



**Model DDX**  
**Single Interlock Preaction Systems**  
 2" (50 mm), 2½" (65 mm), 3" (80 mm),  
 76 mm, 4" (100 mm), 6" (150 mm),  
 165 mm & 8" (200 mm)

## Technical Specifications and Instructions for Installation, Operation, and Maintenance

- Electric Release Trim Available with 175 psi (12.1 bar) or 300 psi (20.7 bar) Rated Solenoid Valve
- Electric Release Trim and Wet Pilot Trim Utilizing 7 psi (0.48 bar) Minimum Pneumatic Supervising Pressure
- Dry Pilot Trim Utilizing 8 psi to 28 psi (0.6 to 1.9 bar) Pneumatic Supervising Pressure
- Externally Resettable Clapper
- One Main Drain



Electric actuation trim shown.  
 Image subject to change.

## General

Single Interlock Preaction Systems are designed for water sensitive areas that require protection from inadvertent water flow into the sprinkler system piping.

At the heart of the Reliable Single Interlock Preaction System is the Model DDX Deluge Valve. This deluge valve is a hydraulically operated, straight-through-design, differential latching clapper-type (see Fig. 1). System maintenance is simplified since the deluge valve can be reset externally without removing the cover plate. This feature provides a significant system-restoration time advantage. The Model DDX Deluge Valve has an intermediate chamber and thereby does not require an in-line air check valve. Subsequently, the deluge valve only requires a single drain connection.

The trim sets for the single interlock preaction systems provide all of the necessary equipment for connections to the Model DDX Deluge Valve's pushrod chamber inlet and outlet ports, a 1¼" (30 mm) main drain on 2" (50 mm), 2½" (65 mm), 76 mm and 3" (80 mm) valve sizes or a 2" (50 mm) main drain on 4" (100 mm), 165 mm, 6" (150 mm) and 8" (200 mm) valve sizes, alarm devices, air supply, and required pressure gauges. The trim sets are available in individual (loose) parts, in time-saving, segmented assembled kit forms or fully assembled to the Model DDX Deluge Valve (with or without a control valve). The major benefits of a single interlock preaction system, when compared with a wet pipe or deluge system are as follows:

- A fire alarm sounds prior to the operation of a sprinkler head, which may enable extinguishing the fire by handheld means before the actual operation of any sprinklers and subsequent water damage.
- A trouble annunciator signals whenever the integrity of the piping or sprinklers is accidentally or intentionally disturbed; however, no water flow or water damage will occur at that time.
- Speedy detection and an early fire alarm are provided by fire detectors, without the delay associated with water delivery time in the event of a fire. Note that with a wet pipe system, the fire alarm is delayed until after water has begun flowing from an operated sprinkler head.

Sprinkler piping in Wet Pilot and Electric Actuation Single Interlock Preaction Systems can effectively be supervised by means of a Reliable Model B-SI Air Compressor Panel or other pneumatic source meeting the requirements of NFPA 13. Loss of supervisory pneumatic pressure due to a damaged sprinkler or sprinkler pipe will not cause water to flow through the Model DDX Deluge Valve and into the system piping. Loss of pneumatic pressure will activate a trouble-annunciating device when the system pressure falls below the preset limit. **Note:** Wherever the word "air" is used in this bulletin as a reference to the pneumatic pressure source it shall also mean "air or nitrogen."

**Wet Pilot Line Single Interlock Preaction Systems** use a pilot line consisting of a line of closed sprinklers or pilot line detectors (Reliable's Model F1-FTR), which are located in the area to be protected. These sprinklers/detectors are more sensitive (lower activation temperature) than the sprinkler heads installed in the fire sprinkler system. The wet pilot line is directly installed to the Model DDX Deluge Valve pushrod chamber. Wet pilot line sprinklers are detection devices and do not provide any water to aid in the firefighting capability of the fire sprinkler system.

To fully operate a Wet Pilot Line Single Interlock Preaction System, heat from a fire must fuse a wet pilot line sprinkler/detector thereby releasing the water pressure from the Deluge Valve pushrod chamber. As water pressure is lost in this chamber, the main water supply will open the Deluge Valve clapper, thereby flowing water into the fire sprinkler piping. Water flowing into the system will flow through the intermediate chamber of the deluge valve to a mechanical sprinkler alarm (if present) will simultaneously activate the alarm pressure switch mounted in the trim. The alarm pressure switch can electrically initiate the shut-down or start up of equipment, such as computer, HVAC, or other secondary alarm devices. The flow of water into the sprinkler system piping converts the dry system into a wet system. In the event that the fire subsequently produces enough heat to operate a fire sprinkler, water will flow from that sprinkler.

In most cases the fire sprinkler piping is supervised with air or nitrogen pressure (see NFPA 13). Loss of supervisory air due to a damaged sprinkler or the sprinkler piping will not cause the Model DDX Deluge Valve to open. The supervisory air supply for the fire sprinkler piping may effectively be supervised by the Reliable Model B-SI Air Compressor Panel. Other options include the use of the Reliable NS-PaK or Nitrogen Regulator with an approved nitrogen source, the Reliable Model A Pressure Maintenance Device with a tank-mounted air compressor, or a tank-less air compressor controlled by a pressure switch or the Reliable Model B Air Maintenance Device. (See Reliable Bulletin 251).

In **Electric Actuation Single Interlock Preaction Systems**, when one electrical detector senses the presence of fire, the electrical releasing control panel operates the normally-closed solenoid valve (175 psi (12.1 bar) or 300 psi (20.7 bar) rated) to the open position. The solenoid valve, when closed, retains sufficient water pressure in the pushrod chamber of the Model DDX Deluge Valve to maintain it closed. Energizing the solenoid valve relieves the water pressure, thus opening the Deluge Valve and allowing water to flow into the sprinkler system. The flow of water into the sprinkler system piping converts the dry system into a wet system. In the event that the fire subsequently produces enough heat to operate a fire sprinkler, water will flow from that sprinkler.

To fully operate a cross-zoned single interlock system, two electrical detectors must activate and a sprinkler must open. During the early stages of a fire, smoke or heat activates the first detector, which causes the control panel to produce a local alarm and an alarm at the main fire alarm panel. Electrical relays inside the releasing control panel can be used to shut down air moving equipment or activate security doors and other electrical devices when the panel goes into the first alarm condition. Subsequent activation of a second, nearby or adjacent, detector will cause the panel to energize the solenoid valve open and release water into the sprinkler system piping. Water flowing into the sprinkler system piping will simultaneously activate the alarm pressure switch on the valve trim. This pressure switch can electrically initiate the shut down or startup of equipment, such as computers or other second alarm devices. The flow of water into the sprinkler system piping effectively converts the dry system into a wet pipe system. In the event that the fire sub-

sequently produces sufficient heat to operate a sprinkler.

**Dry Pilot Single Interlock Preaction Systems** are used in areas that may be subjected to freezing conditions. They can also be utilized to obtain installed sprinkler heights and pipe lengths greater than the allowed for wet pilot systems. A dry pilot line installation consists of an air-pressurized line of closed sprinklers or pilot line detectors (Reliable Model F1-FTR), which are located in the area to be protected. NFPA 72 or the Authority Having Jurisdiction (AHJ) should be consulted for spacing and elevation requirements for the installation of dry pilot sprinklers/detectors.

To maintain the Model DDX Deluge Valve in a closed position: in areas where moisture-laden air could cause a freezing condition, or other problems in the dry pilot line, the use of a dry, compressed gas such as nitrogen is suggested. Approved gas handling regulators (see Reliable Bulletin 254) and connections are recommended.

The fire sprinkler system piping is generally supervised (see NFPA 13) with air pressure. Loss of supervisory air due to a damaged sprinkler or the sprinkler piping will not cause the Model DDX Deluge Valve to open. A check valve in the trim prevents pneumatic pressure from escaping the Model LP Dry Pilot Actuator in this event. A low air pressure switch (Potter PS25-2) is also provided in the trim. The contacts of this switch will close on the loss of air in the sprinkler piping, thereby providing a low air alarm to aid in insuring the integrity of the sprinkler system piping. The pressure switch should be wired to a supervisory alarm bell or the building alarm system.

Damage to a dry pilot line sprinkler/detector or the dry pilot line piping that causes a significant loss of pressure will cause the Model DDX Deluge Valve to open, flowing water into the fire sprinkler system piping. The supervisory air supply for both the dry pilot line and the fire sprinkler piping can effectively be maintained by means of pressure-switch-operated, tank-mounted air compressor and a Reliable Model A Pressure Maintenance Device (see Reliable Bulletin 251). The compressor tank provides a reserve supply of air, and the Model A Pressure Maintenance Device consistently regulates the air pressure of both the dry pilot line and the fire sprinkler piping.

The dry pilot line sprinklers/detectors must be more sensitive to the heat from a fire than the sprinklers in the fire sprinkler system. The Model F1-FTR (Fixed Temperature Release) is specifically designed for use in dry pilot line operated sprinkler systems. Dry pilot line sprinklers are detection devices and do not provide any water to aid in the firefighting capability of the fire sprinkler system.

The dry pilot line is connected to the Model LP Dry Pilot Actuator and is held closed with between 8 and 28 psi (0,6 and 1.9 bar) of pneumatic pressure. To fully operate a dry pilot line preaction system, heat from a fire must fuse a dry pilot line detector thereby releasing the air pressure from the Model LP Dry Pilot Actuator. The water pressure is then able to overcome the pressure differential of the actuator, allowing water to flow from the Model DDX Deluge Valve's pushrod chamber. As water pressure is lost in the pushrod chamber, the supply pressure will force the valve's clapper open, flowing water into the fire sprinkler system piping. Water flowing into the system will flow through the intermediate chamber of the deluge valve to a mechanical sprinkler alarm (if present) and will simultaneously acti-

vate the alarm pressure switch mounted in the trim. The alarm pressure switch can electrically initiate the shut-down or start up of equipment, such as computer, HVAC, or other secondary alarm devices. The flow of water into the sprinkler system piping converts the dry system into a wet system. In the event that the fire subsequently produces enough heat to operate a fire sprinkler, water will flow from that sprinkler.

## Listings & Approvals:

(Only when used with Reliable Trim Sets.)

1. Reliable 2" (50 mm), 2½" (65 mm), 76 mm, 3" (80 mm), 4" (100 mm), 165 mm, 6" (150 mm) and 8" (200 mm) Electric Actuation Single Interlock Preaction Systems, Wet Pilot Line Single Interlock Preaction Systems and Dry Pilot Line Single Interlock Preaction Systems are Underwriters Laboratories, Inc. Listed and UL certified for Canada (cULus) in the Special System Water Control Valve-Deluge Type (VLFT) category.
2. Reliable 2" (50 mm), 2½" (65 mm), 76 mm, 3" (80 mm), 4" (100 mm), 165 mm, 6" (150 mm) and 8" (200 mm) Electric Actuation Single Interlock Preaction Systems are certified by Factory Mutual Approvals (FM). Factory Mutual does not approve the use of smoke detectors or cross zoned detectors in preaction systems.

## System Operation

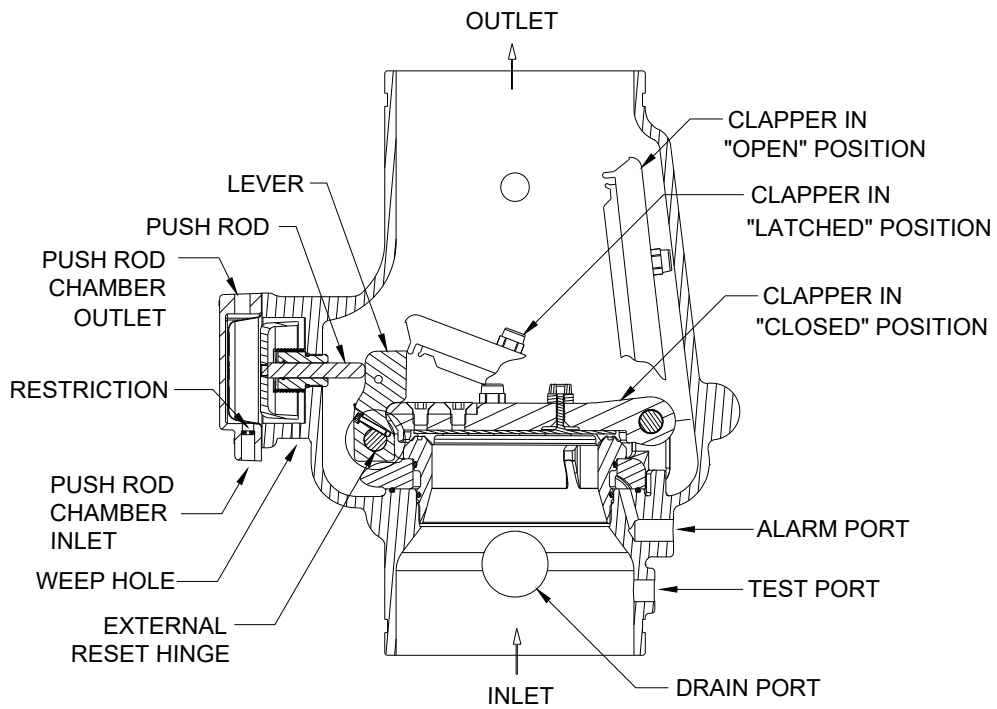
When set correctly for service, the Model DDX Deluge Valve is hydraulically established to separate the supply water from the sprinkler system piping. The Reliable Model DDX Deluge Valve is shown in both closed and open positions in Fig. 1. In the closed position, the supply pressure acts on the underside of the clapper and also on the pushrod through the pushrod chamber inlet restriction. The resultant force due to the supply pressure acting on the pushrod is multiplied by the mechanical advantage of the lever and is more than sufficient to hold the clapper closed against normal supply pressure surges.

