

# Reliable®

## Model DDX PrePaK™, Type F Preaction System

2" (50mm), 2½" (65mm), 3" (80mm),  
4" (100mm), 6" (150mm) & 8" (200mm)

## Instructions for Installation, Operation, Care and Maintenance

### Double Interlock Electric/Pneumatic Release

8 psi - 24 psi (0.6 bar - 1.7 bar) Recommended Supervisory Pressure



### General Description

The Reliable Type F Model DDX PrePaK system is a completely self-contained, supervised preaction system that can be readily installed within a floor space of less than 7.5 square feet (0.70 square meters) (not including door swing). Refer to Fig. 1 for cabinet dimensions. Installation of the PrePaK system (not including exterior devices, i.e., detectors and alarm bells), requires just three piping connections. These connections are the water supply, the sprinkler system and the drain. Reference locations of these piping connections are shown in Fig. 1. Two electrical supply connections are required. **Note:** The Model DDX PrePaK system is available with an optional 115V VAC (60Hz) air compressor and an optional Potter Model PFC-4410-RC Releasing/Control panel wired for a 120 VAC (50Hz) or 220 VAC (50/60Hz) power supply.

Full assembly drawings for the units are available on the Reliable Automatic Sprinkler Company website ([www.reliablesprinkler.com](http://www.reliablesprinkler.com))

The Reliable Type F PrePaK system utilizes an optional Potter Model PFC-4410-RC Releasing/Control Panel. This fully programmable, microprocessor-based releasing panel is Underwriters Laboratories, Inc. Listed and is in compliance with NFPA 13 and NFPA 72. Because the PFC-4410-RC is totally zone and output programmable, the Reliable Type F PrePaK system can be utilized in many different preaction applications without having to rewire any of the factory installed devices. Once the previously described connections are completed, the 24 VDC detectors, output devices, and relay contacts may be connected to achieve the desired system implementation.

The Type F PrePaK system is designed specifically for double interlock applications. Reliable double interlock preaction systems are designed for water sensitive areas that require protection from inadvertent water flow into the sprinkler system piping.

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

- A. A fire alarm sounds prior to the flow of water from a sprinkler, which may enable extinguishment of the fire by handheld means before the operation of any sprinkler occurs.

- B. An annunciator signals whenever the integrity of piping or sprinklers is accidentally or intentionally disturbed; however, no water flow occurs at that time.
- C. Detection and notification of a fire condition 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 and operated sprinkler.

To flow water into the system piping of a Type F double interlock preaction system, two events must take place:

- 1) A fire detection device must detect heat and/or smoke thereby causing the releasing/control panel to energize the normally-closed solenoid valve.
- 2) The sprinkler system piping must discharge enough supervisory air for the Model LP Dry Pilot Actuator to operate. This is generally the result of a sprinkler operating due to fire.

In the event that the system piping is ruptured, or a sprinkler head is accidentally opened, the Model LP Dry Pilot Actuator will open and a low system air pressure alarm will sound. The Model DDX Deluge Valve, however, will not be released to flow water since the solenoid valve still remains closed. Conversely, in the event of a false detection signal, the releasing/control panel will activate an alarm, but the Model DDX Deluge Valve will not flow water due to the fact that the Model LP Dry Pilot Actuator remains closed.

When using the Reliable Type F PrePaK system in double interlock applications the sprinkler system is pressurized (supervised) with air provided by the optional factory-installed air compressor (or on-site Nitrogen supply) and is monitored by a system pressure switch. If Nitrogen is used as the supervisory gas, an optional Nitrogen Kit is available. This kit contains a regulator and an additional pressure switch that is used to monitor any low pressure conditions that may arise due to having a limited Nitrogen supply. The optional factory-installed air compressor can be utilized for make-up air until the Nitrogen supply can be replenished.

**Note:** Compressed air is not to be considered as dry air and may create ice plugs in the sprinkler system piping.

A Model B Hydraulic Manual Emergency Releasing station is standard equipment in the Type F PrePaK system. 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 the PrePaK system assembly. The cable tie is designed to allow, in case of an emergency, forceful turning of the valve handle to the ON position.

### Listings and Approvals

1. Underwriters Laboratories, Inc. Listed and Certified for Canada\* (cULus) as an assembled unit in the "Special System Water Control Valves Assembled Units" category, (VKYL).  
\*The system's pressure switches must be specified to meet Canadian requirements. This option is available.

2. Factory Mutual Approved as a Refrigerated Area Sprinkler System for use in refrigerated rooms or buildings. Refrigerated area sprinkler systems are FM Approved as complete systems. Systems are FM approved for use with thermal detectors and Class A detector wiring only.
3. Factory Mutual Approved for applications where FM Global Data Sheets allow the use of double-interlock preaction systems.
4. OSHPD Special Seismic Certification Preapproval (OSP) for SDS=2.50 and z/H=1, when installed with optional seismic kit.

**Note:** Although PrePaK system units are UL Listed, custom built units are sometimes supplied upon request. The components within these special units maintain their individual Listings/Approvals, whereas the assembled units do not.

PrePaK system units are also available without their Potter PFC-4410-RC Releasing/Control Panel and Air Compressor. These units will still retain their Listings/Approvals, however the installing contractor should make sure that any remote controlled Releasing/Control Panels used with these units are Listed/Approved and programmed to handle the required sequence of operation necessary to operate the automatic sprinkler system. Any unauthorized modification or addition made on-site to a factory-built Listed/Approved unit will void the Listing/Approval. Such modifications or additions may void the unit's warranty as well. Consult Reliable's Technical Services Department before proceeding with any such modifications or additions.

### Technical Data

1. The Reliable Type F Model DDX PrePaK system is rated for a minimum water supply pressure of 20 psi (1.4 bar) and a maximum water supply pressure of 250 psi (17.2 bar). Note: 1 bar = 100 kPa.
2. Friction loss, expressed in equivalent length of Schedule 40 pipe and based on Hazen-Williams Formula is:

System Size:	Equivalent Length
2" (50mm)	19.4 ft (1.3 m)
2½" (65mm)	24.5 ft (1.8 m)
3" (80mm)	28.9 ft (3.8 m)
4" (100 mm)	32.8 ft (17.7 m)
6" (150 mm)	54.7 ft (21.8 m)
8" (200mm)	79.3ft (24.2m)

These values account for the Model DDX Deluge Valve, supply manifold tee, butterfly control valve, and small pipe/manifold located directly above Model DDX Deluge Valve.

3. Shipping Weight:

System Size	Weight
2" (50 mm), 2½" (65 mm) & 3" (80 mm)	554 lb. (252 kg)
4" (100 mm)	710 lbs (322 kg)
6" (150 mm)	800 lbs (363 kg)
8" (200mm)	1350lbs (531kg)

4. Please reference Figure 1 for dimensions.

# ASSEMBLY DIMENSIONS INCHES [CM]

SYSTEM SIZE	A	B	C	D	E	F	G	H	J	M		L	WITHOUT SYSTEM CONTROL VALVE	WITH SYSTEM CONTROL VALVE	N	P
										K (RIGHT)	K (LEFT)					
2" (50MM)	25.0 [63.5]	28.3 [71.8]	70.0 [177.8]	50.0 [127.0]	13.1 [33.2]	14.3 [36.3]	14.3 [36.3]	6.3 [16.0]	13.6 [34.5]	1.8 [4.5]	3.3 [8.3]	22.0 [55.8]	27.2 [69.0]	24.1 [61.2]	13.0 [33.0]	9.0 [22.8]
2-1/2" (65MM)	25.0 [63.5]	28.3 [71.8]	70.0 [177.8]	50.0 [127.0]	13.1 [33.2]	14.3 [36.3]	14.3 [36.3]	6.3 [16.0]	13.6 [34.5]	1.8 [4.5]	3.3 [8.3]	22.0 [55.8]	27.9 [70.8]	24.1 [61.2]	13.0 [33.0]	9.0 [22.8]
3" (80MM)	25.0 [63.5]	28.3 [71.8]	70.0 [177.8]	50.0 [127.0]	13.1 [33.2]	14.3 [36.3]	14.3 [36.3]	6.3 [16.0]	13.6 [34.5]	1.8 [4.5]	3.3 [8.3]	22.0 [55.8]	27.9 [70.8]	24.1 [61.2]	13.0 [33.0]	9.0 [22.8]
4" (100MM)	25.0 [63.5]	28.3 [71.8]	70.0 [177.8]	50.0 [127.0]	13.1 [33.2]	14.3 [36.3]	14.3 [36.3]	6.3 [16.0]	13.6 [34.5]	1.8 [4.5]	3.3 [8.3]	22.0 [55.8]	28.5 [72.3]	24.1 [61.2]	13.0 [33.0]	9.0 [22.8]
6" (150MM)	30.0 [76.2]	33.0 [88.8]	74.0 [188.0]	60.0 [152.4]	14.8 [37.5]	15.0 [38.1]	15.0 [38.1]	7.0 [17.7]	13.6 [34.5]	5.3 [13.4]	4.8 [12.1]	27.0 [68.5]	29.3 [74.4]	24.1 [61.2]	15.0 [38.1]	11.0 [27.9]
8" (200MM)	30.0 [76.2]	33.0 [88.8]	74.0 [188.0]	60.0 [152.4]	14.8 [37.5]	15.0 [38.1]	15.0 [38.1]	7.0 [17.7]	13.6 [34.5]	5.3 [13.4]	4.8 [12.1]	27.0 [68.5]	26.2 [66.5]	20.5 [52.0]	15.0 [38.1]	11.0 [27.9]

