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# Model DV-1 Deluge Valve, External Resetting 4 and 6 Inch (DN100 and DN150) Flange x Flange or Flange x Groove

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## General Description

The 4 and 6 inch (DN100 and DN150), Model DV-1 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 foam-water and double interlock. The DV-1 Valves also provide for actuation of fire alarms upon system operation.

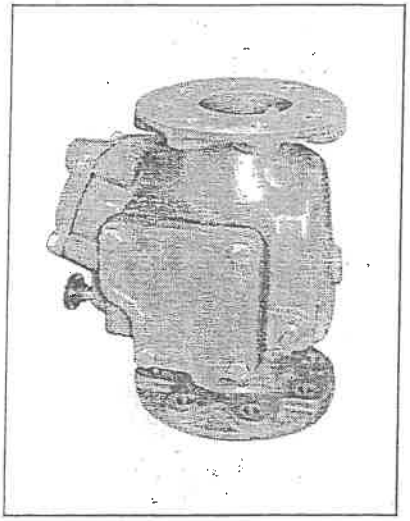
The external resetting feature of the DV-1 Valve provides for easy resetting of a deluge or preaction system, without having to open a valve handhole cover to manually reposition a clapper and latch mechanism. Simply depressing a plunger at the left side of the DV-1 Valve allows the clapper and latch to reset.

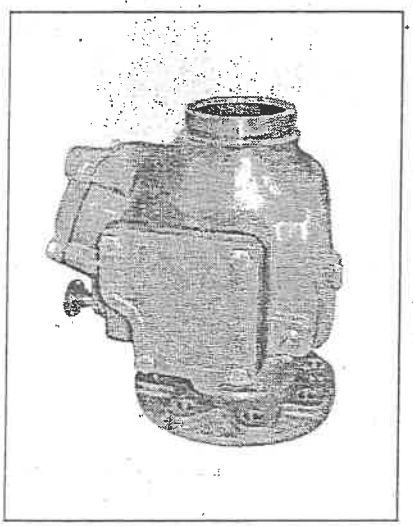
Operation of a DV-1 Valve is provided by an actuation (detection) system that is separate from the normally dry system piping. Trim configuration options for automatic operation of the DV-1 include wet pilot actuation, dry pilot actuation, and electric actuation. Trim arrangements also provide for local emergency (manual) release of the DV-1 Valves.

*WARNING*

*The Model DV-1 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.*





| VALVE PARTS | | | |
|---|---|---|---|
| NO. | DESCRIPTION | QTY. | REF. |
| 1 | Valve Body | 1 | NR |
| 2 | Clapper | 1 | See (b) |
| 3 | Clapper Facing | 1 | See (a) or (b) |
| 4 | Clapper Facing Retainer | 1 | See (b) |
| 5 | Clapper Hex Bolt | 1 | See (b) |
| 6 | Seat Ring | 1 | NR |
| 7 | Clapper Latch | 1 | See (d) |
| 8 | Reset Bushing O-Ring | 1 | See (c) |
| 9 | Reset Bushing | 1 | See (c) |
| 10 | Reset Plunger O-Ring | 1 | See (c) |
| 11 | Reset Plunger | 1 | See (c) |
| 12 | Reset Knob | 1 | See (c) |
| 13 | Diaphragm Housing Hex Bolt | 5 | See (d) |
| 14 | Diaphragm Retainer | 1 | See (d) |
| 15 | Flange/Push Rod Assembly | 1 | See (d) |

| VALVE PARTS | | | |
|---|---|---|---|
| NO. | DESCRIPTION | QTY. | REF. |
| 16 | Diaphragm | 1 | See (a) or (d) |
| 17 | Diaphragm Housing | 1 | See (d) |
| 18 | Hinge Pin Square Head Pipe Plug | 4 | CH |
| 19 | Hinge Pin Bearing | 4 | NR |
| 20 | Clapper Hinge Pin | 1 | See (b) |
| 21 | Latch Hinge Pin | 1 | See (d) |
| 22 | Handhole Cover | 1 | See (e) |
| 23 | Handhole Cover Gasket | 1 | See (a) or (e) |
| 24 | Handhole Cover Hex Bolt, 4 Inch Valve | 4 | See (e) |
| | 6 Inch Valve | 5 | See (e) |
| 25 | Dow Corning FS3452 Flourosilicone Grease, 1.5 g | 1 | See (c) |
| 26 | Alarm Port Reducing Hex Bushing | 1 | CH |

| REPLACEMENT PARTS | | |
|---|---|---|
| NO. | DESCRIPTION | P/N |
| (a) | Repair Parts Kit, Includes 3, 16, 23 | |
| | 4 Inch Valve | 92-470-1-101 |
| | 6 Inch Valve | 92-470-1-102 |
| (b) | Clapper Assembly, Includes 2-5, 20 | |
| | 4 Inch Valve | 92-470-1-103 |
| | 6 Inch Valve | 92-470-1-104 |
| (c) | Reset Plunger Parts Kit, 4 & 6 Inch Valves, Includes 8-12, 25 | 92-470-1-105 |
| (d) | Diaphragm & Latch Parts Kit, Includes 7, 13-17, 21 | |
| | 4 Inch Valve | 92-470-1-106 |
| | 6 Inch Valve | 92-470-1-107 |
| (e) | Handhole Cover Parts Kit, Includes 22-24 | |
| | 4 Inch Valve | 92-470-1-108 |
| | 6 Inch Valve | 92-470-1-109 |

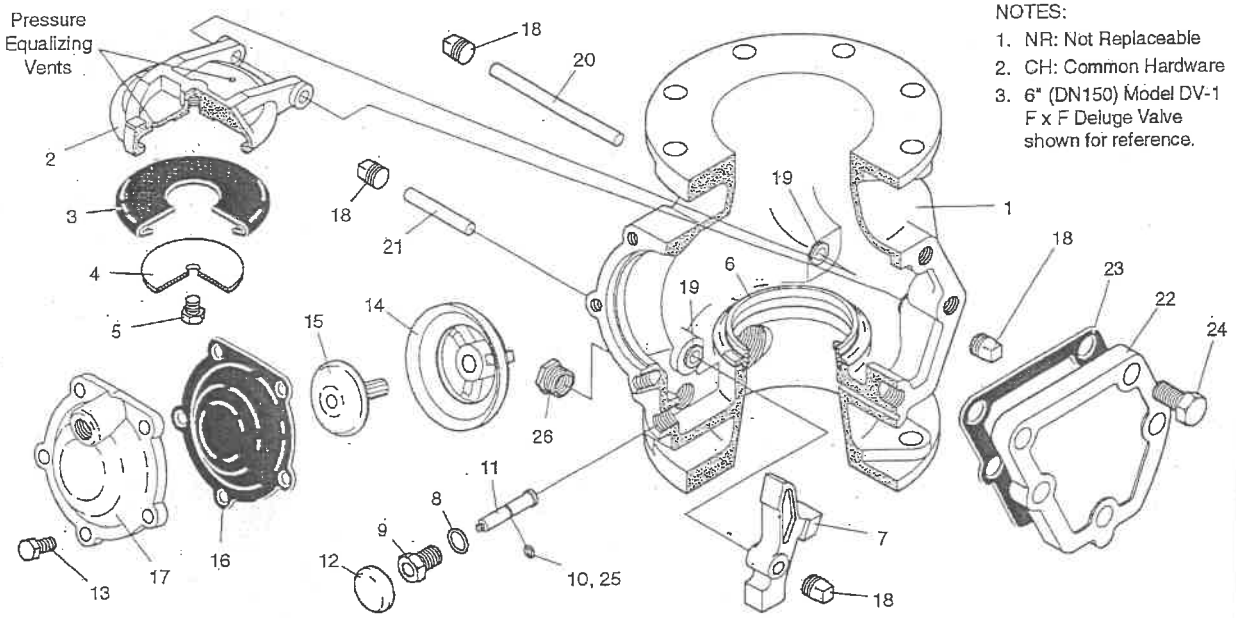
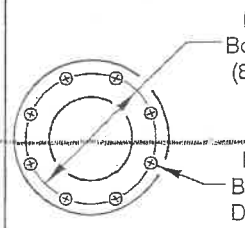



*FIGURE 1*
*4 and 6 INCH (DN100 and DN150) MODEL DV-1 DELUGE VALVE*
*— ASSEMBLY —*




| Specification | Nominal Dimensions in Inches and (mm) 4" (DN100) Valve A | 4" (DN100) Valve B | 6" (DN150) Valve A | 6" (DN150) Valve B |
|---|---|---|---|---|
| ANSI B16.1 (Class 125) | 7.50 (190,5) | 0.75 (19,0) | 9.50 (241,3) | 0.88 (22,2) |
| AS 2129 (Table E) | 7.00 (178,0) | 0.71 (18,0) | 9.25 (235,0) | 0.87 (22,0) |
| ISO 2084 (PN10) * | 7.09 (180,0) | 0.71 (18,0) | 9.45 (240,0) | 0.87 (22,0) |
| JIS B 2210 (10K) | 6.89 (175,0) | 0.75 (19,0) | 9.45 (240,0) | 0.91 (23,0) |

* Same drilling as for BS 4504 Section 3.2 (PN10) and DIN 2532 (PN10).

*TABLE A — DIMENSIONAL SPECIFICATIONS FOR SELECTION OF FLANGE DRILLING*

# Technical Data

**Approvals:**
UL and C-UL Listed (wet pilot, dry pilot, or electric actuation).

FM Approved (wet pilot, dry pilot, or electric actuation).

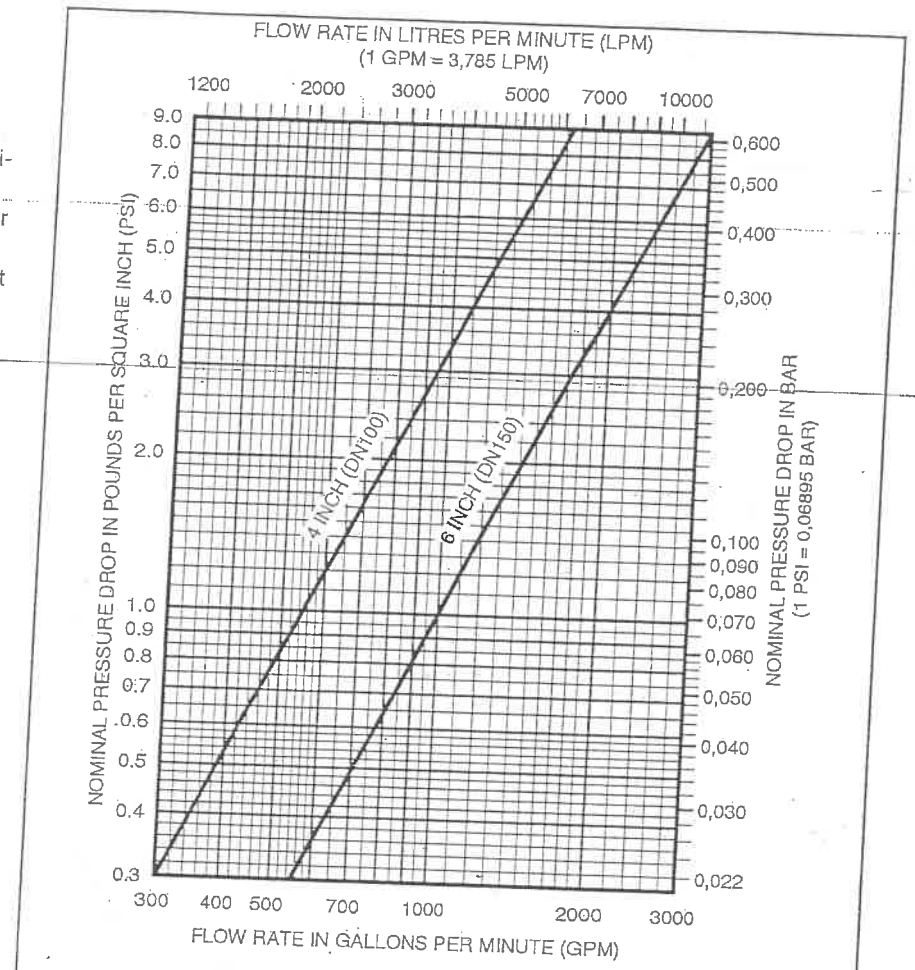
LPCB Approved (wet pilot or dry pilot actuation).