To fully operate (deliver water from) a Wet Pilot Line Single Interlock Preaction System, two independent events must coexist before water flow will occur. A wet pilot line sprinkler/detector must fuse along with a fire sprinkler on the system. Independent operation of either a detector or fire sprinkler will cause an alarm to annunciate, but will not cause water discharge from the fire sprinkler system piping.

When a fire is detected, the opened wet pilot line sprinkler/detector vents the pushrod chamber to atmosphere through the chamber outlet. Since the pressure cannot be replenished through the inlet restriction as rapidly as it is vented, the pushrod chamber pressure falls instantaneously. When the pushrod chamber pressure approaches approximately one-third of the supply pressure, the upward force of the supply pressure acting beneath the clapper overcomes the lever-applied force thereby opening the clapper.

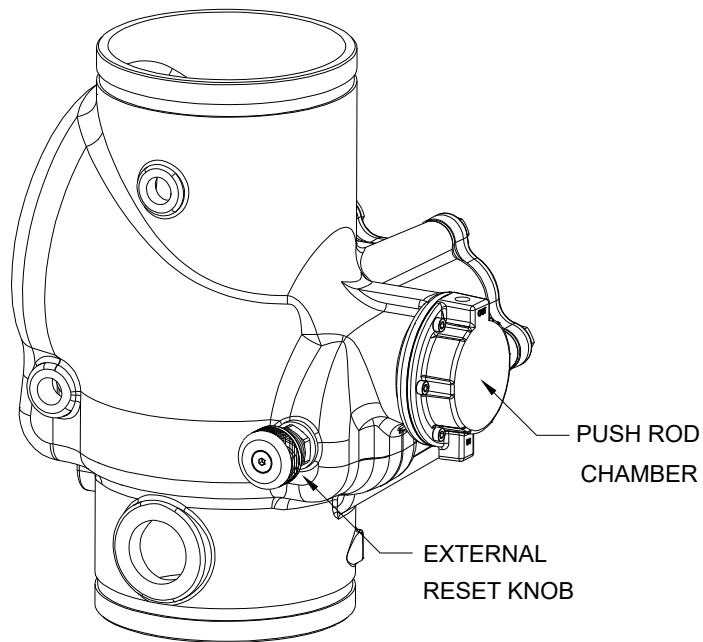
To fully operate (deliver water from) an Electric Actuation Single Interlock Preaction System, two independent events must coexist. One electrical detector (two detectors in a cross-zoned system) must activate and a sprinkler must open. Independent operation of either one will cause an alarm to annunciate, but will not cause water to discharge from the sprinkler system piping.

When a fire is detected, the energized solenoid valve vents the pushrod chamber to atmosphere through the chamber's outlet. Since the pressure cannot be replenished through the inlet



MODEL DDX VALVE: SECTION VIEW

1C\_COMMDDX\_1



MODEL DDX VALVE: REAR VIEW

TO RESET: PUSH INWARD AND ROTATE KNOB CLOCKWISE (AS VIEWED FROM REAR)  
 TO RESET CLAPPER. NOTE: PUSH ROD CHAMBER MUST BE VENTED TO DRAIN.

Fig. 1

restriction as rapidly as it is vented, the pushrod chamber pressure falls instantaneously. When the pushrod chamber pressure approaches approximately one-third of the supply pressure, the upward force of the supply pressure acting beneath the clapper over comes the lever-applied force thereby opening the clapper.

To fully operate (deliver water from) a Dry Pilot Line Single Interlock Preaction System, two independent events must coexist. A dry pilot line sprinkler/detector must fuse along with a fire sprinkler on the system. Independent operation of either a detector or fire sprinkler will cause an alarm to annunciate, but will not cause water discharge from the fire sprinkler system piping.

When a fire is detected, the Model LP Dry Pilot Line Actuator vents the pushrod chamber to atmosphere through the chamber outlet. Since the pressure cannot be replenished through the inlet restriction as rapidly as it is vented, the pushrod chamber pressure falls instantaneously.

When the pushrod chamber pressure approaches approximately one-third of the supply pressure, the upward force of the supply pressure acting beneath the clapper overcomes the lever-applied force thereby opening the clapper.

In all Reliable Single Interlock Preaction Systems, once the clapper has opened, the lever acts as a latch, preventing the clapper from returning to the closed position. Water from the supply flows through the Deluge Valve into the system piping. Water also flows through the alarm outlet to the alarm devices.

Resetting the clapper of the Model DDX Deluge Valve is accomplished using the convenient external reset knob on the rear of the valve.

The external reset feature of the Model DDX Deluge Valve provides a means for simple, economical system testing, which is one essential facet of a good maintenance program. The external reset feature does not, however, eliminate another important facet of good maintenance, namely, periodic cleaning and inspection of the internal valve parts.

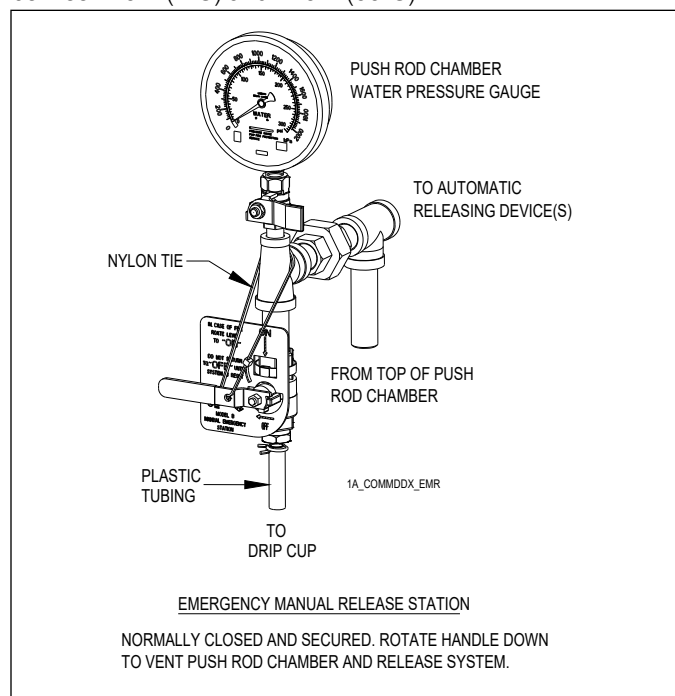
A valve body drain is provided in the event that water builds up due to condensate from the air supply system or water left inside from system testing. After closing the main supply valve, the condensate drain can be opened slightly until the water inside the valve body and the main pipe column has drained. See the section titled "Draining Excess/Condensate Water From System" in this bulletin for the detailed procedure.

The Model B Manual Emergency Station is also included in all Reliable Single Interlock Preaction System trim sets. It consists of an aluminum nameplate mechanically attached to a ball valve. The valve handle in its OFF position is guarded against accidental turning to the ON position (and system discharge) by a nylon cable tie provided with each trim kit. The cable tie is inserted after the system has been restored for operation. The nylon cable tie is designed to allow, in case of an emergency, forceful turning of the valve handle to the ON position. As an alternative to the Model B Hydraulic Manual Emergency Station, the Model A Hydraulic Manual Emergency Pull Box (see Reliable Bulletin 506) is also available and can be provided as an option.

Whenever ambient temperature conditions are high, the water temperature in the Model DDX Deluge Valve pushrod chamber could possibly increase, thereby increasing the pressure in the chamber to values exceeding the rated pressure of the system. In an indoor installation where standard room temperatures are

exceeded, a pressure relief kit may be needed. Pressure relief kit, P/N 6503050001, can be installed into the pushrod chamber's releasing line to limit the pressure to 250 psi (17.2 bar).

Reliable Model DDX Deluge Valve with associated Single Interlock Preaction Trims sizes 2" (50 mm), 2½" (65 mm), 76 mm, 3" (80 mm), 4" (100 mm), 165 mm, 6" (150 mm) and 8" (200 mm) are rated for use at a minimum water supply pressure of 20 psi (1.4 bar); and a maximum water supply pressure of 250 psi (17.2 bar) for 2" (50mm), 2½" (65mm), 76mm, 3" (80mm) and 8" (200mm) valve sizes and 300 psi (20.7 bar) for 4" (100mm), 165mm and 6" (150mm) valve sizes. Water supplied to the inlet of the valve and to the pushrod chamber must be maintained between 40°F (4°C) and 140°F (60°C).



## Pressurizing Line Connection

The water supply for the pushrod chamber must be provided from a dedicated connection to the water supply piping. Pressurizing lines for multiple Model DDX Deluge Valve pushrod chambers must never be manifolded together. Each Model DDX Deluge Valve must have its own pushrod chamber pressurizing line connection.

This connection must be made on the supply side of the water supply control valve. This can be accomplished by:

- Using a tapped connection directly below or next to the main water supply control valve using a welded outlet or the appropriate mechanical fittings. A grooved-end outlet coupling is one way to achieve this; or
- Using a water supply control valve that has an available threaded (NPT) supply-side tap design to allow for a direct water supply connection to the Model DDX Deluge Valve pushrod chamber.

**Caution:** The Reliable DDX valve is designed with an inlet restriction built into the pushrod chamber. It is important not to introduce additional restrictions into the direct water supply connection or the discharge from the pushrod chamber by installing additional valves or improperly installing the copper lines used in the trim of the valve.

