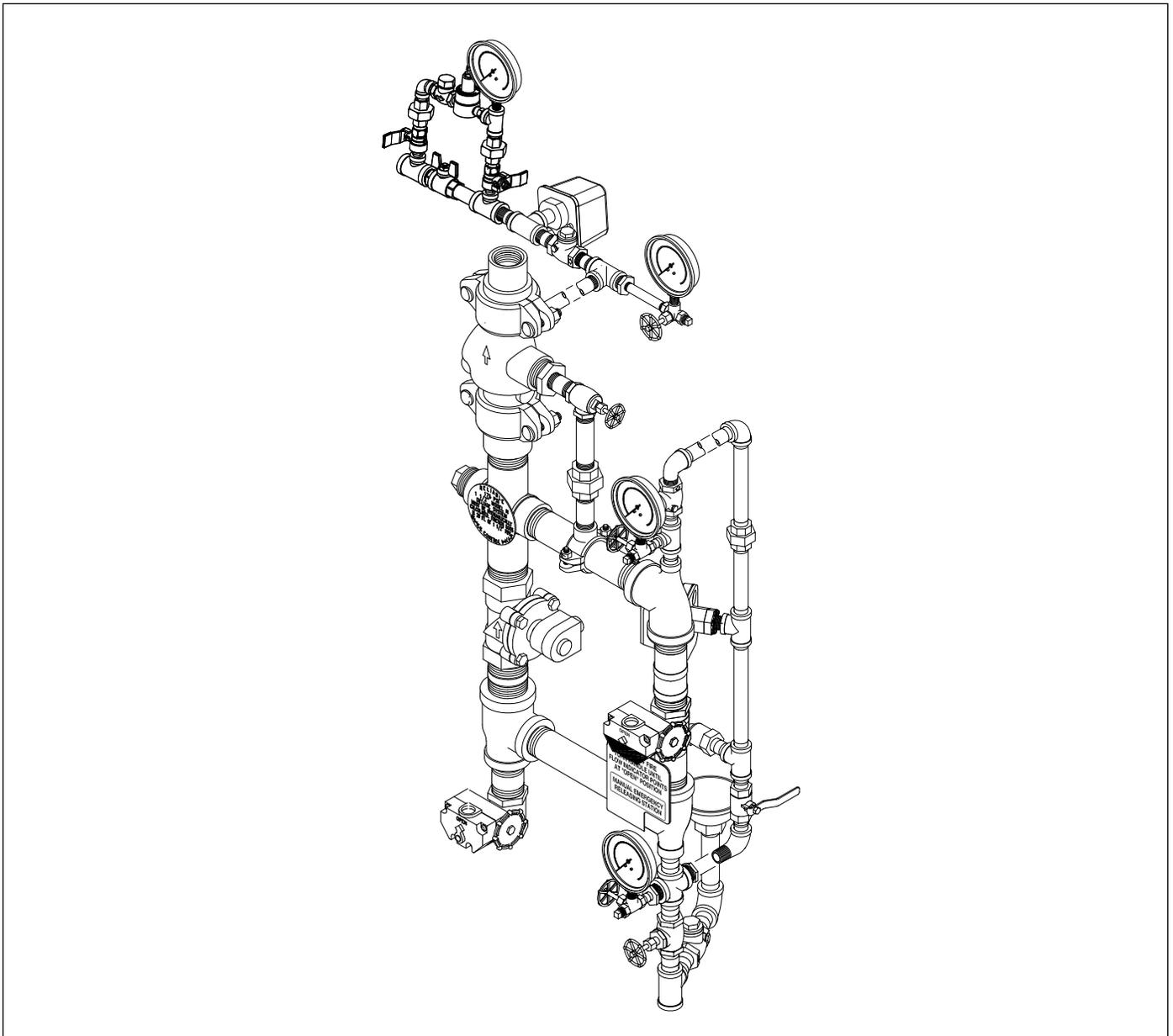




# Model H Double Interlock Preaction System 1½" (40mm) Size

## Instructions for Installation, Operation, Care and Maintenance

**10 PSI (0.7 bar) Minimum Supervisory Pressure  
With Electric/Electric Actuation  
Type D System**



## General Description

Reliable Preaction Systems are designed for water sensitive areas which require protection from inadvertent water flow into the sprinkler system piping.