**Deluge Valve:**
The 4 and 6 inch (DN100 and DN150), Model DV-1 Deluge Valves are for vertical installations (flow going up), and they are rated for use at a maximum service pressure of 175 psi (12,1 bar). The nominal installation dimensions are shown in Figures 4, 7, and 10.

Flanged connections are available drilled per ANSI, ISO, AS, and JIS specifications (Ref. Table A). The grooved outlet connections, as applicable, are cut in accordance with standard groove specifications for steel pipe. They are suitable for use with grooved end pipe couplings that are listed or approved for fire protection system service. Available combinations of inlet and outlet connections are detailed in the Ordering Procedure section.

Threaded port connections of valves having flanges drilled to either ANSI or JIS specifications are NPT threaded per ANSI Standard B1.20.1. Threaded port connections of valves having flanges drilled to either ISO or AS specifications are available either threaded per ISO 7/1 or NPT threaded per ANSI Standard B1.20.1. Valves with NPT threaded ports will readily accept the trim arrangements detailed in Figures 3, 6, or 9.

Components for the DV-1 Valve are shown in Figure 1. The Body, Diaphragm Cover, and Handhole Cover are ductile iron. The Handhole Cover Gasket is neoprene, and the Clapper Facing, Diaphragm, and O-rings are EPDM. The Seat Ring, Clapper, Diaphragm Retainer, and Flange of the Flange & Push Rod Assembly are bronze. The Clapper Latch is aluminum bronze, the Reset Bushing is brass, and the Bearings are bronze. The Clapper Facing Retainer, Clapper Bolt, Reset Plunger, Clapper Hinge Pin, Latch Hinge Pin, and the Push Rod of the Flange & Push Rod Assembly are fabricated from stainless steel. The Reset Knob is phenolic, and the Handhole Cover Bolts, Diaphragm Cover Bolts, and Pipe Plugs are steel.




The approximate friction loss, 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 valve and 30 feet for the 6 inch valve. The equivalent length of pipe has been calculated on a typical flow rate of 600 GPM for the 4 inch valve and 1500 GPM for the 6 inch valve.

*GRAPH A*
*4 and 6 INCH (DN100 and DN150) MODEL DV-1 DELUGE VALVE*
*— NOMINAL PRESSURE LOSS VERSUS FLOW —*

# Valve Trim

The Wet Pilot Actuation Trim, Dry Pilot Actuation Trim, and Electric Actuation Trim form a part of the laboratory listings and approval of the DV-1 Valves and are necessary for their proper operation. Each package of trim includes the following items:

- 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)

To ease field assembly of the trim arrangements, the appropriate components required for Wet Pilot Actuation, Dry Pilot Actuation, or Electric Actuation are provided partially assembled as shown in Figure 12.

# Wet Pilot Actuation

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 (DN15) Schedule 40 steel pipe. The pilot line is connected to the "Wet Pilot Detection" connection shown in Figures 4 and 12. Nominal installation dimensions for the Wet Pilot Actuation Trim are shown in Figure 4.

Wet pilot sprinklers are to be minimum 5.6 K-factor orifice listed or approved automatic sprinklers. Manual Control Stations are to be the Model MC-1 described in Technical Data Sheet TD1382.

The maximum height of a wet pilot line above the DV-1 Valve must not exceed the limitations given in Graph B as a function of the minimum water supply pressure to the DV-1 Valve and the length of the pilot line to the most remote pilot sprinkler.

Provision must be made for installing a 5.6 K-factor 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 DV-1 Valve and the equivalent length of fittings plus horizontal pipe from the DV-1 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 available minimum 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 DV-1 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 Lines must be maintained at a minimum temperature of 40°F/4°C.*

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

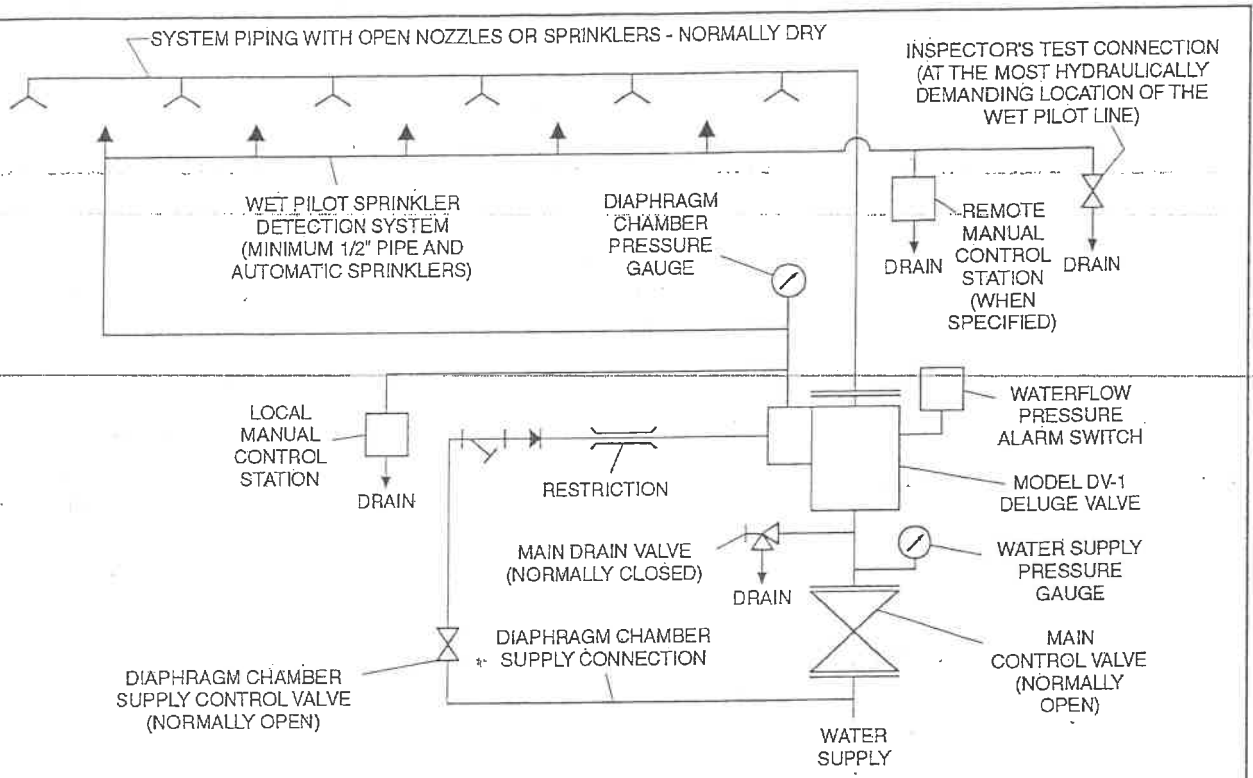
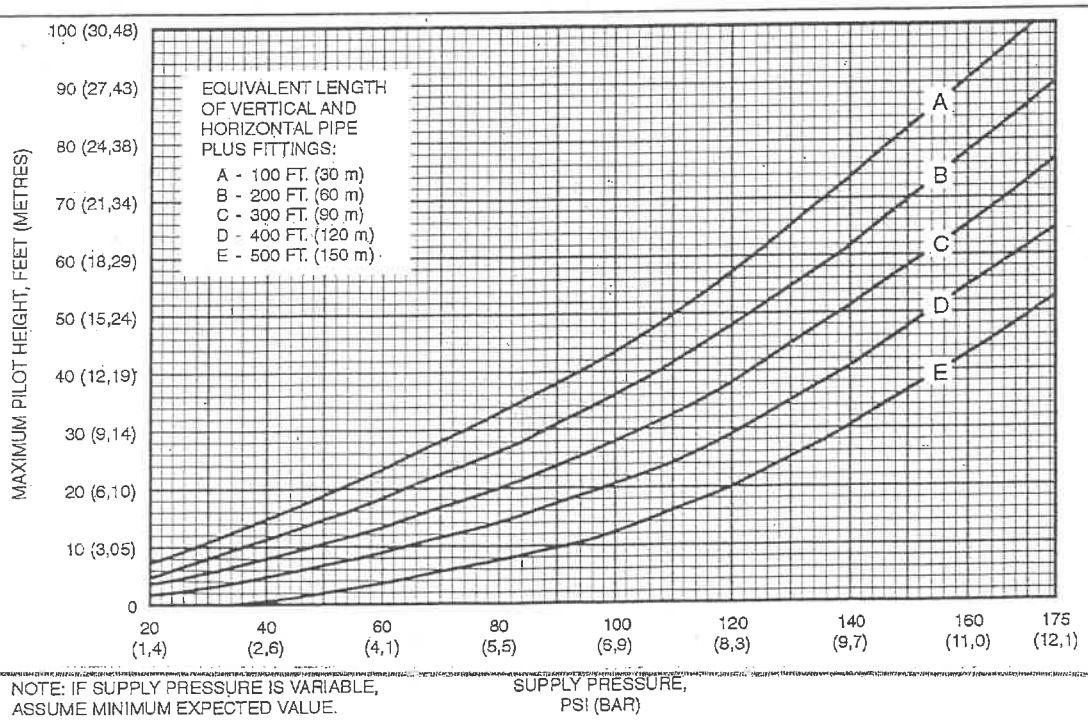