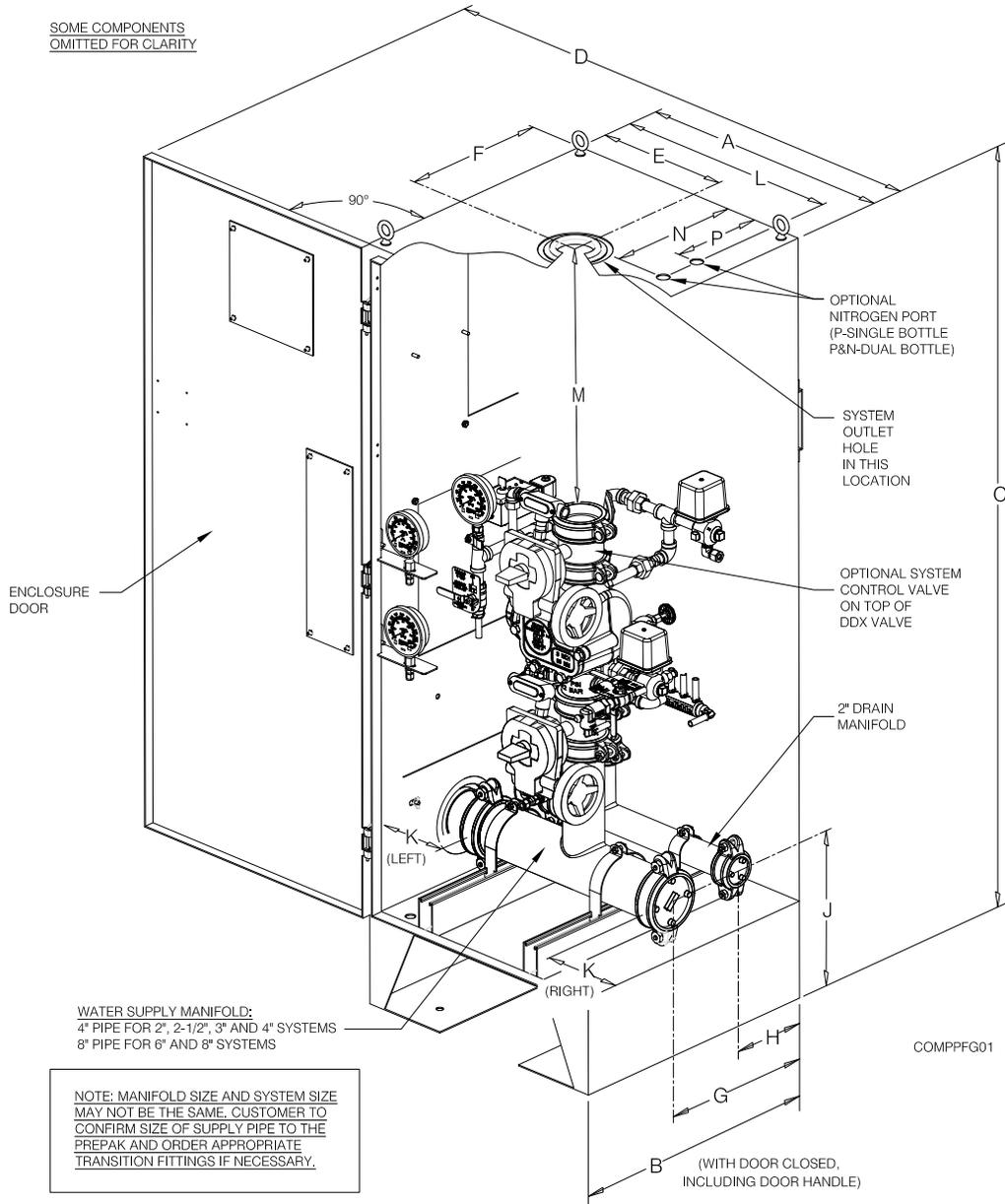


Fig. 1

The following is a list of Technical Data Bulletins which describe the valves and devices which are used in the system:

Device	Reliable Bulletin # (unless otherwise noted)
Model DDX Deluge Valve	Reliable Bulletin 519
Type F Double Interlock Preaction Trim	Reliable Bulletin 751
Low Air Pressure Switch	Potter, 5401564
Alarm Pressure switch	Potter, 5400928
Nitrogen Pressure Switch	Potter, 5400930
Mechanical Sprinkler Alarm	Reliable Bulletins 612/613
Releasing Control Panel	Potter Manual #5403550
Fire Alarm Devices	Reliable Bulletin 700
Desiccant Dryer	Wilkerson Catalog 9EM-TK-190-4

The following table provides a quick reference to the various programs (found in this bulletin and the Potter Manual #5403550) that may be utilized with a Type F PrePaK system:

Desired Application	Program
Single Interlock, Single Zone	Potter Program #6 (Factory Setting)
Single Interlock, Cross-Zoned	Potter Program #7

**Note:** The Model DDX Type F PrePaK Double Interlock Preaction system utilizes a solenoid controlled by single interlock programming in conjunction with a pneumatic (mechanical) actuator.

## Installation Requirements

The automatic sprinklers, releasing devices, fire detection devices, manual pull stations, and signaling devices which are utilized with the Reliable Model DDX Type F PrePaK system must be UL and/or ULC Listed or FM Approved, as applicable.

The steel enclosure and all the interconnecting piping must be located indoors 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. The solenoid valve is operated and supervised by the Potter Model PFC-4410-RC Releasing Control Panel. Details on the electrical connections of this system to the Potter Panel can be found in the Potter Manual #5403550, Installation, Operation and Instruction of PFC-4410-RC Releasing Control Panel (this manual is included with other pertinent manuals and shipped inside the enclosure). This panel is fully zone and output programmable and may be adapted to several applications. Hydrostatic Testing of DDX Valves and DDX Systems.

## Optional Seismic Kit

Reliable part number 6501200041 (25" x 28" cabinet for 2"-4" systems without nitrogen generator) and 6501200042 (30" x 33" cabinet for 6" and 8" systems, and all units with nitrogen generator) are seismic upgrade kits required to make the Reliable PrePaK OSHPD compliant. One kit is required for each PrePaK (reference Caution Sheet 331).

## 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 NFPA13. 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 / Nitrogen Pressure Requirements

The Model DDX Type F PrePaK system includes gauges indicating the pneumatic and water pressures of Model LP Dry Pilot Actuator. Table A specifies the air or nitrogen pressure level to be applied to the Actuator. The factory installed Pressure Maintenance Device in the unit automatically provides adequate makeup air or nitrogen flow to maintain supervisory pressure with normal leakage for the system piping, while restricting the flow of makeup air or nitrogen to allow for system operation. Please note that when the optional Model B1 Accelerator is to be utilized to expedite water-delivery time, the pneumatic pressure must be not less than 15 psi (1.0 bar).

**Table A**

Water Pressure psi (bar)	System Air or Nitrogen Pressure psi (bar)
Maximum	Not Less Than
20 (1.4)	8 (0.6)
30 (2.1)	10 (0.7)
50 (3.4)	12 (.8)
75 (5.2)	13 (.9)
100 (6.9)	15 (1.)
125 (8.6)	16 (1.1)
150 (10.3)	17 (1.2)
175 (12.1)	18 (1.2)
200 (13.8)	19 (1.3)
225 (15.5)	21 (1.4)
250 (17.2)	22 (1.5)
275 (19.0)	23 (1.6)
300 (20.7)	24 (1.7)

**Notes:**

- Supervisory air or nitrogen pressure should not exceed 30 psi (2.1 bar). Excess pressure may result in damage to the actuator.
- Fastest valve operation is achieved with supervisory air or nitrogen pressure indicated; however, pressure must never be less than the minimum specified in the table above.
- Air maintenance devices that maintain a constant pressure are recommended; however, if a tank-less compressor is used, the "compressor on" setting of the pressure switch must never be lower than the minimum pressure in the table above.

