

# Reliable®

**Model DDX N2-Blast® PrePaK**  
**Type D Preaction System**  
 2" (50mm), 2-1/2" (65mm),  
 3" (80mm), 4" (100mm)

## Instructions for Installation, Operation, Care and Maintenance

**10 PSI (0.7 bar) Pneumatic  
Supervising Pressure**

**Single Interlock - Electric Release**

**Double Interlock - Electric/Electric Release**

### General Description

The Reliable Model DDX PrePaK with integrated nitrogen generation is a completely self-contained, supervised preaction system that can be readily installed within a floor space of less than 7 ft<sup>2</sup> (0.65 m<sup>2</sup>) (not including door swing). Installation of the PrePaK (not including exterior devices, i.e., detectors and alarm bells) requires three piping connections: the water supply, the sprinkler system, and the drain. Reference locations of these piping connections are shown in Fig.1. Independent electrical supplies are required for the optional system air compressor (115 or 220 VAC), the optional Potter Model 4410 Releasing Control Panel (115/220 VAC), and the nitrogen generator (115 VAC).

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

The Reliable Model DDX N2-Blast® PrePaK incorporates a South-Tek Systems FPS-900 pressure swing adsorption N2-Blast® nitrogen generator, complete with independent air compressor, nitrogen storage tank, control system and AutoPurge™ device. The nitrogen generator is completely wired, tested, and integrated with the Model DDX PrePaK, and supplies 98% pure nitrogen to the piping network to limit electrochemical, galvanic, and micro-biologically influenced corrosion (MIC). Operation and maintenance information can be found in this bulletin as well as the South-Tek Systems website ([www.southteksystems.com](http://www.southteksystems.com)).

The Reliable Model DDX PrePaK 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. The PFC-4410-RC is totally zone and output programmable such that the Reliable Model DDX PrePaK 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.



**Note:** N2-Blast®, Blast-off®, and AutoPurge™ are registered trademarks of South-Tek Systems, LLC.

**Reliable Automatic Sprinkler Co., Inc.**, 103 Fairview Park Drive, Elmsford, New York 10523

The Model DDX Type D PrePaK can be used in both single and double interlock applications. Reliable Single and 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 single/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 extinguishing 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 unless the detection system has been activated .
- 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 an operated sprinkler.

In single interlock applications, one or more detectors sense the presence of fire, thereby causing the electrical releasing control panel to activate notification appliances and energize the solenoid releasing valve to the open position. The use of cross-zoned detectors will require operation of two detectors on separate zones before the solenoid valve can open (**Note: Verify that the detection method, including the use of cross-zoned detection, are permitted by all applicable codes and standards, as well as the requirements of all authorities having jurisdiction. Cross-zoned detection may not be permitted in New York City or by Factory Mutual.**) The solenoid valve, when closed, preserves supply water pressure in the Model DDX valve's push-rod chamber. Actuating the solenoid valve releases that water pressure which allows the Model DDX valve to open.

To discharge water from sprinklers on a single interlock system with cross-zoned detection, two separate electrical detection zone 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 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 this first condition. Subsequent activation of a second, nearby or adjacent detector, on a separate detection zone, will cause the panel to energize the solenoid valve open and release water into the sprinkler piping. Water flowing into the sprinkler piping will simultaneously produce water pressure that cause the transfer of contacts in the alarm pressure switch mounted in the riser assembly, thereby activating a water flow alarm device. The flow of water into the sprinkler piping effectively converts the dry system into a wet-pipe sprinkler system. In the event that the fire subsequently produces

sufficient heat to operate a sprinkler, water will flow from that sprinkler.

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

In the event that the system piping is ruptured or a sprinkler is accidentally opened, the system pressure switch will operate and an alarm will sound. The Model DDX Type D however, will not release water since the detection system has not been activated.

When using the Reliable Model DDX PrePaK in either single or double interlock applications, the sprinkler system is pressurized (supervised) with air or nitrogen and is monitored by a system pressure switch.

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

## Approvals

- The Model DDX N2-Blast PrePak Type D preaction system is FM Approved as a factory-assembled Preaction System to Approval Standard 1011/1012/1013, Deluge and Preaction Sprinkler Systems.
- The Model DDX deluge valve and Type D preaction trim are FM Approved and cULus Listed.
- The South-Tek N2-Blast® Model FPS-900-RS nitrogen generator is FM Approved to Approval Standard 1035, Nitrogen Generators for Corrosion Mitigation.
- OSHPD Special Seismic Certification Preapproval (OSP) for SDS=2.50 and z/H=1, when installed with optional seismic kit.

# ASSEMBLY DIMENSIONS

SYSTEM SIZE	A	B	C	D	E	F	G	H	J	K		L	WITHOUT	WITH
										(RIGHT)	(LEFT)		SYSTEM	SYSTEM
													SIDE	SIDE
													VALVE	VALVE
2" (50MM)	30.0 [76.2]	33.1 [84.0]	74.0 [187.9]	60.0 [152.4]	12.8 [32.4]	19.7 [50.0]	19.7 [50.0]	11.6 [29.4]	11.6 [29.4]	8.0 [20.3]	2.0 [5.1]	34.0 [86.3]	34.0 [86.3]	30.0 [76.2]
2-1/2" (65MM)	30.0 [76.2]	33.1 [84.0]	74.0 [187.9]	60.0 [152.4]	12.8 [32.4]	19.7 [50.0]	19.7 [50.0]	11.6 [29.4]	11.6 [29.4]	8.0 [20.3]	2.0 [5.1]	34.0 [86.3]	34.0 [86.3]	30.0 [76.2]
3" (80MM)	30.0 [76.2]	33.1 [84.0]	74.0 [187.9]	60.0 [152.4]	12.8 [32.4]	19.7 [50.0]	19.7 [50.0]	11.6 [29.4]	11.6 [29.4]	8.0 [20.3]	2.0 [5.1]	34.0 [86.3]	34.0 [86.3]	30.0 [76.2]
4" (100MM)	30.0 [76.2]	33.1 [84.0]	74.0 [187.9]	60.0 [152.4]	12.8 [32.4]	19.7 [50.0]	19.7 [50.0]	11.6 [29.4]	11.6 [29.4]	8.0 [20.3]	2.0 [5.1]	34.0 [86.3]	34.0 [86.3]	29.5 [74.9]

SOME COMPONENTS OMITTED FOR CLARITY

DIMENSIONS: INCHES  
[CM]

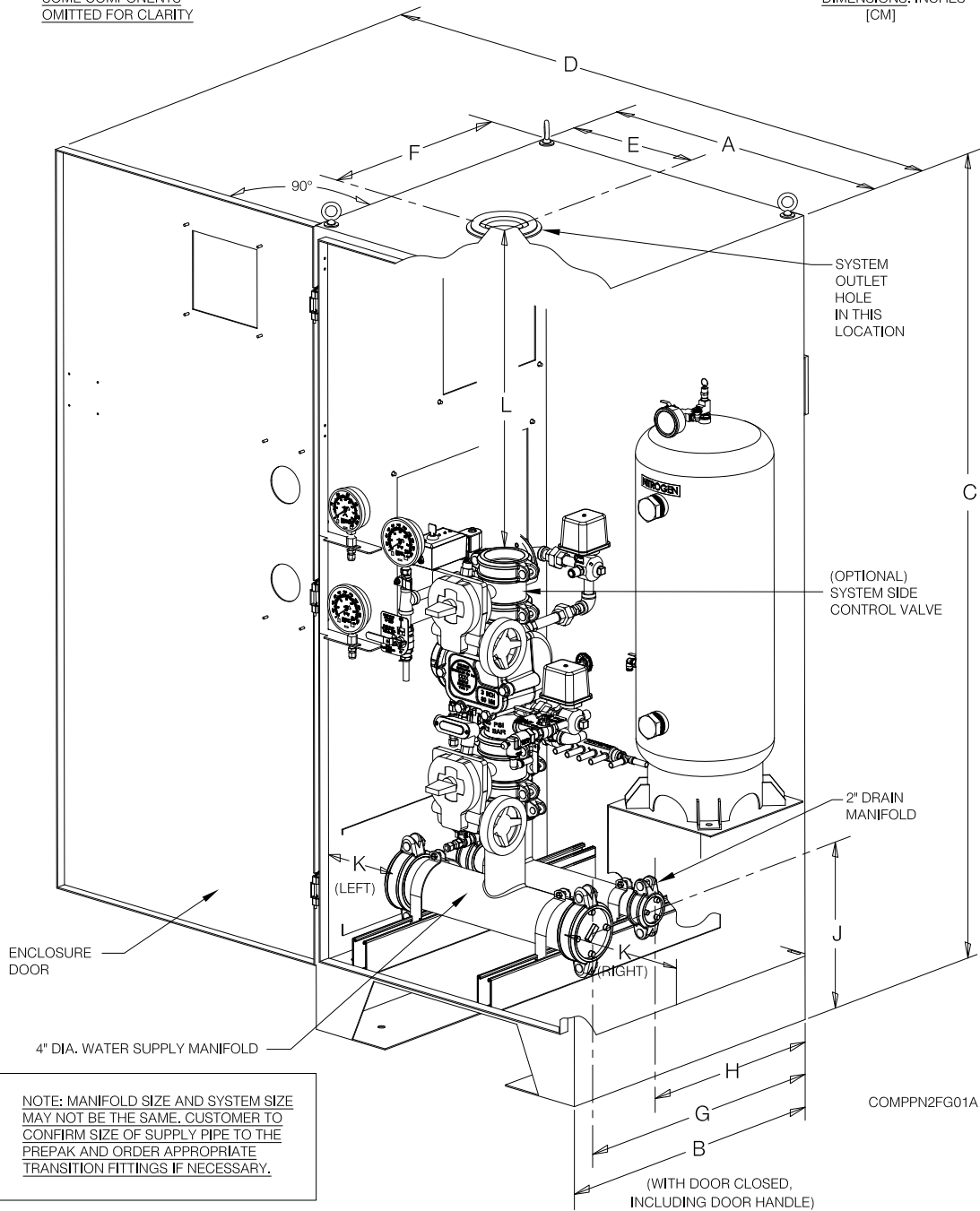


Fig. 1

## Technical Data

1. The Reliable Model DDX PrePaKs are rated for a minimum supply pressure of 20 psi (1.4 bar) and a maximum supply pressure of 250 psi (17.2 bar).
2. Friction loss, expressed in equivalent length of Schedule 40 pipe and based on Hazen-Williams Formula with C=120 and a flowing velocity of 15 ft/s (4.6 m/s), is:

System Size	Equivalent Length
2" (50mm)	4.4' (1.3m)
2-1/2" (65mm)	6.0' (1.8m)
3" (80mm)	12.6' (3.8m)
4" (100 mm)	32.8 ft (17.7 m)

These values account for the Model DDX valve, supply manifold tee, butterfly control valve, and the short section of pipe located directly above Model DDX valve.