## Wet Pilot Line Height vs Length

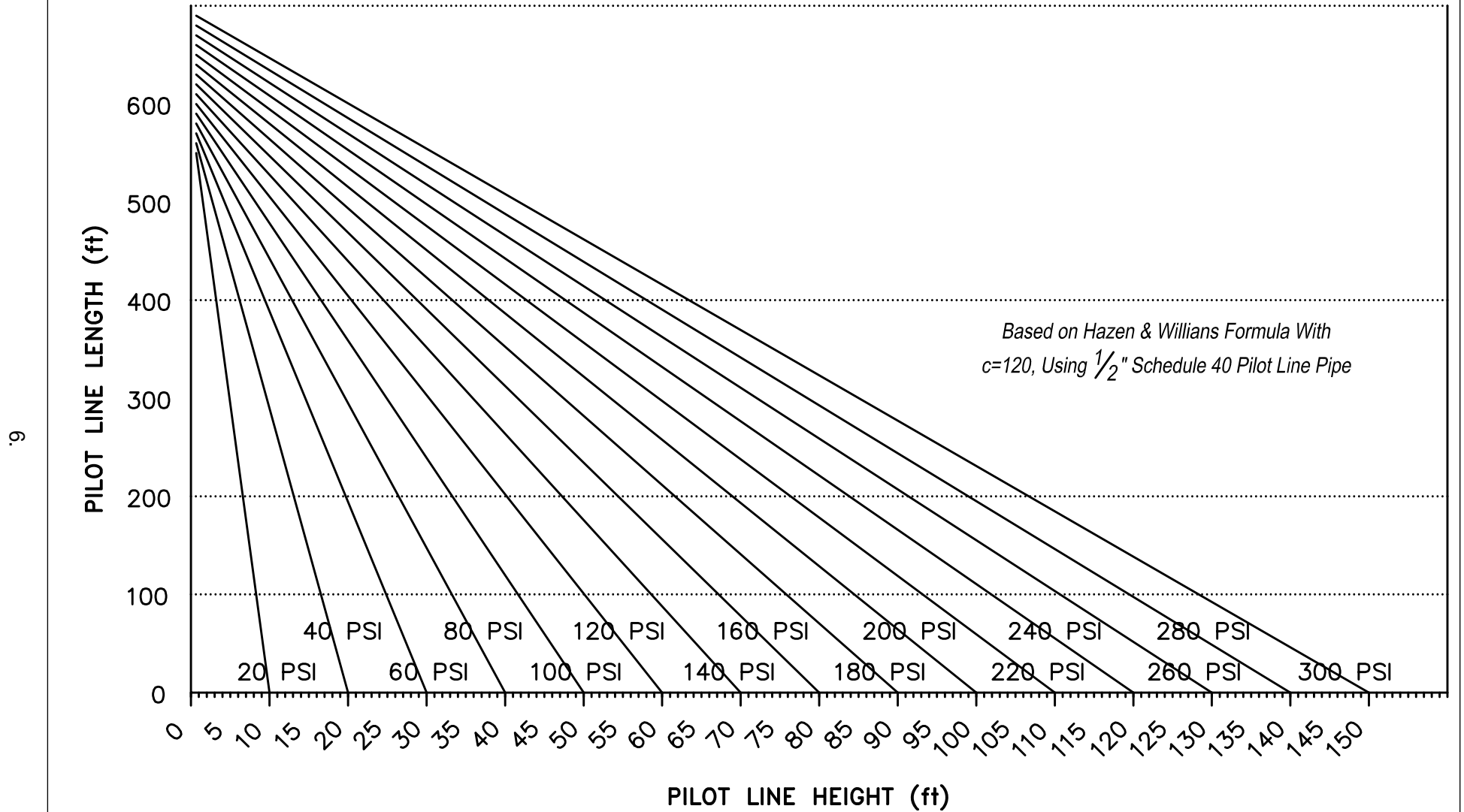


Fig. 2

# Hydrostatic Testing of DDX Valves and DDX Systems

As required by NFPA 13, fire sprinkler systems with working pressures up to and including 150 psi are to be hydrostatically tested at a water pressure of 200 psi. Fire sprinkler systems with working pressures above 150 psi are required to be hydrostatically tested at 50 psi above the system working pressure. In addition to the hydrostatic tests described above, dry pipe and double interlock preaction systems require an additional low pressure air test.

In some cases, hydrostatic testing (in accordance with the NFPA 13 requirements noted above) will result in pressures that exceed the working pressure of the valve and trim kit for the two-hour test period. The valve and applicable trim kit have been tested, approved and listed under these conditions and as such, hydrostatic testing in accordance with NFPA 13 is acceptable. In addition, the clapper can remain in the closed position and the trim kit need not be isolated, as each has been designed to withstand hydrostatic testing as required by NFPA 13.

Hydrostatically testing the valve and trim to pressures higher than their rating is limited to the hydrostatic test as referenced by NFPA 13. It does not address the occurrence(s) of a “water hammer” effect, which can indeed damage the valve. A “water hammer” in the water supply piping of the valve can create pressures in excess of the rated pressure and should be avoided by all necessary means. This condition may be created from improper fire pump settings, underground construction work, or an improper venting of trapped air in the water supply piping.

## System Design Considerations

The automatic sprinklers, pilot line detectors, electrical detectors, pull stations, signaling devices, release control panel, and other devices (as applicable) used with the Single Interlock Praction System must be UL Listed or FM Approved and acceptable to the authority having jurisdiction.

The Deluge Valve, and all interconnecting piping must be located in a readily visible and accessible location and in an area that can be maintained at a minimum temperature of 40°F (4°C). **Note:** Heat tracing is not permitted.

Pendent sprinklers, other than dry pendants, used on preaction systems shall be installed on return bends per NFPA 13.

In Wet Pilot Line Single Interlock Praction Systems, the wet pilot line is only a detection system and does not contribute to controlling the fire. Wet pilot line installation is subject to the following restrictions:

- a. It is not to be installed in an area subject to freezing.
- b. It is not to be installed in an area where temperatures in excess of 150°F (65°C) are anticipated.
- c. Maximum wet pilot line length and height must comply with data provided in Fig. 2.

For Dry Pilot Line Single Interlock Praction Systems, the pilot line detectors must be installed in the upright position.

# System Air Pressure Requirements

**For Wet Pilot Line and Electric Actuation systems,** the Reliable Model B-SI Air Compressor Panel is recommended to maintain the supervisory air pressure at approximately 7 psi (0.5 bar). Please refer to technical bulletin 252. The use of other pneumatic sources that meet the requirements of NFPA 13 are also acceptable. In no case shall the supervisory pressure be less than 7 psi (0.5 bar) or more than 20 psi (1.4 bar).

When using a pneumatic supply other than a B-SI Air Compressor panel, an optional subassembly is available for connecting the pneumatic supply (see Figure 4 and ordering instructions on Page 15).

**For Dry Pilot Line systems,** a pneumatic source meeting the requirements of NFPA 13 is required to maintain supervisory pressure in the dry pilot line and the system. Supervisory pressure shall be in accordance with Table A. The “not less than” value listed represents the pneumatic pressure required to hold the Model LP Dry Pilot Actuator in the closed position against the incoming water supply. The “not more than” value represents the pneumatic pressure at which the deluge valve may not operate due to pressure differential across the valve clapper.

Note that multiple systems supplied from a single source are required by NFPA 13 to have individual listed pressure maintenance devices.

**Table A**

Water Pressure psi (bar)	Pneumatic Pressure to be Pumped into Sprinkler System psi (bar)	
	Not Less Than	Not More Than
20 (1.4)	8 (0.6)	10 (.7)
30 (2.1)	10 (0.7)	14 (1.0)
50 (3.4)	12 (0.8)	16 (1.1)
75 (5.2)	13 (0.9)	17 (1.2)
100 (6.9)	15 (1.0)	19 (1.3)
125 (8.6)	16 (1.1)	20 (1.4)
150 (10.3)	17 (1.2)	21 (1.4)
175 (12.1)	18 (1.2)	22 (1.5)
200 (13.8)	19 (1.3)	23 (1.6)
225 (15.5)	21 (1.4)	25 (1.7)
250 (17.2)	22 (1.5)	26 (1.8)
275 (19.0)	23 (1.6)	27 (1.9)
300 (20.7)	24 (1.7)	28 (1.9)

**Note:** During system set-up, a higher pneumatic pressure may temporarily be required in order to properly set the Model LP Dry Pilot Line Actuator.

## System Electrical Requirements

When Using the Electric Actuation Single Interlock Praction System, all releasing, alarm and detection devices in the Single Interlock Praction System may be supervised by the Potter PFC-4410-G3 Releasing Control Panel. The power supply, the standby emergency power supply, battery charger, and the rectifier circuitry are all contained within the Potter PFC-4410-RC Releasing Control Panel. Other panels that are listed and approved for release of special systems may be used provided they are compatible with the solenoid valve on the preaction system trim. Note that batteries providing ninety hours of standby power are required for Factory Mutual Approved systems.

**Note:** Do not attempt repair of the solenoid valve. Solenoid must remain in factory condition to maintain warranty. Immediate replacement of solenoid valve is recommended where concerns exist about the internal condition or operational status of the device.

### Standard Solenoid Valve Specifications:

Parker-Hannifin Model 73218BN4UNLVN0C111C2

Rated working pressure: 175 psi (12.1 bar)

Voltage: 24 VDC

Power: 10 Watts

Current: 0.41 Amps Holding

Enclosure Coil: NEMA 4X

Pipe Size: ½" NPT Female

Cv Factor: 4.0

### Alternate Solenoid Valve Specifications:

Parker-Hannifin Model 73212BN4TNLVN0C322C2

Rated working pressure: 300 psi (20.7 bar)

Voltage: 24 VDC

Power: 22 Watts

Current: 0.83 Amps Holding

Enclosure Coil: NEMA 4X

Pipe Size: ½" NPT Female

Cv Factor: 2.8

### Technical Data

Reliable Single Interlock Preaction Systems, with associated trim, size 2" (50 mm), 2½" (65 mm), 76 mm, 3" (80 mm), 4" (100 mm), 165 mm, 6" (150 mm) & 8" (200 mm) are rated for use at minimum water supply pressure of 20 psi (1.4 bar) and maximum supply pressure of 250 psi (17.2 bar) for 2" (50mm), 2½" (65mm), 76mm, 3" (80mm) and 8" (200mm) valve sizes and 300 psi (20.7 bar) for 4" (100mm), 165mm and 6" (150mm) valve sizes. Water supplied to the inlet of the valve and to the pushrod chamber must be maintained between 40°F (4°C) and 140°F (60°C).

The following list of technical bulletins pertains to valves and devices that may be used in this preaction system:

Deluge Valve	Reliable 519
Hydraulic Emergency Station (Model A)	Reliable 506
Mechanical Sprinkler Alarm	Reliable 612/613
Pressure Maintenance Device	Reliable 251
Nitrogen Regulating Device	Reliable 254
Model B-SI Compressor Panel	Reliable 252
Releasing/Control Panel	Potter 5401600
Pilot Line Detector	Reliable 180
Waterflow Pressure Alarm Switch	Potter 5400928

### Model DDX Deluge Valve Description

- Rated working pressure:  
Valve & System - 250 psi (17.2 bar) for 2" (50mm), 2½" (65mm), 76mm, 3" (80mm) and 8" (200mm) valve sizes and 300 psi (20.7 bar) for 4" (100mm), 165mm and 6" (150mm) valve sizes.
- Factory tested to a hydrostatic pressure of 500 psi (34.5 bar) for 2" (50mm), 2½" (65mm), 76mm, 3" (80mm) and 8" (200mm) valve sizes and 600 psi (41.4 bar) for 4" (100mm), 165mm and 6" (150mm) valve sizes. (Valve only)

### 3. End and trim connections:

- ANSI/AWWA C606 grooved inlet and outlet

Nominal Pipe Size	Outlet Diameter	Groove Diameter	Groove Width	Outlet Face to Groove
2" (50 mm)	2.375" (60mm)	2.250" (57mm)	11/32" (9.0mm)	5/8" (16mm)
2½" (65 mm)	2.875" (73mm)	2.720" (69mm)	11/32" (9.0mm)	5/8" (16mm)
76 mm	3.000" (76mm)	2.845" (72mm)	11/32" (9.0mm)	5/8" (16mm)
3" (80 mm)	3.500" (89mm)	3.344" (85mm)	11/32" (9.0mm)	5/8" (16mm)
4" (100 mm)	4.500" (114mm)	4.334" (110mm)	3/8" (9.5mm)	5/8" (16mm)
165 mm	6.500" (165mm)	6.330" (161mm)	3/8" (9.5mm)	5/8" (16mm)
6" (150 mm)	6.625" (168mm)	6.455" (164mm)	3/8" (9.5mm)	5/8" (16mm)
8" (200 mm)	8.625" (219mm)	8.441" (214mm)	7/16" (11mm)	3/4" (19mm)

- Threaded openings Per ANSI B 2.1
- Flange Dimensions

Flange Type:	Nominal Pipe Size	Bolt Circle Diameter	Bolt Hole Diameter	Flange Outside Diameter	Flange Thickness	Number of Bolts
ASME B16.5 Class 150	4" (100mm)	7½" (191mm)	¾" (19mm)	9" (229mm)	15/16" (24mm)	8
ISO 7005-2 PN16	4" (100mm)	7¾" (180mm)	¾" (19mm)	9" (229mm)	15/16" (24mm)	8
ASME B16.5 Class 150	6" (150mm)	9½" (241mm)	7/8" (22mm)	11" (279mm)	15/16" (24mm)	8
ISO 7005-2 PN16	6" (150mm)	9¾" (240mm)	7/8" (22mm)	11" (279mm)	15/16" (24mm)	8
ASME B16.5 Class 150	8" (200mm)	11¾" (298mm)	7/8" (22mm)	13½" (343mm)	1" (25.4mm)	8
ISO 7005-2 PN16	8" (200mm)	11½" (295mm)	7/8" (22mm)	13½" (343mm)	1" (25.4mm)	12