**Note:** During system set-up, a higher pneumatic pressure may be required in order to properly set the Model LP Dry Pilot Actuator. The dew point of the air supply must be maintained below the lowest ambient temperature to which the preaction system will be exposed. Introduction of moisture into the system piping exposed to freezing temperatures can create ice blockage which could prevent proper system operation. As a minimum, the supply of air should be taken from the area of lowest temperature within the protected area. The air supply system must be carefully designed to prevent plugging by frost deposits. Special requirements, such as those in FME&R's "Installation Guidelines for Refrigerated Storage" may need incorporated.

Nitrogen used in refrigerated area systems minimizes a possibility of ice build-up and blockage inside the system piping that could inhibit proper system operation. The dewpoint of nitrogen compressed to 20 psig (1.4 bar) pressure is -46°F (-43.3°C), and -52°F (-46.7°C) when compressed to 10 psig (0.7 bar). High-pressure nitrogen cylinders can typically be rented from a local source, with rental fees varying by supplier and cylinder sizes. The calculated nitrogen supply in lbs (kg) to pressurize various system capacities to 10 psi (0.7 bar) at different freezer temperatures is shown in Table B.

A Nitrogen Kit is available as an option, for installations where nitrogen is used as the supervisory gas. A "low-nitrogen" LED is mounted onto the door of the Potter Model PFC-4410-RC Releasing/Control Panel. It will illuminate when the nitrogen pressure switch detects that the available nitrogen supply falls to 100 psi (6.9 bar). The nitrogen source should be replaced promptly upon operation of the pressure switch. If the nitrogen supply is not replaced, the entire amount of make-up air will come solely from the unit's air compressor (if installed).

**Table B**

System Capacity Gal. (L)	Freezer Temperature					Approx. Fill Time (min.)*
	20°F (-6.7°C)	0°F (-18°C)	-20°F (-29°C)	-40°F (-40°C)	-60°F (-51°C)	
250 (946)	1.90 (.86)	1.90 (.86)	2.00 (.90)	2.10 (.95)	2.20 (1.00)	1
500 (1891)	3.64 (1.65)	3.80 (1.72)	4.00 (1.81)	4.20 (1.91)	4.40 (2.00)	2
750 (2840)	5.50 (2.50)	5.70 (2.60)	6.00 (2.72)	6.30 (2.86)	6.60 (3.00)	3
1,000 (3785)	7.30 (3.30)	7.60 (3.44)	8.00 (3.62)	8.33 (3.78)	8.80 (4.00)	4

**Note:** To obtain required nitrogen supply (lbs.) for 15 psi (1.0 bar) or 22 psi (1.5 bar), multiply the tabulated values by a factor of 1.5 or 2.2 respectively.

(1 bar = 100 kPa)

\* When filled with the Rapid Air – Fill Shutoff Valve open.

If the air compressor in the Model DDX Type F PrePaK system is used to initially fill the sprinkler system with air, the steel enclosure door should remain open to provide maximum intake air flow to the air compressor. The air compressor is connected to a storage tank. This tank functions as a reservoir, providing make-up air to compensate for small, intermittent leaks in the sprinkler system. It should be noted that significant leaks may overburden this storage tank, thereby causing the air compressor to continuously cycle on and off.

The factory-installed system air pressure switch may need on-site adjustment to correspond with the air pressure values found in Table A. Adjustment, if required, should be made according to Potter Bulletin 5401564 included with the switch.

**System Electrical Requirements**

All releasing, alarm, and detection devices in the Reliable Model DDX Type F PrePaK system are supervised by a Potter Model PFC-4410-RC Releasing Control Panel. All of the terminals are translated to a water-tight terminal box mounted on the interior of the enclosure. All field wiring is connected to this terminal box. **Note:** The EOL (End of Line) resistors have also been relocated.

The Reliable Model DDX PrePaK system is delivered with six factory-installed electrical devices. They consist of the following:

- A system air pressure switch, which is used to monitor sprinkler piping.
- An alarm pressure switch, which indicates an actuation of the deluge valve.
- A normally-closed, releasing solenoid valve, which is used to actuate the deluge valve.
- A 1/2 HP (2", 2-1/2", & 3" valve), 1 HP (4" valve), or 1-1/2 HP (6" & 8" valve) air compressor with tank.
- A supervised butterfly (main control) valve (Note: A system side butterfly valve is available as an option).
- A release control disable switch (RCDS) which is used to disable the solenoid valve for test purposes.

**Note:** This unit is available with an optional Potter Electric Signal Co. CoilKeeper™ solenoid coil monitoring switch.

The factory electrical connections of these devices, along with information on the connection of detection devices (initiating zones 1 and 2), signaling devices, and supervisory outputs to the Potter PFC4410-RC Releasing Control Panel are included in this bulletin. The power supply, standby emergency power supply, battery charger and rectifier circuitry are all contained within the PFC4410 panel. Batteries that provide 90 hours of standby power are provided with the panel. For additional information and detailed wiring diagrams, please refer to Potter Manual #5403550 (Installation, Operation and Instruction of PFC4410-RC Releasing Control Panel).

**Note:** In order for the solenoid valve to maintain a warranty it must remain sealed as it came from the factory. If there are concerns about the valve's internal components, immediate replacement is recommended.

### System Operation (Double Interlock)

To fully activate (discharge water from) the Reliable Model DDX Type F PrePaK system, a fire detection device must activate and pneumatic pressure must be lost from the sprinkler system piping (normally from the activation of one or more fire sprinklers).

When the system is properly set for service, the water supply pressure simultaneously acts on both the underside of the deluge valve's clapper and on the valve's push rod by means of the pressurized push rod chamber. The resultant pressure force acting on the push rod, in unison with the mechanical advantage of the deluge valve lever, is more than sufficient to hold the valve clapper in the closed position against the water supply pressure.

Energizing the releasing solenoid valve is only one of the events required towards opening the deluge valve. Air pressure in the sprinkler system must also be reduced to a level low enough to activate the Model LP Dry Pilot Actuator. Both of these events allows the deluge valve's push-rod chamber to be vented to drain through its outlet. Since the push-rod chamber pressure cannot be replenished through the inlet restriction as rapidly as it is vented, the pressure falls rapidly. When the push-rod chamber pressure drops below one-third of the water supply pressure, the force acting beneath the valve clapper becomes greater than the push-rod force acting on the lever which causes the clapper to open. Refer to Reliable Technical Bulletin 751 for further details.

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 and also through the alarm outlet to activate water flow alarm devices. Note that the solenoid valve will be maintained open by the Potter Model PFC-4410-RC Releasing/Control Panel latching feature until it is reset for operation.

After system shutdown and draining, the Model DDX Deluge Valve clapper is easily reset without special tools using the external reset feature. Restore detection devices by resetting or replacing any operated device. Once detection devices are restored the system can be reset (see Resetting Model DDX Type F Double Interlock Preaction System).

### Resetting Model DDX Type F Double Interlock Preaction System

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 counterclockwise (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. Purge all air from the actuation piping: Open the solenoid valve by operating a detector or an electric manual emergency station. **Note:** that the Model LP Dry Pilot Actuator should also be open since there is no pneumatic pressure on the system.
  10. While water is flowing through the solenoid valve AND the actuator, cause the actuator to close first by applying air or nitrogen pressure to the system.
  11. Open the air or nitrogen supply quick fill valve to restore supervisory pressure in the sprinkler system and close the dry pilot actuator. Allow the pressure to build to the level specified in Table A, 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 and the alarm line valve until air pressure has built up to the recommended level.)
  12. After the Model LP Dry Pilot Actuator has been set, close the solenoid valve by resetting the release control panel. (All detectors and manual pull stations must be in a normal state before the panel can be reset.)
- Note:** It is important that the piping between the solenoid valve and the dry pilot actuator is filled with water and not air. This is accomplished by closing the dry pilot actuator FIRST while water is flowing through the device and closing the solenoid valve only AFTER the actuator is completely set.

13. Open the alarm line valve. Verify the main drain valve is open. Slightly open 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. If no leak occurs, the Deluge Valve clapper is sealed. Slowly open the main valve controlling water supply until fully open and verify that it is properly monitored.

14. 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.

15. 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 is open, as well as all pressure gauge valves. 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. Releasing device — Check outlet of the releasing device (i.e., solenoid valve and 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.

7. 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.

8. Operational test — Open the Model B Manual Emergency Station. Alternatively, operate the electrical detection system and deplete pneumatic pressure from the sprinkler system.

**Note:** AN OPERATIONAL TEST WILL CAUSE THE DELUGE VALVE TO OPEN AND FLOW WATER INTO THE SPRINKLER SYSTEM.

9. 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 the deluge valve and open the main drain valve.