3. Shipping Weight:

System Size	Weight
2" (50mm)	950 lbs (431 kg)
2-1/2" (65mm)	
3" (80mm)	
4" (100 mm)	1075 lbs (488 kg)

4. Please reference Figure 1 for dimensions.

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 D Double Interlock Preaction Trim	Reliable Bulletin 750
Low Air Pressure Switch	Potter 5400928
Alarm Pressure switch	Potter 5400928
Releasing Control Panel	Potter Manual #5403550

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

Desired Application	Program
Single Interlock, Single Zone	Potter Program #6 (Factory Setting)
	Potter Program #7
Single Interlock, New York City	Custom NYC Program
Double Interlock, Single Zone	Potter Program #9
Double Interlock, Cross Zoned	Potter Program #10

\*Note: Factory Program setting.

## 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 D PrePaK 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.

## System Supervising Pressure Requirements

In accordance with NFPA 13, when using the Reliable Model DDX Type D PrePaK in double interlock applications, a minimum of 7 psi (0.5 bar) pneumatic pressure is required to supervise the sprinkler system. When initially filling the system with air, the enclosure's door should remain open in order to provide maximum intake air flow to the air compressor. The air compressor is connected to an ASME rated 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 Pressure Maintenance Device supplied with the system is factory set to maintain system pneumatic pressure at approximately 10 psi (0.7 bar). Readjusting system pressure to approximately 10 psi (0.7 bar), if necessary, is accomplished by first loosening the locknut on the air pressure regulator and turning the adjustment screw. The system air pressure gauge that is attached to the vertical pipe/manifold (mounted directly above the Model DDX Deluge Valve) may be used to verify the correct level of pneumatic pressure.

The system air pressure switch is factory set to operate between 8 psi and 4 psi (0.6 bar and 0.3 bar) with decreasing pressure.

## System Electrical Requirements

All releasing, alarm, and detection devices in the Reliable Model DDX Type D PrePaK 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 is delivered with six factory-installed electrical devices. They consist of the following:

1. A system air pressure switch, which is used to monitor sprinkler piping.
2. An alarm pressure switch, which indicates an actuation of the deluge valve.
3. A normally-closed, releasing solenoid valve, which is used to actuate the deluge valve.
4. A 1/2 HP (2", 2-1/2", & 3" valve), or 1 HP (4" valve) air compressor with tank.
5. A supervised butterfly (main control) valve (**Note:** A system side butterfly valve is available as an option).
6. 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 PFC4420-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 (Single Interlock)

To fully activate and discharge water from the Reliable Model DDX Type D PrePaK in a single interlock application, a fire detection device (smoke, heat, etc.; or two devices with cross-zoned detection) must activate. Subsequently, a fire sprinkler must open.

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

Energizing the releasing solenoid valve allows the deluge valve push-rod chamber to be vented to drain. Since the pressure cannot be replenished through the inlet restriction as rapidly as it is vented through the outlet, the push-rod chamber pressure falls rapidly. When the push-rod chamber pressure drops below one-third of the supply pressure, the opening force acting beneath the clapper becomes greater than the push-rod force acting on the lever. This causes the clapper to open. Refer to Reliable Bulletin 519 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. Water also flows through the deluge valve alarm outlet to activate any water flow alarm devices. Note that the solenoid valve will be maintained open by the Potter Model PFC-4410-RC Releasing Control Panel's latching feature until it is reset for operation.

After system shutdown and draining, the Model DDX Deluge Valve 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 Potter Model PFC-4410-RC Releasing Control Panel reset), and supply pressure is re-supplied to the push-rod chamber, the deluge valve is reset.

### System Operation (Double Interlock)

To fully activate and discharge water from the Reliable Model DDX Type D PrePaK in a double interlock application, two independent events must coexist. An electrical fire detection device (smoke, heat, etc.) and the system air pressure switch must be activated. This pressure switch is activated by a reduction of the system pneumatic pressure as a result of sprinkler operation. Both of these events will cause the control panel to energize the solenoid valve, thereby releasing water through the deluge valve and into the sprinkler system. The initiation of either one of these events will only cause an alarm to annunciate, and will not fill the sprinkler system.

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

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## Resetting Single And Double Interlock Systems

1. Close the main valve controlling water supply to the deluge valve and close the ¼" air shutoff valve.
2. Close the pushrod chamber supply valve.
3. Open the 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 Manual Emergency Release Valve. **Note:** The above steps accomplish the relieving of pressure in the pushrod chamber of the deluge valve.
5. Push in the plunger of ball drip valve to force the ball from its seat, and drain any water in the alarm line.
6. With the Model B Manual Emergency Station open, push in and rotate the deluge valve external reset knob counterclockwise (when facing valve) until you hear a distinct clicking noise, indicating that the clapper has closed.

**Note:** The reset knob can be rotated only after pressure in the pushrod chamber is reduced to atmospheric conditions (0 psig).

7. Inspect and replace any portion of the sprinkler system subjected to fire conditions.
8. Verify that the following valves are in their respective positions:  
Manual Emergency Release - open  
Main Drain Valve - open  
Alarm Line Valve - open  
Alarm Test Valve - closed  
Condensate Drain valve - closed  
Air Supply Valves - closed
9. Open the pushrod chamber supply valve and allow water to fill the deluge valve pushrod chamber. Close the Manual Emergency Release valve.
10. Bleed any air from the actuation piping by energizing the solenoid valve. This is done by operating the electric manual release station. While water is flowing through the solenoid valve, cause it to close by pressing the system reset button on the Potter PFC-4410-RC Releasing Control Panel. **Note:** All detection devices and the manual pull station must be reset before the releasing/control panel can be reset.
11. Open the air supply valve to restore air pressure in the sprinkler system. The rapid air-fill shutoff valve may be opened to expedite filling of the sprinkler system.
12. 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 drain manifold. If no leak occurs, the deluge valve clapper is sealed. Open slowly, and verify that the main valve controlling water supply is fully opened and properly monitored.
13. Verify that the pushrod chamber supply valve is fully open.

14. Secure the handle of the Model B Manual Emergency Station in the OFF position with a nylon tie (supplied with the assembly).
15. Press the system reset button on the Potter PFC-4410-RC Panel to place the system in the ready condition.  
**Note:** All detection devices must be reset before the panel can be reset.

## Maintenance

The Reliable Model DDX PrePaK and associated equipment shall periodically be given a thorough inspection and test. NFPA 25, Standard for the 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. Periodically open the air/condensate drain valve beneath the air tank to drain any condensate accumulation. Bulletin 519 provides information for maintaining the Model DDX Deluge Valve. Potter Manual #5403550 provides information for maintaining the PFC-4410-RC Releasing Control Panel.

## Inspection And Testing Of Single And Double Interlock Systems

1. **Water supply** — Verify that the valve controlling water supply to the deluge valve is opened fully and properly monitored.
2. **Alarm line** — Verify that the alarm line valve is opened and remains in this position.
3. **Other trimming valves** — Verify that the pushrod chamber supply valve is open as well as all of the pressure gauge valves.
4. **Ball drip valve** — Push in on the plunger to be sure the 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. **System pneumatic pressure** — Verify that system air pressure is between 7 and 10 psi (0.5 bar 0.7 bar). Check the Pressure Maintenance Device for leakage and proper pressure.
6. **Releasing device** — Check the outlet of the releasing device (i.e., solenoid valve or the Model B 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 alarm pressure switch and to the mechanical sprinkler alarm (if present). After testing, close this valve completely. Push in on the plunger of ball drip until all of the water has drained from the alarm line.
8. **Operational test** — Open the Model B Manual Emergency Station only, OR operate the solenoid valve by electrical actuation. This can be done by operating a detector or an electric manual emergency station. Double interlock systems also require that the system air pressure be discharged, through the inspectors test station or other venting means, below 4 psi (0.3 bar) before total system operation will occur. **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 a nylon tie (included with the assembly) after the deluge valve is reset.

## Testing The Model DDX PrePaK Without Causing Water Flow

1. Close the main valve controlling water supply to the deluge valve and open the main drain valve.
2. Verify that the pushrod chamber supply valve is open, allowing water to enter the push-rod chamber.
3. Operate the detection system. For double interlock applications, also disable the air supply and open the condensate drain valve to discharge the system air pressure.
4. Step #3 should result in a sudden drop of water pressure in the deluge valve push-rod chamber via an energized solenoid valve.

5. Reset the detection system - Reverse the detection system operations performed in Step #3 above. **Note:** All detection devices must be reset before the Potter PFC-4410-RC Releasing Control Panel can be reset.
6. Proceed according to the directions listed in the “Resetting Single And Double Interlock Systems” section of this bulletin.

## Draining Excess/Condensate Water From The System

1. Close the main valve controlling water supply to the deluge valve and the pushrod chamber supply valve. Open the main drain valve.
2. Slightly open the condensate drain valve until all water (if any) drains completely. **Note:** Leaving the condensate drain valve open for an extended period of time may allow excess air to bleed off resulting in an undesirable low pressure supervisory signal.
3. Close the main drain valve. Allow the system air pressure to return to its previous level. Open the pushrod chamber supply valve first, and then open the main valve controlling the water supply to the deluge valve.

