or approved (as appropriate) fire detectors.

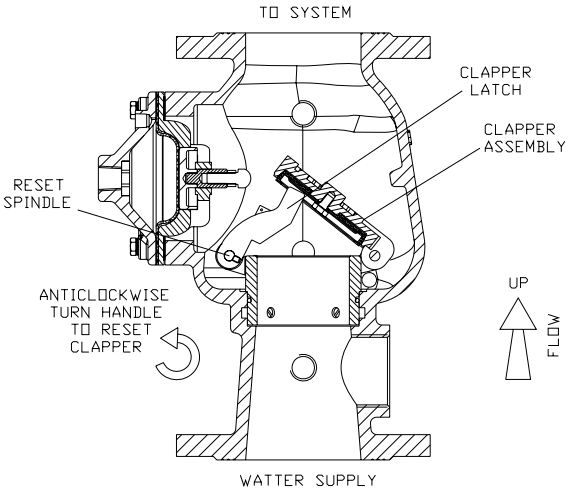
Operation of an electrical device such as a heat sensitive thermostat, smoke



— Set Position —
Figure C-1



— Open Position(Flowing) —
Figure C-2



— Open Position(No Flow) —
Figure C-3

FIGURE C
MODEL F470 EXTERNAL RESETTING MULTIMATIC DELUGE VALVE
— SET AND OPEN POSITIONS —

detector, or electrical manual control station signals the deluge valve releasing panel to energize the Solenoid Valve. In turn, the energized Solenoid Valve opens resulting in a rapid pressure drop in the Diaphragm Chamber of the ZSFG/FM Valve, and the force differential applied through the Clapper Latch which holds the Clapper down in the set position is reduced to below the valve trip point.

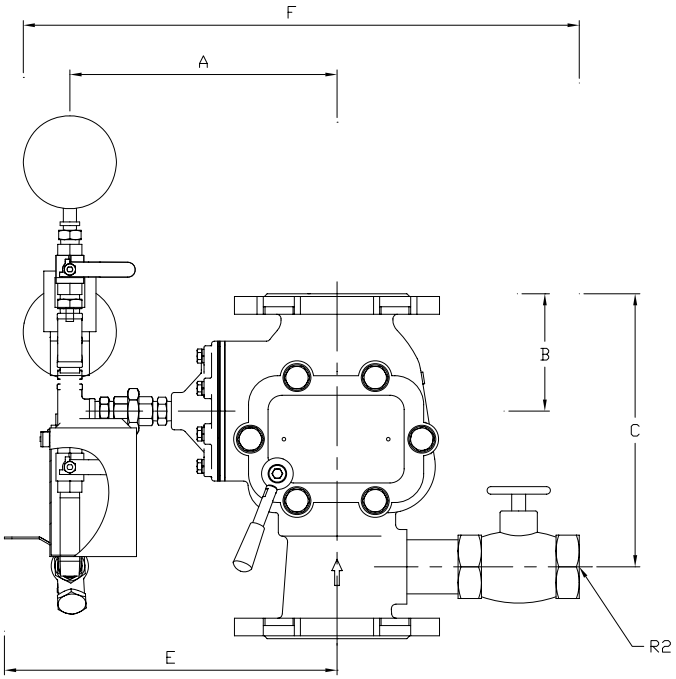
NOTE

Consult with the Authority Having Jurisdiction regarding installation criteria pertaining to electric actuation circuitry.

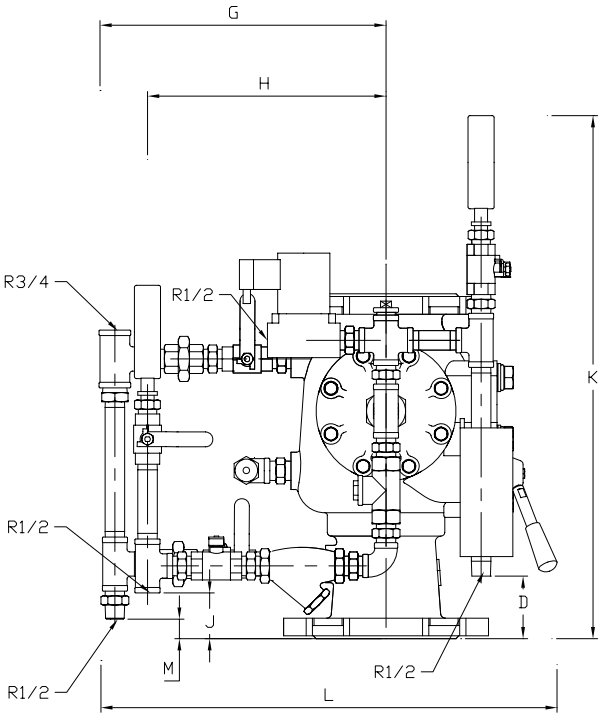
OPERATING PRINCIPLES

The Model ZSFG/FM Deluge Valve is a differential latch type valve which depends upon water pressure in the Diaphragm Chamber (Ref. Figure C-1) to hold the Clapper closed against the water supply pressure.The nominal trip ratio is 2.5 to 1, i.e., the ZSFG/FM Valve operates (opens) when the pressure in the Diaphragm Chamber is reduced to approximately 40 percent of the water supply pressure.