The major benefits of a preaction system, when compared with a wet pipe system, are summarized as follows:

- A. A fire alarm sounds with activation of a detector and prior to the operation of a sprinkler, which may enable extinguishing the fire by handheld means before the operation of any sprinkler head occurs.
- B. An alarm condition occurs whenever the integrity of piping or sprinklers is accidentally or intentionally disturbed; however, no water flow or water damage will result at that time.
- C. Speedy detection with an early fire alarm is provided by fire detectors, without the delay associated with water delivery time in a wet pipe system 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.

To flow water into an Electric/Electric double interlock preaction system, two events must take place. A fire detection device must operate, and a low pressure switch must be operated by the loss of system pressure (sprinkler operation). These two signals must coexist at the releasing control panel which only then will energize the solenoid releasing valve, causing water flow into the system and out of the open sprinkler(s).

This bulletin describes a Reliable Double Interlock Type D Preaction System which utilizes the Reliable Model H 1½" (40mm) Deluge Riser Assembly. This double interlock system uses fire detection devices and system supervisory pressure as two separate zones (inputs) to a cross-zoned Releasing/Control Panel. The system is pressurized (supervised) with air or nitrogen and monitored by the low pressure switch. The solenoid releasing valve remains closed until energized by the releasing control panel. This will occur only when both a fire detection device has operated and the low pressure switch has detected sufficient loss of system supervisory pressure (sprinkler operation).

In the event that the system piping is ruptured or a sprinkler head is accidentally opened, the low pressure switch will operate and an alarm will sound. The riser assembly however, will not release water since the solenoid valve remains closed due to only one input into the cross-zoned control panel.

In the event that a fire detection device is falsely operated, the control panel will activate an alarm. The riser assembly, however, will not release water since the solenoid valve remains closed due to only one input into the cross-zoned control panel.

The requirement for simultaneous inputs from both a detector and the loss of supervising pressure before the riser assembly releases water into a preaction system assures maximum protection against inadvertent water flow before a sprinkler is open. Double interlock systems are primarily used to protect refrigerated areas where accidental water release before a sprinkler is opened can cause ice blockage, resulting in an inoperative sprinkler system and substantial property damage.

A hydraulic manual emergency releasing station is standard equipment in the Model H Riser Assembly. It is identified by a nameplate attached above the releasing valve.

A preaction trim kit is available to provide a bypass drain line and to attach the air or nitrogen supply required to supervise the preaction system. This kit includes a UL Listed Reliable Model G Right Check™ Valve supplied with rigid grooved pipe couplings, as illustrated in Figure 2. To complete the Double Interlock preaction system, the switch/gauge trim kit illustrated in Figure 5 must be added.

## Approvals

The 1½" Model H Riser Assembly is Underwriters Laboratories, Inc. Listed in the Special System Water Control Valves Deluge Type (VLFT) category. It is also listed by Underwriters' Laboratory of Canada. The Model G Right Check™ Valve is listed by UL and ULC. NYC MEA 258-93-E applies to both the Model H Riser Assembly and the Model G Right Check™ Valve.

## Technical Data

The 1½" (40mm) Reliable Double Interlock Preaction System is rated for a minimum supply pressure of 20 psi (1.4 bar) and a maximum supply pressure of 175 psi (12 bar).

Friction loss, expressed in equivalent length of Sch. 40 pipe and based on Hazen-Williams formula with C=120, and a flowing velocity of 15 ft./sec (4.6 m/s), is 29 ft (8.84m) for the Model H Riser Assembly, and 7 ft. (2.1m) for the 2½" (65mm) Model G Right Check™ Valve.

Shipping Weights:

Model H Riser Assembly	52 lbs (23.6 kg)
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The following list of bulletins describe components which are used with this system:

Deluge Riser Assembly	507
Water Flow Pressure Alarm Switch	Potter #5400928
Pressure Maintenance Device	251
Releasing/Control Panel	Potter #5403550
Automatic Nitrogen Reg. Device	254
Model G Riser Check Valve	806
High/Low Air Pressure Switch	Potter #5401524

### System Design Considerations

The automatic sprinklers, releasing devices, electric releasing control panel, fire detection devices, manual pull stations, and signaling devices which are utilized with the Systems must be UL and/or ULC Listed, as applicable.

