Preaction System with DV-5 Deluge Valve
Single Interlock, Supervised — Wet Pilot Actuation
1-1/2 thru 8 Inch (DN40 thru DN200)

General Description

The DV-5 Supervised Single Interlock Preaction System with Wet Pilot Actuation (Refer to Figure 1) utilizes automatic sprinklers and a supplemental detection system. The supplemental detection system is comprised of wet pilot lines and pilot sprinklers. Activation of the detection system automatically operates (releases) the DV-5 Deluge Valve, allowing water to flow into the sprinkler piping system and to be discharged from any sprinklers that may be open.

In accordance with the requirements of the National Fire Protection Association, a preaction system employing more than 20 automatic sprinklers is to have the sprinkler piping automatically supervised to monitor the overall integrity of the system. In the case of a Supervised Single Interlock Preaction System, a Riser Check Valve (that does not require the use of priming water) provides an air check so that the system can be automatically pressurized with a nominal supervisory air or nitrogen pressure of 10 psi (0.69 bar). A supervisory low pressure alarm switch that is set to transfer its contacts at nominally 5 psi (0.34 bar), on decreasing pressure, is utilized to indicate whether there are any abnormal leaks in the sprinkler system piping. Loss of air pressure from the system as a result of a damaged sprinkler or broken piping will not cause the DV-5 Valve to open — the air pressure is for supervisory alarm only.

Typically, the system designer selects the detection components for a single interlock preaction system that will respond to a fire sooner than the automatic sprinklers. Consequently, the system will experience a minimal delay in water delivery over that for a wet pipe sprinkler system because the system will have essentially filled with water before a sprinkler operates. In the case of wet pilot actuation, the system designer selects wet pilot sprinklers that will operate sooner than the automatic sprinklers chosen for use on the sprinkler piping.

Supervised single interlock preaction systems are generally used to protect areas where there is danger of serious water damage that might result from damaged automatic sprinklers or piping. Typically, such areas include computer rooms, storage areas for valuable artifacts, libraries, and archives.

Single interlock preaction systems are also effectively used to protect properties where a pre-alarm of a possible fire condition may allow time for fire extinguishment by alternate suppression means, prior to a sprinkler discharge. In the event the fire cannot otherwise be extinguished, the preaction sprinkler system will then perform as the primary fire protection system.

The DV-5 Deluge Valve (described in Technical Data Sheet TFP1305) is a diaphragm style valve that depends upon water pressure in the Diaphragm Chamber to hold the Diaphragm closed against the water supply pressure. When the DV-5 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, such as an O.S.&Y. gate valve or butterfly valve (Fig. 1).

Opening of a pilot sprinkler, releases water from the Diaphragm Chamber faster than it can be replenished through the 1/8 inch (3.2 mm) restriction provided by the Model ASV-1 Automatic Shut-Off Valve in the diaphragm supply connection (Item 5 - Fig. 3A, also described in Technical Data Sheet TFP1384). This results in a rapid pressure drop in the Diaphragm Chamber to below the valve trip point. The water supply pressure then forces the Diaphragm open, permitting water to flow into the system piping, as well as through the Alarm Port to actuate the system alarms.

As water flows into the system, the pilot chamber of the Model ASV-1 Automatic Shut-Off Valve (Item 5 - Fig. 3A) becomes pressurized and the ASV-1 automatically shuts off the diaphragm chamber supply flow to the DV-5 Diaphragm Chamber. Shutting off the diaphragm chamber supply flow prevents the DV-5 Diaphragm Chamber from becoming re-pressurized, thereby preventing inadvertent closing of the DV-5 during a fire (as may be the case if an actuation device other than a pilot sprinkler were to be closed after its initial operation, for example a remote manual control station).

Continued on Page 4
FIGURE 1 (1 OF 2)
SUPERVISED SINGLE INTERLOCK PREACTION SYSTEM WITH WET PILOT ACTUATION
SYSTEM SCHEMATIC (FRONT VIEW)
1 - DV-5 Deluge Valve
2 - Main Control Valve (N.O.)
3 - Diaphragm Chamber Supply
   Control Valve (N.O.)
4 - Local Manual Control Station
   (Shown at Front of Valve)
5 - Automatic Sprinklers
6 - Wet Pilot Line Sprinklers
   (Fire Detection)
7 - Water Supply Pressure Gauge
   (Shown at Front of Valve)
8 - Diaphragm Chamber Pressure
   Gauge (Shown at Front of Valve)
9 - System Drain Valve (N.C.)
10 - Main Drain Valve (N.C.)
11 - Diaphragm Chamber Automatic Shut-Off
    Valve (Shown at Front of Valve)
12 - Waterflow Pressure Alarm Switch
13 - Water Motor Alarm (Optional)
14 - Riser Check Valve
15 - Supervisory Air Pressure Gauge
    (Shown at Front of Valve)
16 - Automatic Supervisory Air/Nitrogen
    Supply
17 - Supervisory Low Pressure Alarm
    Switch