2. Verify that valve supplying hydraulic pressure to the piston/pushrod chamber is open, allowing water to enter the pushrod chamber.

3. Operate the electrical detection system and deplete pneumatic pressure from the sprinkler system.

4. Operation of the detection combined with loss of pneumatic pressure must result in a sudden drop of water pressure in the pushrod chamber, as indicated by the pressure gauge on the hydraulic release trim.

5. Reset the valve per the reset instructions.

## Maintenance

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/control system out of service may eliminate the fire protection that is provided by the fire protection system. The Reliable Model DDX valve 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. Replace any components found to be corroded, damaged, worn, or non-operable. Increase the frequency of inspections when the valve is exposed to corrosive conditions or chemicals that could impact materials or operation of the assembly.

If face plate is removed during maintenance, torque face plate bolts to the following values during re-installation:

35 ft-lbs. (47 N-m) for 2" through 4" valves

70 ft-lbs. (95 N-m) for 6"-8" valves

## Draining Excess/Condensate Water from the System

1. Notify the owner and monitoring company that maintenance is being performed on the system.

2. Close the main water control valve.

3. Open the Main Drain Valve.

4. Open the Condensate Drain Valve until all water has drained.

5. Close Condensate Drain Valve.

6. Partially open the Main Water Control Valve.

7. Slowly close the Main Drain Valve.

8. Fully open the Main Water Control Valve.

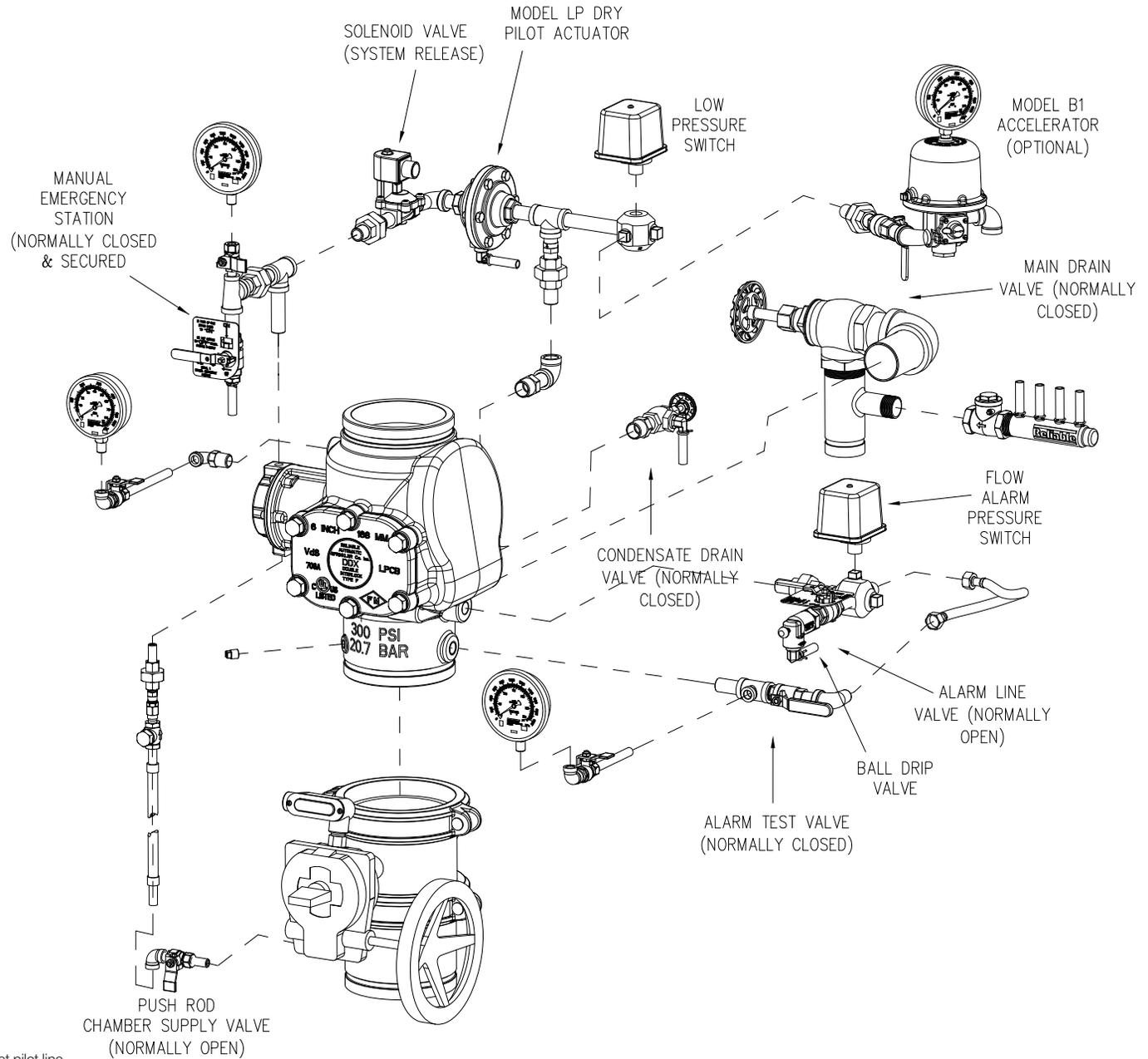
9. Notify the owner and monitoring company that the system has been returned to service.

## **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**

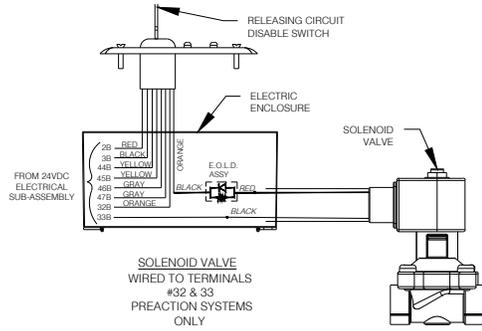
1. Inspections: It is imperative that the system be inspected and tested in accordance with NFPA 25 on a regular basis. The frequency of the inspections may vary due to contaminated water supplies, corrosive water supplies, or corrosive atmospheres. In addition, the alarm devices, detection systems, 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., cleaned and replaced as necessary.
3. If leakage is suspected through the solenoid valve, it should be replaced.



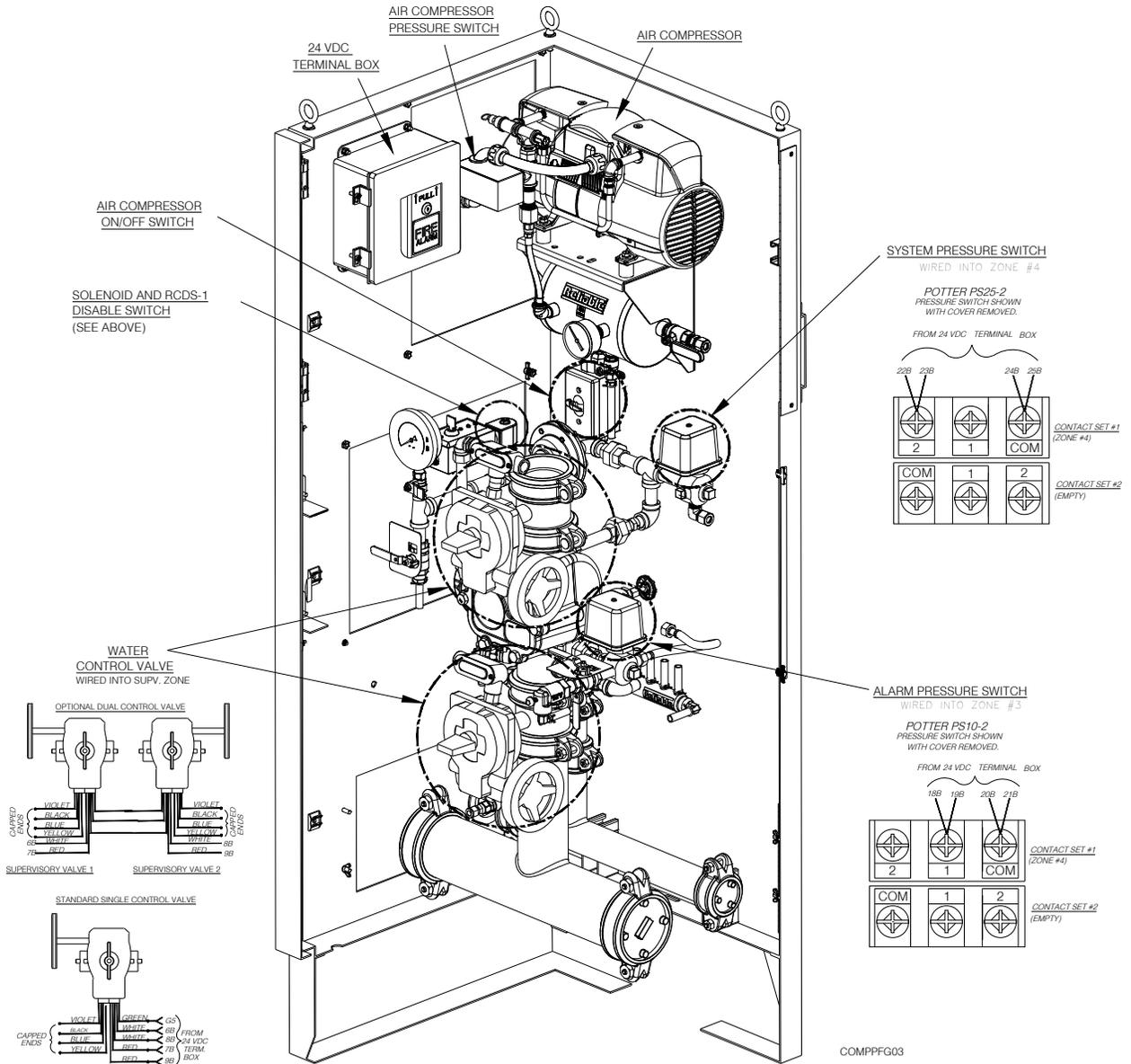
Note: Trim valve location is common to wet pilot line, dry pilot line, and electric release systems.