The Reliable Double Interlock Praction Riser equipment and all interconnecting piping must be located in a readily visible and accessible location and in an area which can be maintained at a minimum temperature of 40°F (4°C).

**NOTE:** HEAT TRACING IS NOT PERMITTED.

### Hydrostatic Testing of 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 and maintain that pressure without loss for two hours. Fire sprinkler systems with working pressures above 150 psi are required to be hydrostatically tested at 50 psi above the system working pressure and maintain that pressure without loss for two hours. 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 Air Pressure Requirements

The Reliable Double Interlock Type D Praction System requires a minimum pneumatic pressure of 10 psi (0.7 bar) to supervise the sprinkler system. The Model A Pressure Maintenance Device is used to maintain system pneumatic pressure at approximately 15 psi (1.03 bar). The Model A Pressure Maintenance Device controls supervisory pressure where a stored source of clean compressed air or nitrogen gas is available at all times. Refer to Reliable technical bulletin 251 for instructions on adjusting system pressure.

The high/low pressure alarm switch should be set to operate at approximately 10 psi (0.3 bar) on decreasing pneumatic pressure and 20 psi (1.38 bar) on increasing pneumatic pressure. Adjustment can be made to the pressure switch by following the manufacturer’s installation and maintenance procedures.

### System Electrical Requirements

All detection, releasing, alarm, and notification devices for the Double Interlock System can be supervised by the Potter PFC-4410G3 Releasing Control Panel or other approved panel listed to operate the solenoid valve.

### System Operation

The Reliable Double Interlock Type D Praction System requires two independent events to coexist before water flow will occur. A fire detection device must operate and the low pneumatic pressure switch must actuate by reducing the system supervising pressure (sprinkler operation). The cross-zoned control panel will now energize the solenoid valve to release water through the riser assembly into the system piping and out the open sprinkler for complete operation of the system.

The Reliable Double Interlock Praction System will automatically operate only when both a fire detection device and the low supervising pressure switch are activated. Operation of either one of these items will only cause an alarm to annunciate, and will not fill the sprinkler system piping with water.

When the releasing control panel energizes the solenoid valve open, water flows from the supply through the riser assembly into the system and to the water flow alarm pressure switch. The valve maintains its open position until the solenoid is de-energized.

**Note:** The listed release control panel used must incorporate a latching circuit to maintain the solenoid valve in the open position until the detection devices are cleared and the control panel is reset.

After system shutdown and draining, the riser assembly is easily reset without special tools. Refer to section “Resetting Model H Double Interlock Praction System” for instructions on returning the system to normal operation.

## Double Interlock Riser Installation

The recommended sequence of installation is as follows:

1. Install the Pre-assembled Deluge Riser Assembly (P/N 6503003001) in accordance with Bulletin 507, "Model H Deluge Riser Assembly."
2. The Preaction Trim Kit (P/N 6501200112), illustrated in Figure 2, consists of items 1 through 17. The assembly has a convenient arrangement for draining the sprinkler system through the Model H Riser Assembly drain line. Assemble the preaction trim kit, as illustrated, using a suitable PTFE - based pipe thread sealant applied to each male thread.

Assemble rigid couplings by first applying a thin coat of silicone or other lubricant that does not contain hydrocarbons to the lips and outside surfaces of the gasket. Position gaskets uniformly on the valve and adjacent reducers so that all grooves are exposed. Place coupling housings over gaskets and engage the housing keys in the grooves. Insert bolts and tighten nuts alternately until housing halves are drawn together uniformly.

3. The Double Interlock Switch/Gauge Trim Kit (P/N 6501200110), illustrated in Figure 3, consists of items 1 through 6. Assemble the kit using a suitable PTFE - based pipe thread sealant applied to each male thread. Verify that the check valve orientation is according to the directional flow arrow illustrated.