When the ZSFG/FM Valve is set for service, the Diaphragm Chamber is pressurized through the trim connections from the inlet side of the system's main control valve, for example an O.S.&Y. Gate valve or butterfly valve (Ref. Figure G-1, G-2, or G-3). Opening of an actuation device, for example the solenoid valve in the Electric Actuation Trim (Ref.Fig.G-3), releases water from the Diaphragm Chamber faster than it can be replenished through the 1/8 inch (3,2mm) Restriction in the Diaphragm Chamber Supply Connection. This results in a rapid pressure drop in the Diaphragm Chamber and the force differential



Front View



Left View

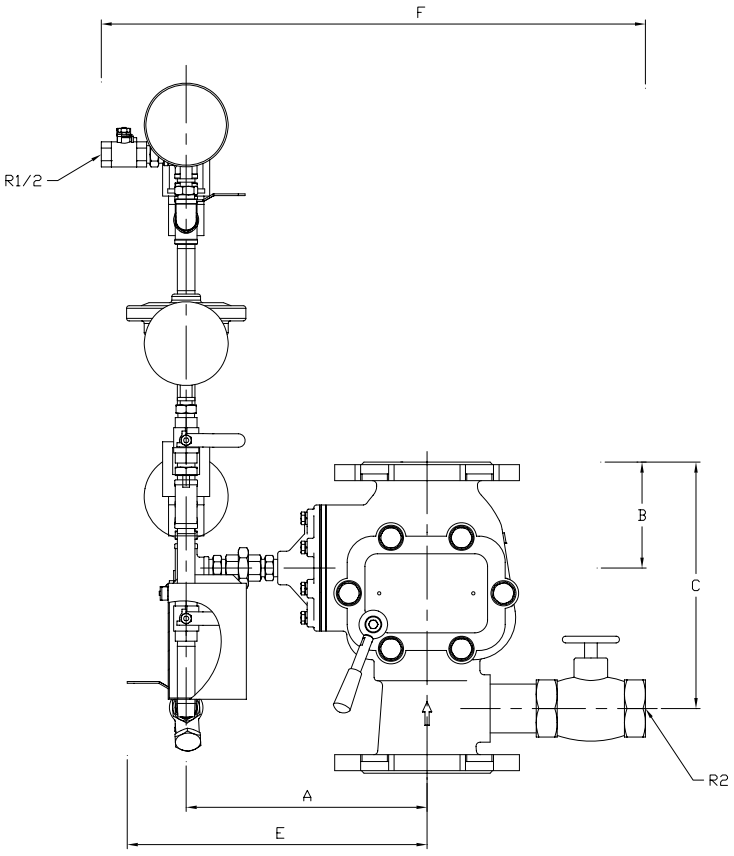
Nominal Installation Dimensions in Inches and (MM)												
VALVE SIZE	A	B	C	D	E	F	G	H	J	K	L	M
4 (100)	11.3 (287)	4.96 (126)	11.54 (293)	2.71 (67)	14.05 (357)	23.5 (597)	12.09 (307)	10.08 (256)	1.97 (50)	22.05 (560)	19.3 (490)	0.87 (22)
6 (150)	11.97 (304)	6.77 (172)	13.0 (330)	3.26 (83)	15.86 (403)	27.8 (705)	13.07 (332)	9.84 (250)	2.97 (71)	22.52 (572)	22.1 (536)	0.43 (11)

FIGURE D

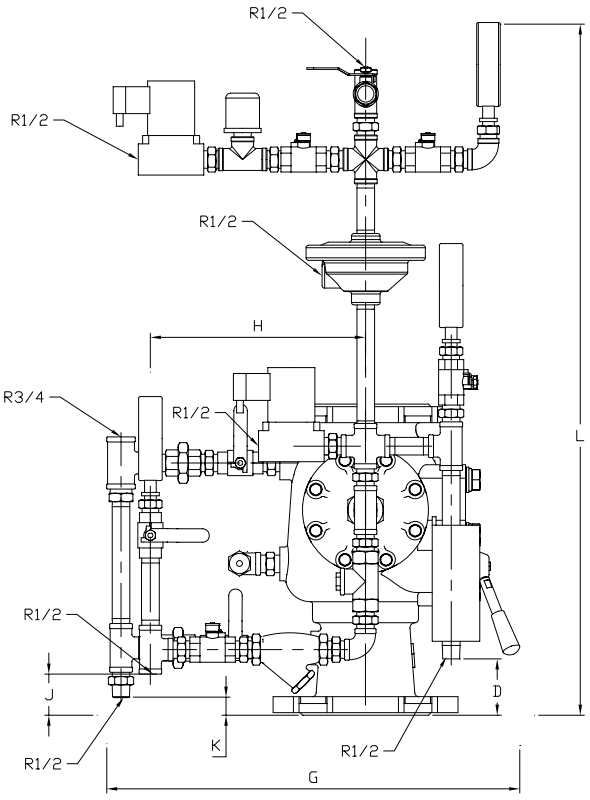
NOMINAL INSTALLATION DIMENSIONS FOR

WET PILOT ACTUATION TRIM OR ELECTRIC ACTUATION TRIM

***** MINIMUM CLEARANCE, ADDITIONAL 2" (50mm) RECOMMENDED



Front View



Left View

Nominal Installation Dimensions in Inches and (MM)											
VALVE SIZE	A	B	C	D	E	F	G	H	J	K	L
4 (100)	11.3 (287)	4.96 (126	11.54 (293)	2.71 (67)	14.05 (357)	25.47 (647)	16.48 (467)	10.08 (256)	1.97 (50)	0.87 (22)	32.36 (822)
6 (150)	11.97 (304)	6.77 (172)	13.0 (330)	3.27 (83)	14.69 (373)	26.57 (675)	22.1 (536)	9.84 (206)	2.59 (71)	0.43 (11)	33.07 (840)

FIGURE E
NOMINAL INSTALLATION DIMENSIONS FOR
DRY PILOT ACTUATION TRIM

***** MINIMUM CLEARANCE, ADDITIONAL 2" (50mm) RECOMMENDED

applied through the Clapper Latch to hold the Clapper down in the set position is reduced to below the valve trip point. The water supply pressure then forces the Clapper open permitting water to flow into the system piping, as well as through the Alarm Port to actuate the system alarms (Ref. Figure C-2).