751FG02

Fig. 2



NOTE: For convenience and where allowed by the approving authority, Type SO power cords are connected to the releasing panel and air compressor when such devices are present in the unit. When required, these power cords may be disconnected and replaced with wiring that is acceptable to the approving authority. Replacement of the factory installed power cords with other approved wiring does not void listing, approval, and/or warranty.



## FACTORY INSTALLED ELECTRICAL DEVICES

(SOME COMPONENTS OMITTED FOR CLARITY)

Fig. 3

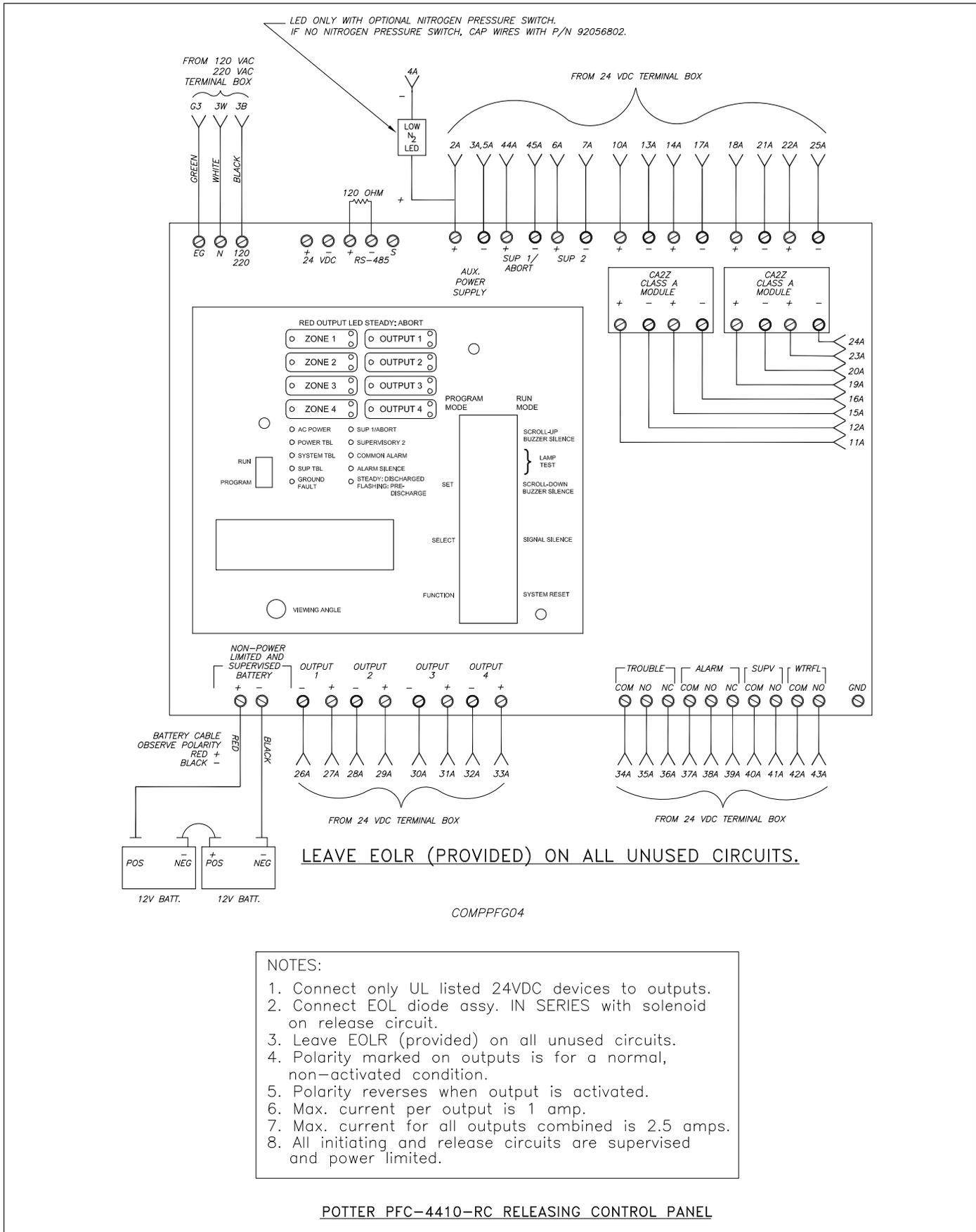
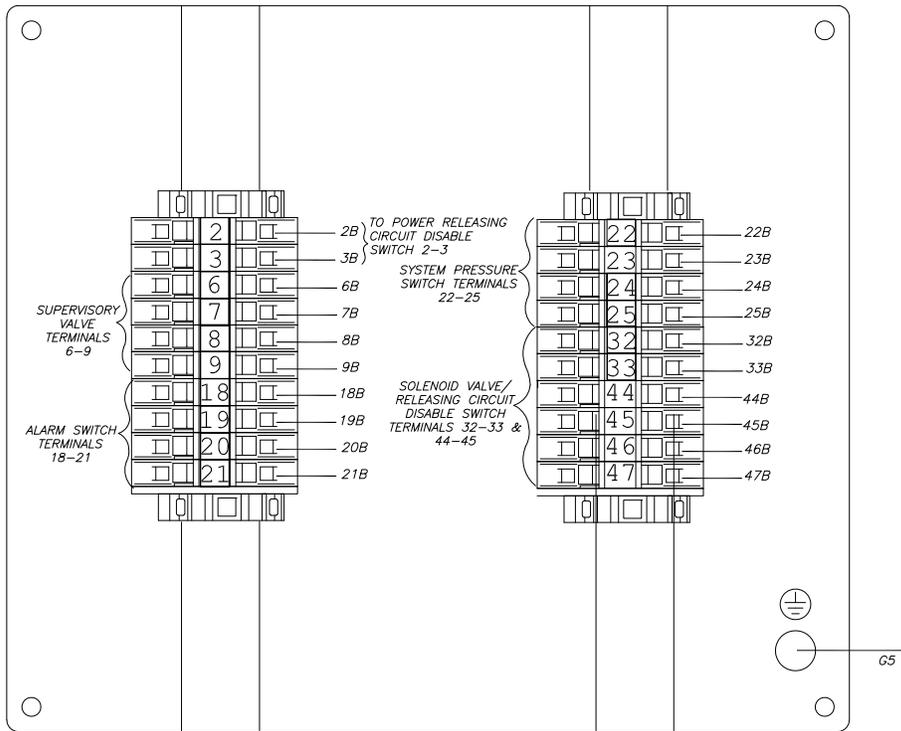
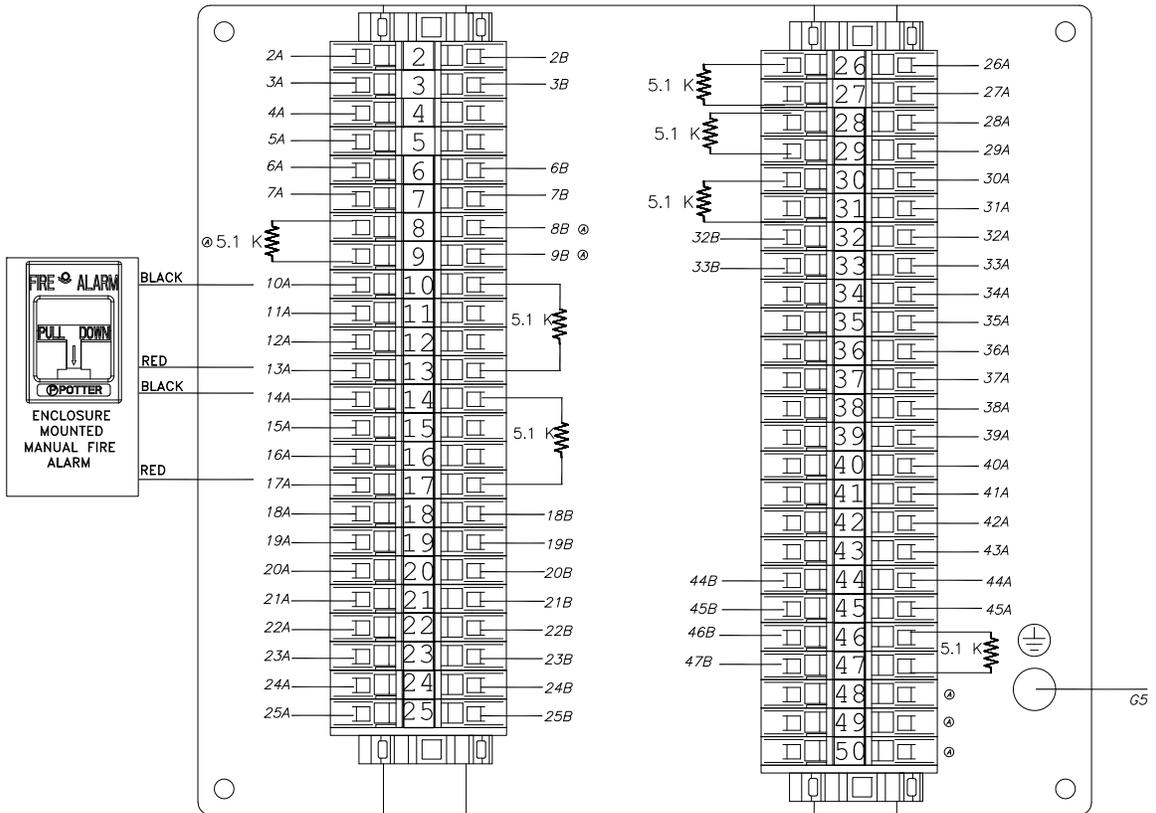