Install the pressure gauge included with this trim kit into the Model A Pressure Maintenance Device after removing the 1/4" NPT (R1/4) plug.

The pressure switch is factory adjusted for 15 psi (1.03 bar) supervisory pressure. If field adjustment is required, refer to the switch manufacturer's technical data sheet. In no case shall the supervisory pressure be less than 10 psi (0.7 bar).

Switch contact ratings are:

10A, 1/2 HP @ 125/250 VAC

2.5A, @ 6/12/24 VDC

4. Install the Pre-assembled Model A Pressure Maintenance Device (P/N 6304000100) with pressure gauge in place, onto the Switch/Gauge Trim Kit.
5. Connect the supervisory pneumatic source to the inlet of the Model A pressure maintenance device. Supervisory pressure must be from a stored source of clean compressed air or nitrogen meeting the requirements of NFPA 13 and must be available at all times.
6. Adjust the outlet pressure of the Model A Pressure Maintenance Device to 15 psi (1.03 bar), or to other desired pressure by following the instructions in Reliable technical bulletin 251. In no case shall the supervisory pressure be set below 10 psi (0.7 bar).

## Maintenance

Reliable Double 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. Systems should be tested, operated, cleaned and inspected at least annually, and parts replaced as required. Refer to Bulletin 507 for information regarding maintenance of the solenoid valve and the manual emergency station valve. Bulletin 251 provides information on the Model A Pressure Maintenance Device.

## Resetting Double Interlock Systems

1. Close the supervised valve controlling water supply to the riser assembly and shut off the system air/nitrogen supply at the Model A Pressure Maintenance Device.
2. Open all drain valves and the manual emergency station valve to drain the system.
3. Open all drain valves and vents at low points throughout the system, closing them when flow of water to drain has stopped.
4. Inspect and replace any portion of the sprinkler system and detection system exposed to fire conditions. Reset detectors.
5. Restore the system supervisory pressure by opening the valves on the Model A Pressure Maintenance Device (refer to Bulletin 251) and adjusting the regulator, as required.
6. Verify that the by-pass drain valve is closed to prevent the loss of pneumatic pressure out of the automatic drain valve. When the supervisory pressure has been properly restored, the pressure switch will automatically reset (contacts will open).
7. Reset the release control panel. This will de-energize the solenoid valve and return it to the normally closed position.
8. Close the emergency manual release station (opened in step 2).
9. Slightly open the main water supply control valve, closing the main drain valve when water flows through it.
10. Close the control valve and observe water supply pressure gauge. System is confirmed to be leak-tight when no drop in pressure occurs.
11. Fully open the main water supply control valve and confirm it is properly supervised.