## 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.

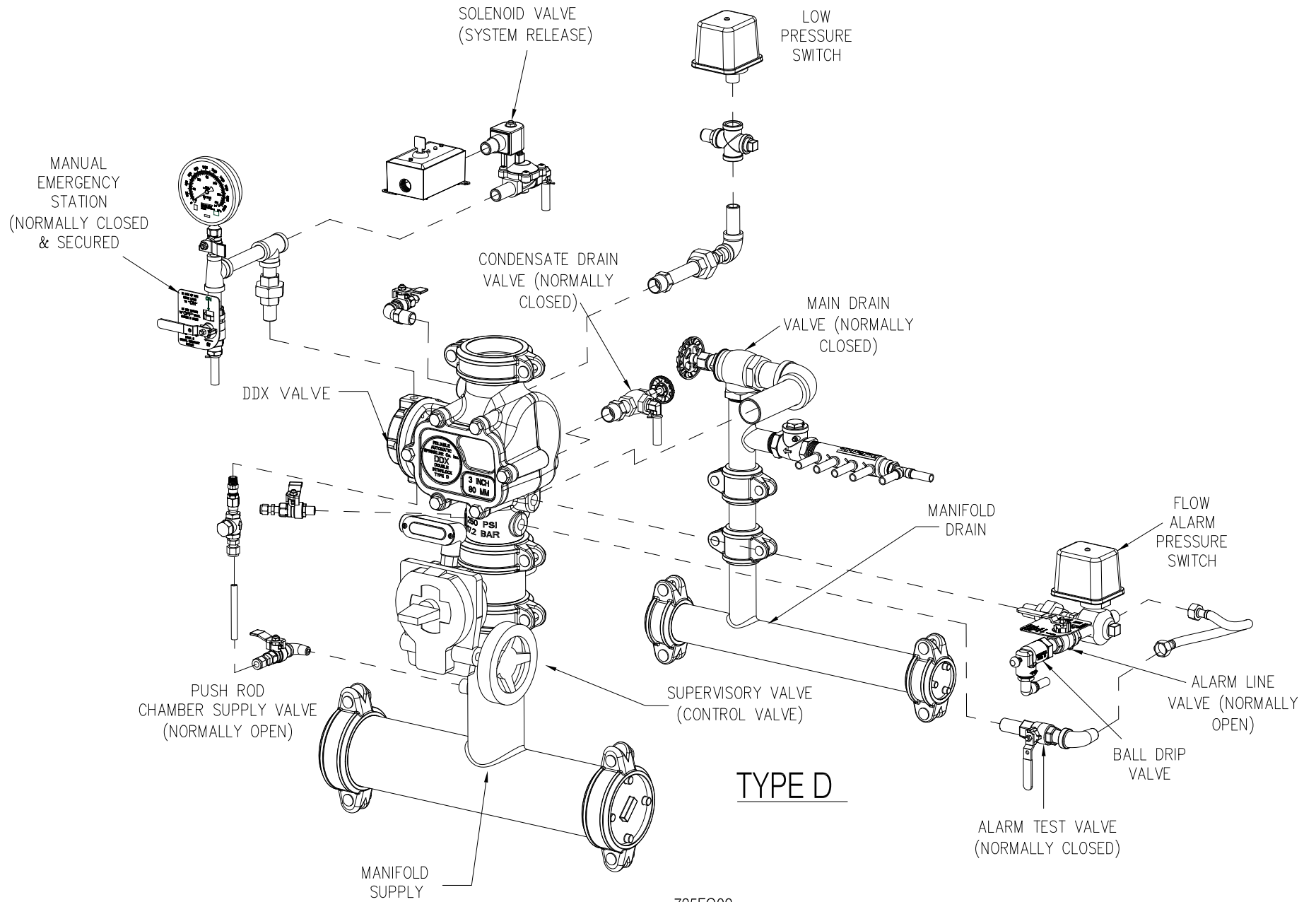
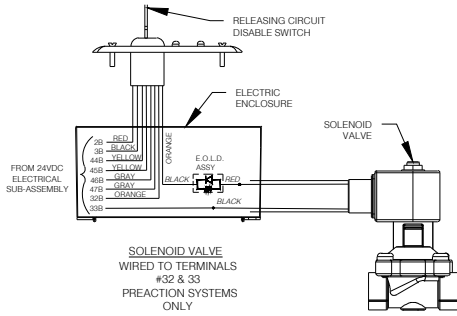
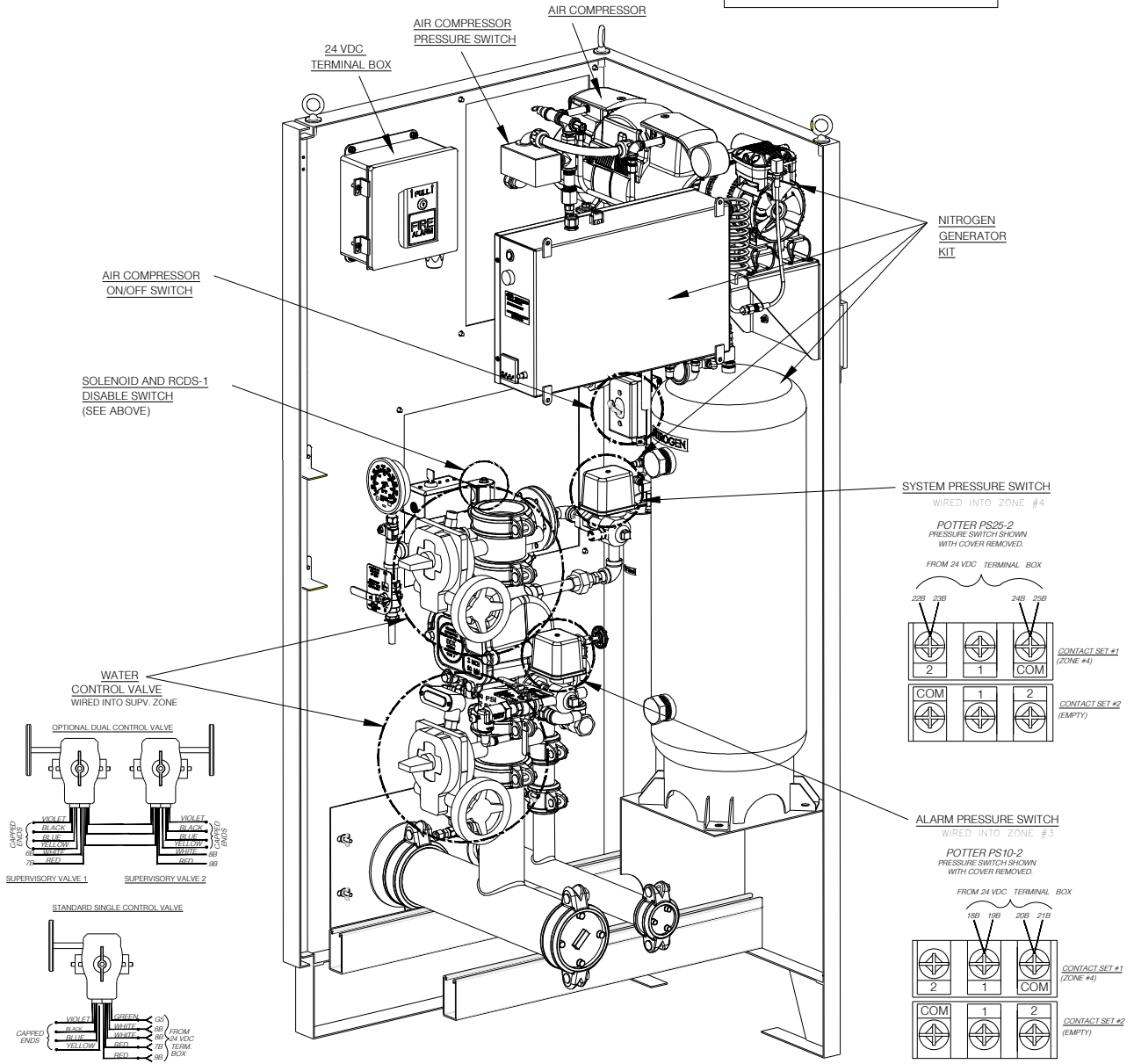


Fig. 2





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.