### 4. Exterior Color:

Valve Size	Color
2" (50 mm)	Black or Red
2½" (65 mm)	Black or Red
76 mm	Red
3" (80 mm)	Black or Red
4" (100 mm)	Black or Red
165 mm	Red
6" (150 mm)	Black or Red
8" (200 mm)	Black or Red

### 5. Face to face dimensions:

Valve Size:	End Connection:	End to End:
2" (50mm), 2½" (65mm), 76mm & 3" (80mm)	Groove/ Groove	12½" (318mm)
4" (100mm)	Groove/ Groove	14" (356mm)
	Flange/ Groove	16" (406mm)
	Flange/ Flange	16" (406mm)
6" (150mm) & 165mm	Groove/ Groove	16" (406mm)
	Flange/ Groove	19" (483mm)
	Flange/ Flange	19" (483mm)
8" (200mm)	Groove/ Groove	19¾" (492mm)
	Flange/ Flange	21¼" (540mm)



6. Valve Shipping Weight:

Valve Size:	End Connection:	Weight:
2" (50mm), 2½" (65mm), 76mm & 3" (80mm)	Groove/ Groove	34 lbs (15 kg)
4" (100mm)	Groove/ Groove	64 lbs (29 kg)
	Flange/ Groove	79 lbs (36 kg)
	Flange/ Flange	92 lbs (42 kg)
6" (150mm) & 165mm	Groove/ Groove	95 lbs (43 kg)
	Flange/ Groove	122 lbs (56 kg)
	Flange/ Flange	138 lbs (69 kg)
8" (200mm)	Groove/ Groove	148 lbs (67 kg)
	Flange/ Flange	197 lbs (90 kg)

7. Trim Shipping Weight:

Trim Configuration	2" (50 mm), 2½" (65 mm), 3" (80 mm) & 76 mm	4" (100 mm), 6" (150 mm), 8" (200 mm) & 165 mm
Wet Pilot Single Interlock	32 lbs (15 kg)	38 lbs (17 kg)
Dry Pilot Single Interlock	45 lbs (20 kg)	52 lbs (24 kg)
Electric Actuation Single Interlock	35 lbs (16 kg)	40 lbs (18 kg)

8. Friction loss (Reference Figure 3).

9. Installation position: Vertical ONLY.

## Trim Descriptions

The Single Interlock Praction Trims for the Reliable Model DDX Deluge Valve are arranged for rapid, easy, and compact attachment, and serve as connection points to Reliable Model C Mechanical Alarms and other devices.

The available Model DDX Single Interlock Praction System trim sets are:

- Wet Pilot Line Single Interlock Praction Trim
- Dry Pilot Line Single Interlock Praction Trim
- Electric Actuation Single Interlock Praction Trim

All three trim configurations can be ordered as individual parts, in time-saving segmentally assembled kit forms, or fully assembled to the Model DDX Deluge Valve (with or without a control valve).

The Model B Hydraulic Manual Emergency Station is a standard item of all Deluge Valve trim sets. It consists of an aluminum nameplate mechanically attached to a ball valve. The valve handle in its OFF position is guarded against accidental turning to the ON position (and system discharge) by a nylon cable tie provided with each trim kit. The cable tie is inserted, after the system has been restored for operation. The nylon cable tie is designed to allow, in case of an emergency, forceful turning of the valve handle to the ON position. As an alternative to the Model B Hydraulic Manual Emergency Station, the Model A Hydraulic Manual Emergency Pull Box (see Bulletin 506) is also available and can be provided as an option.

Model F1-FTR fixed temperature pilot line detectors and spacing requirements are described in Bulletin 180.



# MODEL DDX HYDRAULIC FRICTION LOSS GRAPH

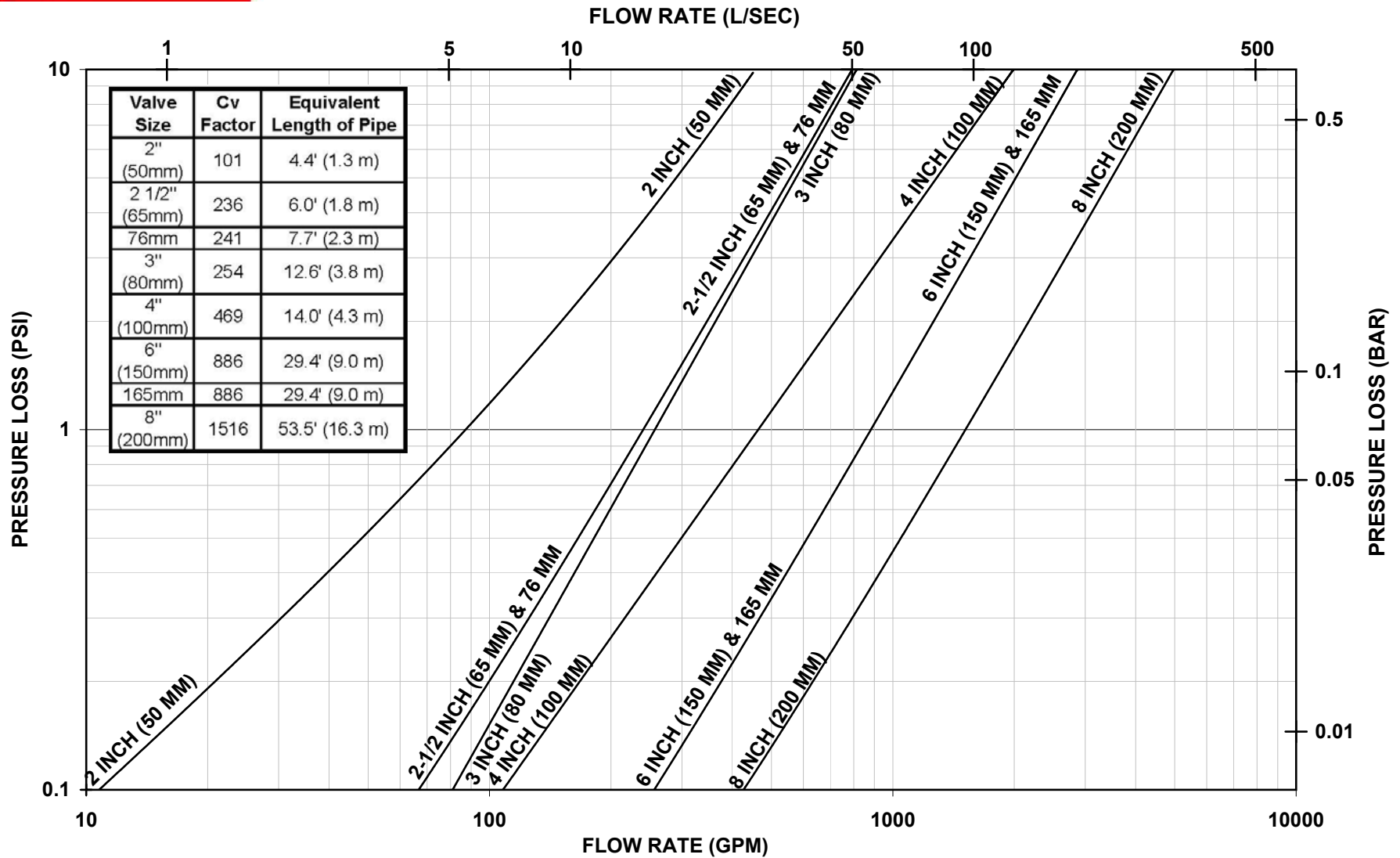
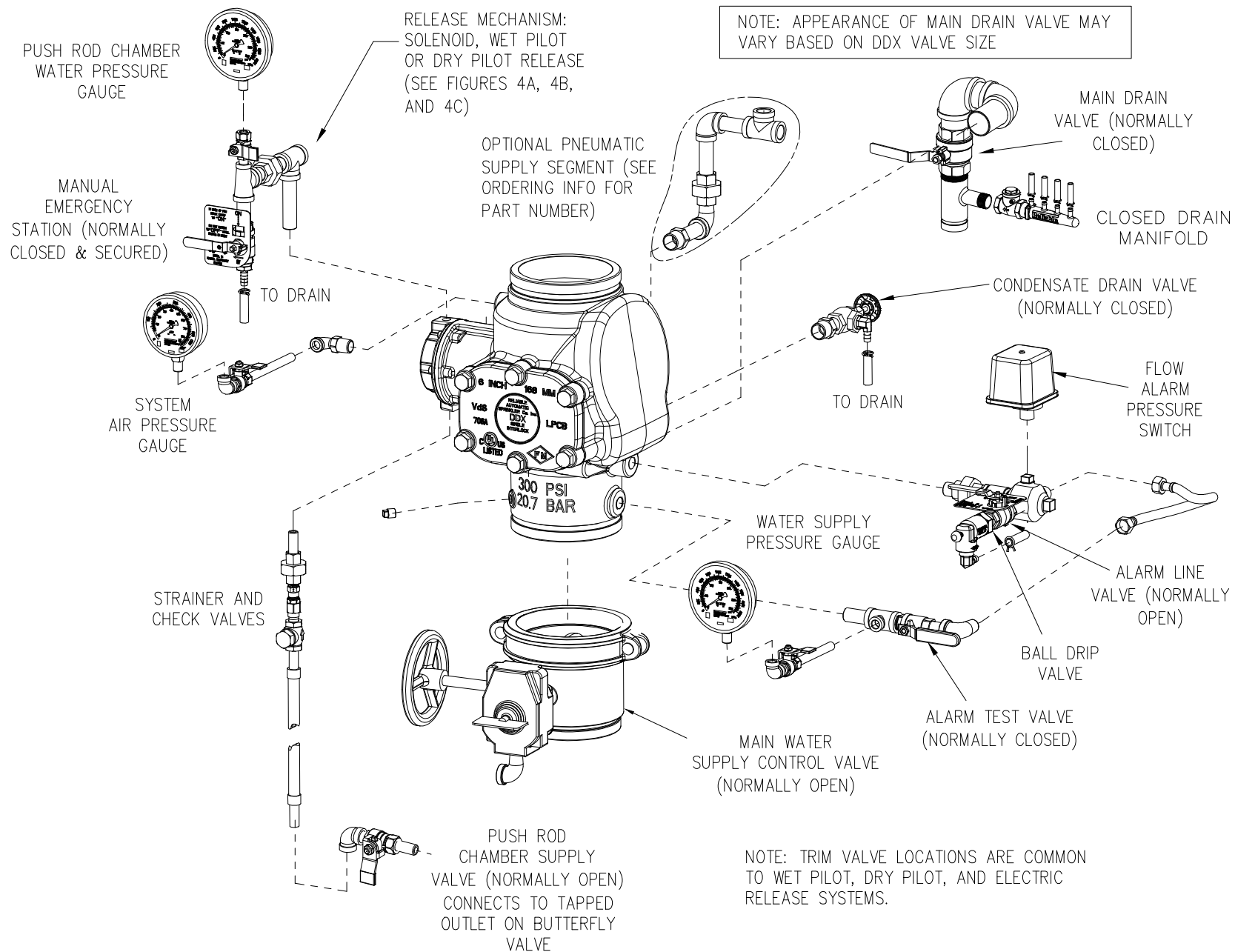


Fig. 3



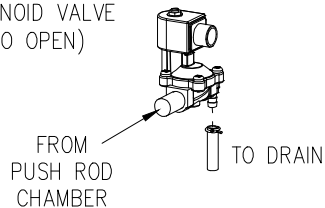
749EXP\_C

Fig. 4

## Electric (Solenoid) Actuation

Figure 4A

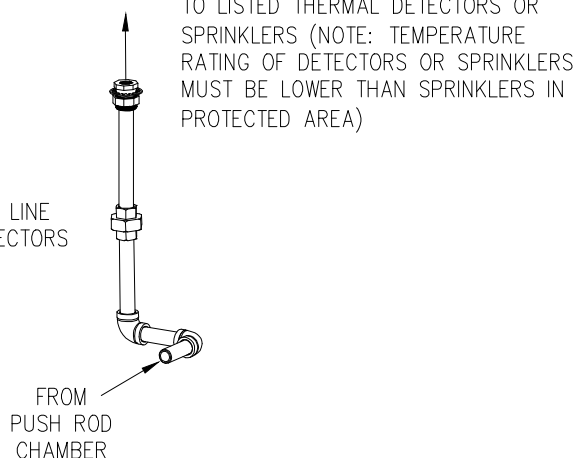
1/2" NORMALLY CLOSED  
24VDC SOLENOID VALVE  
(ENERGIZE TO OPEN)