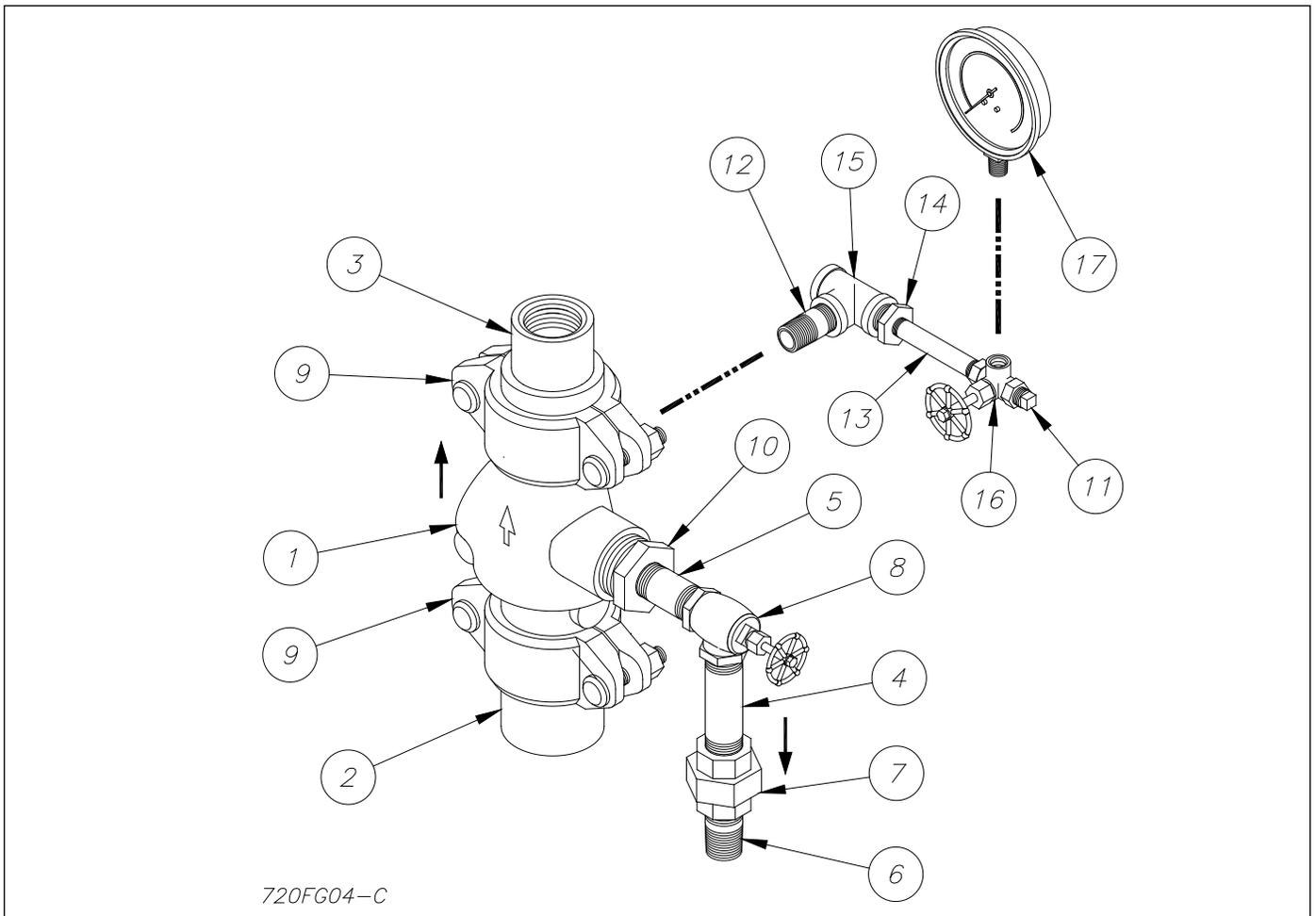


Figure 1 - Preaction Trim Kit

**Parts List, P/N 6501200112**

Item No.	Part No.	Description	No.Req'd.
1	6107020000	Valve, Check, 2½" Model G	1
2	98050002	Reducer, 2½" GRV. x 2" NPTF	1
3	98050003	Reducer, 2½" GRV. x 1½" NPTF	1
4	98543234	Nipple, ¾" x 3½" Lg. (Galv.)	1
5	98543231	Nipple ¾" x 3" Lg. (Galv.)	1
6	98543279	Nipple, ¾" x Close (Galv.)	1
7	98815202	Union, ¾" (Galv.)	1
8	98840113	Valve, Angle ¾" NPT	1
9	7S05101000	Coupling Rigid, 2½"	2
10	98048035	Bushing, 1¼" x ¾" (Galv.)	1
11	96614403	Plug, ¼" (Galv.)	1
12	98543212	Nipple, ½" x Close (Galv.)	1
13	96543220	Nipple, ¼" x 3" Lg. (Galv.)	1
14	98048000	Bushing, ½" x ¼" (Galv.)	1
15	98761651	Tee, ½" (Galv.)	1
16	98840160	Valve, 3-way gauge, ¼"	1
17	98248000	Gauge, Air Pressure	1