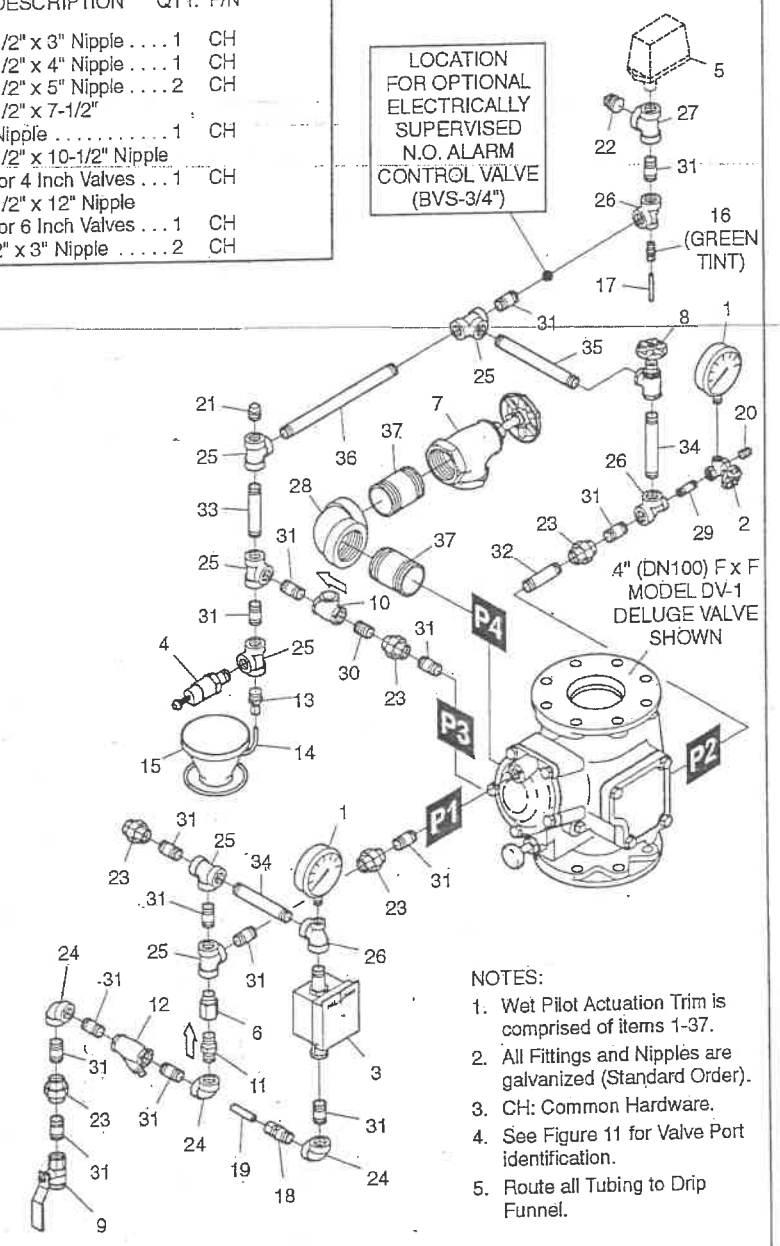

*FIGURE 2*
*SYSTEM SCHEMATIC — WET PILOT ACTUATION*




*GRAPH B*
*4 and 6 INCH (DN100 and DN150) MODEL DV-1 DELUGE VALVE*
*— WET PILOT DESIGN CRITERIA —*

| WET PILOT ACTUATION TRIM P/N 52-470-2-101 (See Note 1) | | | |
|---|---|---|---|
| NO. | DESCRIPTION | QTY. | P/N |
| 1 | 300 psi/ 2000 kPa Water Pressure Gauge | 2 | 92-343-1-005 |
| 2 | 1/4" Gauge Test Valve | 1 | 46-005-1-002 |
| 3 | Model MC-1 Manual Control Station (Gav.) | 1 | 52-289-2-001 |
| 4 | Model AD-1 Automatic Drain Valve (Gav.) | 1 | 52-793-2-004 |
| 5 | Waterflow Pressure Alarm Switch | 1 | Order Separately |
| 6 | Priming Supply Restriction | 1 | 92-020-1-009 |
| 7 | 2" Angle Valve | 1 | 46-048-1-009 |
| 8 | 1/2" Angle Valve | 1 | 46-048-1-004 |
| 9 | 1/2" Ball Valve | 1 | 46-050-1-004 |
| 10 | 1/2" Swing Check Valve | 1 | 46-049-1-004 |
| 11 | 1/2" Spring Loaded Check Valve | 1 | 92-322-1-002 |
| 12 | 1/2" Y-Strainer | 1 | 52-353-1-005 |
| 13 | Drip Funnel Connector | 1 | 92-211-1-005 |
| 14 | Drip Funnel Bracket | 1 | 92-211-1-003 |
| 15 | Drip Funnel | 1 | 92-343-1-007 |
| 16 | 3/32" Vent Fitting | 1 | 92-032-1-002 |
| 17 | 1/4" x 30" Tubing | 1 | CH |
| 18 | 1/2" Tubing Connector | 1 | CH |
| 19 | 1/2" x 24" Tubing | 1 | CH |
| 20 | 1/4" Plug | 1 | CH |
| 21 | 1/2" Plug | 1 | CH |
| 22 | 3/4" Plug | 1 | CH |
| 23 | 1/2" Union | 5 | CH |
| 24 | 1/2" 90° Elbow | 3 | CH |
| 25 | 1/2" Tee | 6 | CH |
| 26 | 1/2" x 1/4" x 1/2" Reducing Tee | 3 | CH |
| 27 | 1/2" x 1/2" x 3/4" Reducing Tee | 1 | CH |
| 28 | 2" 90° Elbow | 1 | CH |
| 29 | 1/4" x 1-1/2" Nipple | 1 | CH |
| 30 | 1/2" x Close Nipple | 1 | CH |
| 31 | 1/2" x 1-1/2" Nipple | 15 | CH |

| NO. | DESCRIPTION | QTY. | P/N |
|---|---|---|---|
| 32 | 1/2" x 3" Nipple | 1 | CH |
| 33 | 1/2" x 4" Nipple | 1 | CH |
| 34 | 1/2" x 5" Nipple | 2 | CH |
| 35 | 1/2" x 7-1/2" Nipple | 1 | CH |
| 36 | 1/2" x 10-1/2" Nipple for 4 Inch Valves | 1 | CH |
| | 1/2" x 12" Nipple for 6 Inch Valves | 1 | CH |
| 37 | 2" x 3" Nipple | 2 | CH |




NOTES:

1. Wet Pilot Actuation Trim is comprised of items 1-37.
2. All Fittings and Nipples are galvanized (Standard Order).
3. CH: Common Hardware.
4. See Figure 11 for Valve Port identification.
5. Route all Tubing to Drip Funnel.

*FIGURE 3*
*4 and 6 INCH (DN100 and DN150) MODEL DV-1 DELUGE VALVES*
*— EXPLODED VIEW OF WET PILOT ACTUATION TRIM (52-470-2-101) —*
*(Refer to Figure 12 to see the factory assembled trim segments, as well as functional callouts of the trim components)*

| Valve Size | Nominal Installation Dimensions in Inches and (mm) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H | J | K | L | M |
| 4 (100) | 12.00 (304,8) | 8.69 (220,7) | 14.25 (362,0) | 13.69 (347,7) | 19.00 (482,6) | 5.44 (138,2) | 6.69 (169,9) | 8.75 (222,3) | 7.75 (196,9) | 6.31 (160,3) | 0.25 (6,4) | 13.25 (336,6) |
| 6 (150) | 12.00 (304,8) | 8.69 (220,7) | 15.12 (384,0) | 14.50 (368,3) | 20.00 (508,0) | 5.50 (139,7) | 7.62 (193,5) | 8.88 (225,6) | 8.56 (217,4) | 6.31 (160,3) | 0.12 (3,0) | 14.25 (362,0) |

* MINIMUM CLEARANCE, ADDITIONAL 2" (500 mm) RECOMMENDED.

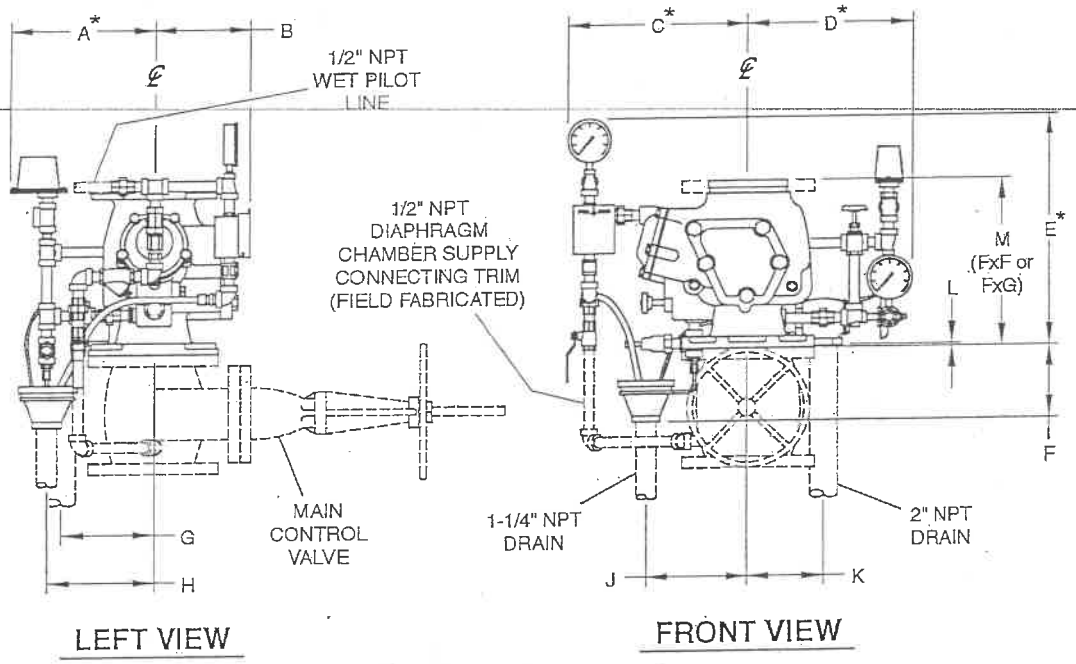



*FIGURE 4*
*4 and 6 INCH (DN100 and DN150) MODEL DV-1 DELUGE VALVE*
*— WET PILOT ACTUATION / NOMINAL INSTALLATION DIMENSIONS —*

# Dry Pilot Actuation

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 (DN15) steel pipe. The pilot line, which is to be pressurized with air or nitrogen, is connected to the "Dry Pilot Detection" connection shown in Figures 7 and 12. Provision must be made for a 5.6 K-factor orifice, Inspector's Test Connection at the most remote location from the DV-1 Valve. Nominal installation dimensions for Dry Pilot Actuation Trim are shown in Figure 7.

The Dry Pilot Actuation Trim is provided with a listed and approved Model DP-1 Dry Pilot Actuator, which is described in Technical Data Sheet TFP1380. The Actuator is rated for use at a maximum pilot service pressure of 50 psi (3,4 bar) and a maximum water supply service pressure of 175 psi (12,1 bar).

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 DV-1 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 5.6 K-factor orifice listed or approved automatic sprinklers. Manual Control Stations are to be the Model MC-1 described in Technical Data Sheet TFP1382.

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.

- Model AMD-1 Air Maintenance Device (pressure reducing type), refer to Technical Data Sheet TFP1221.
- Model AMD-2 Air Maintenance Device (compressor control type), refer to Technical Data Sheet TFP1231.
- Model AMD-3 Nitrogen Maintenance Device (high pressure reducing type), refer to Technical Data Sheet TFP1241.

*NOTES*

*The dew point of the pilot line air pressure must be maintained below the lowest ambient temperature to which the dry pilot actuation system will be exposed. Accumulation of water in the pilot line connection to the Actuator will lower the air pressure at which the Actuator will open and possibly prevent proper operation. Also, introduction of moisture into the pilot lines exposed to freezing temperatures can create an ice buildup which could prevent proper operation of the Actuator.*

*An air dryer must be installed where the moisture content of the air supply is not properly controlled at less than the required value.*

*It is recommended that an AMD-3 Nitrogen Maintenance Device be utilized in dry pilot actuation system applications where the dew point must be maintained below -20°F/-29°C. See Technical Data Sheet TFP1241.*

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

Supervision of the pressure in the dry pilot actuation system and/or alarm which separately indicates operation of the detection system is recommended and may be required by the authority having jurisdiction. A dual setting low pressure alarm switch, such a Potter Electric PS40-2A, is suitable for the service. The recommended pressure settings 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.