FIGURE 1 (2 OF 2)
SUPERVISED SINGLE INTERLOCK PREACTION SYSTEM WITH WET PILOT ACTUATION
SYSTEM SCHEMATIC (REAR VIEW)
The DV-5 Supervised Single Interlock Preaction System with Wet Pilot Actuation Trim 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 performance of the related devices.

The owner is responsible for maintaining their fire protection system and devices in proper operating condition. Contact the installing contractor or product manufacturer with any questions.

**Technical Data**

**Approvals**
UL and C-UL Listed

**Deluge Valve**
DV-5

**Riser Check Valve**
Model CV-1FR

**NOTE:** 1-1/2 inch (DN40) risers utilize a 2 inch (DN50) Model CV-1FR Riser Check Valve connected to the 1-1/2 inch (DN40) DV-5 Deluge Valve by a 2 x 1-1/2 inch Figure 716 Reducing Coupling.

**Valve Trim**
The Supervised Single Interlock Preaction System with Wet Pilot Actuation Trim (Fig. 3A or 3B) forms a part of the laboratory listings and approvals. The trim is necessary for proper operation of the DV-5 Valve.

Each package of trim includes the following items:
- Water Supply Pressure Gauge
- Diaphragm Chamber Pressure Gauge
- Diaphragm Chamber Connections
- Manual Control Station
- Main Drain Valve
- System Drain Valve
- Alarm Test Valve
- Automatic Drain Valve
- System Air Pressure Gauge
- Air Supply Connections
- Low Air Pressure Supervisory Switch
- Waterflow Pressure Alarm Switch (PS10-2)

The following items are included in the Pre-trimmed Valve Assembly and can be ordered separately for the valve trim:
- Model BFV-N Butterfly Valve
- Figure 577 Grooved Coupling

To ease field assembly of the trim arrangement, the trim components are provided partially assembled as shown in Figure 3B.

The trim arrangement is provided with galvanized or black nipples and fittings. The galvanized trim is intended for non-corrosive or corrosive conditions, whereas the black trim is principally intended for use with AFFF systems.

**NOTE:** When the system pressure is greater than 175 psi (12.1 bar), provision is to be made to replace the standard order 300 psi (20.7 bar) Water Pressure Gauges, shown in Figure 3A or 3B with separately ordered 600 psi (41.4 bar) Water Pressure Gauges.

**Detection System**
In order for a single interlock preaction system to be hydraulically calculated as a wet pipe system, as opposed to a dry pipe sprinkler system, the detection system must be designed to operate sooner than the automatic sprinklers on the sprinkler piping. In the case of wet pilot actuation, the system designer selects pilot sprinklers that will operate sooner than the automatic sprinklers chosen for use on the sprinkler piping.

The Supervised Single Interlock Preaction System with Wet Pilot Actuation Trim provides for connection of a detection system consisting of Wet Pilot Line 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 Figure 3B. Nominal installation dimensions for the Supervised Single Interlock Preaction System with 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 TFP1382.

The maximum height of a wet pilot line above the DV-5 Valve must not exceed the limitations shown in Table A as a function of the minimum water supply pressure to the DV-5 Valve for an equivalent length (pipe plus fittings) of the pilot line up to 500 feet 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 line sprinkler or manual control station).
NOTES:
1. Supervised Single Interlock Preaction Trim with Wet Pilot Actuation Trim is comprised of Items 1-42 plus Items P1-P19. Items A1-A4 included only in pre-trimmed valve assemblies as applicable; otherwise ordered separately.
2. All Fittings and Nipples are galvanized (Standard Order).
3. CH: Common Hardware.

FIGURE 3A (1 OF 3)
1-1/2 AND 2 INCH (DN40 AND DN50) DV-5 SUPERVISED SINGLE INTERLOCK PREACTION SYSTEM WITH WET PILOT ACTUATION TRIM EXPLODED VIEW
NOTES:

1. Supervised Single Interlock Preation Trim with Wet Pilot Actuation Trim is comprised of Items 1-44 plus Items P1-P18. Items A1-A3 included only in pre-trimmed valve assemblies as applicable; otherwise ordered separately.
2. All Fittings and Nipples are galvanized (Standard Order).
3. CH: Common Hardware.
4. See Figure 2 of TFP1305 for Deluge Valve Port identification.
5. Route all Tubing to Drip Funnel, Item 14.