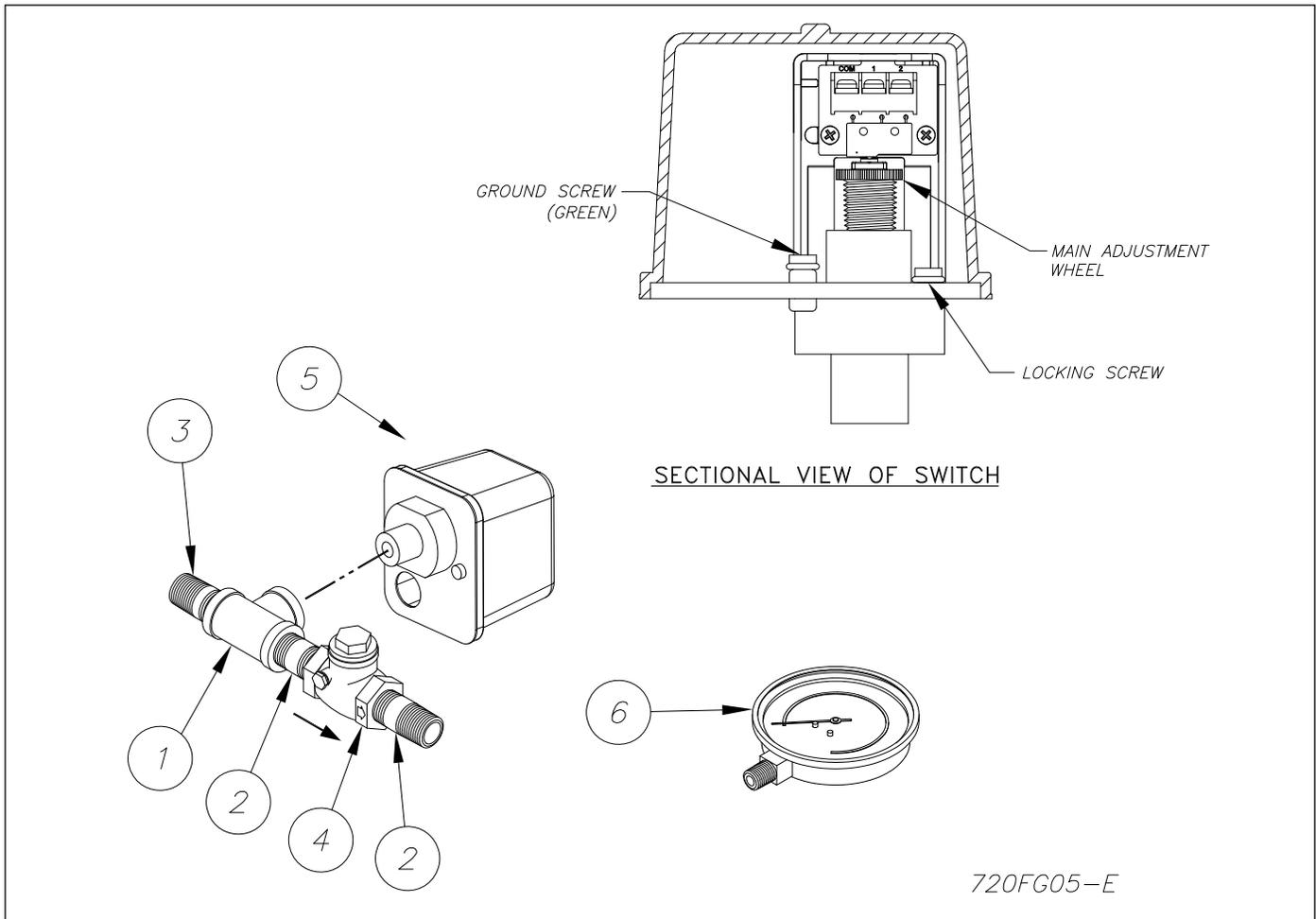


Figure 2 - Double Interlock  
Switch/Gauge Trim Kit

**Parts List, P/N 6501200110**

Item No.	Part No.	Description	No. Req'd
1	96606612	Tee, 3/4" x 1/2" x 1/2" (Galv.)	1
2	98543212	Nipple, 1/2" x Close (Galv.)	2
3	98543279	Nipple, 3/4" x Close (Galv.)	1
4	98840181	Valve, Check, Horizontal, 1/2"	1
5	6990006382	Switch, Pressure (PS10-2)	1
6	98248000	Gauge, Pressure, Air	1

**Inspection and Testing**

1. Confirm the valve controlling water supply to the riser assembly is open fully and properly supervised.
2. Confirm that all pressure gauge valves are open, and that the Model A Pressure Maintenance Device quick fill valve is closed. The two by-pass line valves must be fully open.
3. Check that system supervising pressure is approximately 15 psi (1.03 bar).
4. To test full operation of system, activate the detection system and discharge air or nitrogen pressure from the system.