The Pressure Relief Valve (Ref. Item D6 - Fig. 6) is factory set to relieve at a pressure of approximately 45 psi (3,1 bar); however, it may be field adjusted to a lower pressure, if required.

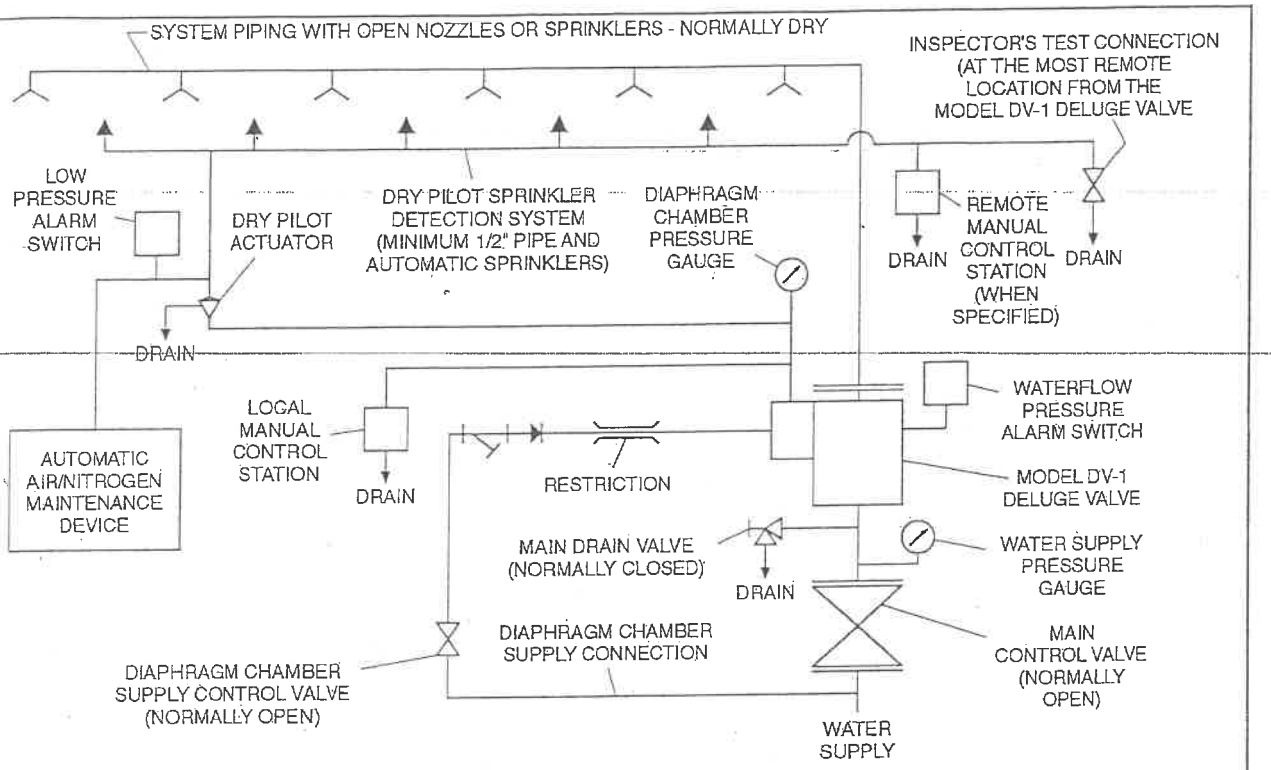
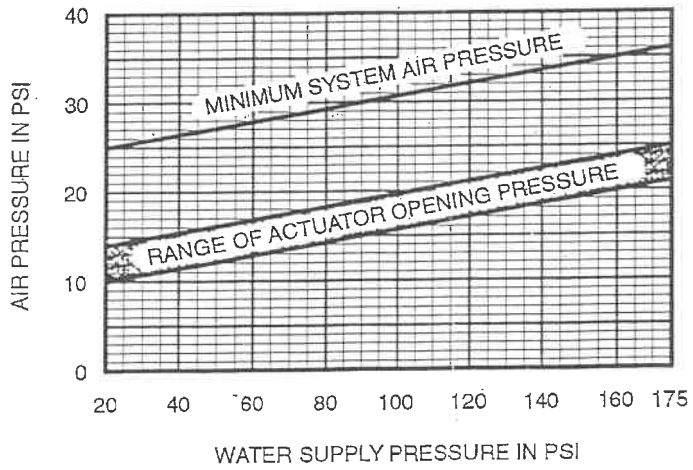



*FIGURE 5*
*SYSTEM SCHEMATIC — DRY PILOT ACTUATION*

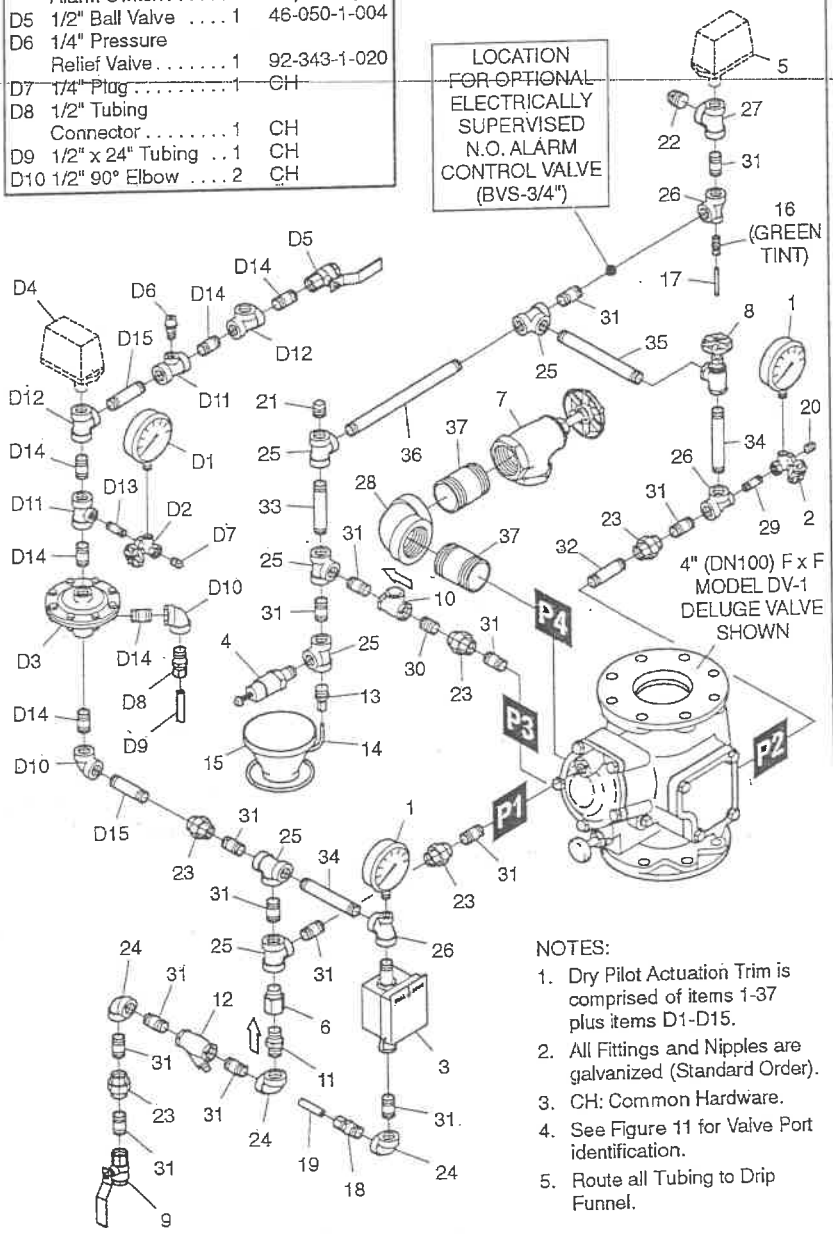



*GRAPH C*
*4 and 6 INCH (DN100 and DN150) MODEL DV-1 DELUGE VALVE*
*— DRY PILOT LINE PRESSURE REQUIREMENTS —*

| DRY PILOT ACTUATION TRIM P/N 52-470-2-102 (See Note 1) NO. | DESCRIPTION | QTY. | P/N |
|---|---|---|---|
| 1 | 300 psi/ 2000 kPa Water Pressure Gauge | 2 | 92-343-1-005 |
| 2 | 1/4" Gauge Test Valve | 1 | 46-005-1-002 |
| 3 | Model MC-1 Manual Control Station (Gav.) | 1 | 52-289-2-001 |
| 4 | Model AD-1 Automatic Drain Valve (Gav.) | 1 | 52-793-2-004 |
| 5 | Waterflow Pressure Alarm Switch | 1 | Order Separately |
| 6 | Priming Supply Restriction | 1 | 92-020-1-009 |
| 7 | 2" Angle Valve | 1 | 46-048-1-009 |
| 8 | 1/2" Angle Valve | 1 | 46-048-1-004 |
| 9 | 1/2" Ball Valve | 1 | 46-050-1-004 |
| 10 | 1/2" Swing Check Valve | 1 | 46-049-1-004 |
| 11 | 1/2" Spring Loaded Check Valve | 1 | 92-322-1-002 |
| 12 | 1/2" Y-Strainer | 1 | 52-353-1-005 |
| 13 | Drip Funnel Connector | 1 | 92-211-1-005 |
| 14 | Drip Funnel Bracket | 1 | 92-211-1-003 |
| 15 | Drip Funnel | 1 | 92-343-1-007 |
| 16 | 3/32" Vent Fitting | 1 | 92-032-1-002 |
| 17 | 1/4" x 36" Tubing | 1 | CH |
| 18 | 1/2" Tubing Connector | 1 | CH |
| 19 | 1/2" x 24" Tubing | 1 | CH |
| 20 | 1/4" Plug | 1 | CH |
| 21 | 1/2" Plug | 1 | CH |
| 22 | 3/4" Plug | 1 | CH |
| 23 | 1/2" Union | 5 | CH |
| 24 | 1/2" 90° Elbow | 3 | CH |
| 25 | 1/2" Tee | 6 | CH |
| 26 | 1/2" x 1/4" x 1/2" Reducing Tee | 3 | CH |
| 27 | 1/2" x 1/2" x 3/4" Reducing Tee | 1 | CH |
| 28 | 2" 90° Elbow | 1 | CH |
| 29 | 1/4" x 1-1/2" Nipple | 1 | CH |
| 30 | 1/2" x Close Nipple | 1 | CH |
| 31 | 1/2" x 1-1/2" Nipple | 15 | CH |
| 32 | 1/2" x 3" Nipple | 1 | CH |
| 33 | 1/2" x 4" Nipple | 1 | CH |
| 34 | 1/2" x 5" Nipple | 2 | CH |
| 35 | 1/2" x 7-1/2" Nipple | 1 | CH |
| 36 | 1/2" x 10-1/2" Nipple for 4 inch Valves; 1/2" x 12" Nipple for 6 Inch Valves | 1 | CH |
| 37 | 2" x 3" Nipple | 2 | CH |

| NO. | DESCRIPTION | QTY. | P/N |
|---|---|---|---|
| D1 | 250 psi/ 1750 kPa Air Pressure Gauge | 1 | 92-343-1-012 |
| D2 | 1/4" Gauge Test Valve | 1 | 46-005-1-002 |
| D3 | Model DP-1 Dry Pilot Actuator | 1 | 52-280-1-001 |
| D4 | Low Air Pressure Alarm Switch | 1 | Order Separately |
| D5 | 1/2" Ball Valve | 1 | 46-050-1-004 |
| D6 | 1/4" Pressure Relief Valve | 1 | 92-343-1-020 |
| D7 | 1/4" Plug | 1 | CH |
| D8 | 1/2" Tubing Connector | 1 | CH |
| D9 | 1/2" x 24" Tubing | 1 | CH |
| D10 | 1/2" 90° Elbow | 2 | CH |

| NO. | DESCRIPTION | QTY. | P/N |
|---|---|---|---|
| D11 | 1/2" x 1/2" x 1/4" Reducing Tee | 2 | CH |
| D12 | 1/2" Tee | 2 | CH |
| D13 | 1/4" x 1-1/2" Nipple | 1 | CH |
| D14 | 1/2" x 1-1/2" Nipple | 6 | CH |
| D15 | 1/2" x 3" Nipple | 2 | CH |




NOTES:

1. Dry Pilot Actuation Trim is comprised of items 1-37 plus items D1-D15.
2. All Fittings and Nipples are galvanized (Standard Order).
3. CH: Common Hardware.
4. See Figure 11 for Valve Port identification.
5. Route all Tubing to Drip Funnel.