FIGURE 3A (2 OF 3)
3 INCH (DN80) DV-5 SUPERVISED SINGLE INTERLOCK
PREACTION SYSTEM WITH WET PILOT ACTUATION TRIM EXPLODED VIEW
NOTES:
1. Supervised Single Interlock Preademption Trim with Wet Pilot Actuation Trim is comprised of Items 1-49 plus Items P1-P17. Items A1-A3 included only in pre-trimmed valve assemblies as applicable; otherwise ordered separately.
2. All Fittings and Nipples are galvanized (Standard Order).
3. CH: Common Hardware.

FIGURE 3A (3 OF 3)
4, 6, AND 8 INCH (DN100, DN150 AND DN200) DV-5 SUPERVISED SINGLE INTERLOCK PREACTION SYSTEM WITH WET PILOT ACTUATION TRIM EXPLODED VIEW
NOTES:
1. Use only 2" (DN50) Model CV-1FR Riser Check Valve in 1-1/2" (DN40) and 2" (DN50) assemblies. Use CV-1FR Valve size equal to mating DV-5 valve in larger assemblies.
2. Nipples 1-4 vary in length relative to DV-5 size. Select per table. All other nipples packed unassembled shall be installed per appropriate trim exploded view, Figure 3A Part 1, 2, or 3.
3. Install subassemblies in alphabetical order.
4. See Figure 2 of TFP1305 for Deluge Valve Port identification.
5. Route all Tubing to Drip Funnel.

<table>
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<tr>
<th>Nipple Number</th>
<th>Select Appropriate Nipple Sizes per DV-5 Deluge Valve Size</th>
</tr>
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<tr>
<td>1-1/2&quot; (DN40)</td>
<td>2&quot; (DN50) 3&quot; (DN80) 4&quot; (DN100) 6&quot; (DN150) 8&quot; (DN200)</td>
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<td>1 1/2&quot; x Close</td>
<td>1/2&quot; x 1/2&quot; 1/2&quot; x 1-1/2&quot; 1/2&quot; x 2-1/2&quot; 1&quot; x 5-1/2&quot; 1/2&quot; x 8-1/2&quot;</td>
</tr>
<tr>
<td>1 1/2&quot; x Close</td>
<td>1&quot; x 1/2&quot; 1/2&quot; x 1-1/2&quot; 1/2&quot; x 2&quot; 1/2&quot; x 3&quot; 1/2&quot; x 3-1/2&quot;</td>
</tr>
<tr>
<td>3 1/2&quot; x 5&quot;</td>
<td>1/2&quot; x 5-1/2&quot; 1/2&quot; x 6-1/2&quot; 1&quot; x 7-1/2&quot; 1/2&quot; x 9&quot;</td>
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<tr>
<td>3 3/4&quot; x 1-1/2&quot;</td>
<td>3/4&quot; x 3-1/2&quot; 3/4&quot; x 4-1/2&quot;</td>
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System Main Drain Size

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<tr>
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<th>3/4&quot; NPT 1-1/4&quot; NPT 2&quot; NPT 2&quot; NPT 2&quot; NPT</th>
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Main Drain Size

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<td>3/4&quot; NPT 1-1/4&quot; NPT 2&quot; NPT 2&quot; NPT 2&quot; NPT</td>
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</tbody>
</table>

FIGURE 3B
1-1/2 THRU 8 INCH (DN40 THRU DN200) DV-5 SUPERVISED SINGLE INTERLOCK PEACTION WITH WET PILOT ACTUATION TRIM OPERATIONAL COMPONENTS SEMI-PREASSEMBLED TRIM EXPLODED ARRANGEMENT
### Nominal Installation Dimensions in Inches and (mm)