**Note:** This test will cause water flow into the system. See next section for testing without causing water flow. .

## Testing Without Causing Water Flow

1. Close the supervised valve controlling water supply to the riser assembly, and note the lower water pressure gauge reading.
2. Activate the detection system and discharge air or nitrogen pressure from the system.
3. Confirm that a sudden drop of water pressure occurs when the solenoid valve opens. When water pressure drops to zero, open the main drain valve and bypass valves to drain any water from above the main control valve.
4. Reset system by following the operation described previously. All detection devices must be reset before the Releasing Panel can be reset.
5. Slowly open the supervised valve controlling water supply to the riser assembly, closing the main drain valve after water flows steadily through it. Fully open the main control valve and confirm it is properly supervised. Verify there is adequate water supply pressure and proper pneumatic supervisory pressure on the appropriate gauges. There should be no pressure reading on the water gauge directly above the manual emergency releasing station when the system is properly reset.

## Guarantee

For guarantee, terms, and conditions, please visit [www.reliablesprinkler.com](http://www.reliablesprinkler.com).

## Ordering Information:

### Specify:

Model H 1-1/2" Deluge Riser Assembly PN 6503003001

AND

Double Interlock Trim 1-1/2" PN 6503003405

**Note:** Double interlock trim package includes one each PN 6501200112 Single Interlock Preaction Kit, PN 6501200110 Double Interlock Switch/Gauge Trim Kit, and PN 6304001110 Model A Pressure Maintenance Device.

All other accessories to be ordered separately.