Fig. 4



24 VDC TERMINAL BOX W/O RELEASING PANEL



COMPPFG05

24 VDC TERMINAL BOX WITH RELEASING PANEL

Fig. 5

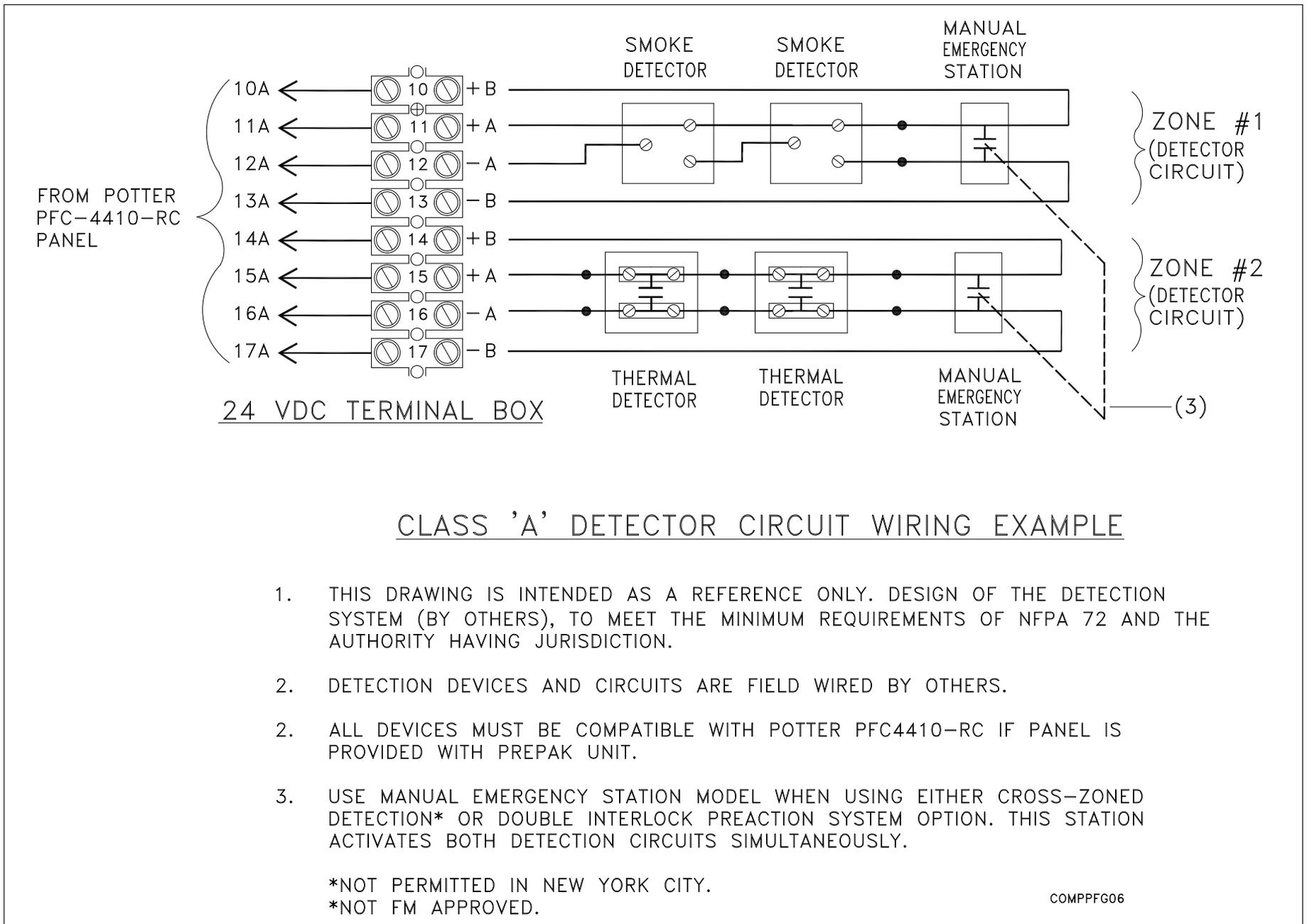
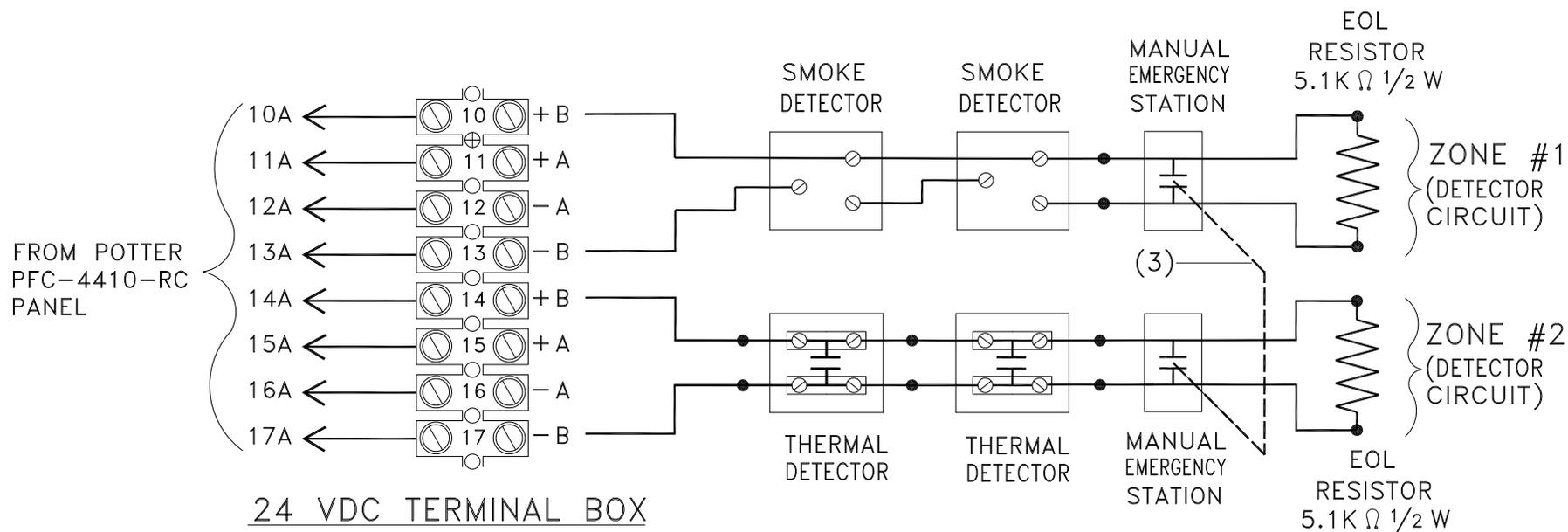