<table>
<thead>
<tr>
<th>Valve Size</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>J</th>
<th>K</th>
<th>L</th>
<th>M</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-1/2&quot; (DN40)</td>
<td>7.00 (177.8)</td>
<td>8.88 (225.4)</td>
<td>13.00 (330.2)</td>
<td>10.50 (266.7)</td>
<td>20.50 (520.7)</td>
<td>4.00 (101.6)</td>
<td>5.81 (147.6)</td>
<td>5.81 (147.6)</td>
<td>3.00 (76.2)</td>
<td>7.00 (177.8)</td>
<td>4.00 (101.6)</td>
<td>14.81 (376.2)</td>
<td>4.02 (102.1)</td>
</tr>
<tr>
<td>2&quot; (DN50)</td>
<td>7.13 (181.0)</td>
<td>9.13 (231.8)</td>
<td>13.00 (330.2)</td>
<td>10.50 (266.7)</td>
<td>21.06 (535.0)</td>
<td>3.13 (79.4)</td>
<td>6.00 (152.4)</td>
<td>6.00 (152.4)</td>
<td>3.00 (76.2)</td>
<td>7.00 (177.8)</td>
<td>3.13 (79.4)</td>
<td>15.38 (390.5)</td>
<td>4.09 (103.9)</td>
</tr>
<tr>
<td>3&quot; (DN80)</td>
<td>7.81 (198.4)</td>
<td>10.44 (265.1)</td>
<td>14.50 (368.3)</td>
<td>10.50 (266.7)</td>
<td>25.00 (635.0)</td>
<td>1.69 (42.9)</td>
<td>6.69 (170.0)</td>
<td>6.69 (170.0)</td>
<td>4.25 (108.0)</td>
<td>7.00 (177.8)</td>
<td>0.25 (6.4)</td>
<td>21.13 (536.6)</td>
<td>3.85 (98.0)</td>
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<tr>
<td>4&quot; (DN100)</td>
<td>10.00 (254.0)</td>
<td>11.75 (298.5)</td>
<td>17.88 (454.0)</td>
<td>10.50 (266.7)</td>
<td>29.13 (739.8)</td>
<td>1.75 (44.5)</td>
<td>6.50 (165.1)</td>
<td>8.56 (217.5)</td>
<td>6.25 (158.8)</td>
<td>7.13 (181.0)</td>
<td>0.38 (9.5)</td>
<td>25.38 (644.5)</td>
<td>4.56 (116.0)</td>
</tr>
<tr>
<td>6&quot; (DN150)</td>
<td>11.38 (289.0)</td>
<td>14.31 (363.5)</td>
<td>18.75 (476.3)</td>
<td>10.50 (266.7)</td>
<td>31.94 (811.2)</td>
<td>3.50 (88.9)</td>
<td>7.88 (200.0)</td>
<td>9.94 (252.4)</td>
<td>6.25 (158.8)</td>
<td>7.13 (181.0)</td>
<td>1.56 (39.7)</td>
<td>29.63 (752.5)</td>
<td>5.86 (149.0)</td>
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<tr>
<td>8&quot; (DN200)</td>
<td>12.00 (304.8)</td>
<td>16.00 (406.4)</td>
<td>21.25 (539.8)</td>
<td>10.50 (266.7)</td>
<td>36.75 (933.5)</td>
<td>1.75 (44.5)</td>
<td>10.75 (273.1)</td>
<td>10.63 (269.9)</td>
<td>6.25 (158.8)</td>
<td>7.13 (181.0)</td>
<td>7.13 (181.0)</td>
<td>36.50 (927.1)</td>
<td>5.26 (134.0)</td>
</tr>
</tbody>
</table>

* MINIMUM CLEARANCE.

**FIGURE 4**
1-1/2 THRU 8 INCH (DN40 THRU DN200) DV-5 SUPERVISED SINGLE INTERLOCK PREACTION WITH WET PILOT ACTUATION TRIM NOMINAL INSTALLATION DIMENSIONS
### System Air Pressure Requirements

The supervisory air (nitrogen) pressure is to be 10 ± 2 psi (0.69 ± 0.14 bar). The use of a higher supervisory pressure is subject to approval by the authority having jurisdiction, and it should be understood that the use of a higher supervisory pressure may increase water delivery time. The use of a lower supervisory pressure may prevent clearing the alarm of the Supervisory Low Pressure Alarm Switch (Item P3 - Fig. 3A), which is factory set to alarm at 5 ± 1 psi (0.34 ± 0.07 bar) on decreasing pressure. The supervisory air supply pressure of 10 ± 2 psi (0.69 ± 0.14 bar) can be provided by any of the following methods. Refer to the applicable data sheet for laboratory approval information.

**NOTES:** Wet Pilot Lines must be maintained at a minimum temperature of 40°F (4°C).

At a minimum, it is recommended that internally galvanized pipe and cast iron fittings be used for wet pilot lines.