COMP2FG03A

**FACTORY INSTALLED  
ELECTRICAL DEVICES**  
(SOME COMPONENTS OMITTED FOR CLARITY)

Fig. 3

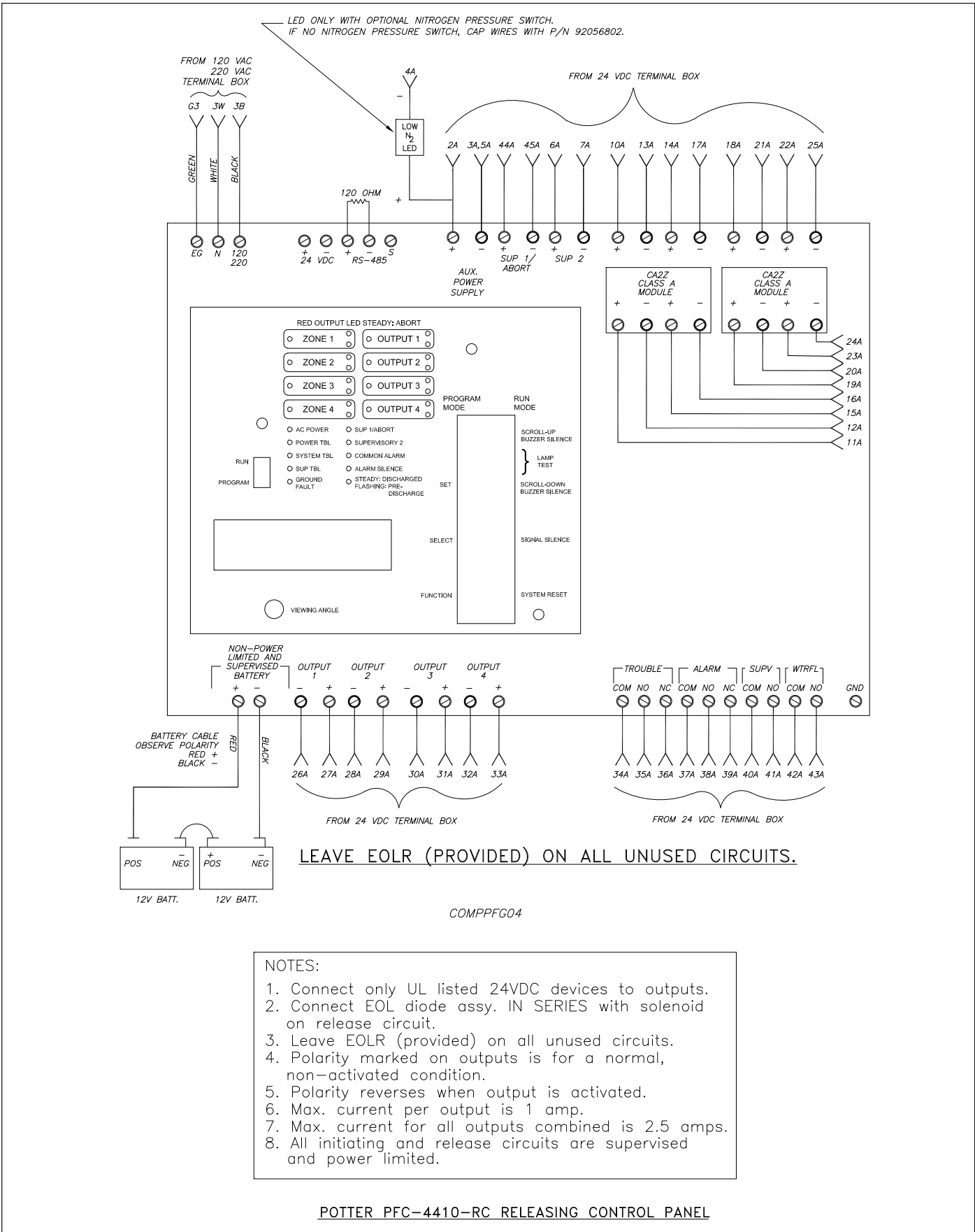
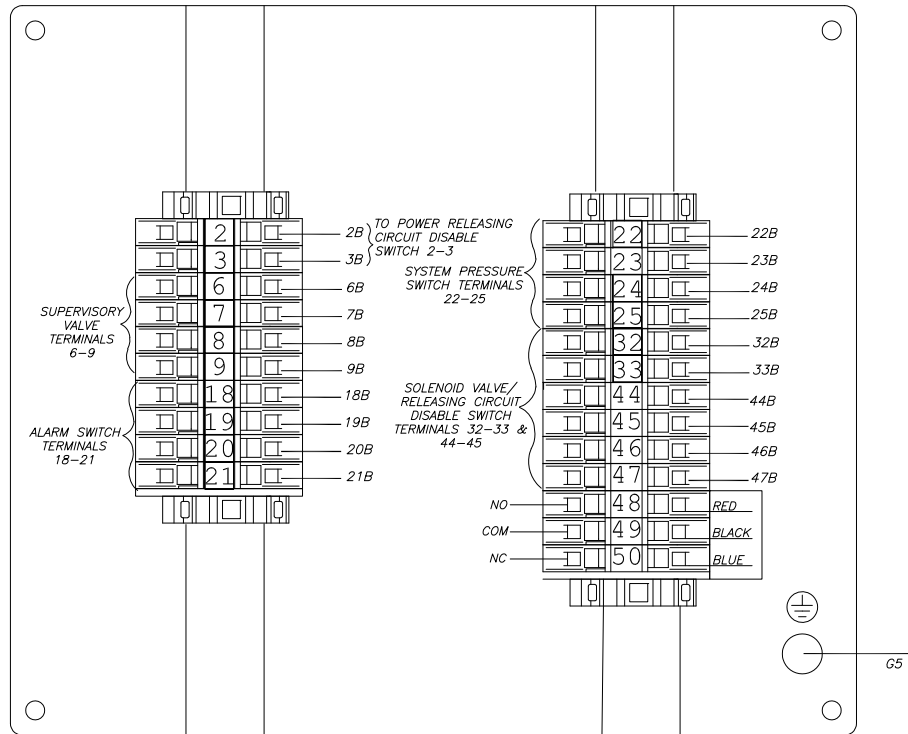
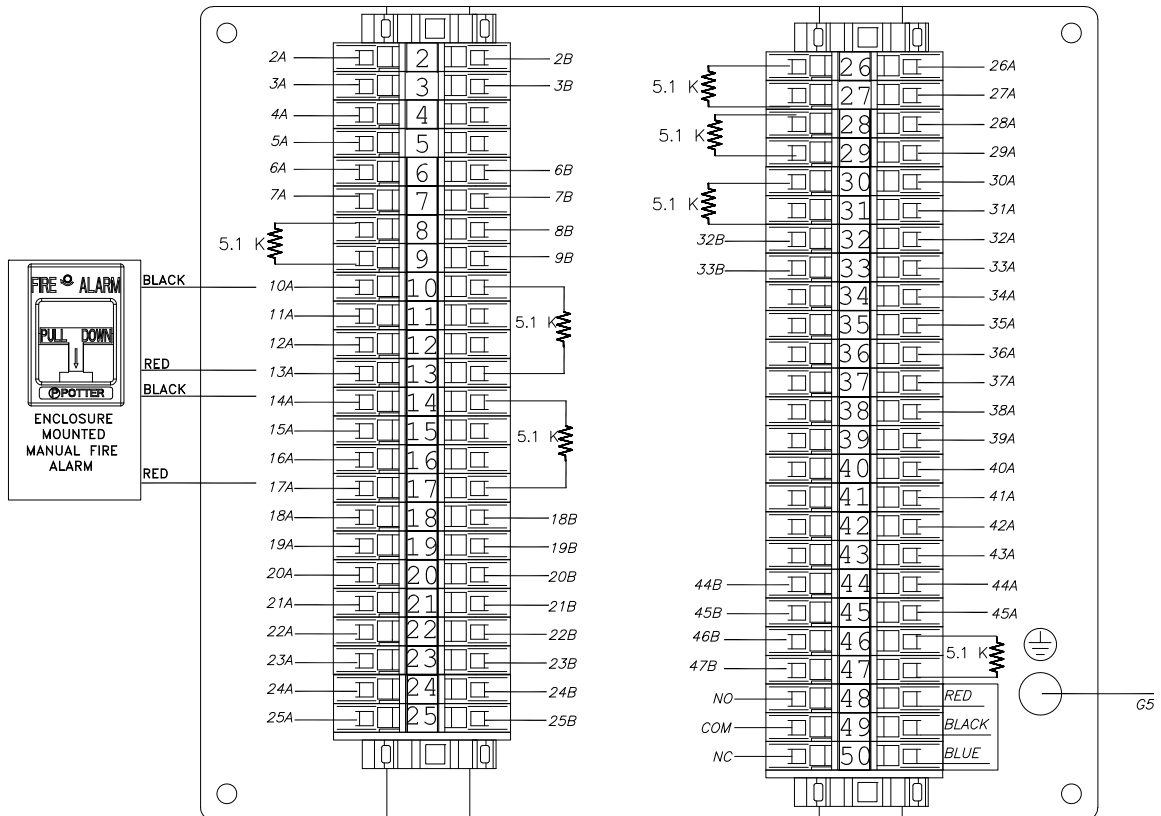