*FIGURE 6*
*4 and 6 INCH (DN100 and DN150) MODEL DV-1 DELUGE VALVES*
*— EXPLODED VIEW OF DRY PILOT ACTUATION TRIM (52-470-2-102)—*
*(Refer to Figure 12 to see the factory assembled trim segments, as well as functional callouts of the trim components)*

| Valve Size | Nominal Installation Dimensions in Inches and (mm) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H | J | K | L | M |
| 4 (100) | 12.00 (304,8) | 8.69 (220,7) | 14.56 (369,8) | 13.69 (347,7) | 30.12 (765,0) | 5.44 (138,2) | 6.69 (169,9) | 8.75 (222,3) | 7.75 (196,9) | 6.31 (160,3) | 0.25 (6,4) | 13.25 (336,6) |
| 6 (150) | 12.00 (304,8) | 8.69 (220,7) | 15.44 (392,2) | 14.50 (368,3) | 31.12 (790,4) | 5.50 (139,7) | 7.62 (193,5) | 8.88 (225,6) | 8.56 (217,4) | 6.31 (160,3) | 0.12 (3,0) | 14.25 (362,0) |

* MINIMUM CLEARANCE, ADDITIONAL 2" (500 mm) RECOMMENDED.

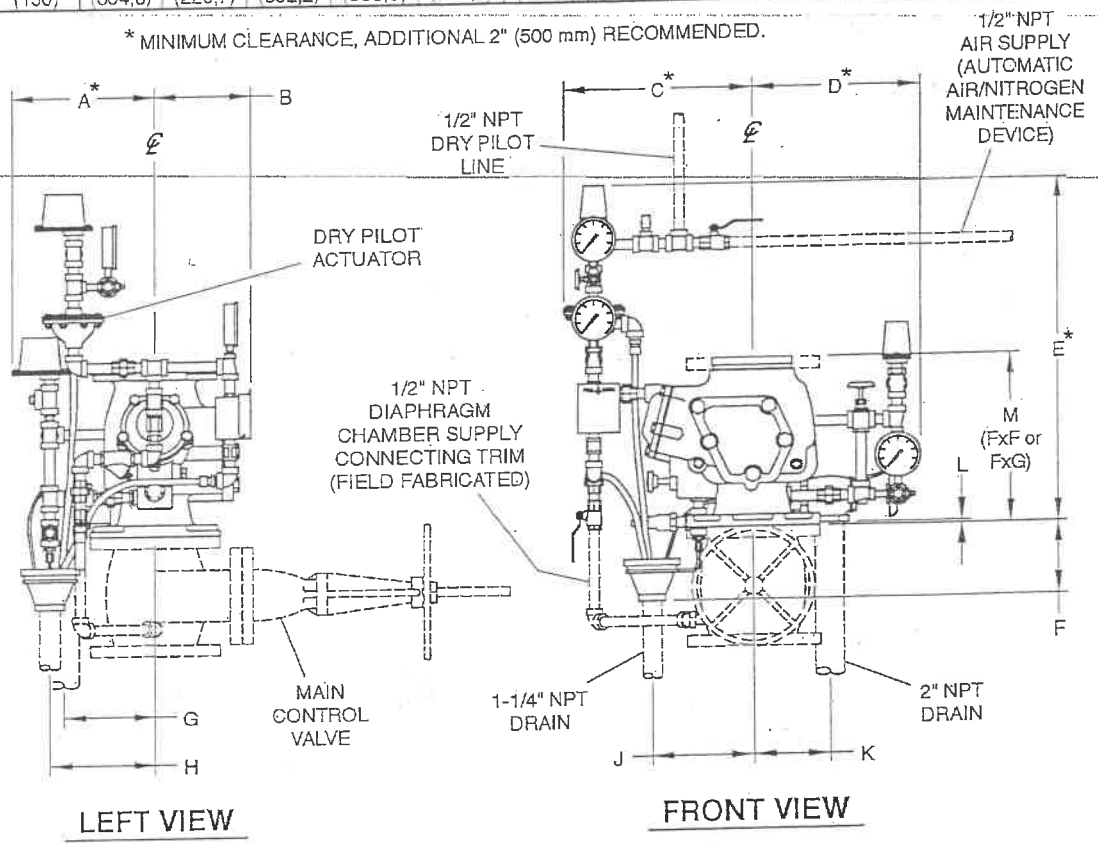



*FIGURE 7*
*4 and 6 INCH (DN100 and DN150) MODEL DV-1 DELUGE VALVE*
*— DRY PILOT ACTUATION / NOMINAL INSTALLATION DIMENSIONS —*

# Electric Actuation

The Electric Actuation Trim is required for electric operation of the DV-1 Valve by a detection system consisting of electrical devices such as heat sensitive thermostats, smoke detectors, and/or electric manual pull stations. Information on the various types of separately ordered Solenoid Valves that may be used with this trim package is given in Technical Data Sheet TFP2180. Nominal installation dimensions for the Electric Actuation Trim are shown in Figure 10.

*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 non-hazardous 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 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 DV-1 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.*

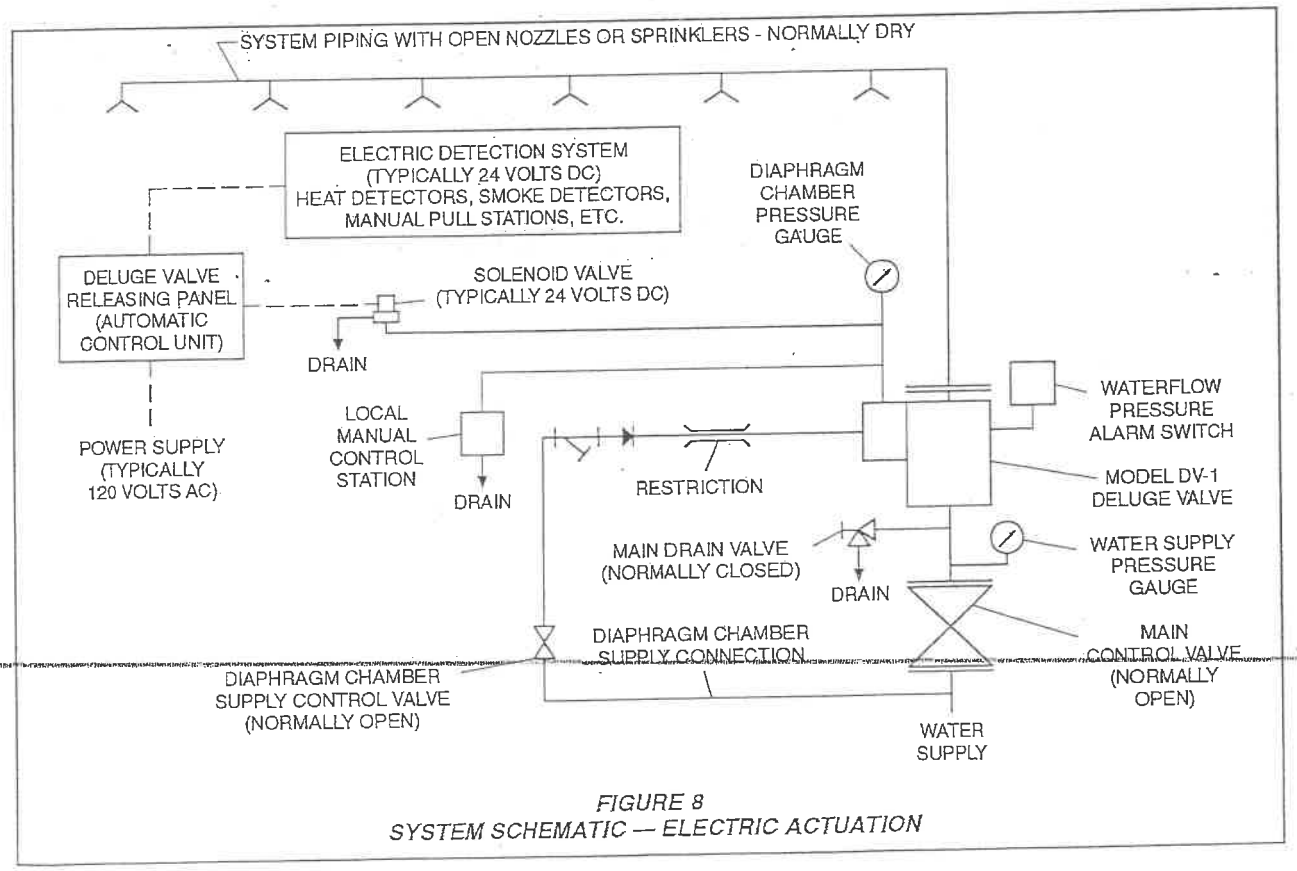



*FIGURE 8*
*SYSTEM SCHEMATIC — ELECTRIC ACTUATION*

| ELECTRIC ACTUATION TRIM P/N 52-470-2-103 (See Note 1) NO. | DESCRIPTION | QTY. | P/N |
|---|---|---|---|
| 1 | 300 psi/ 2000 kPa Water Pressure Gauge | 2 | 92-343-1-005 |
| 2 | 1/4" Gauge Test Valve | 1 | 46-005-1-002 |
| 3 | Model MC-1 Manual Control Station (Gav.) | 1 | 52-289-2-001 |
| 4 | Model AD-1 Automatic Drain Valve (Gav.) | 1 | 52-793-2-004 |
| 5 | Waterflow Pressure Alarm Switch | 1 | Order Separately |
| 6 | Priming Supply Restriction | 1 | 92-020-1-009 |
| 7 | 2" Angle Valve | 1 | 46-048-1-009 |
| 8 | 1/2" Angle Valve | 1 | 46-048-1-004 |
| 9 | 1/2" Ball Valve | 1 | 46-050-1-004 |
| 10 | 1/2" Swing Check Valve | 1 | 46-049-1-004 |
| 11 | 1/2" Spring Loaded Check Valve | 1 | 92-322-1-002 |
| 12 | 1/2" Y-Strainer | 1 | 52-353-1-005 |
| 13 | Drip Funnel Connector | 1 | 92-211-1-005 |
| 14 | Drip Funnel Bracket | 1 | 92-211-1-003 |
| 15 | Drip Funnel | 1 | 92-343-1-007 |
| 16 | 3/32" Vent Fitting | 1 | 92-032-1-002 |
| 17 | 1/4" x 30" Tubing | 1 | CH |
| 18 | 1/2" Tubing Connector | 1 | CH |
| 19 | 1/2" x 24" Tubing | 1 | CH |
| 20 | 1/4" Plug | 1 | CH |
| 21 | 1/2" Plug | 1 | CH |
| 22 | 3/4" Plug | 1 | CH |
| 23 | 1/2" Union | 5 | CH |
| 24 | 1/2" 90° Elbow | 3 | CH |
| 25 | 1/2" Tee | 6 | CH |
| 26 | 1/2" x 1/4" x 1/2" Reducing Tee | 3 | CH |
| 27 | 1/2" x 1/2" x 3/4" Reducing Tee | 1 | CH |
| 28 | 2" 90° Elbow | 1 | CH |
| 29 | 1/4" x 1-1/2" Nipple | 1 | CH |
| 30 | 1/2" x Close Nipple | 1 | CH |
| 31 | 1/2" x 1-1/2" Nipple | 15 | CH |
| 32 | 1/2" x 3" Nipple | 1 | CH |
| 33 | 1/2" x 4" Nipple | 1 | CH |
| 34 | 1/2" x 5" Nipple | 2 | CH |