#### Supply Pressure, P1 Pressure Requirement

<table>
<thead>
<tr>
<th>Supply Pressure, P1 (PSI)</th>
<th>1-1/2” (DN40)</th>
<th>2” (DN50)</th>
<th>3” (DN80)</th>
<th>4” (DN100)</th>
<th>6” (DN150)</th>
<th>8” (DN200)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 (1.4)</td>
<td>7 (1.4)</td>
<td>3 (0.9)</td>
<td>7 (1.4)</td>
<td>17 (5.2)</td>
<td>18 (5.5)</td>
<td>9 (2.7)</td>
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<tr>
<td>40 (2.8)</td>
<td>24 (7.3)</td>
<td>19 (5.8)</td>
<td>30 (9.1)</td>
<td>39 (11.9)</td>
<td>38 (11.6)</td>
<td>38 (11.6)</td>
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<tr>
<td>60 (4.1)</td>
<td>46 (14.0)</td>
<td>38 (11.6)</td>
<td>52 (15.8)</td>
<td>54 (16.5)</td>
<td>56 (17.1)</td>
<td>44 (13.4)</td>
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<tr>
<td>80 (5.5)</td>
<td>58 (17.8)</td>
<td>54 (16.5)</td>
<td>70 (21.3)</td>
<td>60 (18.3)</td>
<td>70 (21.3)</td>
<td>58 (17.8)</td>
</tr>
<tr>
<td>100 (6.9)</td>
<td>78 (23.8)</td>
<td>78 (23.8)</td>
<td>93 (28.3)</td>
<td>78 (23.8)</td>
<td>99 (30.2)</td>
<td>65 (19.8)</td>
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<tr>
<td>120 (8.3)</td>
<td>87 (26.5)</td>
<td>87 (26.5)</td>
<td>117 (35.7)</td>
<td>115 (33.1)</td>
<td>130 (39.6)</td>
<td>96 (29.3)</td>
</tr>
<tr>
<td>140 (9.7)</td>
<td>105 (32.0)</td>
<td>107 (32.6)</td>
<td>139 (42.4)</td>
<td>142 (43.3)</td>
<td>154 (46.9)</td>
<td>141 (43.0)</td>
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<tr>
<td>160 (11.0)</td>
<td>127 (38.7)</td>
<td>123 (37.5)</td>
<td>161 (49.1)</td>
<td>176 (53.6)</td>
<td>161 (49.1)</td>
<td>170 (51.8)</td>
</tr>
<tr>
<td>175 (12.1)</td>
<td>134 (40.8)</td>
<td>138 (42.1)</td>
<td>172 (52.4)</td>
<td>171 (52.1)</td>
<td>194 (59.1)</td>
<td>194 (59.1)</td>
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<tr>
<td>200 (13.8)</td>
<td>160 (48.8)</td>
<td>160 (48.8)</td>
<td>206 (62.8)</td>
<td>223 (68.0)</td>
<td>216 (65.8)</td>
<td>206 (62.8)</td>
</tr>
<tr>
<td>225 (15.5)</td>
<td>185 (56.4)</td>
<td>166 (50.0)</td>
<td>237 (72.2)</td>
<td>233 (71.0)</td>
<td>246 (75.0)</td>
<td>250 (76.2)</td>
</tr>
<tr>
<td>250 (17.2)</td>
<td>201 (61.3)</td>
<td>199 (60.7)</td>
<td>251 (76.5)</td>
<td>247 (75.3)</td>
<td>275 (83.8)</td>
<td>257 (78.3)</td>
</tr>
</tbody>
</table>

**NOTES:**

1. If supply pressure is variable, assume minimum expected value.
2. Maximum pilot height for up to 500 feet (150 meters) of equivalent length of pilot line (pipe plus fittings).
3. Interpolation between data points is permitted.

#### TABLE A

1-1/2 THROUGH 8 INCH (DN40 THROUGH DN200) DV-5 WET PILOT DESIGN CRITERIA FOR UP TO 500 FEET OF EQUIVALENT LENGTH OF PILOT LINE (PIPE PLUS FITTINGS)

- A maximum 200 psi (13.8 bar) plant air supply in combination with the Model AMD-1 Air Maintenance Device described in Technical Data Sheet TFP1221.
- A maximum 3000 psi (206.9 bar) nitrogen cylinder in combination with the Model AMD-3 Nitrogen Maintenance Device described in Technical Data Sheet TFP1241.

**NOTE:** The dew point of the air or nitrogen supply for a system exposed to freezing conditions must be maintained below the lowest ambient temperature to which the system piping will be exposed. Introduction of moisture into the system piping can create ice build up that could prevent proper operation of the system.

The Supervisory Low Pressure Alarm Switch (Item P3 - Fig. 3A) is factory set to alarm at 5 ± 1 psi (0.34 ± 0.07 bar) on decreasing pressure. The Pressure Relief Valve (Item P4- Fig. 3A) is factory set to fully open at 25 ± 2 psi (1.72 ± 0.14 bar) and it begins to crack open at a pressure of about 18 psi (1.24 bar).