Fig. 6



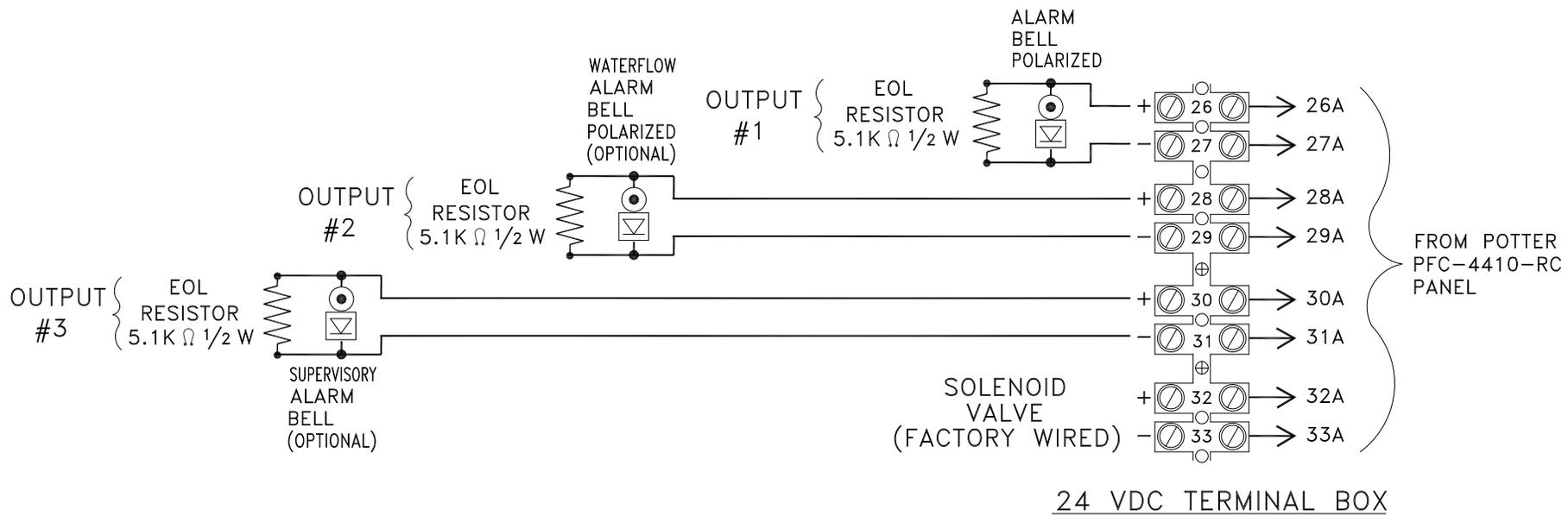
### CLASS 'B' DETECTOR CIRCUIT WIRING EXAMPLE

1. THIS DRAWING IS INTENDED AS A REFERENCE ONLY. DESIGN OF THE DETECTION SYSTEM (BY OTHERS), TO MEET THE MINIMUM REQUIREMENTS OF NFPA 72 AND THE AUTHORITY HAVING JURISDICTION.
2. DETECTION DEVICES AND CIRCUITS ARE FIELD WIRED BY OTHERS.
2. ALL DEVICES MUST BE COMPATIBLE WITH POTTER PFC4410-RC IF PANEL IS PROVIDED WITH PREPAK UNIT.
3. USE MANUAL EMERGENCY STATION MODEL WHEN USING EITHER CROSS-ZONED DETECTION\* OR DOUBLE INTERLOCK PREACTION SYSTEM OPTION. THIS STATION ACTIVATES BOTH DETECTION CIRCUITS SIMULTANEOUSLY.

\*NOT PERMITTED IN NEW YORK CITY.  
 \*NOT FM APPROVED.

COMPPFG07

Fig. 7



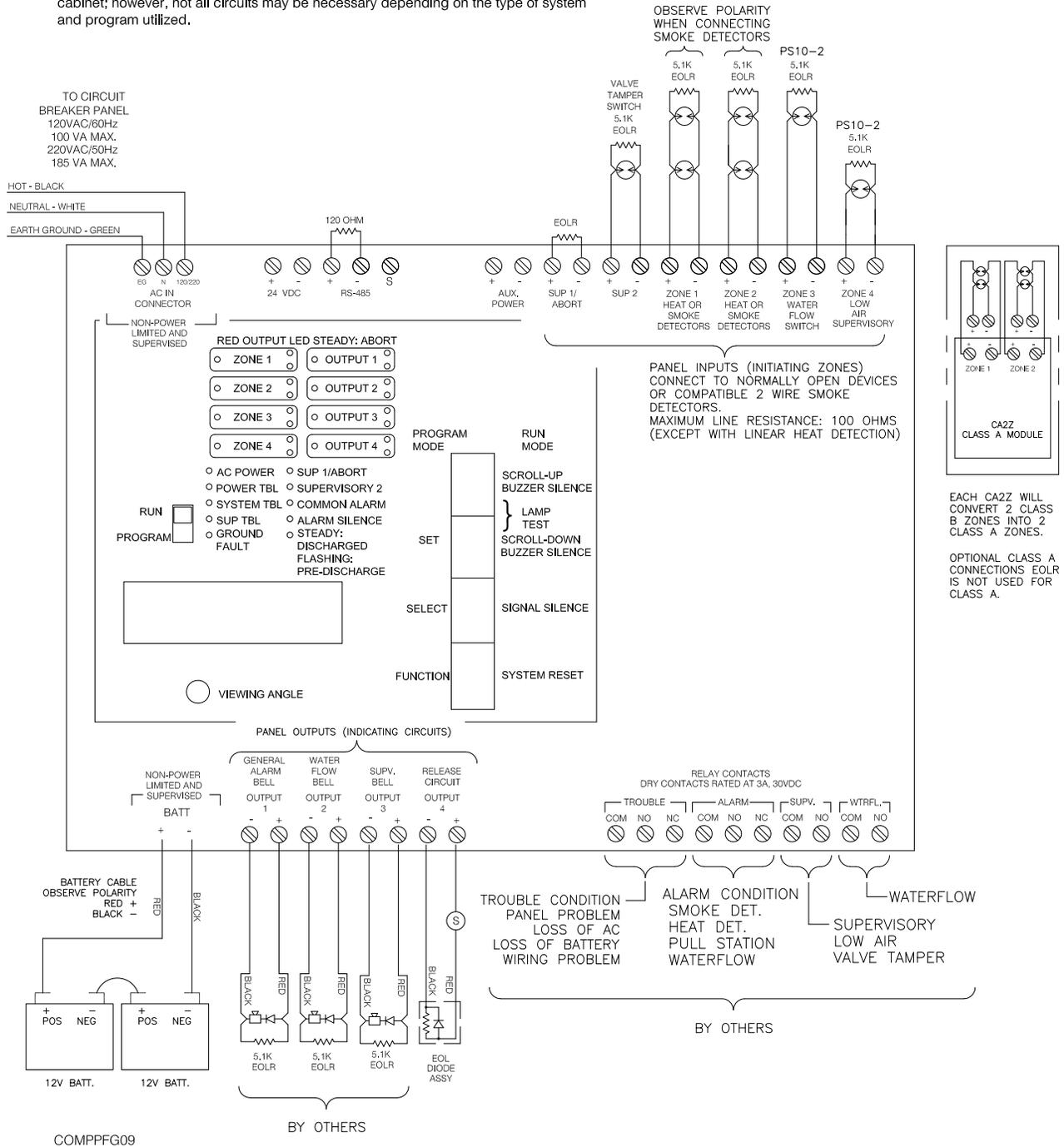
OUTPUT DEVICE CIRCUIT WIRING

COMPPFG08

Fig. 8 — Wiring Diagram

# POTTER PFC4410-RC WIRING SCHEMATIC

Note: Inputs and outputs are mapped to the 24VDC terminal block within the PrePak cabinet; however, not all circuits may be necessary depending on the type of system and program utilized.



## NOTES:

1. Connect only UL listed 24VDC devices to outputs.
2. Connect EOL diode assembly IN SERIES with solenoid on release circuit.
3. Leave EOL resistor on all unused circuits.
4. Polarity marked on outputs is for a normal, non-activated condition.
5. Polarity reverses when output is activated.
6. Max. current per output is 1 amp.
7. Max. current for all outputs combined is 2.5 amps.
8. All initiating and release circuits are supervised and power limited.