| NO. | DESCRIPTION | QTY. | P/N |
|---|---|---|---|
| 35 | 1/2" x 7-1/2" Nipple | 1 | CH |
| 36 | 1/2" x 10-1/2" Nipple for 4 Inch Valves | 1 | CH |
| | 1/2" x 12" Nipple for 6 Inch Valves | 1 | CH |
| 37 | 2" x 3" Nipple | 2 | CH |
| E1 | Solenoid Valve Per Data Sheet TFP2180 | 1 | Order Separately |
| E2 | 1/2" 90° Elbow | 1 | CH |
| E3 | 1/2" Tubing Connector | 1 | CH |
| E4 | 1/2" x 24" Tubing | 1 | CH |
| E5 | 1/2" x 1-1/2" Nipple | 2 | CH |

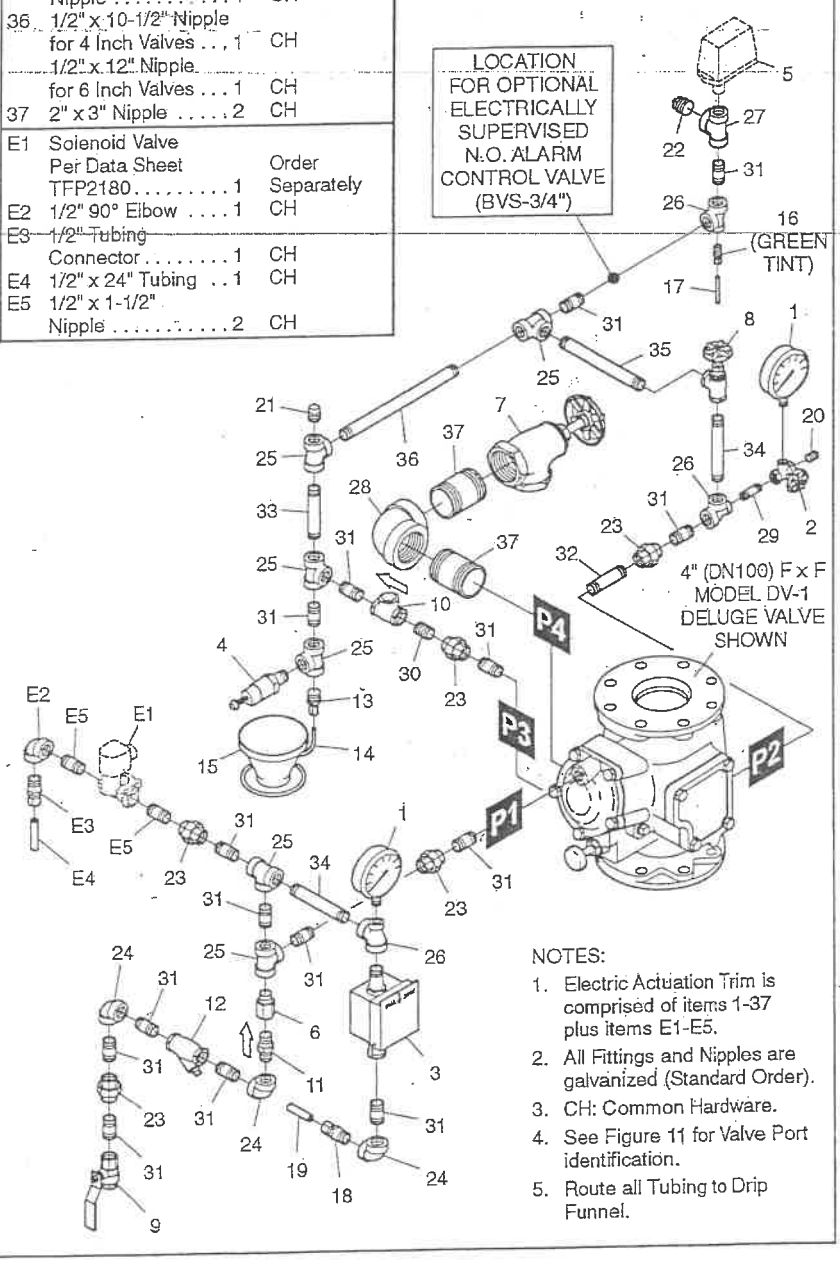



*FIGURE 9*
*4 and 6 INCH (DN100 and DN150) MODEL DV-1 DELUGE VALVES*
*— EXPLODED VIEW OF ELECTRIC ACTUATION TRIM (52-470-2-103)*
*(Refer to Figure 12 to see the factory assembled trim segments, as well as functional callouts of the trim components)*

| Valve Size | Nominal Installation Dimensions in Inches and (mm) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H | J | K | L | M |
| 4 (100) | 12.00 (304,8) | 8.69 (220,7) | 14.25 (362,0) | 13.69 (347,7) | 19.00 (482,6) | 5.44 (138,2) | 6.69 (169,9) | 8.75 (222,3) | 7.75 (196,9) | 6.31 (160,3) | 0.25 (6,4) | 13.25 (336,6) |
| 6 (150) | 12.00 (304,8) | 8.69 (220,7) | 15.12 (384,0) | 14.50 (368,3) | 20.00 (508,0) | 5.50 (139,7) | 7.62 (193,5) | 8.88 (225,6) | 8.56 (217,4) | 6.31 (160,3) | 0.12 (3,0) | 14.25 (362,0) |

* MINIMUM CLEARANCE, ADDITIONAL 2" (500 mm) RECOMMENDED.

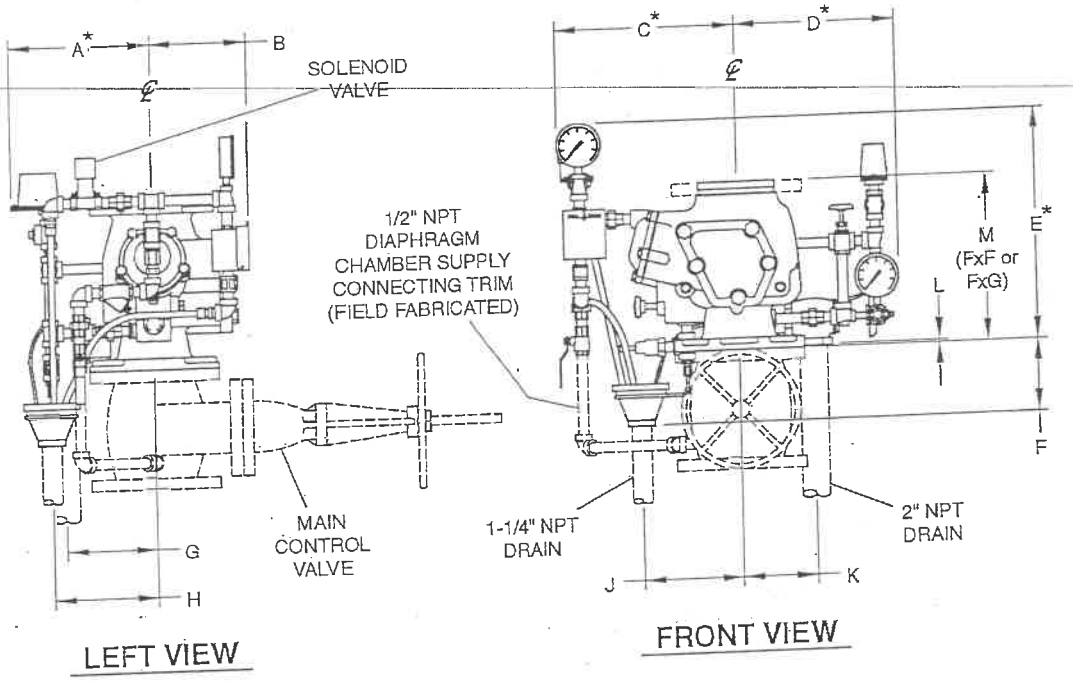



*FIGURE 10*
*4 and 6 INCH (DN100 and DN150) MODEL DV-1 DELUGE VALVE*
*— ELECTRIC ACTUATION / NOMINAL INSTALLATION DIMENSIONS —*