When the system main control valve is closed to stop waterflow into the system, the Clapper will be prevented from resetting by the Clapper Latch until the Rest Handle is turned inward (Ref. Figure C-3). Turning the Reset Handle inward will temporarily reposition the Clapper Latch away from the waterway and allows the Clapper to drop into the seated position.

INSTALLATION

NOTES

Proper operation of the Model ZSFG/FM Deluge Valves depends upon their trim being installed in accordance with the instructions given in this Technical Data Sheet. Failure to follow the appropriate trim diagram may prevent the ZSFG/FM Valve from functioning properly, as well as void listings, approvals, and the manufacturer's warranties.

The ZSFG/FM Valve must be installed in a readily visible and accessible location.

The ZSFG/FM Valve , associated trim, and wet pilot lines must be maintained at a minimumtemperature of 40°F/4°C.

Heat tracing of the ZSFG/FM Valve or its associated trim is not permitted. Heat tracing can result in the formation of hardened mineral deposits which are capable of preventing proper operation.

The Model ZSFG/FM Deluge Valve is to be installed in accordance with the following criteria:

1a. Flange mounting fasteners are to be tightened uniformly using a crossdraw sequence. Fastener specifications are to be as required by the authority having jurisdiction. Tightening torques are to be as indicated below.

Valve Size	Fastener Size	Torque Ft. Lbs. (Nm)
4"	5/8" (M16)	40-50 (54-68)
6"	3/4" (M20)	50-65 (68-81)

1b. All nipples, fittings, and devices must be clean and free of scale and burrs before installation. Use pipe thread sealant sparingly on male pipe threads only.

NOTE

It is recommended that internally galvanized pipe and cast iron fittings be used for wet or dry pilot lines.

2. The ZSFG/FM Valve must be trimmed in accordance with Figures F.

3. Care must be taken to make sure that check valves, strainers, globe valves, etc.are installed with the flow arrows in the proper direction.

4. Suitable provision must be made for disposal of drain water. Drainage water must be directed such that it will not cause accidental damage to property or danger to persons.

5. Connect the Diaphragm Chamber Supply Control Valve to the inlet side of the system's main control valve in order to facilitate setting of the ZSFG/FM Valve (Ref. G-1, G-2, or G-3).

6. An Inspector's Test Connection, as described in the Technical Data section, must be provided forWet or Dry Pilot Actuation systems.

7. An Air Maintenance Device must be provided for Dry Pilot Actuation.

8. A desiccant dryer, when specified for Dry Pilot Actuation, is to be installed between a drip leg and the Air Maintenance Device.

9. The Low Pressure Alarm Switch for Dry Pilot Actuation is to be adjusted as follows:

• Low pressure alarm setting at approximately 6 psi (0,4 bar) below the minimum pilot line service pressure requirement shown in Graph C.

• Fire alarm setting at approximately 15 psi (1,0 bar) below the minimum pilot line service pressure requirement shown in Graph C.

10. Unused pressure alarm switch connections must be plugged.

11. Conduit and electrical connections are to be made in accordance with the requirements of the authority having jurisdiction and/or the National Electric Code.

VALVE SETTING PROCEDURE

Steps 1 through 12 are to be performed when initially setting the Model ZSFG/FM Deluge Valve; after an operational test of the fire protection system; or, after system operation due to a fire.

1. Close the Diaphragm Chamber Supply Control Valve.

2. Close the Main Control Valve, and if the system is equipped with Dry Pilot Actuation, close the Air Supply Control Valve (Ref. Figure F).

3. Open the Main Drain Valve and all auxiliary drains in the system.Close the auxiliary drain valves after water ceases to discharge.Leave the Main Drain Valve open.

4. Depress the plunger of the Automatic Drain Valve to verify that it is open and that the ZSFG/FM Valve is completely drained.

5. Anticlockwise turn the Reset Handle to allow the Clapper to reseat.

Under normal circumstances, the reseating of the Clapper can be heard; however, during an annual operation test procedure, for example, due to minimal flow through a partially opened main control valve, the Clapper may not latch open as shown

in Figure C-3. In which case the reseating sound of the Clapper will not be heard.

Also under normal circumstances, water pressure in the riser will have exerted sufficient force on the Diaphragm so as to have emptied most of the water from the Diaphragm Chamber which, in turn, will ease the anticlockwise turning of the Reset Handle by eliminating the resistive force produced by a water filled Diaphragm Chamber. Therefore, should water remain in the Diaphragm Chamber, the Reset Plunger will need to be depressed with added force to push the remaining water out of the Diaphragm Chamber and through an open actuation device (e.g., a Dry Pilot Actuator or Solenoid Valve).