## Wet Pilot Line Actuation

Figure 4B

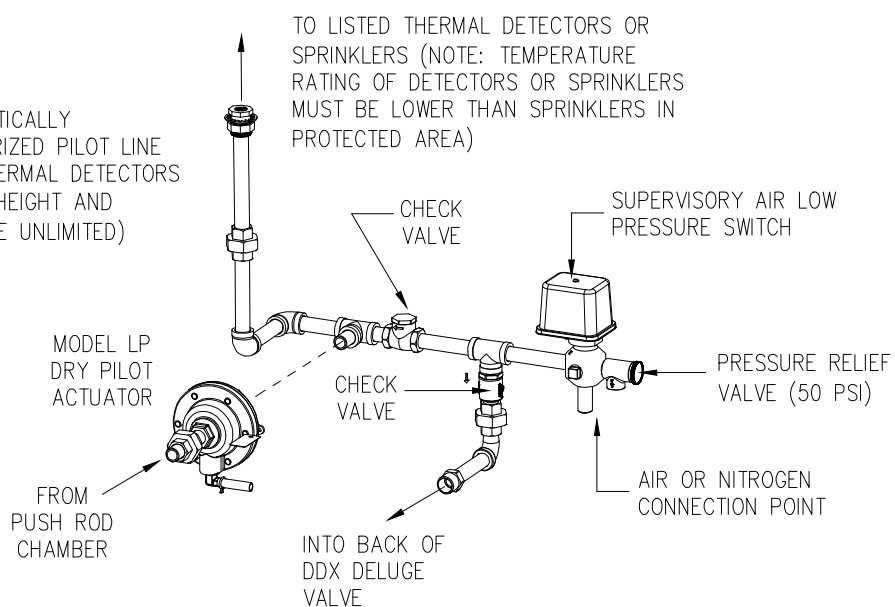
HYDRAULICALLY  
PRESSURIZED PILOT LINE  
WITH THERMAL DETECTORS  
(NOTE: HEIGHT AND  
DISTANCE LIMITED)



## Dry Pilot Line Actuation

Figure 4C

PNEUMATICALLY  
PRESSURIZED PILOT LINE  
WITH THERMAL DETECTORS  
(NOTE: HEIGHT AND  
DISTANCE UNLIMITED)



## Maintenance

Reliable Single Interlock Preaction Systems and associated equipment shall periodically be given a thorough inspection and test. NFPA 25, Inspection, Testing and Maintenance of Water Based Fire Protection Systems, provides minimum maintenance requirements. System components shall be tested, operated, cleaned, and inspected at least annually, and parts replaced as required.

### Resetting Model DDX Single Interlock Preaction Systems

1. Close the valve controlling water supply to the Deluge Valve and close the air or nitrogen supply to the sprinkler system.
2. Close the pushrod chamber supply valve.
3. Open main drain valve and drain system.
4. Open all drain valves and vents at low points throughout the system, closing them when flow of water has stopped. Open the Model B Manual Emergency Station to relieve pressure in the pushrod chamber of the Deluge Valve.
5. With the alarm line valve open, push in the plunger of ball drip valve, forcing the ball from its seat, and drain the alarm line.
6. With the Model B Manual Emergency Station open, push in and rotate the Deluge Valve's external reset knob counter-clockwise (when facing the valve), until you hear a distinct noise indicating that the clapper has reset. **Note:** The reset knob can be rotated only while pressure in the pushrod chamber is vented to atmospheric conditions (0 psig).
7. Inspect and replace any portion of the detection system and/or sprinkler system subjected to fire conditions.
8. Open the pushrod chamber supply valve and allow water to fill the pushrod chamber. Close the Model B Manual Emergency Station.
9. Bleed all air from the actuation piping:
  - A. Wet Pilot Line Single Interlock Preaction Trim—bleed the entire wet pilot line until all air is removed at the most remote sprinkler.
  - B. Electric Actuation Single Interlock Preaction Trim—open the solenoid valve by operating a detector or an electric manual emergency station. While water is flowing through the solenoid valve, cause it to close using the release control panel reset.
  - C. Dry Pilot Line Single Interlock Preaction Trim— If pressurized, remove pneumatic pressure from Model LP Dry Pilot Actuator, allowing water to flow through the actuator. When all air has been expelled from the release line, and there is a solid flow of water into the drain cup, apply compressed air or nitrogen through the pressure maintenance device to close the pilot line actuator. Adjust the air or nitrogen pressure to the appropriate value in Table A as indicated on air pressure gauge.
10. Close the alarm line valve. Open the air or nitrogen supply quick fill valve to restore supervisory pressure in the sprinkler system, then set the pneumatic supply to automatic operation. **Note:** To build supervisory air pressure in the sprinkler system, it may be necessary to temporarily close the main drain valve until air pressure has built up to the manufacturers recommended levels.

11. Open the alarm line valve. Verify the main drain valve is open. Open slightly the main valve controlling water supply to the Model DDX Deluge Valve, closing the main drain valve when water flows. Observe if water leaks through the ball drip valve into the drip cup. If no leak occurs, the Deluge Valve clapper is sealed. Open slowly and verify the main valve controlling water supply is fully opened and properly monitored.
12. Verify that the pushrod chamber supply valve and alarm line valve are open. **The pushrod chamber supply valve must remain open when the Deluge Valve has been reset, to maintain water pressure in the pushrod chamber.**
13. Verify that the Model B Manual Emergency Station is secured in the OFF position with the appropriate nylon tie.

### Inspection and Testing

1. **Water supply** — Confirm that valves controlling water supply to the Deluge Valve are opened fully and properly monitored.
2. **Alarm line** — Confirm that the alarm line valve is open and remains in this position.
3. **Other trim valves** — Confirm that the pushrod chamber supply valve and all pressure gauge valves are open. The main drain valve, condensate drain valve, and alarm test valve should be closed.
4. **Ball drip valve** — Push in on the plunger to be sure ball check is off its seat. If no water appears, the Deluge Valve water seat is tight. Inspect the bleed hole on the underside of the pushrod chamber for leakage.
5. **Dry pilot trim** — Inspect air pressure for conformance to Table A.
6. **Supervisory Pressure** — Confirm that system air pressure is not less than 7 psi (0.48 bar) for wet pilot and electrically actuated systems. Confirm that system air pressure for dry pilot systems is in accordance with Table A of this bulletin. Check the pressure maintenance device for leakage.
7. **Releasing device** — Check outlet of the releasing device (i.e., the dry pilot line actuator, solenoid valve, or the hydraulic manual emergency station) for leakage. Also verify that tubing drain lines from releasing devices are not pinched or crushed which could prevent proper releasing of the Deluge Valve.
8. **Testing alarms** — Open the alarm test valve permitting water from the supply to flow to the electric sprinkler alarm switch and to the mechanical sprinkler alarm (water motor). After testing, close this valve securely. Push in on the plunger of ball drip valve until all water has drained from the alarm line.
9. **Operation test** — Open the Model B Manual Emergency Station, or alternatively, operate the detection system.. **Note:** An operational test will cause the Deluge Valve to open and flow water into the sprinkler system.
10. Secure the Model B Manual Emergency Station in the OFF position with nylon tie after Deluge Valve is reset.

## Testing Detection System Without Operating Deluge Valve

1. Close the valve controlling water supply to Deluge Valve and open the main drain.
2. Verify that the pushrod chamber supply valve is open.
3. Operate the wet pilot line, dry pilot line, or electrical detection system.
4. Operation of the detection system must result in a sudden drop of water pressure in the pushrod chamber.
5. Reset detection system — reverse operations performed in step three above and then proceed according to the directions listed in the “Resetting Model DDX Deluge Valve Single Interlock Preaction Systems” section of this bulletin for resetting the Deluge Valve.

## Draining Excess/Condensate Water From System

1. Close the main valve controlling water supply to Deluge Valve. Open the main drain valve.
2. Slightly open the condensate drain valve until all water has drained. Close the condensate drain valve. **Note:** Leaving the condensate drain valve open for an extended period of time may allow excess air or nitrogen to bleed off resulting in an undesirable low pressure supervisory signal.
3. Allow the air or nitrogen pressure to return to the normal level.
4. Slightly open the main valve controlling water supply to the system.
5. Slowly close the main drain valve.
6. Fully open the main valve controlling water supply to the system, and verify that it is properly monitored.

## Maintenance Procedures - Model DDX Deluge Valve

1. **Mechanical sprinkler alarm not operating:** This is most likely caused by a clogged screen in the strainer of the water motor. Proceed as follows: Remove plug from the strainer. Remove and clean the screen. Replace the screen and the plug, and then tighten securely (Ref. Bulletin 613).
2. **Water leaking from Ball Drip.** This can be caused by either a water column on top of the clapper or a supply water leakage.
  - a. **Leakage due to water column.** This condition is caused by leakage past the clapper seal assembly. Be sure the clapper seal and seat are free of any type of debris or damage. If necessary, follow steps below to replace the seal assembly and/or seat.
  - b. **Supply water leakage.** This condition is caused by leakage past the lower seat O-ring. Follow steps below for inspection and/or replacement of lower seat O-ring.
3. **Air or nitrogen leaking from Ball Drip.** This condition is caused by leakage past either the clapper seal assembly or the upper seat O-ring.
  - a. **Clapper seal leak.** Be sure the clapper seal and seat are free of any type of debris or damage. If necessary, follow steps below to replace the seal assembly and/or seat.
  - b. **Upper seat O-ring.** Follow steps below for inspection and/or replacement of upper seat O-ring.

## Repair Procedures - Model DDX Deluge Valve

The following section provides instructions to correct both conditions:

1. Disable detection system and supervisory pneumatic supply to system.
2. Shut down the valve controlling the water supply to the Deluge Valve and open the main drain valve. Open the condensate drain valve. Close the pushrod chamber supply valve and open the Model B Manual Emergency Station.
3. Remove the Deluge Valve front (handhold) cover and inspect the seat, clapper, and seal assembly for damage. If inspection indicates damage to the seal assembly only, replace as follows:
4. Remove the bumpstop nuts and remove the seal assembly. Install a new seal assembly and thread the bumpstop nuts onto the threaded studs of the seal assembly. Tighten finger tight plus  $\frac{1}{4}$  to  $\frac{1}{2}$  turn.
5. If inspection indicates damage to the clapper, proceed to step 6.
6. At the rear of the valve, disconnect the condensate drain trim section starting with the elbow connector. Then remove the  $\frac{1}{4}$ " globe valve, followed by the  $\frac{3}{4}$ "x $\frac{1}{4}$ " reducing bushing. Remove the retaining rings from the clapper hinge pin, push the hinge through the condensate drain opening and remove the clapper subassembly. Install a new clapper subassembly in the reverse order making sure the clapper spacers are in their proper position.
7. If the seat is damaged, or it is suspected that the leakage is through the seat O-rings, proceed to step 8.
8. Using Reliable P/N 6881603000 Seat Wrench for 2" (50mm), 2 $\frac{1}{2}$ " (65mm), 76mm and 3" (80mm) valve sizes, Reliable P/N 6881604000 for 4" (100mm) valve size, Reliable P/N 6881606000 for the 6" (150mm) and 165mm valve sizes or Reliable P/N 6881608000 Seat Wrench for 8" (200mm) valve size, remove the seat by unscrewing. This will loosen the seat-clapper-mounting ring subassembly. Reach into the valve and grasp the seat and remove it from the valve. Then remove the clapper-mounting ring subassembly from the valve. Visually examine all components of the seat-clapper-mounting ring subassembly replacing any component that appears damaged. New O-rings should always be used for reassembly.
9. Reassembly: clean the bore of the valve body. Lubricate the bore with O-ring grease. Lubricate and install the O-rings onto the seat. Lubricate and install the mounting ring O-ring into the body (8" (200mm) valve size only). Insert the clapper-mounting ring subassembly into the handhold opening of the Deluge Valve using caution to not damage or dislodge the mounting ring O-ring (8" (200mm) valve size only). Align the mounting ring so that the Lever is near the pushrod and the mounting ring "ears" are between the tabs of the valve body. Insert the seat into the valve body and through the clapper-mounting ring subassembly. Start to thread the seat into the body by hand, then tighten the seat with the seat wrench until it bottoms out on the mounting ring. Verify that

the seat-clapper-mounting ring subassembly is in the fully down position between the tabs of the body, and check to see that the lever lines up with the pushrod. Reassemble the handhold cover and set up the Model DDX Deluge Valve as per the section "Resetting Model DDX Deluge Valve Single Interlock Preaction Systems".