Fig. 4



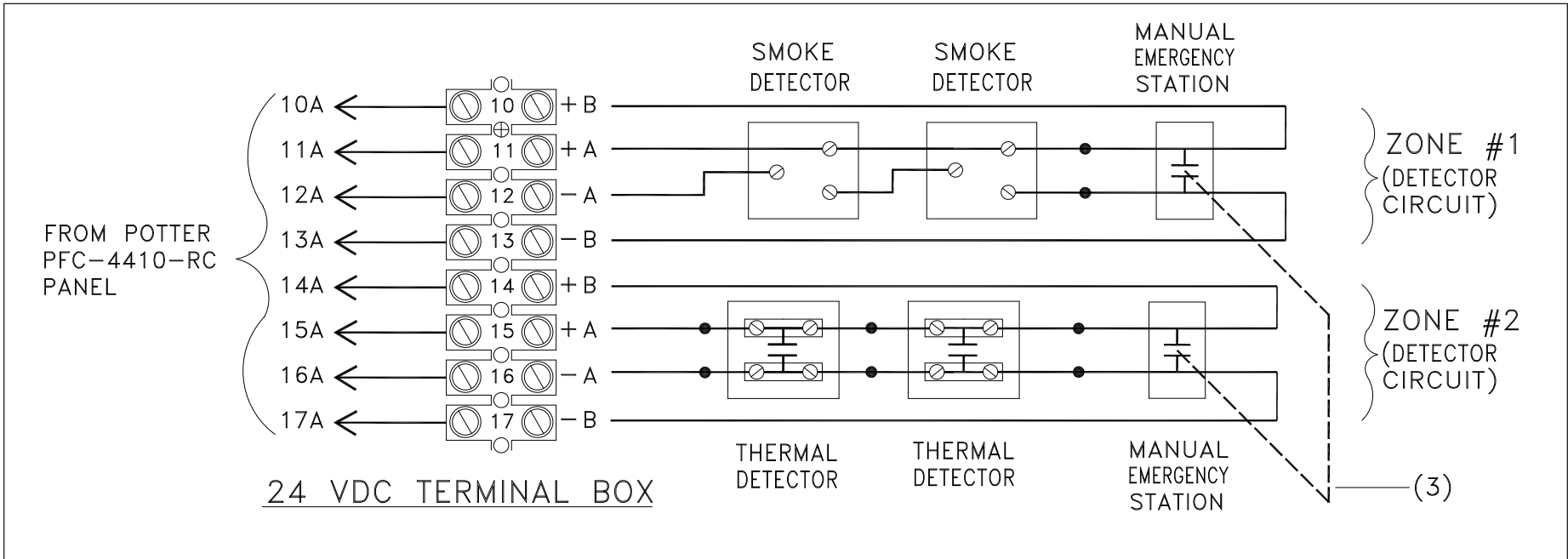
24 VDC TERMINAL BOX W/O RELEASING PANEL



COMPNN2FG05

24 VDC TERMINAL BOX WITH RELEASING PANEL

Fig. 5



### CLASS 'A' 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.

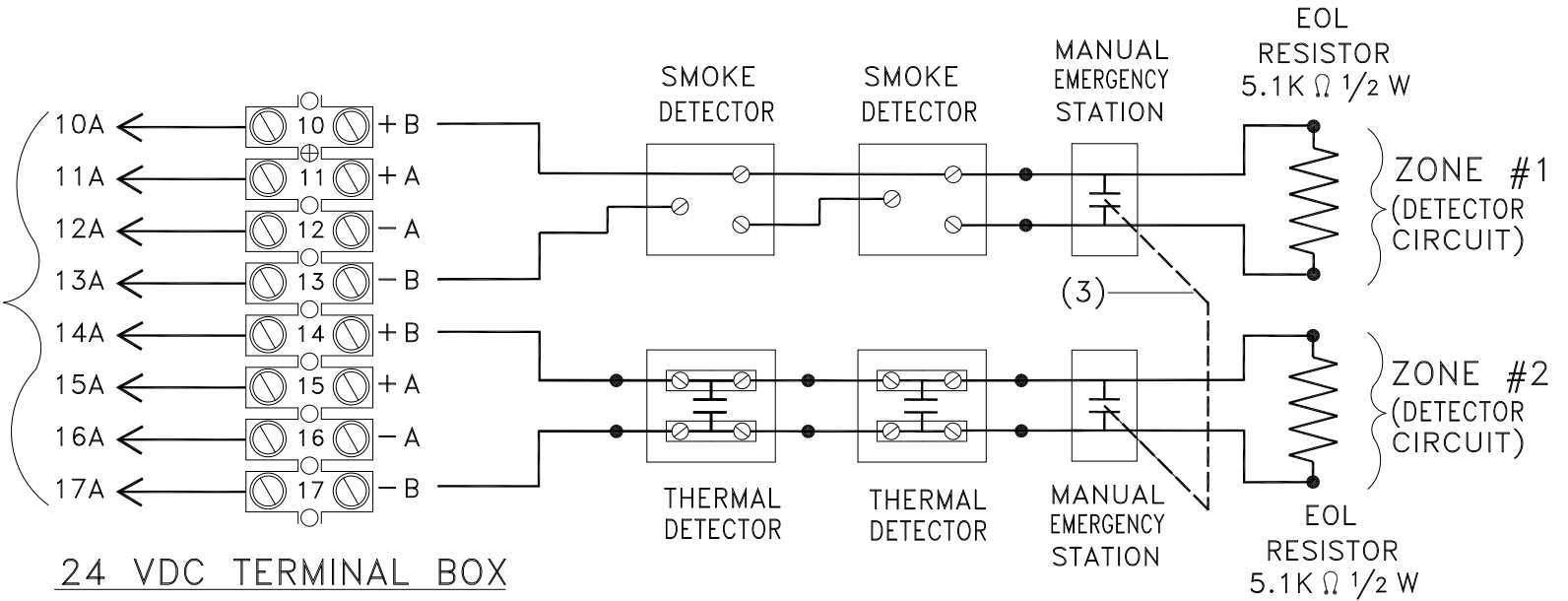
\*NOT PERMITTED IN NEW YORK CITY.  
 \*NOT FM APPROVED.

COMPPFG06

Fig. 6



FROM POTTER  
PFC-4410-RC  
PANEL



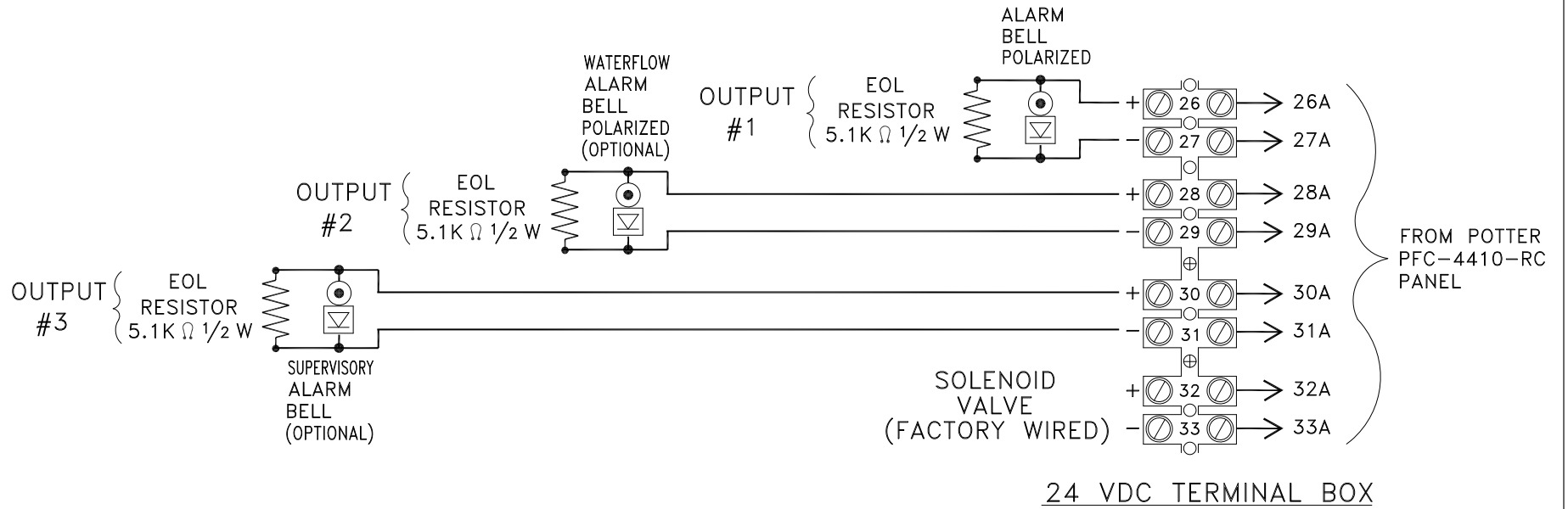
### CLASS 'B' DETECTOR CIRCUIT WIRING EXAMPLE

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



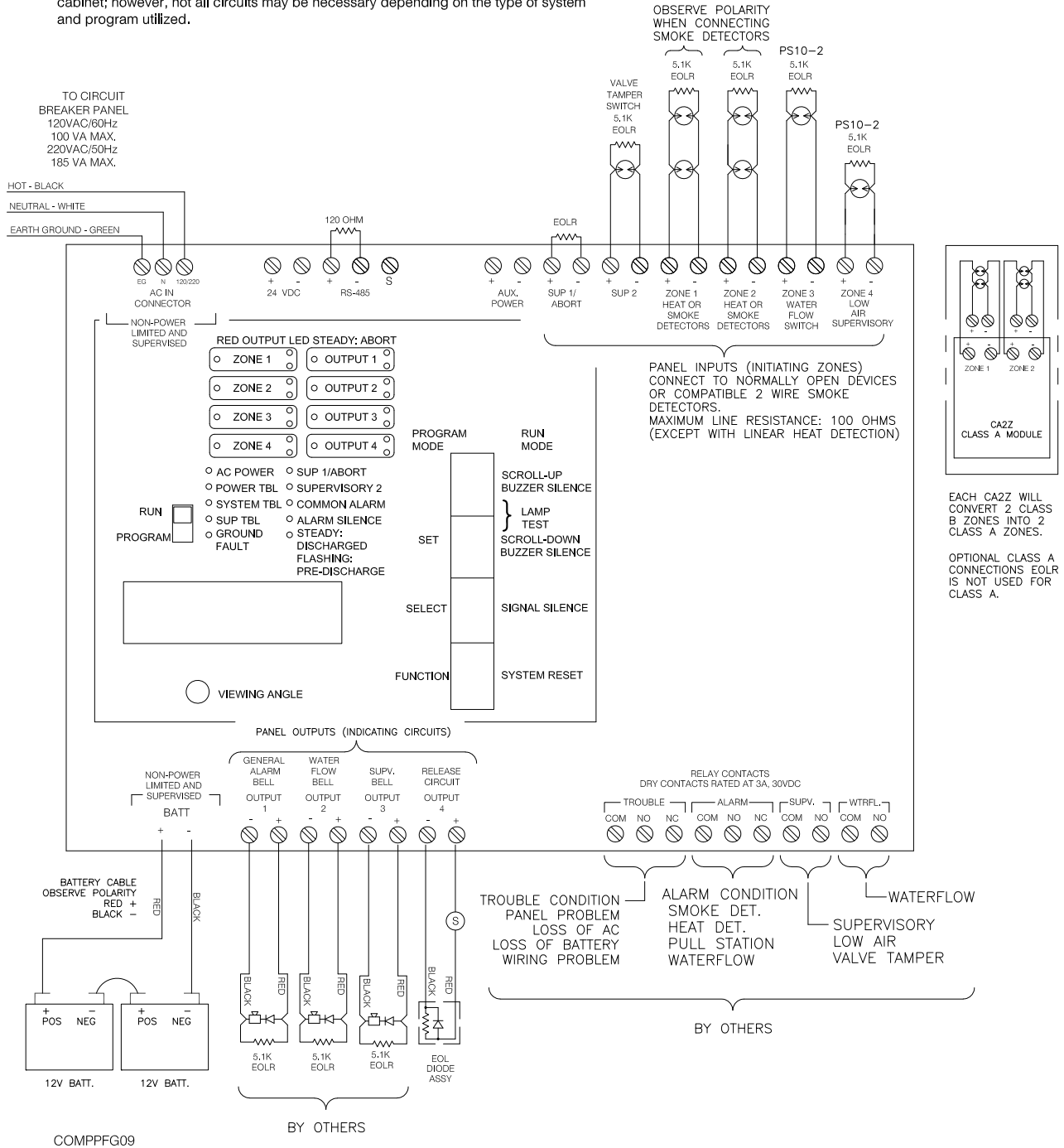
OUTPUT DEVICE CIRCUIT WIRING

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 "PASS-WORD=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 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 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 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 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 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 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).**

## Double Interlock Preaction, Single Zone Detection

### Potter Program #9

1. Apply power to the panel.
2. Slide program switch down.
3. Press the FUNCTION button until display reads "PASS-WORD=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 #9."
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 #9

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

INPUTS: 1 supervisory zone, 1 conventional detection zone, 1 low air supervisory zone, 1 waterflow zone, 1 low air alarm zone.