NOTE

If the Reset Handle can not be turned sufficiently to allow the Clapper to reseat, operate (open) the Manual Control Station and then once again trun the Reset Handle with sufficient force to push the water out of the Diaphragm Chamber through the Manual Control Station drain.

6. Clean the Strainer in the Diaphragm Chamber Supply connection by removing the clean-out plug and strainer basket. The Strainer may be flushed out by momentarily opening the Diaphragm Chamber Supply Control Valve.

7. Open the Alarm Control Valve (Fig. F), if it was closed to silence local alarms.
It is recommended that the Alarm Control Valve be wire sealed in the open position with a No. 16 twisted wire, the ends of which are secured by a lead seal. The wire seal should be looped through the hole in the handle and tightly twisted around the pipe nipple adjacent to the handle.

8. Reset the actuation system.

Manual Actuation — Push the operating lever up; however, do not close the hinged cover at this time.

Wet Pilot Actuation — Replace operated pilot sprinklers and/or reset the manual control stations.

Dry Pilot Actuation—Replace operated pilot sprinklers and/or reset the manual control stations. Re-establish dry pilot pneumatic pressure.

Electric Actuation—Reset the electric detection system in accordance with the manufacturer's instructions to de-energize the solenoid valve.

NOTE

In order to prevent the possibility of a subsequent operation of an overheated solder type pilot sprinkler, any solder type pilot sprinklers which were possibly exposed to a temperature greater than their maximum rated ambient must be replaced.

9. Open the Diaphragm Chamber Supply Control Valve and allow time for full pressure to build up in the Diaphragm Chamber.

10. Operate (open) the Manual Control Station to vent trapped air from the Diaphragm Chamber. If necessary, first open the hinged cover, and then fully pull down on the operating lever. SLOWLY close the operating lever, by pushing it up, after aerated water ceases to discharge from the Manual Control Station drain tubing. Close the hinged cover and insert a new break rod in the small hole through the top of the enclosing box.

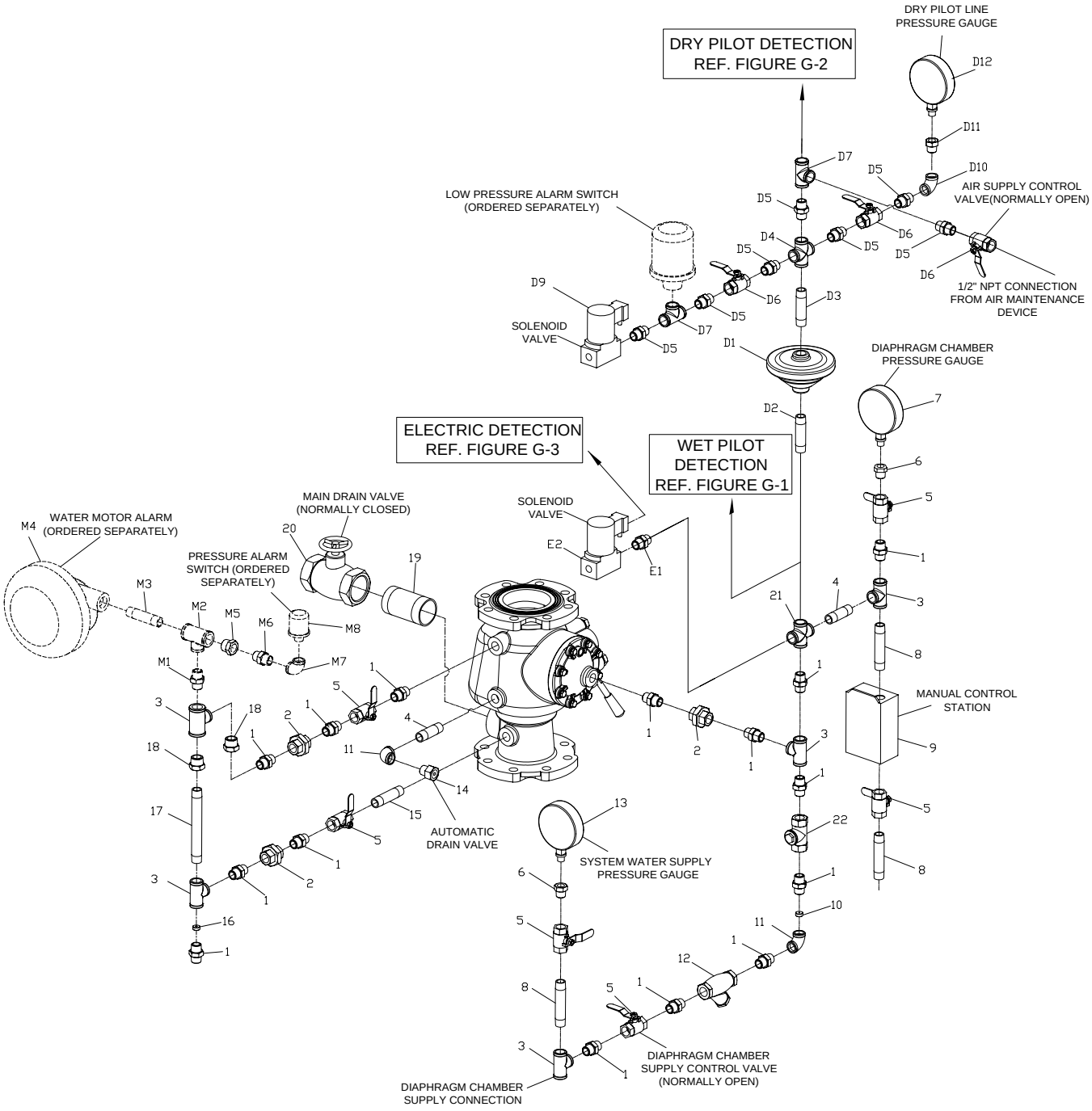
If wet pilot actuation is being used, crack open the Inspector's Test Connection and any other vent valves, to relieve trapped air. After the discharge of air has stopped, close the vent valves and the Inspector's Test Connection.