## Pushrod Chamber Maintenance - Model DDX Deluge Valve

A small bleed hole is located on the underside of the pushrod chamber. If there is air or water leakage coming out of the bleed hole:

- Disable detection system and supervisory pneumatic supply to system.
- Shut down the valve controlling water supply to the Deluge Valve. Relieve the inlet pressure by opening the main drain valve. Close the valve that supplies water to the pushrod chamber, and open the Model B Manual Emergency Station.
- Remove the trim at the unions nearest to the pushrod chamber cover.
- Take the pushrod chamber cover off by removing the six retaining screws.

### CONDITION ONE (Water coming out of the bleed hole):

Water coming out of the bleed hole is caused by a leaking diaphragm. Visually inspect the pushrod chamber cover and piston to determine what could have damaged the diaphragm and then correct. Install a new diaphragm. **NOTE:** The diaphragm has two different surfaces; it is not bi-directional. It will fail if installed backwards! Roll the diaphragm so that the smooth surface (the pressure side) conforms to the inside of the pushrod chamber cover and the fabric side engages the pushrod, and reassemble the six retaining screws with an installation torque of 15 foot-pounds in a star pattern. Set up the Model DDX Deluge Valve as per the section "Resetting Model DDX Deluge Valve Single Interlock Preaction Systems".

### CONDITION TWO (System Air coming out of the bleed hole):

System air coming out of the bleed hole is caused by a defective O-ring assembled to the pushrod guide. Remove the piston-pushrod subassembly, pushrod spring, and pushrod guide. Verify by hand turning, that the pushrod cannot be unscrewed from the piston. Replace all O-rings and the pushrod guide. The correct installation torque for the pushrod guide is 35 inch-pounds.

**CAUTION:** Do not over tighten the pushrod guide. Reassemble the components that were initially removed. Re-install the diaphragm if it appears to be in good shape, otherwise, replace it also. **NOTE:** The diaphragm has two different surfaces; it is not bi-directional. It will fail if installed backwards! Roll the diaphragm so that the smooth surface (the pressure side) conforms to the inside of the pushrod chamber cover and the fabric side engages the pushrod, and reassemble the six retaining screws with an installation torque of 15 foot-pounds in a star pattern. Set up the Model DDX Deluge Valve as per the section "Resetting Model DDX Deluge Valve Single Interlock Preaction Systems".

## Ordering Information

Specify:

### Model DDX Single Interlock Preaction System

- **Size**
- **End Configuration**
- **Operational Trim**
  - Wet Pilot Line
  - Dry Pilot Line
  - Electric Release Trim
- **Trim Assembly**
  - Loose Trim
  - Segmentally Assembled
  - Fully Assembled no Control Valve
  - Fully Assembled with Control Valve

**Note:** Pressure switches are included with fully assembled valves only. When ordering segmented or loose trim, switches must be ordered separately.

### Optional 300 psi (20,7 bar) solenoid valve for electric release trim

### Optional Pneumatic Supply Segment (for Wet Pilot and Electric Actuation Systems Only)

- Without Pressure Switch, PN 6501200056
- With Pressure Switch, PN 6501200057
- With Exp. Proof Pressure Switch, PN 6501200058

## Service Kits

Service kits are available for routine servicing of the valve (reference Figure 6). Service kits for the Model DDX Deluge Valve include the following components:

- Clapper Seal Assembly (item 8)
- Cover Gasket (item 9)
- Bumpstop(s) (item 10)
- Push rod chamber diaphragm (item 18)
- Grease (item 42)

### 2", 2-1/2", and 3" Model DDX Service Kit: PN 6501200R03

### 4" Model DDX Service Kit: PN 6501200R04

### 6" Model DDX Service Kit: PN 6501200R05

### 8" Model DDX Service Kit: PN 6501200R06

**Note:** Early generation 4" and 6" Model DDX valves utilize a drop-in brass clapper. Service kits for early Model DDX valves are as follows:

### 4" Early generation DDX Deluge Valve Service Kit: PN 6501200R07

### 6" Early generation DDX Deluge Valve Service Kit: PN 6501200R08

## Model LP Dry Pilot Line Actuator Parts List

Item No.	Description
1	Lower Housing
2	Upper Housing
3	Seat
4	Diaphragm
5	Facing Plate Assembly
6	Diaphragm Washer
7	Facing Plate Nut
8	Seat O-Ring
9	Bolt
10	Compression Spring

**Note:** Parts list provided for information only. Available only as an assembly; individual parts are not available.

## Maintenance – Model LP Dry Pilot Line Actuator

If water constantly flows through the Model LP Dry Pilot Actuator, or if the actuator will not set up, the diaphragm/seal assembly may need replaced.

1. Close the main valve controlling water supply to the system, and close the air or nitrogen supply to the system.
2. Remove air or nitrogen pressure from the system.
3. Remove the actuator from the trim at the nearest convenient points.
4. Remove six bolts holding the actuator halves together.
5. Clean and inspect all interior surfaces. Replace the diaphragm/seal assembly.
6. Reassemble the actuator using a torque of 12 ft-lbs. on the six bolts in a cross-tightening pattern.
7. Reinstall the actuator and set up the system following the section "Resetting Model DDX Single Interlock Preaction Systems."

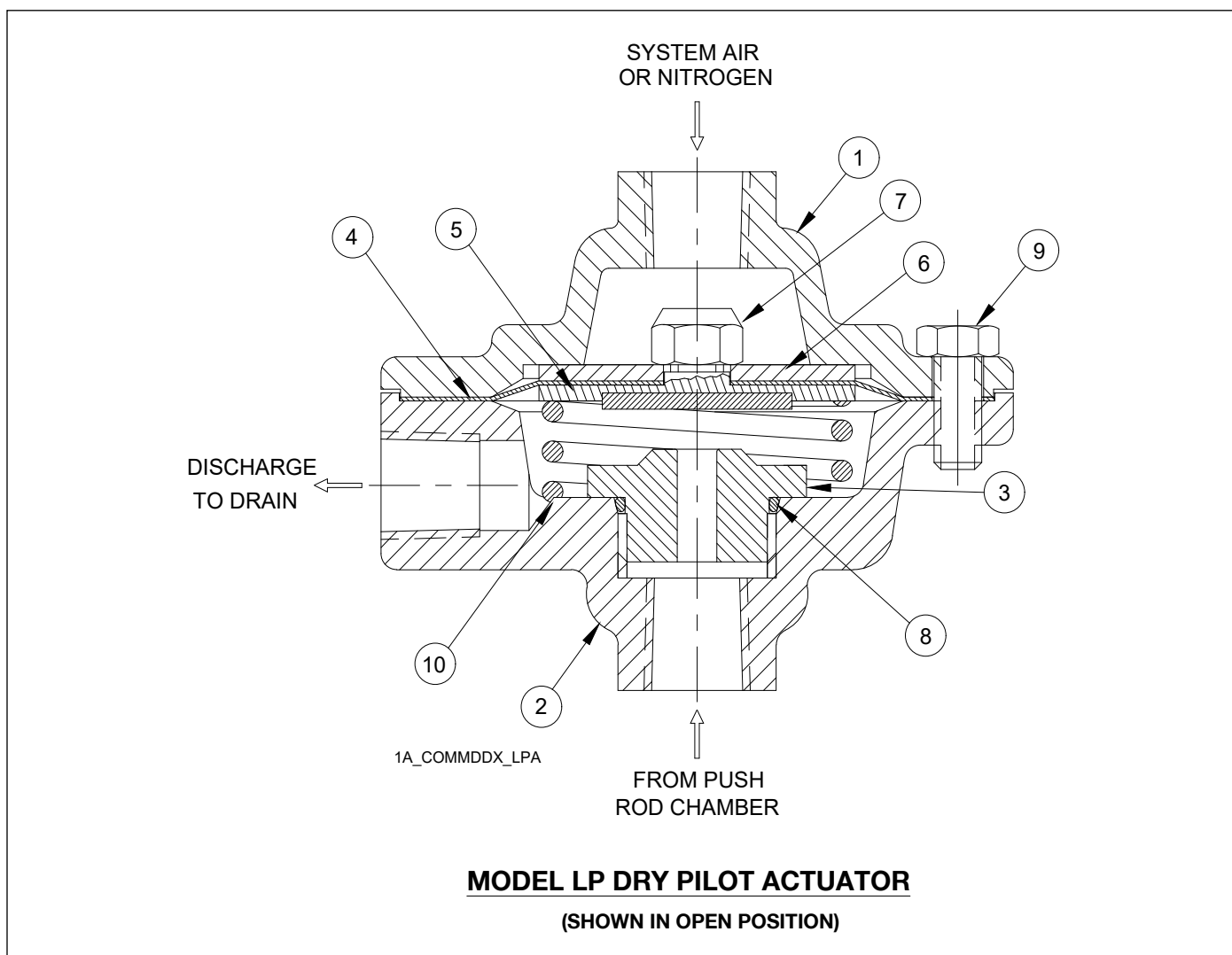


Fig. 5



## MODEL DDX VALVE WITH STAINLESS STEEL SCREW-IN SEAT

IMPORTANT NOTE: Early generation 4" and 6" DDX valves may incorporate a brass drop-in seat. Prior to ordering replacement parts, confirm the presence of a stainless steel screw-in seat or brass drop-in seat. For replacement parts for valves with brass drop-in seat, please contact Reliable Sprinkler Company Technical Services ([techserv@reliablesprinkler.com](mailto:techserv@reliablesprinkler.com))