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

OPERATION: Activation of the conventional detection zone and the low air alarm zone at the same time (or operation of the manual pull station within the PrePak cabinet) will operate the solenoid release circuit and the general alarm bell.

Activation of the conventional zone only will operate the general alarm output.

Activation of the low air supervisory zone will operate the supervisory bell output.

Activation of the waterflow zone will operate the waterflow bell output.

Activation of the low air alarm zone will operate the supervisory bell output. It will not operate the alarm relay.

When Zone #1 is in alarm, Output #1 will operate.

When Zone #2 is activated, Output #3 will operate.

When Zone #3 is in alarm, Output #2 will operate.

When Zone #4 is activated, Output #3 will operate. This will create a supervisory condition not an alarm condition. The alarm relay will not operate, the supervisory relay will.

When both Zones #1 and #4 are activated at the same time, the solenoid circuit will operate.

#### Note:

<sup>(1)</sup> The Butterfly valve in the PrePaK 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 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).**

## Double Interlock Preaction, Cross Zoned Detection

### Potter Program #10

1. Apply power to the panel.
2. Slide 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 #10."
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 #10

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

INPUTS: 1 supervisory zone, 2 conventional detection zones, 1 waterflow zone, and 1 low air alarm zone.

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

OPERATION: Activation of both conventional zones and the low air alarm zone at the same time (or operation of the manual pull station within the PrePak cabinet) will operate the solenoid release circuit and the general alarm bell.

Activation of either conventional zone only will operate the general alarm output.

Activation of the waterflow zone will operate the waterflow bell output.

Activation of the low air alarm zone will operate the supervisory bell output. It will not operate the alarm relay.

When either Zone #1 or #2 is in alarm, Output #1 will operate.

When Zone #3 is in alarm, Output #2 will operate.

When Zone #4 is activated, Output #3 will operate. This will create a supervisory condition not an alarm condition. The alarm relay will not operate, the supervisory relay will.

When Zones #1, #2 and #4 are activated at the same time, the solenoid release circuit will operate.

#### Note:

<sup>(1)</sup> The Butterfly valve in the PrePak 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 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 Preaction, New York City Custom Program

1. Apply power to the 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. Slide the program switch up.
9. Slide the program switch down.
10. Apply steps 3 to 5.
11. Press the SELECT button until the display reads "PROGRAM #0."
12. Press the SET button.
13. Press the FUNCTION button until the display reads "OUTPUT 1: INDICATING."
14. Press the SET button until the display reads "OUTPUT #2: INDICATING."
15. Press the SELECT button until the display reads "TROUBLE BELL." Press the SET button.
16. Press the FUNCTION button until the display reads "ZONE 1 OUTPUTS." The "v" is pointing to the first available output for the zone indicated on the display. If the number is displayed, it is turned on for that zone. If the number is not displayed, the zone is turned off.
17. Press the FUNCTION button until the display reads "ZONE 3 OUTPUTS."
18. Press the SELECT button. The "1" should appear under the "v".
19. Press the SET button twice. The panel is completely programmed except for the custom banner and zone messages. If these messages are not desired, then slide the program switch back up.

## CUSTOM NYC PROGRAM

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 TROUBLE	Panel trouble condition is mapped to Output #2 (Trouble Bell) for NYC				
#3 SUPERVISORY	X				X
#4 RELEASE		X			

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

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

OPERATION: Activation of either the conventional zone or the manual release (or operation of the manual pull station within the PrePak cabinet) will operate the solenoid release circuit and the general alarm bell.

Activation of the waterflow zone will operate the general alarm bell.

Activation of either the low air zone or the supervisory zone will operate the supervisory bell.

A trouble condition (low battery, wiring problem, etc.) will operate the trouble 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 #1 (alarm bell) will operate.

When either Zone #4 or the supervisory zone is activated, Output #3 (supervisory bell) will operate.

When the panel is in a trouble condition, Output # 2 (trouble bell) will operate.

### Note:

<sup>(1)</sup> The Butterfly valve in the PrePaK 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 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).**



# FPS-900-RS Nitrogen Generator

## General

This manual provides instruction for the proper use and maintenance of South-Tek Systems N2-Blast® FPS-900-RS. South-Tek Systems and Reliable are not responsible for damages when using this in manners not approved by South-Tek Systems and Reliable. The user(s) of this document should confer any questions with a qualified South-Tek Systems representative on its commissioning and correct use. Please contact South-Tek Systems with any question or concerns at:

South-Tek Systems, LLC  
2940 Orville Wright Way Ste 600  
Wilmington, NC, 28405  
Tel: (888) 526-6284  
Email: Info@southteksystems.com  
http://www.southteksystems.com/

## Important Information

All personnel (and their supervisors) installing, operating, and maintaining the N2-Blast® must read and fully understand this manual prior to installing, operating or performing maintenance. The N2-Blast® produces nitrogen (N<sub>2</sub>) at a low flow rate, which quickly dissipates into the air. N<sub>2</sub> gas is not poisonous, but do not directly inhale since high concentrations can cause asphyxiation. Install the unit in a well-ventilated room that is not sealed off from normal living space air changes. All personnel involved with the installation, operations, and maintenance of the N2-Blast® must follow safe working practices, including OSHA and local health/safety code regulations.

## Safety Guidelines

The following section outlines the basic safety considerations about installation and operation of the N2-Blast® FPS-900-RS. For other equipment used with the nitrogen generator, such as external air compressors, and dryers, refer to the manufacturer's safety guidelines.

Using the N2-Blast® FPS-900-RS correctly is important for safety and trouble-free operation. Wrong use can cause damages to the system or can lead to incorrect gas supply. The nitrogen generator produces nitrogen at a low flow rate, which quickly dissipates into the air. Nitrogen is not poisonous, but do not directly inhaled, since high concentrations, can cause asphyxiation. Install the unit in a well-ventilated room, unsealed off from normal living space air changes.

**Warning:** Install the unit in a within a well-ventilated room, one that is not sealed off from normal living space air changes.

Read carefully and act accordingly before operating or repairing the unit:

- The operator must use safe working practices and rules when running the nitrogen generator.
- The owner is responsible for always keeping the unit in safe working conditions.
- Always use approved parts when performing maintenance and repairs. Make sure that replacement parts meet or exceed the original parts' specification.
- Only competent individuals, trained and authorized, can install, operate, perform maintenance and repair.
- Isolate incoming and outgoing pressures to the generator, and depressurize the service or repair section before performing any mechanical work, including changing the filters.
- Vent the nitrogen generator's exhaust gas outside or to a large, well-ventilated room to avoid suffocation due to lack of oxygen.
- Wear safety glasses if the cabinet door is open while the machine is running.
- Use ear protection when the equipment is running.

**NOTE: Always following local and site safety regulations in conjunction with this manual. Correct use of the nitrogen generator is important for personal safety. Incorrect safety practices can cause damage to the individual and equipment.**

Follow safe working practices, OSHA, and local health and safety regulation when maintaining the N2-Blast® FPS-900-RS.

## Air Supply

The N2-Blast® FPS-900-RS includes a built-in air compressor to supply gas to the nitrogen generator. It is not for performing quick fills; a separate suitable air compressor for should be used to fill the system.

## Electrical Requirements

The N2-Blast® FPS-900-RS requires 120VAC / 50-60hz / 1ph and draws < 8A. A 240VAC option is also available. It has a built-in 20A over-current protection device and comes with a standard 3-prong US power cord for the electrical connection (unless otherwise specified). It comes with UL 508A ICP certification, and the electrical schematics are available upon request.

## Site Specifications

Unless designed otherwise, install in a nonhazardous indoor location with temperatures between 40-100°F (4°- 38°C). For ease of maintenance, troubleshooting, and minimizing pressure drop, install the equipment in the same area. Leave enough space around the generator and other equipment for routine maintenance.

## Key Features

### Air Compressor

An oil-less internal air compressor has an engineered dampening system reducing vibration and noise throughout the cabinet. The air compressor has a pre-filter to catch small particulates that can cause damage. The recommended replacement for the pre-filter is 1000 run hours or 1-year, whichever comes first. Dirtier environments may need more frequent changes. Consult with the supplier for a different filter maintenance schedule if installing in a dirty environment.

### Air Filters

The generator has an air inlet pre-filters and two filters between the compressed air and O<sub>2</sub> separation beds - the particulate and coalescing. The 5-micron particulate filter catches the bulk particles, and the 0.1 micron coalescing catches the remaining smaller particles. Both filters feature an auto-drain that drains any water buildup within the filter housing. These drain lines are on the cabinet's bottom right side. Connect these drain lines to a safe location.

### Programmable Logic Controller

An integrated PLC within the cabinet that features smart timing to maximize the generator's performance. It controls the valve timing and sequencing to move compressed gas throughout the system. It also has a smart feature to automatically switch between different "modes" based on the current run stages (see Chapter 7: System Operation for more about the unit's functionality).

### Safety Relief Valves

The installed ASME safety relief valves add additional safety to protect component failures.

### Nitrogen Tank

A nitrogen tank inside the cabinet comes with ball valves, safety relief, and a gauge.

### Automatic Cut-In and Cut-Out

The generator starts and stops based on a pressure switch. Do not adjust the factory preset cut-in and out pressure without first consulting with South-Tek Systems.

### AutoPurge™

Designed to cycle nitrogen continuously through the fire protection system, the AutoPurge™ consists of a ball valve, strainer, and a tunable orifice that is set based upon the capacity of the system. The device connects to a 1/2" NPT outlet on the system preferably at a remote location from the system riser, in an area where water will not collect, and is accessible (see Figure 10).

When set properly the AutoPurge™ is designed to ensure 98% minimum purity throughout the system within two (2) weeks. A convenient outlet port is provided for connection of a Quick-Check Portable® Nitrogen Purity Sensor (not provided; order separately).

### Patented BlastOff® – Leak Detection System

The "BlastOff® Leak Detection" is a patented feature which sends an alarm if it detects a possible gas leak. The alarm signal can be an audible, visual, and dry contact connection to the "Building Management System (BMS)". Power cycle the unit to reset the alarm but avoid doing this without finding the cause, as it will shorten the generator's life.