11. Inspect drain connections from the Manual Control Station, Solenoid Valve, Dry Pilot Actuator, and Alarm Devices, as applicable. Any leaks must be corrected before proceeding to the next step.

12. Slowly open the Main Control Valve. Close the Main Drain Valve as soon as water discharges from the drain connection. Observe the Automatic Drain Valve for leaks. If there are leaks, determine/correct the cause of the leakage problem. If there are no leaks, the ZSFG/FM Valve is ready to be placed in service and the Main Control Ave must then be fully opened.

NOTE

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



Note: Refer to Page 11 for the corresponding bills of materials.

FIGURE F
EXPLODED VIEW OF VALVE TRIM

1 - 1/2" Nipple
2 - 1/2" Union
3 - 1/2" Tee
4 - 1/2" x 65mm Nipple
5 - 1/2" Ball Valve
6 - Pressure Connector
7 - Pressure Gauge
8 - 1/2" x 100mm Nipple
9 - Manual Control Station
10 - Restrictor
11 - 1/2" 90° Elbow
12 - 1/2" Y Strainer
13 - Pressure Gauge
14 - Automatic Drain Valve
15 - 1/2" x 85mm Nipple
16 - Restrictor
17 - 1/2" x 170mm Nipple(100mm Valve)
1/2" x 190mm Nipple(150mm Valve)
18 - 1/2" x 3/4" Reducer
19 - 2" x 120mm Nipple
20 - 2" Globe Valve
21 - 1/2" Cross
22 - 1/2" Check valve
D1 - Dry Pilot Actuator
D2 - 1/2" x 150mm Nipple
D3 - 1/2" x 120mm Nipple
D4 - 1/2" Cross
D5 - 1/2" Nipple
D6 - 1/2" Globe Valve
D7 - 1/2" Tee
D8 - Low Pressure Alarm Switch
D9 - 1/2" Solenoid Valve
D10 - 1/2" Elbow
D11 - Pressure Connector
D12 - Pressure Gauge
E1 - 1/2" Nipple
E2 - 1/2" Solenoid Valve
M1 - 3/4" Nipple
M2 - 3/4" Tee
M3 - 3/4" x 120mm Nipple
M4 - Water Motor Alarm
M5 - 1/2" x 3/4" Reducer
M6 - 1/2" Nipple
M7 - 1/2" Elbow
M8 - Pressure Switch

NOTES:

1. Wet Pilot Actuation Trim constists of Items 1 through 22.
2. Dry Pilot Actuation Trim consists of Items 1 through 22 plus Items D1 through D12.
3. Electric Actuation Trim consists of Items 1 through 22 plus Items E1 through E2.
4. Water Motor Alarm and Pressure Alarm Switch Trims consist of Item M1 through M8, this should be ordered separately.
5. “Standard order” trim is provided with black nipples and fittings: however, galvanized nipples and fittings are available on “special order”.

VALVE TRIM
BILLS OF MATERIALS

CARE AND MAINTENANCE

The following procedures and inspections should be perform as indicated, in addition to any specific requirements of the NFPA, and any impairment must be immediately corrected. It is also recommended that fire protection systems be inspected by a qualified Inspection Service.

NOTES

The operational test procedure, waterflow pressure alarm test procedure, and low pressure alarm test procedure will result in operation of the associated alarms. Consequently, notification must first be given to the owner and the fire department, central station, or other signal station to which the alarms are connected. Before closing a fire protection system main control valve for maintenance work on the fire protection system which it controls, permission to shut down the effected fire protection systems must first be obtained from the proper authorities and all personnel who may be affected by this decision must be notified.

Annual Operation Test Procedure

Proper operation of the ZSFG/FM Valve (i.e., opening of the ZSFG/FM Valve as during a fire condition) should be verified at least once a year as follows:

1. If watermust be prevented from flowing beyond the riser, perform the following steps.
a. Close the Main Control Valve.
b. Open the Main Drain Valve.
c. Open the Main Control Valve one turn beyond the position at which water just begins to flow from the Main Drain Valve.
d. Close the Main Drain Valve.

2. Determine the type of actuation/ detection system, and operate the ZSFG/FM Valve accordingly.

NOTE

Be prepared to quickly perform Steps 3, 4, and 5, if water must be prevented from flowing beyond the riser.

Wet Pilot Actuation — Open the Inspector’s Test Connection.

Dry Pilot Actuation — Open the Inspector’s Test Connection.

Electric Actuation — Test the deluge releasing panel (automatic control unit) in accordance with the manufacturer’s instructions to energize the solenoid valve.