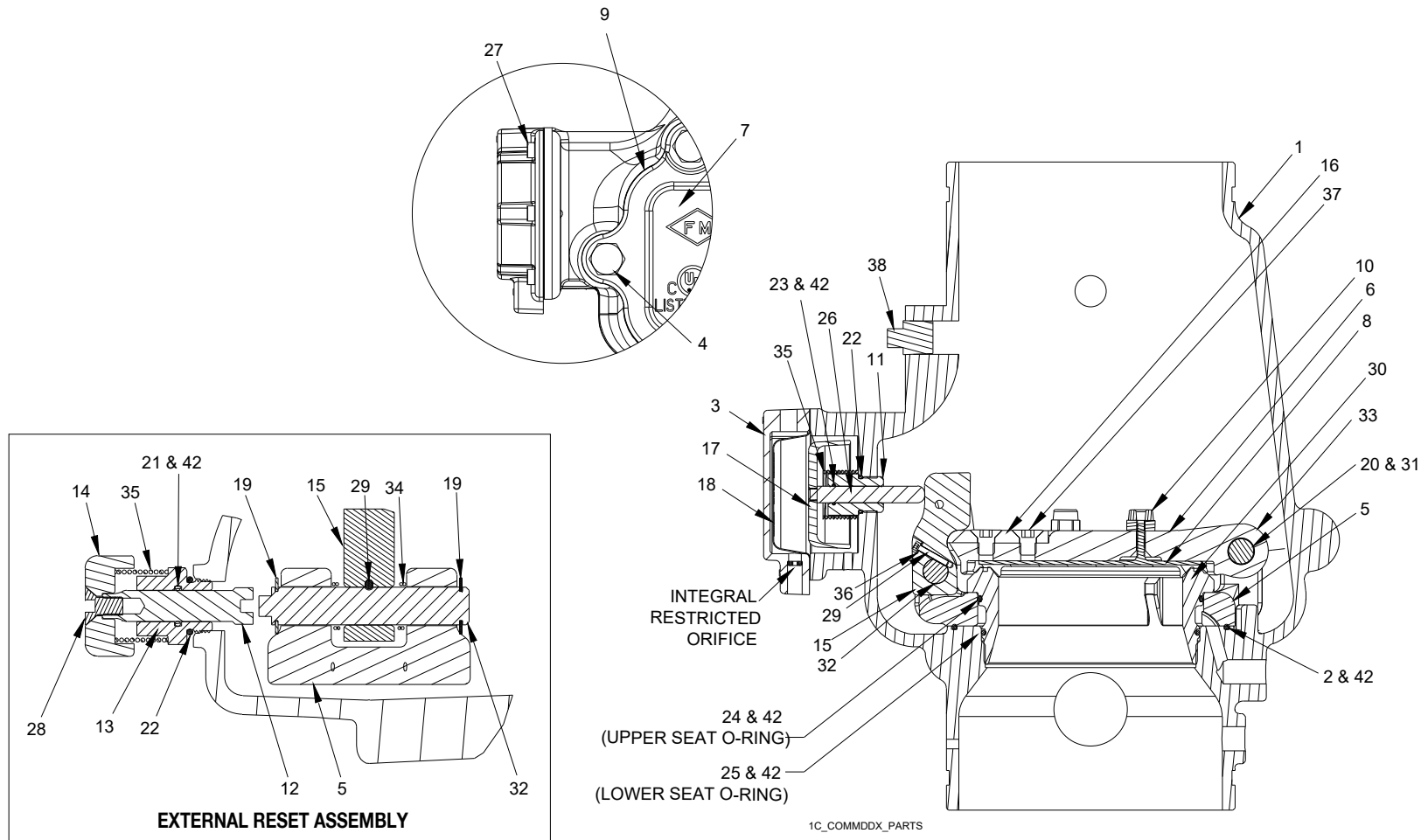


Fig. 6

## Model DDX (Screw-In Seat Configuration) Deluge Valves Parts List

Item No.	Part No.								Part Description	QTY.	Material
	2" (50mm)	2½" (65mm)	76mm	3" (80mm)	4" (100mm)	165mm	6" (150mm)	8" (200mm)			
1	91006011	91006012	91006023	91006013	91006005	91006027	91006007	91006028	Valve Body Groove/Groove	1	Ductile Iron 65-45-12
	N/A	N/A	N/A	N/A	91006045	N/A	91006067	N/A	Valve Body Flange/Groove		
	N/A	N/A	N/A	N/A	91006035	N/A	91006037	91006039	Valve Body Flange/Flange		
2	N/A	N/A	N/A	N/A	N/A	N/A		95406414	O-ring (Mounting Ring)	1	Buna-N
3	71040416								Pushrod Cover Assembly	1	Ductile Iron 65-45-12 & Brass C360000
4	91106123				N/A	N/A		N/A	Hex Bolt ½"-13 x 1¼"	6	Zinc Plated Steel
	N/A				95606107	N/A		N/A	Hex Bolt ½"-13 x 1½"	6	
	N/A				N/A	91106006		N/A	Hex Bolt ⅝"-11 x 1¼"	6	
	N/A				N/A	N/A		95606110	Hex Bolt ⅝"-11 x 2"	8	
5	91306013				91306014	91306016	91306018	Mounting Ring	1	Stainless Steel CF8 or CF8M	
6	91916003				91916014	91916016	91916008	Clapper	1	Stainless Steel CF8 or CF8M	
7	92116063				92116064	92116065	92116066	92116068	Access Cover	1	Ductile Iron 65-45-12
8	93416003				93416014	93416016		93416008	Seal Assembly	1	Stainless Steel 304 & EPDM
9	93706003				93706004	93706006		93706008	Access Cover Gasket	1	Buna-N or Neoprene
10	93722000				93722000	N/A		N/A	Bumpstop Assembly	1	Stainless Steel UNS S31600 & EPDM
	N/A				N/A	93722000		N/A		2	
	N/A				N/A	N/A		93722000		3	
11	93916006								Pushrod Guide	1	Acetal
12	93916066								Reset Shaft	1	Brass UNS C36000
13	94106066								Reset Housing	1	Brass UNS C36000
14	94356006								Reset Knob	1	Aluminum 6061
15	94506003				94506004	94506016		94506008	Lever	1	Stainless Steel UNS S17400
16	95006412				94006412	95006410		95006410	Striker	1	Aluminum Bronze C95400
17	95106006								Piston	1	Stainless Steel CF8M
18	95276006								Diaphragm	1	EPDM & Polyester
19	95306267				N/A	N/A		N/A	Retaining Ring, ⅜" Shaft, Lever Pin	2	Stainless Steel 15-7 or 17-7
	N/A				95306267	N/A		N/A	Retaining Ring, ½" Shaft, Lever Pin		
	N/A				N/A	95306269		N/A	Retaining Ring, ⅝" Shaft, Lever Pin		
	N/A				N/A	N/A		95316408	Retaining Ring, ¾" Shaft, Lever Pin		
20	95306268				N/A	N/A		N/A	Retaining Ring, ⅜" Shaft, Hinge Pin	2	Stainless Steel 15-7 or 17-7
	N/A				95306267	95306267		N/A	Retaining Ring, ½" Shaft, Hinge Pin		
	N/A				N/A	N/A		95316408	Retaining Ring, ¾" Shaft, Hinge Pin		
21	95406007								O-Ring, Reset Housing ID	1	Buna-N
22	95406024								O-Ring, Reset Housing & Pushrod Guide OD	2	Buna-N
23	95406407								O-Ring, Pushrod Guide ID	1	Buna-N
24	95406410				95406409	95436126		95406413	O-Ring, Upper Seat	1	Buna-N
25	95406411				95406420	95446226		95406412	O-Ring, Lower Seat	1	Buna-N
26	95506006								Pushrod	1	Stainless Steel UNS S30300
27	95606114								Socket Head Screw, ¼"-20 x ⅝"	6	Steel
28	95606127								Flat Head Socket Cap Screw ⅜"-16 x ¾"	1	Steel
29	95606133				N/A	N/A		N/A	Socket Head Screw #6-32 x ½"	1	Stainless Steel 18-8
	N/A				95606130	95606130		95606130	Socket Head Screw #10-32 x 1"		Stainless Steel UNS S31600
30	96016003				96016014	96016016		96016008	Seat	1	Stainless Steel CF8M
31	96206003				N/A	N/A		N/A	Hinge Pin	1	Stainless Steel UNS S30400
	N/A				96216086	96216086		96206008			Stainless Steel UNS S21800
32	96216003				N/A	N/A		N/A	Lever Pin	1	Stainless Steel UNS S17400
	N/A				96216044	96216047		96216008			Stainless Steel UNS S21800
33	96310003				96906904	96906904		96310008	Clapper Spacer	2	Teflon or Acetal

## Model DDX (Screw-In Seat Configuration) Deluge Valves Parts List (Continued)

Item No.	Part No.								Part Description	QTY.	Material
	2" (50mm)	2½" (65mm)	76mm	3" (80mm)	4" (100mm)	165mm	6" (150mm)	8" (200mm)			
34	96406003				N/A	N/A		N/A	Lever Spring	1	Stainless Steel UNS S30400
	N/A				96406004	96406005		96406008			Stainless Steel UNS S31600
35	96406906								Piston/ Reset Spring	2	Stainless Steel UNS S31600
36	96906112				N/A	N/A		N/A	Spring Lock Washer, #6	1	Stainless Steel 18-8
	N/A				96906111	96906111		96906111	Spring Lock Washer, #10		Stainless Steel UNS S31600
37	95606140				N/A	N/A		N/A	Flat Head Socket Cap Screw ¼"-20 x ½"	2	Stainless Steel 18-8
	N/A				95606139	N/A		N/A	Stainless Steel UNS S31600		
	N/A				N/A	N/A		95606135	Flat Head Socket Cap Screw ½"-13 x ¾"		Stainless Steel UNS S31600
38	98604402								Plug, ½" NPT	1	Steel
39	94616921								Knob Caution Label (Not Shown)	1	Polystyrene
40	91556922								Ball Chain, 1/8" (Not Shown) (Length is in Inches)	6	Nickel Plated Brass
41	91556923								Clamping Link, Ball Chain (Not Shown)	1	
42	699993406								O-Ring Grease, Dupont™ Krytox® GPL-205	A/R	Krytox®

### Model DDX Valve with Wet-Pilot Line Trim

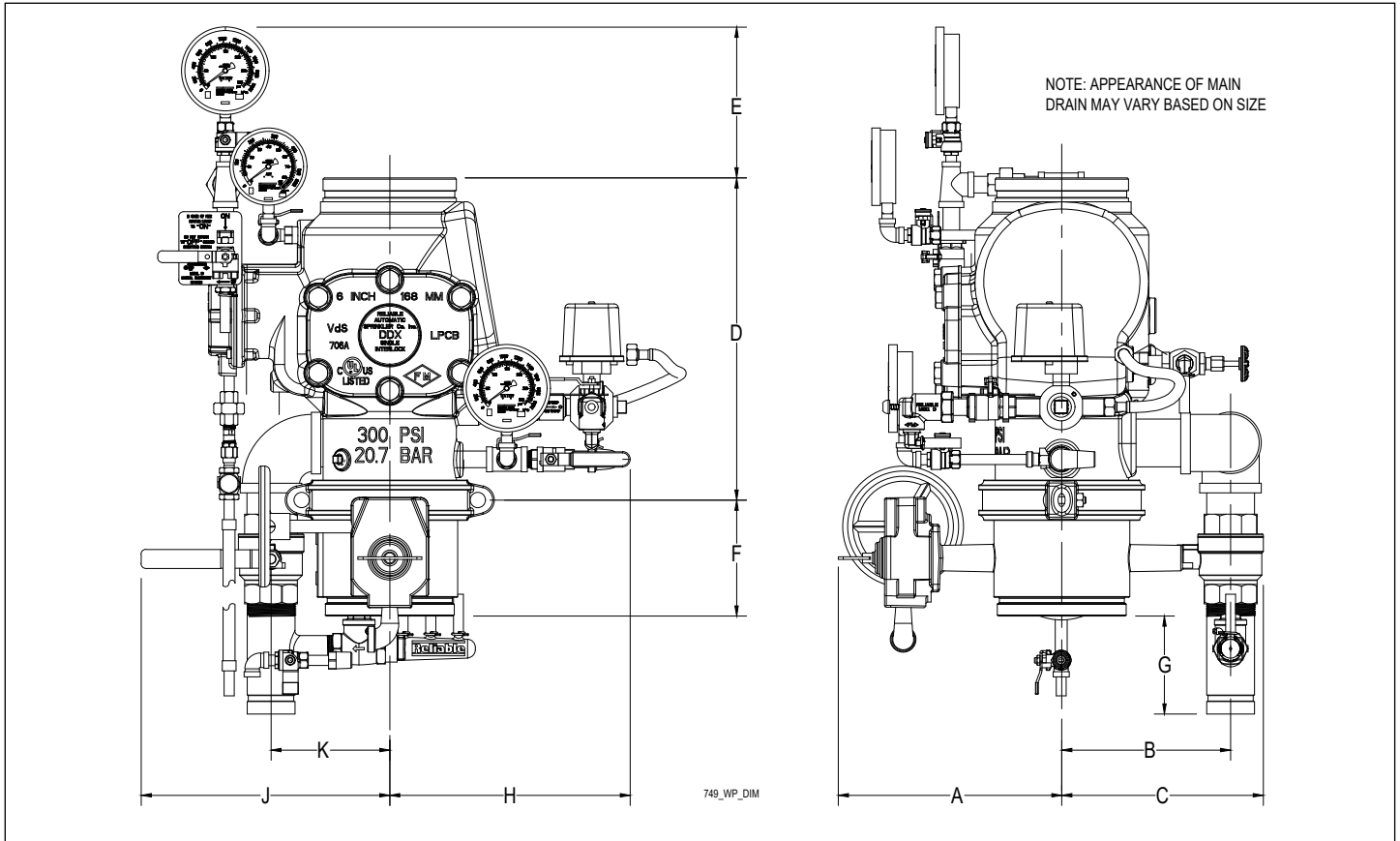


Fig. 7

### Model DDX Valve with Wet-Pilot Release Trim Dimensions

Nominal Pipe Size	Installation Dimensions in Inches (mm)										
	A	B	C	D <sup>(1)</sup>	D <sup>(2)</sup>	E	F <sup>(3)</sup>	G	H	J	K
2" (50mm)	8-1/2 (216)	7-3/4 (197)	9-1/8 (232)	12-1/2 (318)	NA	8-3/8 (213)	3-7/8 (98)	1-1/2 (38)	10 (254)	9-1/2 (241)	4 (102)
2-1/2" (65 mm), 3" (80 mm) & 76 mm	8-1/2 (216)	7-3/4 (197)	9-1/8 (232)	12-1/2 (318)	NA	8-3/8 (213)	3-7/8 (98)	1-3/8 (35)	9-7/8 (251)	9-1/2 (241)	3-7/8 (99)
4" (100 mm)	9-3/4 (248)	7-5/8 (194)	9-1/4 (235)	14 (356)	16 (406)	7-1/4 (184)	4-9/16 (116)	5-1/4 (133)	11 (279)	11-7/8 (301)	5-1/2 (140)
6" (150 mm) & 165 mm	11-1/8 (283)	8-1/8 (206)	9-3/4 (248)	16 (406)	19 (483)	6-7/8 (175)	5-7/8 (149)	3-3/4 (95)	11 (279)	12 (305)	5-1/2 (140)
8" (200 mm)	12-5/8 (321)	9 (229)	10-5/8 (270)	19-3/8 (492)	21-1/4 (540)	3-3/4 (95)	5-1/4 (134)	4-1/8 (105)	12-5/8 (306)	12 (305)	5-1/2 (140)

#### Notes:

1. End to end take out of Model DDX valve with grooved inlet.
2. End to end take out of Model DDX valve with flanged inlet where available (see page 10; also reference Bulletin 519).
3. Not applicable to 76mm or 165mm systems, or systems using a flanged inlet Model DDX valve.