### N2-Blast® FPS-900-RS Specifications

- Nitrogen Purity 98.5+%
- Integrated Installation in Reliable PrePak
- Display Hours/Power on/Operating
- N<sub>2</sub> Storage Pressure 60-70 PSIG (±5%)
- Cabinet Port Connections 1/2" NPT Female
- Electrical 110-220V / 50-60Hz / 1Phase; 20 Amp Breaker
- Compressor Integral / Oil-Free
- Ambient Temperature 40° to 100°F
- Noise Level (dbA) < 90 dbA

## Operation

The nitrogen generator uses valve sequencing to produce nitrogen. The design meets specifications of a fire protection system. Consult with South-Tek System for written approval before performing any field changes or customization. Unauthorized changes void all warranties and may cause damages or malfunctions to the system.

This section describes the major control functions and instrumentations associated with the nitrogen generators. All programs are proprietary and password protected from the factory. Do not alter any controls or instrumentations. Changes without South-Tek Systems' written consent voids the performance specifications.

### Controller Modes

To utilize the buttons on the front of the controller the unit must be in "S" or "Switch" mode and unlocked. If the system is displaying "LOCK", the Mode Select Button may be pressed and held to unlock the controller (repeat this step if a system lockout is desired). To change to Switch Mode, press the Mode Select Button when the controller is unlocked until the System Mode Indicator displays "S". This mode allows access to two features:

- Alarm Simulation (5) – Hold the Alarm Simulation Button for 3 seconds or press the filter replacement reset button 3 times within 3 seconds to activate. This will simulate an alarm condition and trip the alarm dry contact in the unit for 2 seconds so that proper functioning can be confirmed.

- Filter Change Reset (0) – When a new FRP (Filter Replacement Kit) is installed, the 1000-hour filter change time must be reset. After replacing the filter elements, press and hold the Filter Change Reset Button for 7 seconds. An audible beep will confirm that the time is reset and filter alarm will be reset. (**Note:** this will also trigger the Customer Alarm Relay for one second)

### **Normal Run/Standby Mode (run/Stdby)**

“Run” mode is when the FPS-900-RS is producing nitrogen and supplying it to the storage tank. The system will automatically enter “Standby” mode when the tank is fully pressurized (70 PSIG  $\pm$ 5 PSIG). It will remain in “Standby” mode until the tank pressure falls 7-10 psig.

#### **To run the system in normal run mode:**

1. Connect power to the system.
2. Open the nitrogen generator’s 3-way outlet ball valve to nitrogen-out position.
3. On the nitrogen tank, open the gas inlet valve.
4. Push the On/Off toggle button on the upper right control panel to the “On” position (up) and the system will automatically turn on and start filling the storage tank with nitrogen.

#### **To stop the system:**

1. Switch the nitrogen generator’s 3-way outlet ball valve to the bypass position.
2. System will automatically stop once it reaches the cut-out pressure of approximately 65-75 PSIG.
3. In the case of an emergency shut off, push the On/Off toggle button on the upper left control panel to the “Off” position. The unit will shut down immediately.

### **Alarm Mode**

When an alarm mode is activated, it will trigger the audible buzzer, alarm contact, and flash the cause of the alarm on the screen. The customer alarm contact wiring can be viewed on the supplied wiring diagram. The customer alarm dry contact is constantly energized and will constantly illuminate the LED indicator on top of the contact. This is so when there is no power or power is lost on the system, the contact will de-energize and show a fault condition. The alarm contact has a max rating of 6A at 250VAC and 2A at 24VDC.

### **Bypass Mode (BPASS)**

During the 30-minute fire protection piping system fill test or an issue with the generator is detected, the operator can switch the system into manual bypass mode by turning the handle on the 3-way ball valve to the bypass position. With the handle in the “Bypass Mode”, the bypass alarm triggers the audible buzzer, alarm contact, and flashes “BPASS” on the controller’s 7-segment display. The alarm will turn off once the handle is back to normal run position.

### **BLASTOFF® Alarm Mode (B-Off)**

The nitrogen generator activates a BlastOff® Alarm when it detects potential leaks or nitrogen being over-drawn. The BlastOff® Alarm will trigger the audible buzzer, alarm contact, and flash “B-OFF” on the controller’s 7-segment display. Inspect and test the system for leaks and component failures. Power cycle the unit to reset the alarm but avoid doing this without finding the cause, as it will shorten the generator’s life. Contact South-Tek System or the local installer for further troubleshooting.

### **Low System Pressure Alarm Mode (Lo-n2)**

The low system pressure alarm activates when a system pressure is detected below the normal functioning limits of the nitrogen generator. This may be from an issue with the generator, a supply valve being shut off, or caused by a large leak in the fire protection system.

### **Power Loss Alarm Mode (-----)**

The Power Loss alarm activates when the nitrogen generator loses power for any reason. This will cause the alarm contact to trigger.

### **Filter Replacement Alarm Mode (FILTr)**

Once the generator has been running for 1000 hours or more, the filter replacement alarm will activate. Replace the filters according to Section 9 Maintenance. After replacing the filter elements, press and hold the Filter Change Reset Button for 7 seconds. An audible beep will confirm that the time is reset, and filter alarm will shut off if it is active. (Note: resetting this will also trigger the Customer Alarm Relay for one second)

### **Start-up Procedures**

Use caution when working with pressurized gas. Always leak check every line before using the system. Note: Line leaks will cause the N2-Blast® FPS-900-RS to run excessively, shortening its life and possibly causing excessive wear on the compressor.

1. Visually inspect the unit to ensure no damage occurred during shipping and handling.
2. Check the power connection is correct.
3. Turn the 3-way ball valve on the system output to the “Bypass” position.
4. Open the inlet ball valve on the nitrogen storage tank if it is closed.
5. Push the power button on the top left of the cabinet to the “On” position (up). The air compressor will power on if the storage tank is under pressurized. If neither the compressor nor PLC display power on, check the wiring and supply power to the generator.

6. Once the system is running, the pressure gauge will increase to 65-70 PSIG within 30 minutes or less. While it is running, check the system for leaks to ensure proper functionality.
  - a. Once it reaches 65-70 PSIG, the system will enter "Standby" mode and automatically shut off the internal air compressor. Check the controller on the control panel for the "StdbY" display.
  - b. Once in standby, note the pressure reading on the tank pressure gauge. Monitor the pressure for the next 5 minutes for any loss in pressure. If there is a pressure drop, check for leaks around connection fittings, otherwise proceed to the next step.
7. Switch the 3-way ball valve on the system output to the "Nitrogen Out" position and the system will turn on and fill the storage tank with nitrogen.
8. Completely fill the storage tank and allow the nitrogen generator to go into standby mode.
9. Once in standby mode, monitor the tank pressure gauge for 5 minutes and ensure no significant leaks are in the sprinkler system.

### Air Intake Filter

The integrated air compressor, of the N2-Blast® FPS-900-RS, has an air intake pre-filter. It prevents particles from entering the compressor housing and damaging internal components. Replace this filter once per year or every 1000 hours, whichever comes first. To do so, remove the pre-compressor filter cap by twisting it clockwise. Remove the old element and use a clean dry cloth to clean the filter bowl before installing the new element.

### Air Filter Replacement

The particulate and coalescing filters, after the air compressor, are designed to capture particulate and moisture prior to entering the rest of the system. These filters need to be replaced once per year or every 1000 hours, whichever comes first.

**Note: Annual Filter replacement kit part # FRP-007  
Follow these instructions to replace filters:**

1. Turn off the unit and remove the front cabinet door.
2. Locate the air filters on the bracket in the top-left of the cabinet (see Figure 11).
3. Make sure the filters are completely depressurized by checking the pressure gauge.
4. Remove both filter bowls by turning them counter-clockwise.
5. After removing the filter bowls, rinse debris out of the bowls with warm water.
6. Dry the bowls with a clean dry cloth and replace old O-rings with the ones in the kits and lubricate the seals.
7. Change the filter elements:
  - a. Particulate Element - Pull the plastic element housing out of the filter bowl. Twist off the black plastic cover and pull off the particulate element. Install the new element in the reverse order.

- b. Coalescing Element - Twist the coalescing element counter-clockwise. Install the new element in the reverse order.
8. After replacing all elements and O-rings and cleaning the bowls, install the bowls back to their corresponding filter housings. Hand-tighten only.

After replacing the filters, check the filter bowls for leaks by turning on the unit momentarily. Turn the unit off to reinstall the front cover and then power the unit back on. Once powered up, the air compressor will turn on and the system will start producing nitrogen.

## Key Contacts

Contact your local provider/installer for any questions about the performance and/or maintenance of the system. They will be best suited to answer your questions and your quickest solution on any issues you may have. If they cannot be reached, contact the manufacturer at:

South-Tek Systems, LLC.  
tel (888) 526-6284 fax (910) 332-4178  
Email: info@southteksystems.com

## FAQS

### 1. Power Issues

If the N2-Blast® FPS-900-RS does not have power, the production and storage of nitrogen will become apparent once the storage pressure drops.

- Check the power cord.
- Has the building's circuit breaker or GFCI tripped? Locate the breaker and reset. If breaker continues to trip, you may have that circuit overloaded.