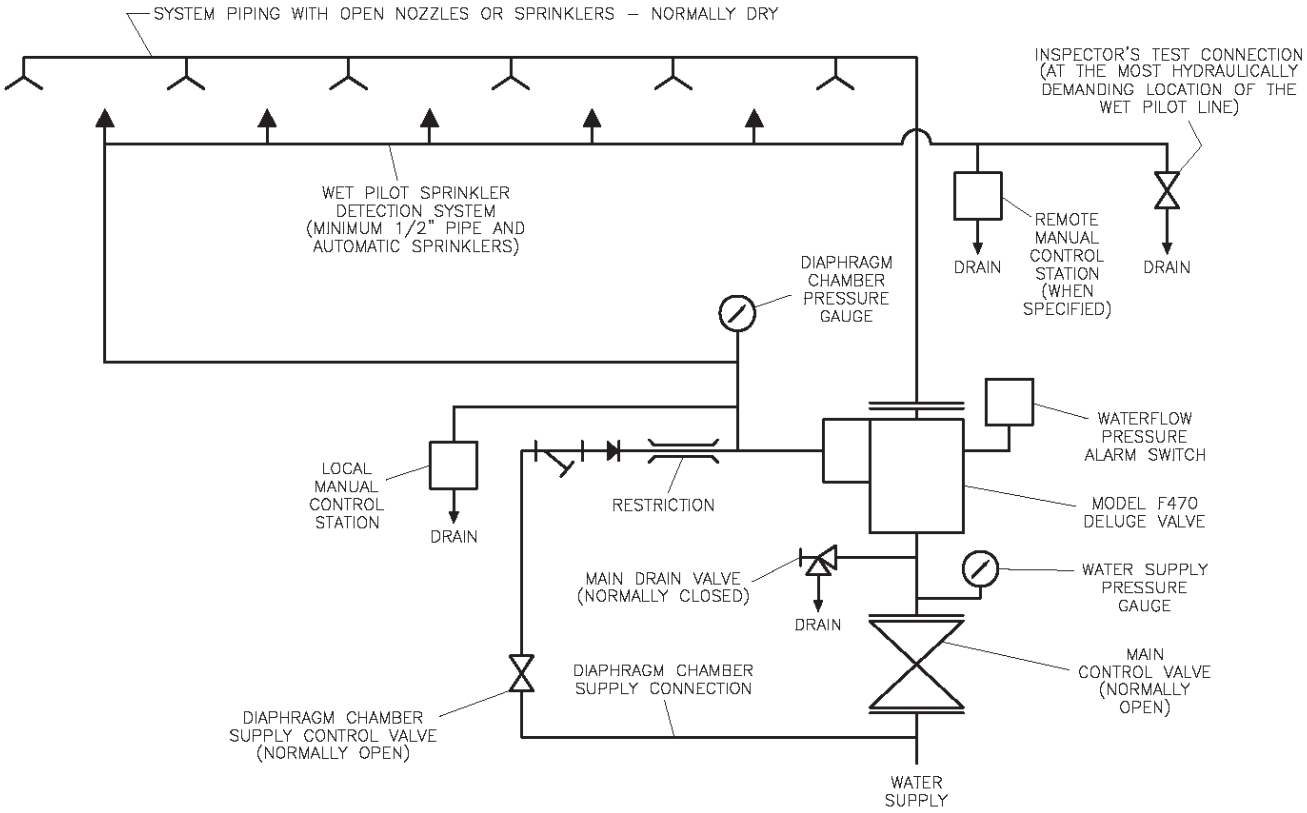


FIGURE G-1
DELUGE VALVE SYSTEM SCHEMATIC
— WET PILOT ACTUATION—

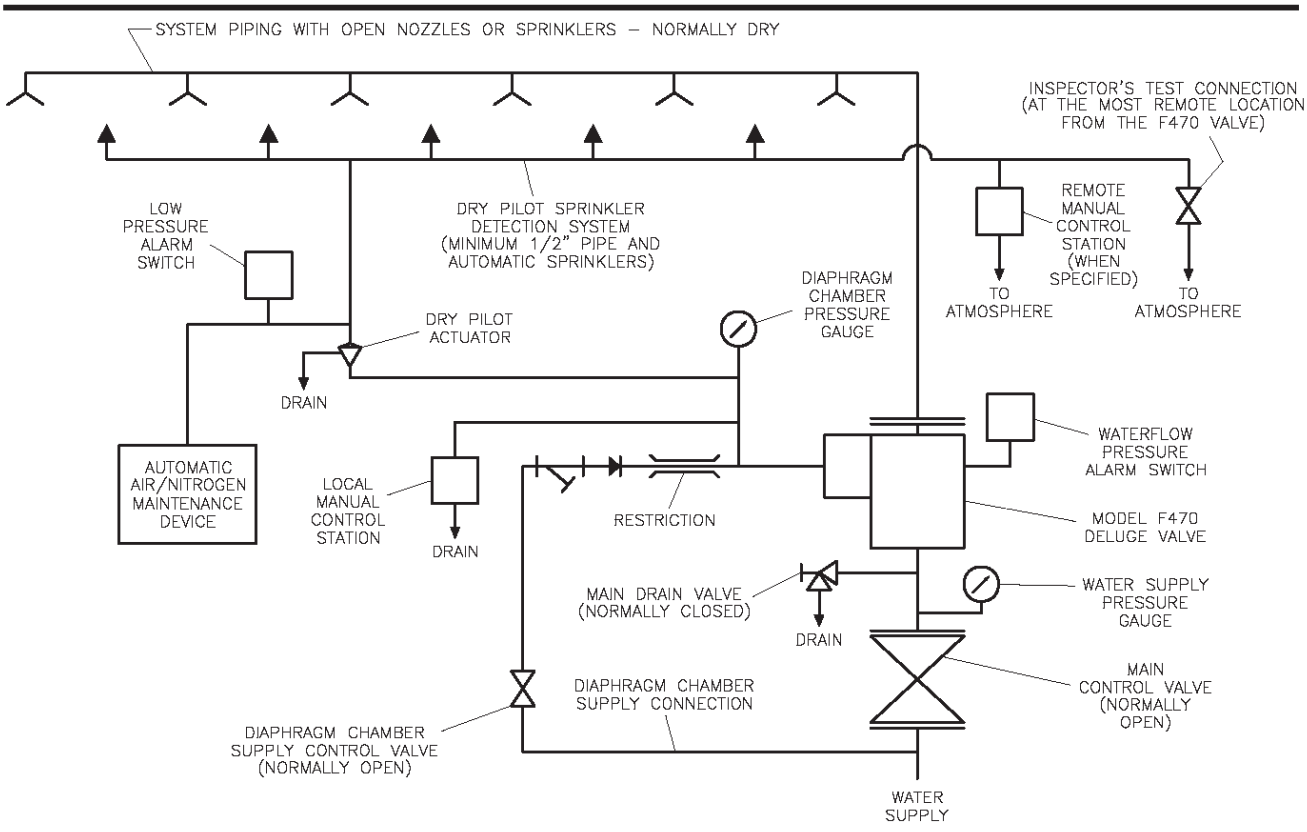


FIGURE G-2
DELUGE VALVE SYSTEM SCHEMATIC
— DRY PILOT ACTUATION—

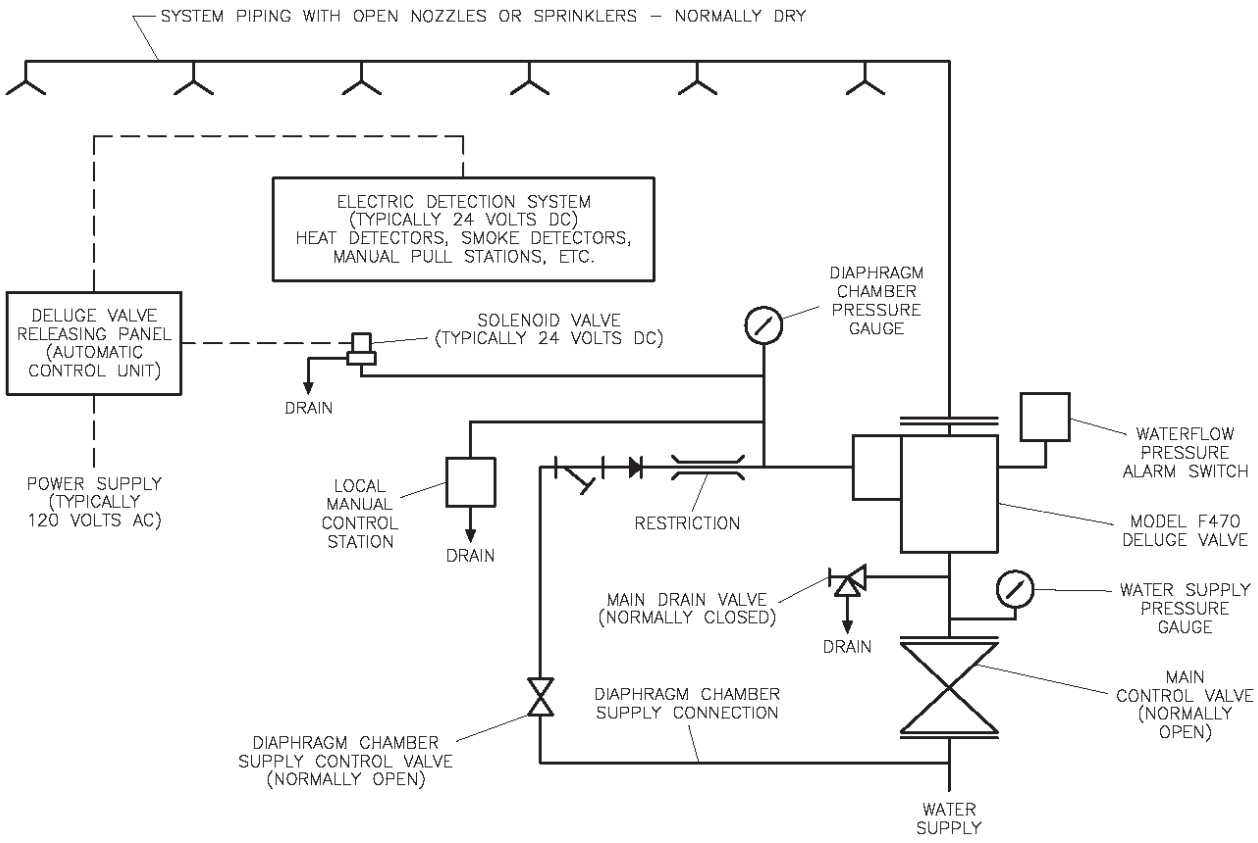


FIGURE G-3
DELUGE VALVE SYSTEM SCHEMATIC
— ELECTRIC ACTUATION—

3. Verify that the ZSFG/FM Valve has tripped, as indicated by the flow of water into the system.

4. Close the Diaphragm Chamber Supply Control Valve.

5. Close the system's Main Control Valve.

6. Reset the ZSFG/FM Deluge Valve in accordance with the Valve Setting Procedure.

Five Year Internal Valve Inspection

Once every five years during the annual operational test procedure and prior to the ZSFG/FM Valve being reset, the internal parts of the ZSFG/FM Valve should be cleaned and then inspected for wear and damage. Make certain that the two 1/8 inch (3,2mm) diameter pressure equalizing vents in the top of the Clapper are open. Special consideration should be given to the condition of the Diaphragm and the Clapper Facing. The Diaphragm and/or Clapper Facing should be replaced if there are any signs of deterioration due to age or chemicals in the water.