### Model DDX Valve with Dry-Pilot Release Trim

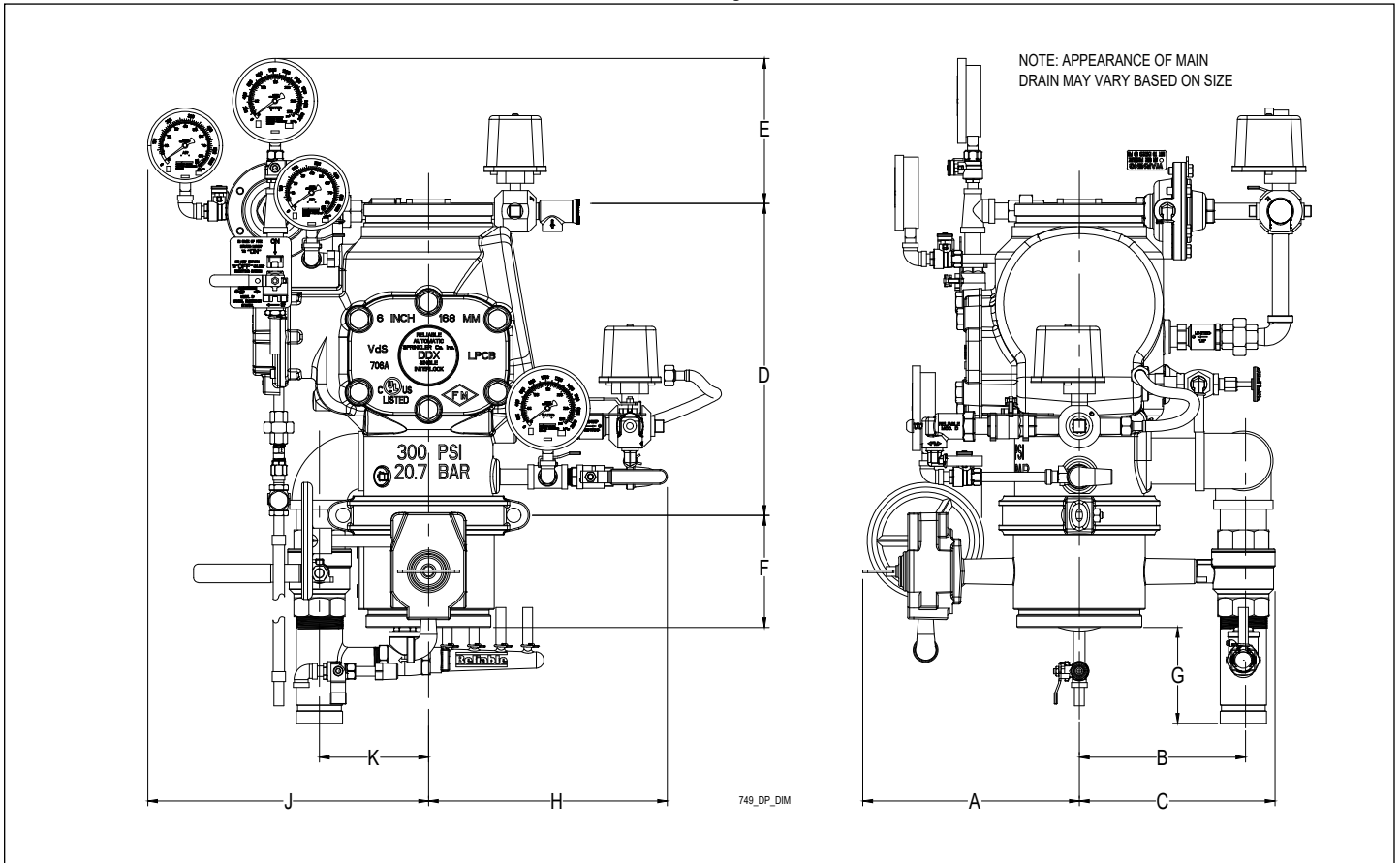


Fig. 8

### Model DDX Valve with Dry-Pilot Release Trim Dimensions

Nominal Pipe Size Inches (mm)	Installation Dimensions in Inches (mm)										
	A	B	C	D <sup>(1)</sup>	D <sup>(2)</sup>	E	F	G	H	J	K
2" (50)	8-1/2 (216)	7-3/4 (197)	9-1/8 (232)	12-1/2 (318)	NA	8-3/8 (213)	3-7/8 (98)	1-1/2 (38)	10 (254)	12-1/2 (318)	4 (102)
2-1/2" (65), 3" (80), & 76mm	8-1/2 (216)	7-3/4 (197)	9-1/8 (232)	12-1/2 (318)	NA	8-3/8 (213)	3-7/8 (98)	1-3/8 (35)	9-7/8 (251)	12-1/2 (318)	3-7/8 (99)
4" (100)	9-3/4 (248)	7-5/8 (194)	9-1/4 (235)	14 (356)	16 (406)	7-1/4 (184)	4-9/16 (116)	5-1/4 (133)	11 (279)	13-7/8 (352)	5-1/2 (140)
6" (150) & 165mm	11-1/8 (283)	8-1/8 (206)	9-3/4 (248)	16 (406)	19 (483)	6-7/8 (175)	5-7/8 (149)	3-3/4 (95)	11 (279)	14-1/4 (362)	5-1/2 (140)
8" (200)	12-5/8 (321)	9 (229)	10-5/8 (270)	19-3/8 (492)	21-1/4 (540)	3-3/4 (95)	5-1/4 (134)	4-1/8 (105)	12-5/8 (306)	15-1/4 (387)	5-1/2 (140)

#### Notes:

1. End to end take out of Model DDX valve with grooved inlet.
2. End to end take out of Model DDX valve with flanged inlet where available (see page 10; also reference Bulletin 519).
3. Not applicable to 76mm or 165mm systems, or systems using a flanged inlet Model DDX valve.

## Model DDX Valve with Electric Release Trim

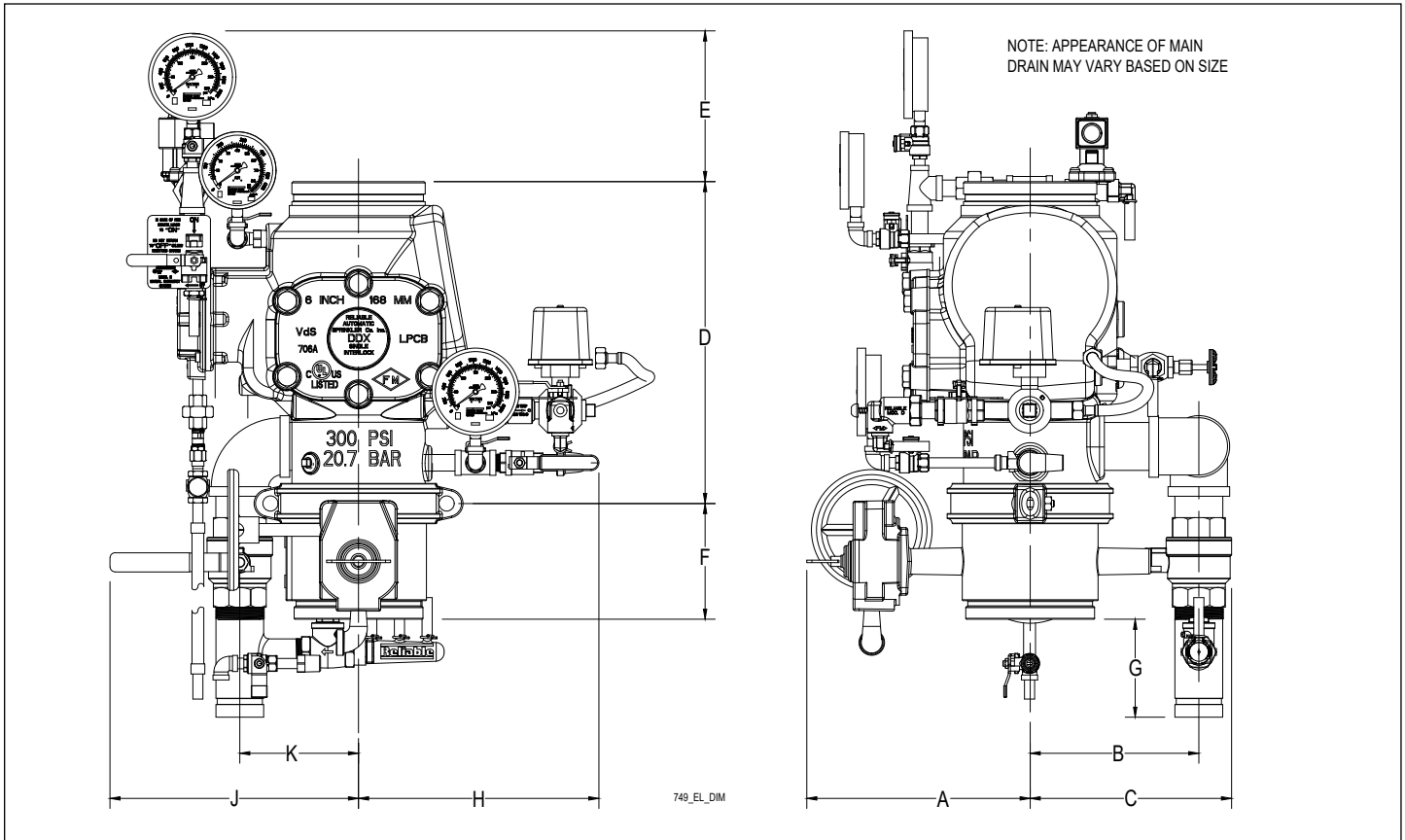


Fig. 9

### Model DDX Valve with Electric Release Trim Dimensions

Nominal Pipe Size Inches (mm)	Installation Dimensions in Inches (mm)										
	A	B	C	D <sup>(1)</sup>	D <sup>(2)</sup>	E	F <sup>(3)</sup>	G	H	J	K
2" (50)	8-1/2 (216)	7-3/4 (197)	9-1/8 (232)	12-1/2 (318)	NA	8-3/8 (213)	3-7/8 (98)	1-1/2 (38)	10 (254)	9-1/2 (241)	4 (102)
2-1/2" (65), 3" (80), & 76mm	8-1/2 (216)	7-3/4 (197)	9-1/8 (232)	12-1/2 (318)	NA	8-3/8 (213)	3-7/8 (98)	1-3/8 (35)	9-7/8 (251)	9-1/2 (241)	3-7/8 (99)
4" (100)	9-3/4 (248)	7-5/8 (194)	9-1/4 (235)	14 (356)	16 (406)	7-1/4 (184)	4-9/16 (116)	5-1/4 (133)	11 (279)	11-7/8 (301)	5-1/2 (140)
6" (150) & 165mm	11-1/8 (283)	8-1/8 (206)	9-3/4 (248)	16 (406)	19 (483)	6-7/8 (175)	5-7/8 (149)	3-3/4 (95)	11 (279)	12 (305)	5-1/2 (140)
8" (200)	12-5/8 (321)	9 (229)	10-5/8 (270)	19-3/8 (492)	21-1/4 (540)	3-3/4 (95)	5-1/4 (134)	4-1/8 (105)	12-5/8 (306)	12 (305)	5-1/2 (140)

#### Notes:

1. End to end take out of Model DDX valve with grooved inlet.
2. End to end take out of Model DDX valve with flanged inlet where available (see page 10; also reference Bulletin 519).
3. Not applicable to 76mm or 165mm systems, or systems using a flanged inlet Model DDX valve.

The equipment presented in this bulletin is to be installed in accordance with the latest published Standards of the National Fire Protection Association, Factory Mutual Research Corporation, or other similar organizations and also with the provisions of governmental codes or ordinances whenever applicable.

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