Fig. 9 — Wiring Diagram

## Single Interlock, Single Detection Zone

### Potter Program #6

1. Apply power to panel.
2. Slide the program switch down.
3. Press the FUNCTION button until the display reads "PASSWORD=000."
4. To enter a password, press the SELECT button until the proper number is displayed above the "^" symbol; then press the SET button to move to the next digit. After entering the third number the display will change. (All panels are shipped with a "000" password.)
5. Press the FUNCTION button until the display reads "PROGRAM ##." (the second "#" character refers to the current program number between "0" and "24").
6. Press the SELECT button until the display reads "PROGRAM #6."
7. Press the SET button
8. The panel is completely programmed except for the custom banner and zone messages. Slide the program switch back up.

### POTTER PROGRAM #6

OUTPUTS	ZONES				
	Supervisory 2 <sup>(1)</sup>	#1 Conventional <sup>(2)</sup>	#2 Conventional <sup>(2)</sup>	#3 Waterflow	#4 Low Air Supervisory
#1 ALARM		X			
#2 WATERFLOW				X	
#3 SUPERVISORY	X				X
#4 RELEASE		X			

INPUTS: 1 conventional zone, 1 manual release zone, 1 waterflow zone, 1 low air zone, 1 supervisory zone.

OUTPUTS: 1 general alarm bell, 1 waterflow bell, 1 supervisory bell, 1 solenoid release circuit.

OPERATION: Activation of either conventional zone (or operation of the manual pull station within the PrePaK system cabinet) will operate the solenoid release circuit and the general alarm bell. Activation of the waterflow zone will operate the waterflow bell. Activation of either the low air zone or the supervisory zone will operate the supervisory bell. When either Zone #1 or #2 is in alarm, Output #1 (general alarm) and Output #4 (solenoid release) will operate. When Zone #3 is in alarm, Output #2 (waterflow bell) will operate. When either Zone #4 or the supervisory zone is activated, Output #3 (supervisory bell) will operate.

#### Note:

<sup>(1)</sup> The Butterfly valve in the PrePaK system assembly is connected to Supervisory 2 input of the Potter PFC-4410RC Releasing/Control panel

<sup>(2)</sup> The emergency manual release within the PrePaK system cabinet is wired into the conventional detection zones 1 and 2, and is designed to release the solenoid for setup and testing purposes.

**For additional information, please refer to the "Installation, Operation, and Instruction Manual" for the Potter PFC4410-RC Releasing Control Panel (provided with the unit).**

## Single Interlock, Cross Zoned Detection

### Potter Program #7

1. Apply power to panel.
2. Slide the program switch down.
3. Press the FUNCTION button until the display reads "PASSWORD = 000."
4. To enter a password, press the SELECT button until the proper number is displayed above the "^" symbol; then press the SET button to move to the next digit. After entering the third number the display will change. (All panels are shipped with a "000" password).
5. Press the FUNCTION button until the display reads "PROGRAM ##." (the second "#" character refers to the current program number between "0" and "24").
6. Press the SELECT button until the display reads "PROGRAM #7."
7. Press the SET button.
8. The panel is completely programmed except for the custom banner and zone messages. Slide the program switch back up.

### POTTER PROGRAM #7

OUTPUTS	ZONES				
	Supervisory 2 <sup>(1)</sup>	#1 Conventional <sup>(2)</sup>	#2 Conventional <sup>(2)</sup>	#3 Waterflow	#4 Low Air Supervisory
#1 ALARM		X	X		
#2 WATERFLOW				X	
#3 SUPERVISORY	X				X
#4 RELEASE		XX	XX		

INPUTS: 2 conventional zones (cross-zoned), 1 waterflow zone, 1 low air zone, 1 supervisory zone.

OUTPUTS: 1 general alarm bell, 1 waterflow bell, 1 supervisory bell, 1 solenoid release circuit.

OPERATION: Activation of both conventional zones at the same time (or operation of the manual pull station within the PrePaK system cabinet) will operate the solenoid release circuit and the general alarm bell. Activation of either conventional zone will operate the general alarm bell. Activation of the waterflow zone will operate the waterflow bell. Activation of either the low air zone or the supervisory zone will operate the supervisory bell. When either Zone #1 or #2 is in alarm, Output #1 (general alarm) will operate. When Zones #1 and #2 are in alarm at the same time, Output #4 (solenoid release) and Output #1 (general alarm) will operate. When Zone #3 is in alarm, Output #2 (waterflow bell) will operate. When either Zone #4 or the supervisory zone is activated, Output #3 (supervisory bell) will operate.

**Note:**

<sup>(1)</sup> The Butterfly valve in the PrePaK system assembly is connected to Supervisory 2 input of the Potter PFC-4410RC Releasing/Control panel

<sup>(2)</sup> The emergency manual release within the PrePaK system cabinet is wired into the conventional detection zones 1 and 2, and is designed to release the solenoid for setup and testing purposes.

**For additional information, please refer to the "Installation, Operation, and Instruction Manual" for the Potter PFC4410-RC Releasing Control Panel (provided with the unit).**

## Reliable PrePaK™ Part Number Configurator (Type F)

PREPAK	SIZE <sup>(1)</sup>	SYSTEM TYPE	SOLENOID <sup>(2)</sup>	RELEASE CONTROL PANEL <sup>(4)</sup>	AIR COMPRESSOR <sup>(5)(6)</sup>	OPTIONS <sup>(7)</sup>	FUTURE
655	Select Below	2	Select Below	Select Below	Select Below	Select Below	0
	2 = 2"			0 = NO CONTROL PANEL	0 = None	0 = None	
	0 = 2-1/2"		1 = 175 PSI Rated	1 = POTTER 4410RC	1 = 1/2 HP 115VAC 60HZ QRM2-50115T (2", 2-1/2", & 3 Systems)	1 = Nitrogen Cylinder Supply Kit	
	3 = 3"		2 = 300 PSI Rated		2 = 1 HP 115VAC 60HZ QRM2-100115T (4" Systems)	2 = Nitrogen Cylinder Supply Kit & B-1 Accelerator	
	4 = 4"				3 = 1-1/2 HP 115VAC 60HZ GAP OL915150AC (6" & 8" Systems)	3 = NS-ASAM	
	6 = 6"				4 = 1/2 HP 220VAC 60HZ QRM2-50220T (2", 2-1/2", & 3 Systems)	4 = NS-ASAM & B-1 Accelerator	
	8 = 8"		5 = 175 PSI Rated w/ Coil Supervisory Switch <sup>(3)</sup>		5 = 1 HP 220VAC 60HZ QRM2-100220T (4" Systems)	5 = B-1 Accelerator	
	A = 2" w/SYS Side Control Valve				6 = 1-1/2 HP 220VAC 60HZ GAP OL915150AC (6" & 8" Systems)	6 = Desiccant Kit	
	B = 2-1/2" w/ SYS Side Control Valve				7 = 1/2 HP 220VAC 50HZ QRM2-50220T-50HZ (2", 2-1/2", & 3 Systems)	7 = Desiccant Kit & B-1 Accelerator	
	C = 3" w/SYS Side Control Valve				8 = 1 HP 220VAC 50HZ QRM2-100220T-50HZ (4" Systems)		
	D = 4" w/SYS Side Control Valve				9 = 1-1/2 HP 220VAC 50HZ GAP OL2870150AC-50 (6" & 8" Systems)		
	E = 6" w/SYS Side Control Valve						
	F = 8" w/SYS Side Control Valve						

**Notes:**

1. Manifold size may differ from system size. Customer to confirm size of supply pipe to PrePaK™ and provide appropriate transition fittings/couplings if necessary (see Figure 1 of this document).
2. Reference technical bulletin 718 for solenoid model numbers and details.
3. cULus listed Potter Electric Signal Company CoilKeeper™.
4. If "0 = None" option is selected, customer to provide separate UL and/or FM release control panel for systems utilizing electric solenoid release. Panel must be compatible with the solenoid valve selected from above.
5. Air compressor size depends on system capacity and normal system pressure.
6. If "0 = None" option is selected, customer to provide separate, appropriately sized compressed air or nitrogen source.
7. Use "0 = None" for systems utilizing a separate nitrogen generator. Connect to inlet side of Model A Pressure Maintenance Device. Note that nitrogen generator must incorporate a tank.

**Optional Seismic Kit (order separately):** Reliable part number 6501200041 (25" x 28" cabinet for 2" -4" systems) and 6501200042 (30" x 33" cabinet for 6" and 8" systems) are seismic upgrade kits required to make the Reliable PrePaK OSHPD compliant. One kit is required for each PrePaK (reference Caution Sheet 331).