**Friction Loss**

The nominal pressure loss versus flow data for the DV-5 Deluge Valve plus Riser Check Valve is provided in Graph A.
Installation

General Instructions

1-1/2 inch (DN40) risers utilize a 2 inch (DN50) Riser Check Valve in combination with the 1-1/2 inch (DN40) DV-5 Deluge Valve.

Proper operation of the DV-5 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-5 Valve from functioning properly, as well as void listings, approvals, and the manufacturer’s warranties.

The DV-5 Valve must be installed in a readily visible and accessible location.

The DV-5 Valve, associated trim, and wet pilot lines must be maintained at a minimum temperature of 40°F (4°C).

Heat tracing of the DV-5 Valve or its associated trim is not permitted. Heat tracing can result in the formation of hardened mineral deposits that are capable of preventing proper operation.

The DV-5 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.

Step 2. The DV-5 Valve must be trimmed in accordance with Figure 3A or 3B.

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-5 Valve (Ref. Figure 4).

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

Step 9. Unused pressure alarm switch connections must be plugged.

Step 10. A suitable automatic supervisory air (nitrogen) supply, as described in the Technical Data section, is to be installed in accordance with the applicable technical data sheet and set for 10 ± 2 psi (0.69 ± 0.14 bar).

Step 11. A desiccant dryer, when required for the supervisory air supply, is to be installed between a drip leg and the Model AMD-1 Air Maintenance Device or between the Model G16AC812 Automatic Supervisory Air Supply and the Preamtion Trim.

Step 12. The Supervisory Low Pressure Alarm Switch is to be wired to the supervisory alarm initiating circuit of an alarm panel.

Step 13. 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 14. Before a system hydrostatic test is performed in accordance with NFPA 13 system acceptance test requirements, the DV-5 Diaphragm Chamber is to be depressurized; the Automatic Drain Valve (Item 4, Fig. 3A) is to be temporarily replaced with a 1/2 inch NPT plug, the 3/32 inch Vent Fitting (Item 16 - Fig. 3A) is to be temporarily replaced with a 1/4 inch NPT plug, and the Diaphragm Cover Bolts must be uniformly and securely tightened using a cross-draw sequence. After tightening, double-check to make certain that all of the Diaphragm Cover Bolts are securely tightened.

Valve Setting Procedure

Steps 1 through 12 are to be performed when initially setting the DV-5 Deluge Valve after an operational test of the fire protection system, or after system operation due to a fire.

Step 1. Close the Main Control Valve.

Step 2. Close the Diaphragm Chamber Supply Control Valve, and close the Air Supply Control Valve (Ref. Fig. 3B).

Step 3. Open the Main Drain Valve, System Drain Valve, and all auxiliary drains in the system. Close the System Drain Valve and 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-5 Valve is completely drained.

Step 5. 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 6. 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.

NOTE: In order to prevent the possibility of a subsequent operation of an over-heated 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 7. Open the Diaphragm Chamber Supply Control Valve and allow time for full pressure to build up in the Diaphragm Chamber.

Step 8. 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.

Step 9. Operate (open) the Supervisory Low Pressure Alarm Switch.

Step 10. Verify the ability for the DV-5 Diaphragm to hold pressure as follows:

- With the diaphragm chamber pressurized per Step 8, temporarily close the Diaphragm Chamber Supply Control Valve, and then monitor the Diaphragm Chamber Pressure Gauge for a drop in pressure.

- If a drop in pressure is noted, the DV-5 Diaphragm is to be replaced and/or any leaks must be corrected before proceeding to the next step.

- If the Diaphragm Chamber Pressure Gauge indicates no drop in pressure, re-open the Diaphragm Chamber Supply Control Valve and proceed to the next step.

Step 11. Replace operated automatic sprinklers on the system piping and then open the Supervisory Air Supply Control Valve and allow the system to automatically re-establish its nominal
The approximate friction loss, based on the Hazen and Williams formula and expressed in equivalent length of pipe with C-120, is as follows:

- 15 feet of 1-1/2 Sch. 40 pipe for the 1-1/2 inch Valve Combination** calculated on a typical flow rate of 100 gpm.
- 28 feet of 2 inch Sch. 40 pipe for the 2 inch Valve Combination* calculated on a typical flow rate of 175 gpm.
- 37 feet of 3 inch Sch. 40 pipe for the 3 inch Valve Combination* calculated on a typical flow rate of 350 gpm.
- 48 feet of 4 inch Sch. 40 pipe for the 4 inch Valve Combination* calculated on a typical flow rate of 600 gpm.
- 73 feet of 6 inch Sch. 40 pipe for the 6 inch Valve Combination* calculated on a typical flow rate of 1500 gpm.
- 103 feet of 8 inch Sch. 30 Pipe for the 8 inch Valve Combination* calculated on a typical flow rate of 2500 gpm.