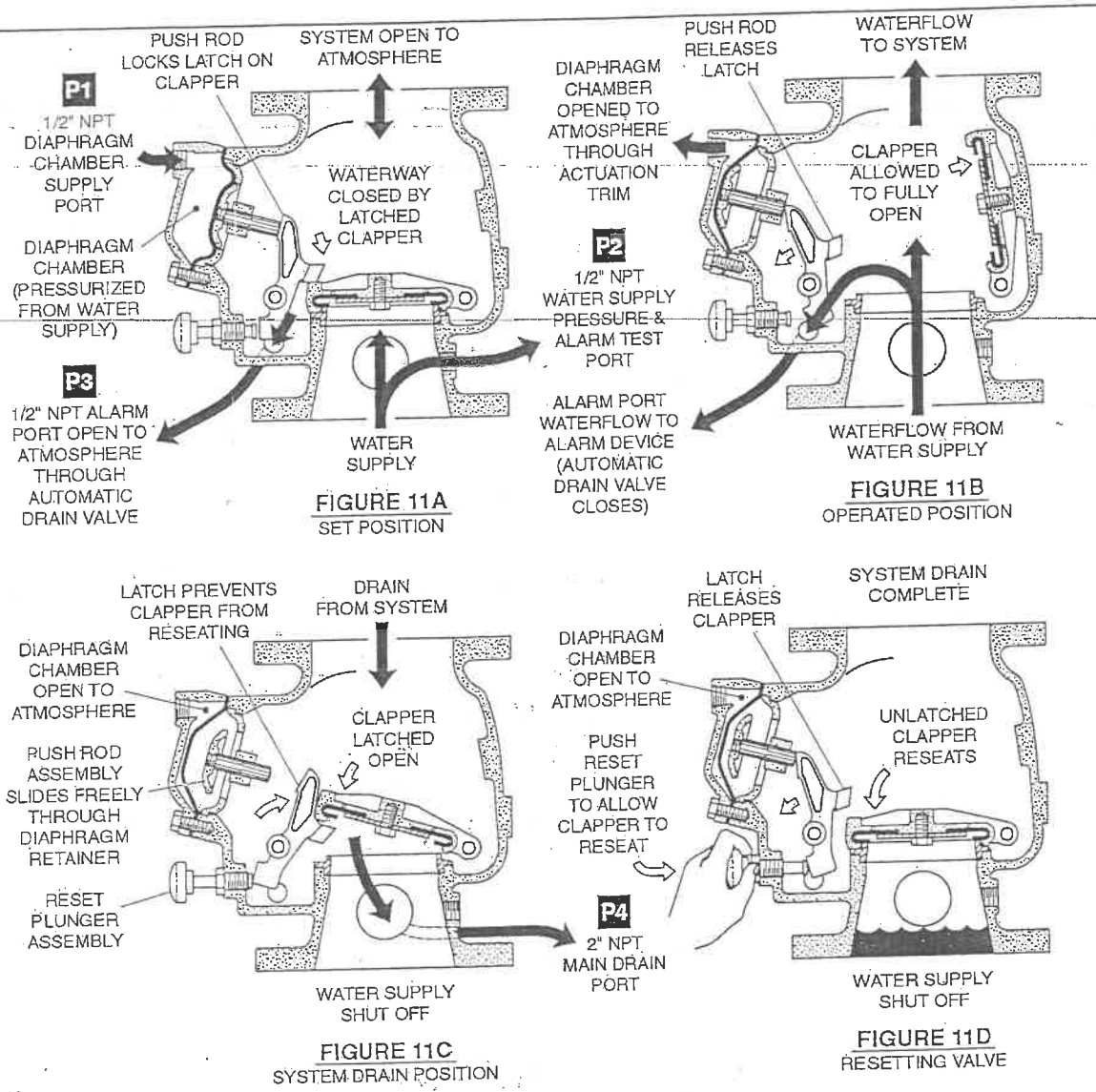



*FIGURE 11*
*4 and 6 INCH (DN100 and DN150) MODEL DV-1 DELUGE VALVE*
*— SET AND OPEN POSITIONS —*

# Operating Principles

The Model DV-1 Deluge Valve is a differential latch type valve which depends upon water pressure in the Diaphragm Chamber (Ref. Figure 11A) to hold the Clapper closed against the water supply pressure. The nominal trip ratio is 2.5 to 1, i.e., the DV-1 Valve operates (opens) when the pressure in the Diaphragm Chamber is reduced to approximately 40 percent of the water supply pressure.

When the DV-1 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 4, 7, and 10). Opening of an actuation device, for example the solenoid valve in the Electric Actuation Trim (Ref. Fig. 10), 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 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 11B).

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 Reset Knob is pushed inward (Ref. Figures 11C and 11D). Pushing the Reset Knob inward will temporarily reposition the Clapper Latch away from the waterway and allows the Clapper to drop into the seated position.

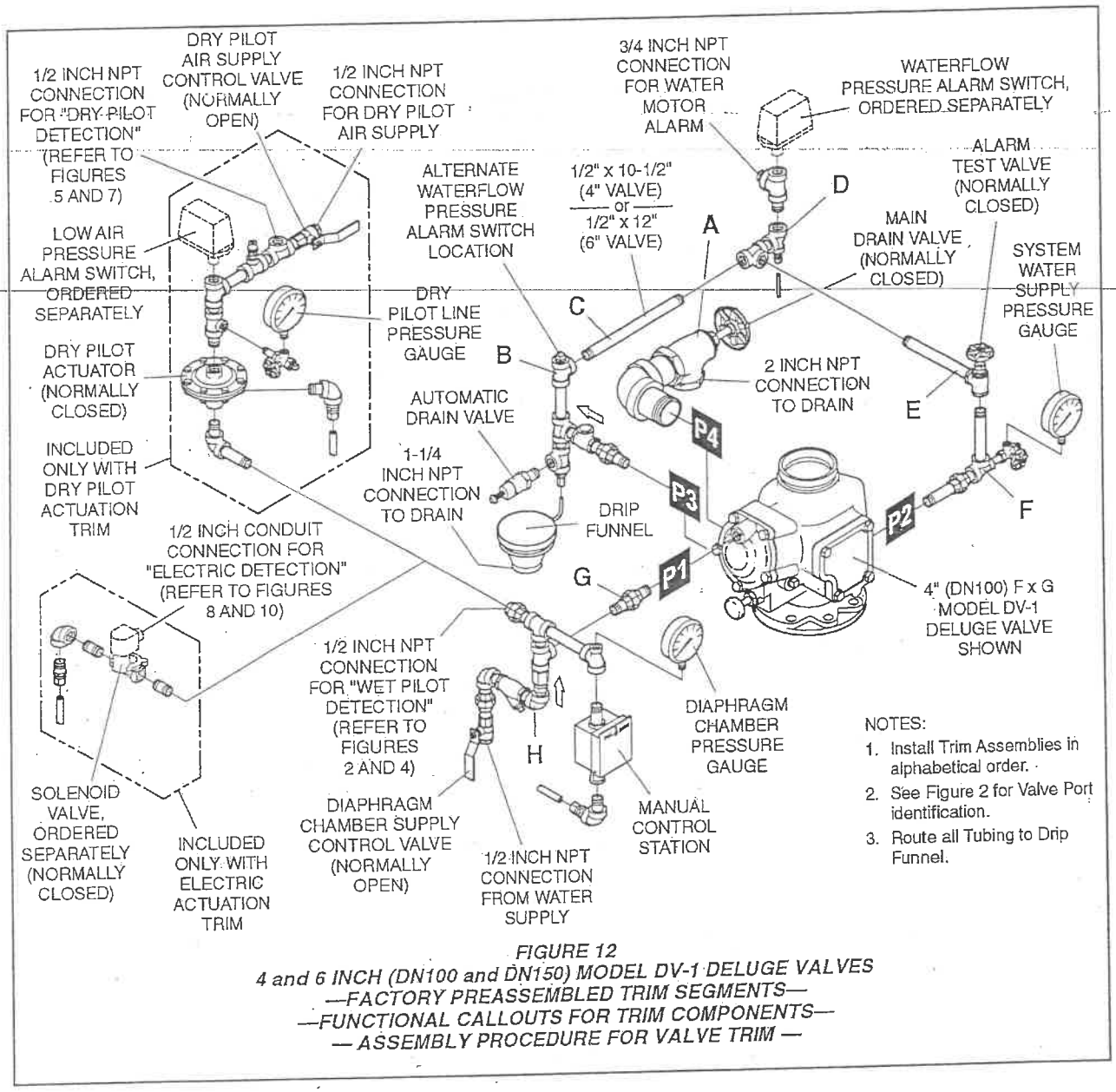



*FIGURE 12*
*4 and 6 INCH (DN100 and DN150) MODEL DV-1 DELUGE VALVES*
*—FACTORY PREASSEMBLED TRIM SEGMENTS—*
*—FUNCTIONAL CALLOUTS FOR TRIM COMPONENTS—*
*— ASSEMBLY PROCEDURE FOR VALVE TRIM —*

# Installation

*NOTES*

*Proper operation of the Model DV-1 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 DV-1 Valve from functioning properly, as well as void listings, approvals, and the manufacturer's warranties.*

*The DV-1 Valve must be installed in a readily visible and accessible location.*

*The DV-1 Valve, associated trim, and wet pilot lines must be maintained at a minimum temperature of 40°F/4°C.*

*Heat tracing of the DV-1 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 DV-1 Deluge Valve is to be installed in accordance with the following criteria:

**Step 1.** 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.*

**Step 2.** The DV-1 Valve must be trimmed in accordance with Figures 3 and 12.

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

**Step 4.** Drain tubing to the drip funnel must be installed with smooth bends that will not restrict flow.

Step 5. The main drain and drip funnel drain may be interconnected provided a check valve is located at least 12 inches (300 mm) below the drip funnel.

Step 6. 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.

Step 7. 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 DV-1 Valve (Ref. Figures 4, 7, and 10).

Step 8. An Inspector's Test Connection, as described in the Technical Data section, must be provided for Wet or Dry Pilot Actuation systems.

Step 9. An Air Maintenance Device, as described in the Technical Data Section, must be provided for Dry Pilot Actuation.

Step 10. A desiccant dryer, when specified for Dry Pilot Actuation, is to be installed between a drip leg and the Air Maintenance Device.

Step 11. 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.

Step 12. Unused pressure alarm switch connections must be plugged.

Step 13. The Pressure Relief Valve provided with the Dry Pilot Actuation Trim is factory set to relieve at a pressure of approximately 45 psi (3,1 bar), which can typically be used for a maximum normal dry pilot actuation system pressure of 40 psi (2,8 bar). The Pressure Relief Valve may be reset; however, it must be be reset to relieve at a pressure which is in accordance with the requirements of the authority having jurisdiction.

To reset the Pressure Relief Valve, first loosen the jam nut and then adjust the cap accordingly — clockwise for a higher pressure setting or counterclockwise for a lower pressure setting. After verifying the desired pressure setting, tighten the jam nut.

Step 14. Conduit and electrical connections are to be made in accordance with the requirements of the authority having jurisdiction and/or the National Electric Code.

Step 15. Before a system hydrostatic test is performed in accordance with NFPA 13 system acceptance test requirements, the Clapper Assembly is to be manually latched open (Ref. Fig. 11D); the Automatic Drain Valve (Item 6, Fig. 3, 6, or 9) is to be temporarily replaced with a 1/2 inch NPT plug, the 3/32 inch Vent Fitting (16 - Fig. 3, 6, or 9) is to be temporarily replaced with a 1/4 inch NPT plug, and the Handhole Cover Bolts are to be tightened using a cross-draw sequence.

# Valve Setting Procedure

Steps 1 through 11 are to be performed when initially setting the Model DV-1 Deluge Valve; after an operational test of the fire protection system; or, after system operation due to a fire.

Step 1. Close the Diaphragm Chamber Supply Control Valve.

Step 2. Close the Main Control Valve, and if the system is equipped with Dry Pilot Actuation, close the Air Supply Control Valve (Ref. Fig. 12).

Step 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.

Step 4. Depress the plunger of the Automatic Drain Valve to verify that it is open and that the DV-1 Valve is completely drained.

Step 5. Push the Reset Knob inward 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 11C. 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 pushing of the Reset Knob 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 Knob can not be depressed sufficiently to allow the Clapper to reseat, operate (open) the Manual Control Station and then once again push the Reset Knob with sufficient force to push the water out of the Diaphragm Chamber through the Manual Control Station drain.*

Step 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.

Step 7. 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 that were possibly exposed to a temperature greater than their maximum rated ambient must be replaced.*

Step 8. Open the Diaphragm Chamber Supply Control Valve and allow time for full pressure to build up in the Diaphragm Chamber.

Step 9. 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.

Step 10. Inspect drain connections from the Manual Control Station, Sole-

noid Valve, Dry Pilot Actuator, and Alarm Devices, as applicable. Any leaks must be corrected before proceeding to the next step.

**Step 11.** 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 DV-1 Valve is ready to be placed in service and the Main Control Valve 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.*

# Care and Maintenance

The following procedures and inspections should be performed as indicated, in addition to any specific requirements of the NFPA, and any impairment must be immediately corrected.

The owner is responsible for the inspection, testing, and maintenance of their fire protection system and devices in compliance with this document, as well as with the applicable standards of the National Fire Protection Association (e.g., NFPA 25), in addition to the standards of any authority having jurisdiction. The installing contractor or product manufacturer should be contacted relative to any questions.