NOTE

If the water supply contains chemicals which tend to attack an EPDM type rubber or the five year inspection indicates a build-up of debris within the valve which could affect its proper operation, then the frequency of the internal valve inspection procedure should be increased as appropriate.

Worn or damaged parts must be replaced and the ZSFG/FM Valve must be reassembled in accordance with Figure B. The Cap Screws securing the Diaphragm and Handhole Covers should be uniformly tightened using a cross-draw sequence.

Quarterly Solenoid Valve Test Procedure For Electric Actuation

Proper operation of the Solenoid Valve

for electric actuation should be verified at least quarterly as follows:

1. Close the Main Control Valve.

2. Open the Main Drain Valve.

3. Test the automatic control unit (deluge releasing panel) in accordance with the manufacturer's instructions to energize the solenoid valve.

4. Verify that the flow of water from the Solenoid Valve drain connection increases to a full flow.

5. Verify that the Diaphragm Chamber pressure has decreased to below 25% of the water supply pressure.

6. Reset the electric detection system in accordance with the manufacturer's instructions to de-energize the solenoid valve. Check the Solenoid Valve drain for leaks. Any leaks must be corrected before proceeding to the next step.

7. Slowly open the Main Control Valve. Close the Main Drain Valve as soon as water discharges from the drain connection. Observe the Automatic Drain Valve for leaks. If there are leaks, determine/correct the cause of the leakage problem. If there are no leaks, the ZSFG/FM Valve is ready to be placed in service and the Main Control Valve must then be fully opened.

Quarterly Dry Pilot Actuator Test Procedure For Dry Pilot Actuation

Proper operation of the Dry Pilot Actuator for dry pilot actuation should be verified at least quarterly as follows:

1. Close the Main Control Valve.

2. Open the Main Drain Valve.

3. Open the Inspector's Test Connection on the Dry Pilot Line.

4. Verify that the flow of water from the Dry Pilot Actuator drain connection increases to a full flow.

5. Verify that the Diaphragm Chamber pressure has decreased to below 25% of the water supply pressure.

6. Close the Inspector's Test Connection and allow the dry pilot line pressure to re-establish. Check the Dry Pilot Actuator drain for leaks. Any leaks must be corrected before proceeding to the next step.

7. Slowly open the Main Control Valve. Close the Main Drain Valve as soon as water discharges from the drain connection. Observe the Automatic Drain Valve for leaks. If there are leaks, determine/correct the cause of the leakage problem. If there are no leaks, the ZSFG/FM Valve is ready to be placed in service and the Main Control Ave must then be fully opened.

Quarterly Waterflow Alarm Test Procedure

Testing of the system waterflow alarms should be performed quarterly. To test the waterflow alarm, open the Alarm Test Valve, which will allow a flow of water to the Pressure Alarm Switch and/or Water Motor Alarm. Upon satisfactory completion of the test, close the Alarm Test Valve.

Quarterly Low Pressure Alarm Test Procedure And Condensate Drain Procedure For Dry Pilot Actuation

For Dry Pilot Actuation, testing of the Low Pressure Alarm Switch and drainage of the pilot line condensate should be performed quarterly as follows.

1. Close the Diaphragm Chamber Supply Control Valve.

2. Close the Main Control Valve.

3. Open the Main Drain Valve.

4. Drain the dry pilot line condensate as follows.

a. Close the Gauge Test Valve located below the Dry Pilot Line Pressure Gauge.
b. Remove the 1/4" Plug from the Gauge Test Valve.
c. Crack Open the Gauge Test Valve and allow all condensate, if any, to drain out.
d. Close the Gauge Test Valve, replace the Plug, and then open the Gauge Test Valve.

5. Open the Inspector's Test Connection, and slowly relieve pneumatic pressure. Verify that the Low pressure Alarm Switch is operational and that the low pressure set points are as follows:

• Low pressure alarm setting at approximately 6 psi (0,4 bar) below the minimum pilot line service pressure requirement shown in Graph C.
• Fire alarm setting at approximately 15 psi (1,0 bar) below the minimum pilot line service pressure requirement

shown in Graph C.

6. Close the Inspector's Test Connection, and allow the Dry Pilot Line to automatically repressurize.

7. Open the Diaphragm Chamber Supply Control Valve.

8. Slowly open the Main Control Valve. Close the Main Drain Valve as soon as water discharges from the drain connection. Observe the Automatic Drain Valve for leaks. If there are leaks, determine/correct the cause of the leakage problem. If there are no leaks, fully open theMain Control Valve.

WARRANTY

Seller warrants for a period of one year from the date of shipment (warranty period) that the products furnished hereunder will be free from defects in material and workmanship. For further details on Warranty, see Price List.