**GRAPH A**

**DELUGE AND CHECK VALVE COMBINATION***

**NOMINAL PRESSURE LOSS VERSUS FLOW**

*DV-5 Deluge Valve combined with Model CV-1FR Riser Check Valve

**1-1/2 Inch DV-5 Deluge combined with 2 Inch Model CV-1FR Riser Check Valve
Care and Maintenance

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

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.

The owner is responsible for 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. Contact the installing contractor or product manufacturer with any questions.

It is recommended that automatic sprinkler systems be inspected, tested, and maintained by a qualified Inspection Service in accordance with local requirements and/or national codes.

**NOTICE**

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.

When the system is using either a seawater or brackish water supply, internal and external inspection of the DV-5 Valve and Trim is essential. Parts showing any signs of corrosion must be replaced to ensure the integrity of the system.

Annual Operation Test Procedure

Proper operation of the DV-5 Valve (i.e., opening of the DV-5 Valve as during a fire condition) must 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.** Open the Wet Pilot Line Inspector's Test Connection.

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

**Step 3.** Verify that the DV-5 Valve has tripped, as indicated by the flow of water into the system.

**Step 4.** Close the system's Main Control Valve.

**Step 5.** Close the Diaphragm Chamber Supply Control Valve and the Supervisory Air Supply Control Valve.

**Step 6.** Reset the DV-5 Deluge Valve in accordance with the Valve Setting Procedure.

Quarterly Waterflow Alarm Test Procedure

Testing of the system airflow alarms must be performed quarterly. To test the airflow 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 Supervisory Low Pressure Alarm Test Procedure

Proper operation of the Supervisory Low Pressure Alarm Switch must be performed quarterly as follows:

**Step 1.** Crack open the System Main Drain Valve for the Riser Check Valve (Item P7, Figure 3A) to slowly relieve supervisory air pressure from the system. Verify that the Supervisory Low Pressure Alarm Switch is operational and that the low pressure set point is approximately 5 psi (0.34 bar).

**Step 2.** Close the System Main Drain Valve (Item P7, Figure 3A) and allow the system supervisory pressure of 10 ± 2 psi (0.69 ± 0.14 bar) to be automatically re-established. The Supervisory Low Pressure Alarm Switch should return to its "normal" condition.

Pressure Relief Valve Maintenance

Over pressurization of the system piping with air will result in the opening of the Pressure Relief Valve (Item P4, Fig. 3A). If the Relief Valve continues to bleed air after the system pressure has been reduced to its normal supervisory pressure range of 10 ± 2 psi (0.69 ± 0.14 bar), most likely debris became lodged in the seating area. To help clean the seating area, slowly pull up on the ring at the top of the Relief Valve to allow a full flow of air through the Relief Valve, and then release the ring to allow the Relief Valve to snap closed. Repeat the cleaning procedure as necessary.
Limited Warranty
For warranty terms and conditions, visit www.tyco-fire.com.

Ordering Procedure
The DV-5 Deluge Valve with Single Interlock Preaction Wet Pilot Actuation trim can be ordered pre-assembled or non-assembled as separate items. For non-assembled, the following items must be ordered separately:

- DV-5 Deluge Valve
- Model CV-1FR Riser Check Valve
- Coupling
- Single Interlock Preaction Wet Pilot Actuation Trim, Semi-Preassembled
- Supervisory Air Supply
- Accessories

NOTE: 1-1/2 inch (DN40) risers utilize a 2 Inch (DN50) Model CV-1FR Riser Check Valve connected to the 1-1/2 inch (DN40) DV-5 Deluge Valve by a 2 x 1-1/2 inch Figure 716 Reducing Coupling.