It is recommended that automatic sprinkler systems be inspected, tested, and maintained by a qualified inspection Service.

*NOTES*

*Some of the procedures outlined in this section 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 that it controls, permission to shut down the affected fire protection systems must first be obtained from the proper authorities and all personnel who may be affected by this action must be notified.*

**Drop In Water Supply Pressure Below Normal Range**

*NOTE*

*If the water supply pressure is significantly reduced below the normally expected static pressure range (as could occur in the case of a water main break or repair), and there is a subsequent drop in the diaphragm chamber water pressure below its normal range (due, for example, to a leak in a piping connection to or from the diaphragm chamber or, a leak in the diaphragm chamber check valve caused by dirt or debris in the check valve seal area), a deluge valve such as the Model DV-1 could inadvertently trip, if its water supply pressure is quickly restored.*

A drop in the water supply pressure to below its normal range (as in the case of an interrupted water supply condition) constitutes an emergency impairment as defined by NFPA 25. Should this condition occur, **immediately close the main control valve** and utilize the following procedure to reset the system:

**Step 1.** Prior to the water supply pressure being restored to the closed main control valve, note the pressure indicated by the diaphragm chamber pressure gauge and, whether the pressure is within the normally expected range.

**Step 2.** If the diaphragm chamber pressure is below the normal range, check for and correct any source of leakage from the diaphragm chamber, prior to resetting the system.

**Step 3.** After the water supply pressure is restored to the main control valve, reset the Model DV-1 Deluge Valve in accordance with the Valve Setting Procedure section.

*NOTE*

*For fire protection systems subject to an emergency impairment caused by an interrupted water supply condition, it is recommended that consideration be given to installing a low water supply pressure switch, with the appropriate alarm/indications, to monitor the water supply pressure*

**Annual Operation Test Procedure**

Proper operation of the DV-1 Valve (i.e., opening of the DV-1 Valve as during a fire condition) should be verified at least once a year as follows:

**Step 1.** If water must be prevented from flowing beyond the riser, perform the following steps.

- Close the Main Control Valve.
- Open the Main Drain Valve.
- Open the Main Control Valve one turn beyond the position at which water just begins to flow from the Main Drain Valve.
- Close the Main Drain Valve.

**Step 2.** Determine the type of actuation/detection system, and operate the DV-1 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.

**Step 3.** Verify that the DV-1 Valve has tripped, as indicated by the flow of water into the system.

**Step 4.** Close the Diaphragm Chamber Supply Control Valve.

**Step 5.** Close the system's Main Control Valve.

**Step 6.** Reset the DV-1 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 DV-1 Valve being reset, the internal parts of the DV-1 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 DV-1 Valve must be reassembled in accordance with Figure 1. 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:

Step 1. Close the Main Control Valve.

Step 2. Open the Main Drain Valve.

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

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

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

Step 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.

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 DV-1 Valve is ready to be placed in service and the Main Control Valve 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 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:

Step 1. Close the Main Control Valve.

Step 2. Open the Main Drain Valve.

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

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

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

Step 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.

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 DV-1 Valve is ready to be placed in service and the Main Control Valve must then be fully opened.

**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.

Step 1. Close the Diaphragm Chamber Supply Control Valve.

Step 2. Close the Main Control Valve.

Step 3. Open the Main Drain Valve.

Step 4. Drain the dry pilot line condensate as follows.

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

Step 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.

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

Step 7. Open the Diaphragm Chamber Supply Control Valve.

Step 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 the Main Control Valve.

# Limited Warranty

Products manufactured by Tyco Fire Products are warranted solely to the original Buyer for ten (10) years against defects in material and workmanship when paid for and properly installed and maintained under normal use and service. This warranty will expire ten (10) years from date of shipment by Tyco Fire Products. No warranty is given for products or components manufactured by companies not affiliated by ownership with Tyco Fire Products or for products and components which have been subject to misuse, improper installation, corrosion, or which have not been installed, maintained, modified or repaired in accordance with applicable Standards of the National Fire Protection Association, and/or the standards of any other Authorities Having Jurisdiction. Materials found by Tyco Fire Products to be defective shall be either repaired or replaced, at Tyco Fire Products' sole option. Tyco Fire Products neither assumes, nor authorizes any person to assume for it, any other obligation in connection with the sale of products or parts of products. Tyco Fire Products shall not be responsible for sprinkler system design errors or inaccurate or incomplete information supplied by Buyer or Buyer's representatives.

IN NO EVENT SHALL TYCO FIRE PRODUCTS BE LIABLE, IN CONTRACT, TORT, STRICT LIABILITY OR UNDER ANY OTHER LEGAL THEORY, FOR INCIDENTAL, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES, INCLUDING BUT NOT LIMITED TO LABOR CHARGES, REGARDLESS OF WHETHER TYCO FIRE PRODUCTS WAS INFORMED ABOUT THE POSSIBILITY OF SUCH DAMAGES, AND IN NO EVENT SHALL TYCO FIRE PRODUCTS' LIABILITY EXCEED AN AMOUNT EQUAL TO THE SALES PRICE.

*THE FOREGOING WARRANTY IS MADE IN LIEU OF ANY AND ALL OTHER WARRANTIES EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.*

# Ordering Procedure

*NOTE*

*Refer to Table A for Flange Drilling Specifications.*

### Standard DV-1 Deluge Valve (American Standard Flange Drilling, Threaded Ports, and Groove Outside Diameter, as applicable):

Specify: (specify 4 inch or 6 inch) Model DV-1 Deluge Valve with (specify inlet x outlet) connections, P/N (specify).

| | |
|---|---|
| 4 Inch ANSI Flange x ANSI Flange | P/N 52-470-1-013 |
| 4 Inch ANSI Flange x 4.50"(114,3 mm) Outside Dia. Groove | P/N 52-470-4-613 |
| 6 Inch ANSI Flange x ANSI Flange | P/N 52-470-1-015 |
| 6 Inch ANSI Flange x 6.62"(168,3 mm) Outside Dia.Groove | P/N 52-470-4-615 |

### Standard Galvanized DV-1 Valve Trim (Ref. Figures 3, 6, 9, and 12):

Specify: Semi-Preassembled Galvanized (specify type) Trim for Model DV-1 Deluge Valve, P/N (specify).

| | |
|---|---|
| Wet Pilot Actuation | P/N 52-470-2-101 |
| Dry Pilot Actuation | P/N 52-470-2-102 |
| Electric* Actuation | P/N 52-470-2-103 |

*Solenoid Valve Ordered Separately

### Accessories:

Refer to the Technical Data Sheets for the following, as applicable, for details and additional accessories:

| | |
|---|---|
| Solenoid Valve for Electric Actuation | See TFP2180 |
| Model PS10-2A Potter Electric Waterflow Pressure Alarm Switch | P/N 2571 |
| Model PS40-2A Potter Electric Dry Pilot Low Air Pressure Alarm Switch | P/N 2573 |
| Model WMA-1 Water Motor Alarm | P/N 52-630-1-001 |
| Model AMD-1 Air Maintenance Device | P/N 52-324-2-002 |
| Model AMD-2 Air Maintenance Device | P/N 52-326-2-001 |
| Model AMD-3 Nitrogen Maintenance Device | P/N 52-328-2-001 |
| Model MC-1 (Gav.) Manual Control Stations for remote wet or dry pilot actuation | P/N 52-289-2-001 |

### Replacement Valve Parts:

Specify: (description) for use with (specify) size Model DV-1 Deluge Valve, P/N (see Figure 1).

### Replacement Trim Parts :

Specify: (description) for use with (Model DV-1 Deluge Valve, P/N (see Figure 3).

### Weights:

The following are the nominal weights for the valves and trim:

| | |
|---|---|
| 4 Inch (DN100) F x G Deluge Valve | 67 lbs. (31 kg) |
| 4 Inch (DN100) F x F Deluge Valve | 77 lbs. (35 kg) |
| 6 Inch (DN150) F x G Deluge Valve | 101 lbs. (45 kg) |
| 6 Inch (DN150) F x F Deluge Valve | 111 lbs. (49 kg) |
| Wet Pilot Actuation Trim | 28 lbs. (13 kg) |
| Dry Pilot Actuation Trim | 41 lbs. (18 kg) |
| Electric Actuation Trim | 33 lbs. (15 kg) |

### Other DV-1 Deluge Valve:

*NOTES*

*Other DV-1 Deluge Valves are valves ordered with a any combination of flange, threaded ports, or groove outside diameter not offered under "Standard DV-1 Deluge Valve" offerings.*

*Valves with NPT threaded ports are intended for use with the "Standard Galvanized DV-1 Valve Trim" offered and detailed in this document. Valves with ISO threaded ports are intended for use with special order trim that is provided by local distributors to meet the specific needs of certain localities. Please contact your local ditributor regarding valves and valve trim for specific localities.*

Specify: (specify size) Model DV-1 Deluge Valve with (specify inlet x outlet) connections with (specify NPT or ISO) threaded ports, P/N (specify).

### Part Numbers For Other Model DV-1 Deluge Valves:

**Other 4 Inch Valves with NPT Ports**

| | |
|---|---|
| ISO Flange x ISO Flange | P/N 52-470-5-113 |
| AS Flange x AS Flange | P/N 52-470-4-313 |
| JIS Flange x JIS Flange | P/N 52-470-4-713 |
| ISO Flange x 4.50"(114,3 mm) Outside Dia. Groove | P/N 52-470-5-213 |
| AS Flange x 4.50"(114,3 mm) Outside Dia. Groove | P/N 52-470-4-413 |
| JIS Flange x 4.50"(114,3 mm) Outside Dia. Groove | P/N 52-470-4-813 |

**Other 4 Inch Valves with ISO Ports**

| | |
|---|---|
| ISO Flange x ISO Flange | P/N 52-470-4-113 |
| ISO Flange x 4.50"(114,3 mm) Outside Dia. Groove | P/N 52-470-4-213 |

**Other 6 Inch Valves with NPT Ports**

| | |
|---|---|
| ISO Flange x ISO Flange | P/N 52-470-5-115 |
| AS Flange x AS Flange | P/N 52-470-4-315 |
| JIS Flange x JIS Flange | P/N 52-470-4-715 |
| ISO Flange x 6.62"(168,3 mm) Outside Dia. Groove | P/N 52-470-5-625 |
| AS Flange x 6.62"(168,3 mm) Outside Dia. Groove | P/N 52-470-4-415 |
| JIS Flange x 6.62"(168,3 mm) Outside Dia. Groove | P/N 52-470-4-815 |
| ANSI Flange x 6.50"(165,1 mm) Outside Dia. Groove | P/N 52-470-4-225 |
| ISO Flange x 6.50"(165,1 mm) Outside Dia. Groove | P/N 52-470-5-215 |
| AS Flange x 6.50"(165,1 mm) Outside Dia. Groove | P/N 52-470-5-415 |
| JIS Flange x 6.50"(165,1 mm) Outside Dia. Groove | P/N 52-470-5-815 |

**Other 6 Inch Valves with ISO Ports**

| | |
|---|---|
| ISO Flange x ISO Flange | P/N 52-470-4-115 |
| ISO Flange x 6.62"(168,3 mm) Outside Dia. Groove | P/N 52-470-4-625 |
| ISO Flange x 6.50"(165,1 mm) Outside Dia. Groove | P/N 52-470-4-215 |