### 2. Pressure Issues

The N2-Blast® FPS-900-RS will produce and store Nitrogen (N<sub>2</sub>) at 70 (+/-3) psig. Once the storage tank reaches 70 (+/-3) psig, the system will go into Standby Mode. When the pressure drops by about 7-10 psig, the system will go into Run Mode and begin to refill the storage tank. Contact the manufacturer or factory trained technician if system does not properly operate within these ranges

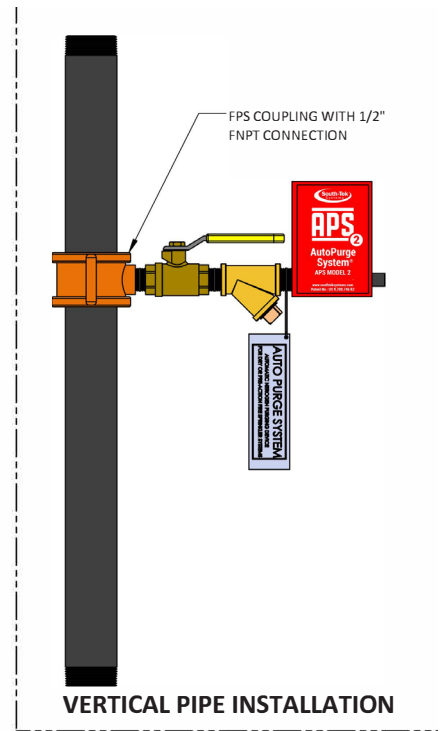
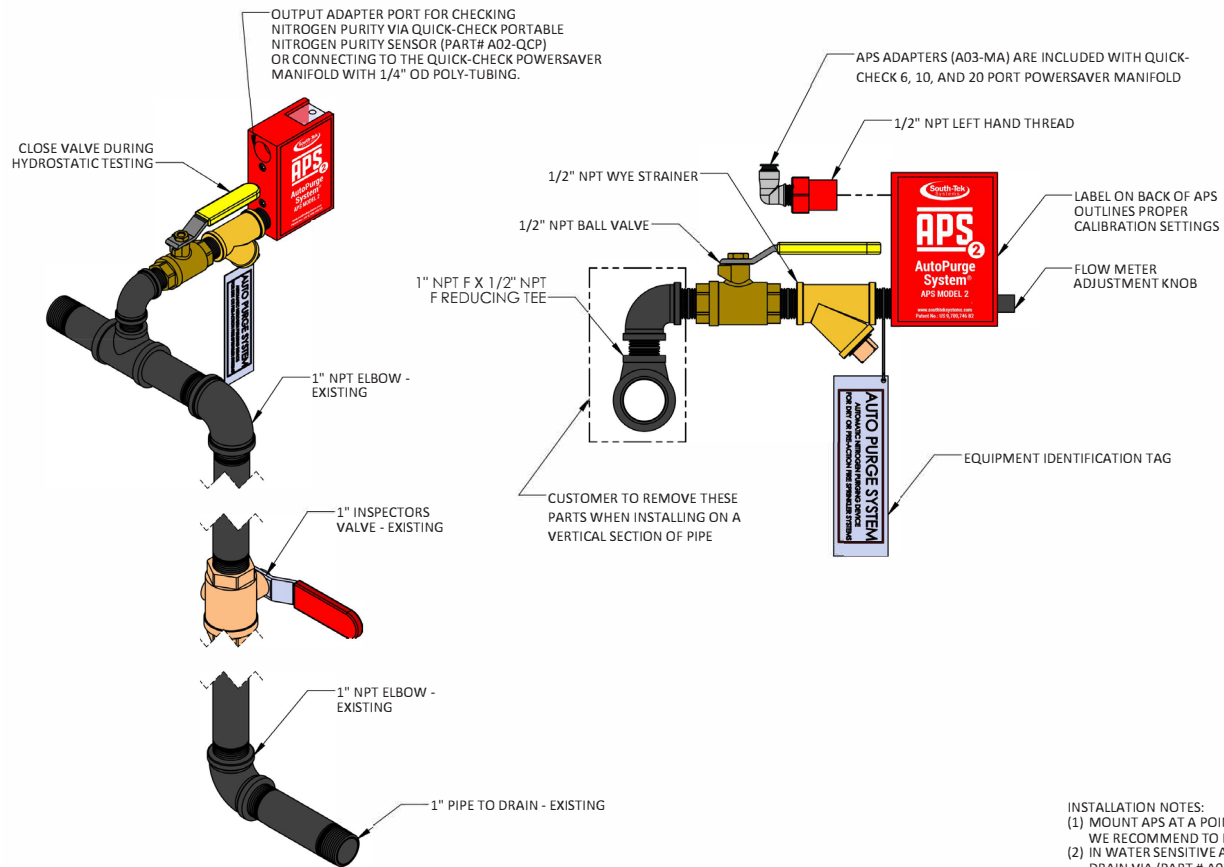
### Nitrogen Pressure Check:

The pressure gauge on the storage tank should be between 60 and 70 psig. If the pressure is low, check the following:

- Check the power.
- Find out if fire protection system is being tested.
- Check for leaks throughout system.

### 3. Leaks

As with any gas system, only use a spray bottle on non-electrical equipment to find leaks. Fix or replace leaking fittings or old hose. Push-to-connect fittings will show bubbles and typically have up to a 5ccm acceptable leakage rate. Contact your local provider/installer for help.



INSTALLATION NOTES:  
 (1) MOUNT APS AT A POINT IN WHICH WATER WILL NOT COLLECT WITHIN THE FIRE PROTECTION PIPING. WE RECOMMEND TO PLACE THE APS AS FAR FROM THE PUMP ROOM AS POSSIBLE.  
 (2) IN WATER SENSITIVE AREAS, USING THE OUTPUT ADAPTER PORT YOU CAN PLUMB THE APS TO A DRAIN VIA (PART # A03-WDK)"N2-BLAST - APS WATER DRAIN ADAPTER KIT".

Fig. 10



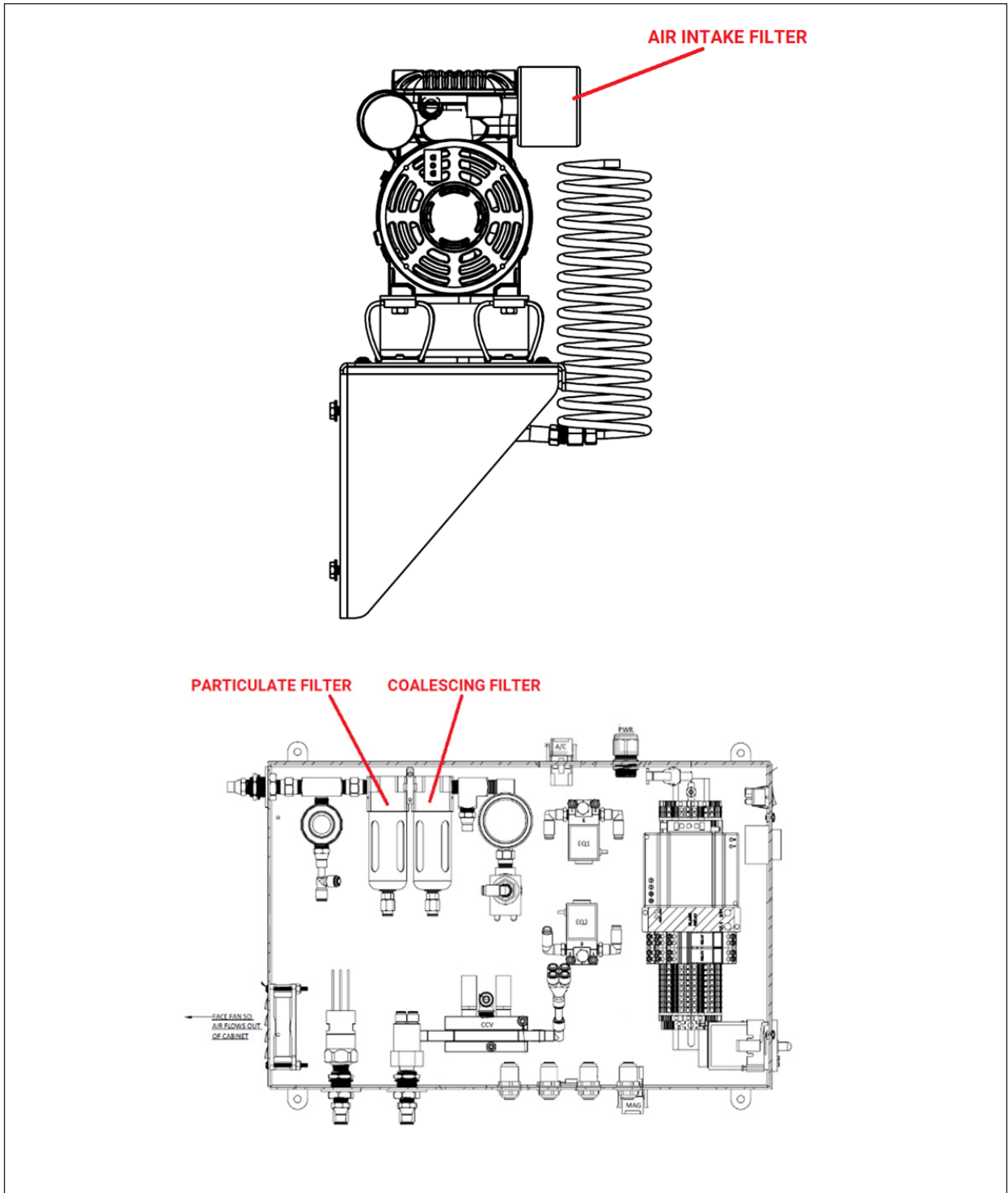


Fig. 11 - Nitrogen Generator Filter Locations



## Reliable PrePaK™ Part Number Configurator (Type D with N2-Blast®)

PREPAK	SIZE <sup>(1)</sup>	SYSTEM TYPE	SOLENOID <sup>(2)</sup>	RELEASE CONTROL PANEL <sup>(4)</sup>	AIR COMPRESSOR <sup>(5)(6)</sup>	GENERATOR OPTION	FUTURE
655	Select Below	1	Select Below	Select Below	Select Below	8	0
27.	2 = 2"			0 = No Control Panel	0 = None		
	0 = 2-1/2"		1 = 175 PSI Rated	1 = POTTER 4410RC	1 = 1/2 HP 115VAC 60HZ QRM2-50115T		
	3 = 3"		2 = 300 PSI Rated		2 = 1 HP 115VAC 60HZ QRM2-100115T		
	4 = 4"				3 = 1/2 HP 220VAC 60HZ QRM2-50220T		
	6 = 6"				4 = 1 HP 220VAC 60HZ QRM2-100220T		
	A = 2" w/SYS Side Control Valve		5 = 175 PSI Rated W/ Coil Supervisory Switch <sup>(3)</sup>				
	B = 2-1/2" w/SYS Side Control Valve						
	C = 3" w/SYS Side Control Valve						
	D = 4" w/SYS Side Control Valve						
	E = 6" 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.

**Optional Seismic Kit (order separately):** Reliable part number 6501200042 (30" x 33" cabinet) seismic upgrade kit is required to make the Reliable N2Blast PrePaK OSHPD compliant. One kit is required for each PrePaK (reference Caution Sheet 331).