Replacement Trim Parts
Specify: (description) for use with DV-5 Deluge Valve, P/N (see Figure 3A)

DV-5 Deluge Valve (Select One)
P/Ns are for American Standard Groove x Groove Connections, and Threaded Ports. For other configurations refer to Technical Data Sheet TFP1305. Specify: (size) DV-5 Groove x Groove Deluge Valve, P/N (specify):

<table>
<thead>
<tr>
<th>Size</th>
<th>P/N</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-1/2 Inch</td>
<td>P/N 52-477-1-919</td>
</tr>
<tr>
<td>2 Inch</td>
<td>P/N 52-477-1-910</td>
</tr>
<tr>
<td>3 Inch</td>
<td>P/N 52-477-1-912</td>
</tr>
<tr>
<td>4 Inch</td>
<td>P/N 52-477-1-913</td>
</tr>
<tr>
<td>6 Inch</td>
<td>P/N 52-477-1-915</td>
</tr>
<tr>
<td>8 Inch</td>
<td>P/N 52-477-1-916</td>
</tr>
</tbody>
</table>

Riser Check Valve (Select One)
P/Ns are for American Standard Grooved Connections. For other configurations refer to Technical Data Sheet TFP9590 for the Groove x Groove Model CV-1FR Riser Check Valve. Specify: (size), Model CV-1FR Groove x Groove Riser Check Valve, P/N (specify):

<table>
<thead>
<tr>
<th>Size</th>
<th>P/N</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Inch</td>
<td>P/N 59-590-1-020</td>
</tr>
<tr>
<td>3 Inch</td>
<td>P/N 59-590-1-030</td>
</tr>
<tr>
<td>4 Inch</td>
<td>P/N 59-590-1-040</td>
</tr>
<tr>
<td>6 Inch</td>
<td>P/N 59-590-1-060</td>
</tr>
<tr>
<td>8 Inch</td>
<td>P/N 59-590-1-080</td>
</tr>
</tbody>
</table>

NOTE: For 1-1/2 inch (DN40) risers, use the 2 Inch (DN50) Riser Check Valve.

Coupling (Select One)
P/Ns are for American Standard Grooved Connections. For other configurations and finishes refer to Technical Data Sheet TFP1830 or TFP1880. A coupling to attach the Riser Check Valve to the outlet of the Deluge Valve must be separately ordered. Specify: (size), (Figure #), painted, (description), P/N (specify). For 1-1/2 inch risers, order an additional Reducing Coupling for the outlet of the 2 inch Riser Check Valve.

2 x 1-1/2 Inch Figure 716
Painted Reducing Coupling P/N 7162015ES

Pre-trimmed DV-5 Assembly without Butterfly Valve
Specify: (specify size), (specify) End Connection, Pre-trimmed DV-5 Assembly without Butterfly Valve, P/N (specify):

<table>
<thead>
<tr>
<th>Size</th>
<th>P/N</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Inch F x G</td>
<td>P/N 52-934-2-1AP</td>
</tr>
<tr>
<td>4 Inch F x G</td>
<td>P/N 52-944-2-1AP</td>
</tr>
<tr>
<td>6 Inch F x G</td>
<td>P/N 52-964-2-1AP</td>
</tr>
<tr>
<td>8 Inch F x G</td>
<td>P/N 52-984-2-1AP</td>
</tr>
</tbody>
</table>

Accessories (as needed)
Specify: (description), P/N (specify):

- 600 psi Water Pressure Gauge
- Model WMA-1 Water Motor Alarm (TFP921)
- Model MC-1 Manual Control Station with galvanized connections for remote wet pilot actuation (TFP1382)

Supervisory Air Supply (Select One)
A device capable of maintaining a nominal system air or nitrogen pressure of nominal 10 psi (0.69 bar) must be separately ordered. Specify: (model and description), P/N (specify):

<table>
<thead>
<tr>
<th>Device</th>
<th>P/N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model AMD-1</td>
<td>P/N 52-324-2-002</td>
</tr>
<tr>
<td>Nitrogen Device</td>
<td>P/N 52-328-2-001</td>
</tr>
<tr>
<td>Automatic Supervisory Air Supply</td>
<td>P/N 52-150-1-001</td>
</tr>
</tbody>
</table>

Pre-trimmed DV-5 Assembly with Butterfly Valve
Specify: (size), G x G End Connection, Pre-trimmed DV-5 Assembly with Butterfly Valve, P/N (specify):

<table>
<thead>
<tr>
<th>Size</th>
<th>P/N</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-1/2 Inch G x G</td>
<td>P/N 52-914-0-1AP</td>
</tr>
<tr>
<td>2 Inch G x G</td>
<td>P/N 52-924-0-1AP</td>
</tr>
<tr>
<td>3 Inch G x G</td>
<td>P/N 52-934-0-1AP</td>
</tr>
<tr>
<td>4 Inch G x G</td>
<td>P/N 52-944-0-1AP</td>
</tr>
<tr>
<td>6 Inch G x G</td>
<td>P/N 52-964-0-1AP</td>
</tr>
<tr>
<td>8 Inch G x G</td>
<td>P/N 52-984-0-1AP</td>
</tr>
</tbody>
</table>