# Installation Dimension in Inches

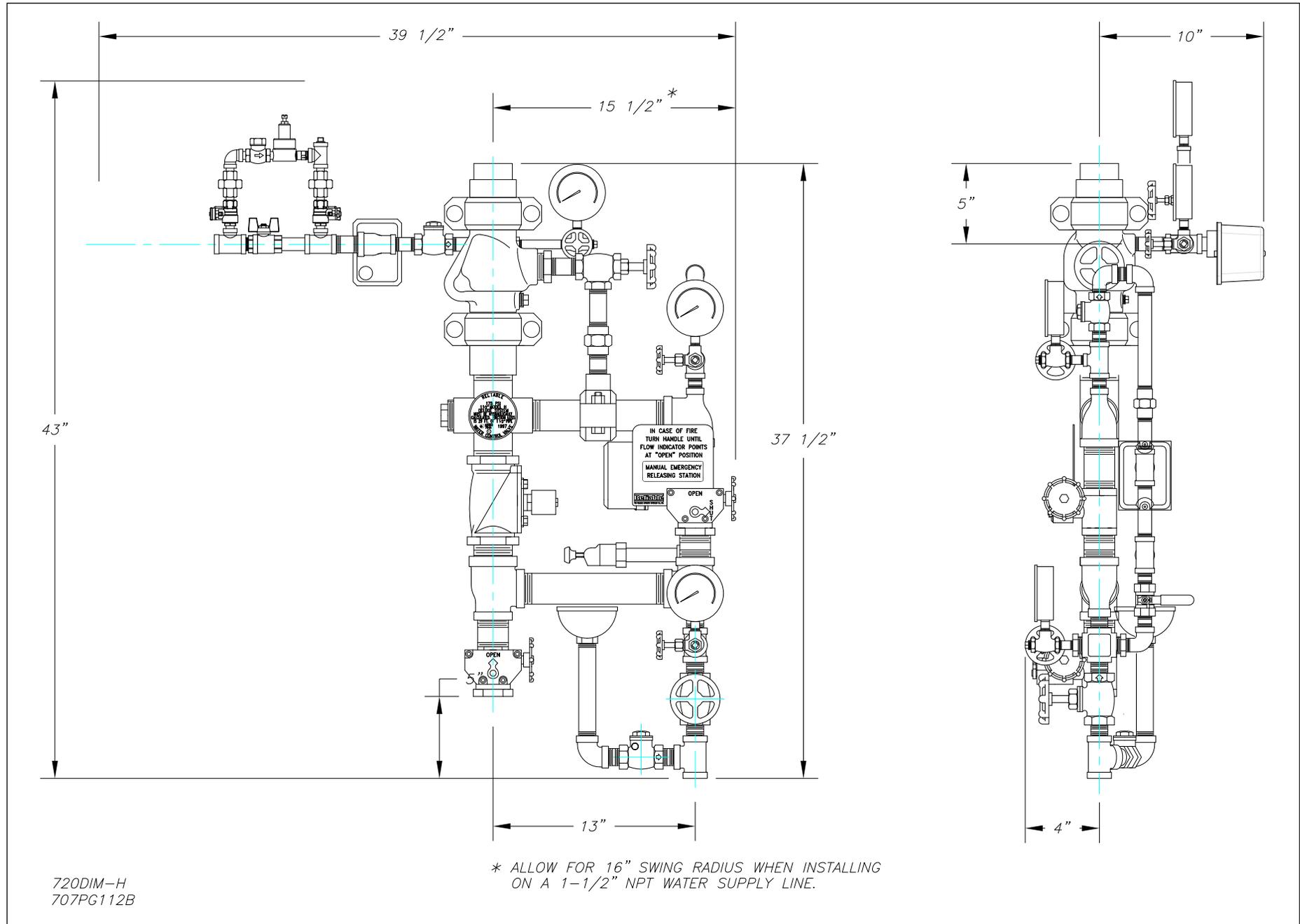


Figure 3

## **SOLENOID VALVE INSPECTIONS, TESTS AND MAINTENANCE**

**WARNING: THE OWNER IS RESPONSIBLE FOR MAINTAINING THE FIRE PROTECTION SYSTEM IN PROPER OPERATING CONDITION. ANY SYSTEM MAINTENANCE OR TESTING THAT INVOLVES PLACING A CONTROL VALVE OR DETECTION SYSTEM OUT OF SERVICE MAY ELIMINATE THE FIRE PROTECTION OF THAT SYSTEM. PRIOR TO PROCEEDING, NOTIFY ALL AUTHORITIES HAVING JURISDICTION. CONSIDERATION SHOULD BE GIVEN TO EMPLOYMENT OF A FIRE PATROL IN THE AFFECTED AREA.**

**WARNING: PRIOR TO OPERATING THE SOLENOID VALVE, BE SURE TO CLOSE THE SYSTEM CONTROL VALVE TO AVOID UNINTENTIONAL OPERATION OF THE DELUGE VALVE**

1. Inspections: It is imperative that the system be inspected and tested in accordance with NFPA 25 on a regular basis. The frequency of the inspections may vary due to contaminated water supplies, corrosive water supplies, or corrosive atmospheres. In addition, the alarm devices, detection systems, or other connected trim may require a more frequent schedule. Refer to the system description and applicable codes for minimum requirements.
2. The valve must be inspected at least monthly for cracks, corrosion, leakage, etc., and cleaned, repaired, or replaced, or replaced as necessary.
3. If leakage is suspected through the solenoid valve, the valve diaphragms and seats should be inspected and if necessary, repaired or replaced.

**WARNING: CLOSE SYSTEM CONTROL VALVE, TURN OFF POWER SUPPLY, AND DEPRESSURIZE VALVE BEFORE DISASSEMBLING VALVE. IT IS NOT NECESSARY TO REMOVE THE VALVE FROM THE PIPE LINE TO MAKE INSPECTIONS.**

4. When lubricating valve components, use high grade silicone grease (Dow Corning® 111 Compound Lubricant or equal).
5. When reassembling, tighten parts to torque values indicated in the manufacturer's maintenance instructions (packed with valve).
6. After maintenance is completed, operate the valve a few times to be sure of proper operation. A metallic "click" signifies the solenoid is operating.
7. All service must be performed by qualified personnel. Upon completion of inspections or replacement of the valve, the entire system must be checked for proper operation. See appropriate system description and testing instructions for additional information.

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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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