

# Reliable®

**Model DDX-LP N2-Blast® PrePak**  
**Low Pressure Dry Pipe System**  
 2" (50mm), 2-1/2" (65mm),  
 3" (80mm), 4" (100mm)

## Instructions for Installation, Operation, Care and Maintenance

### Low Pressure Dry Pipe System 8 psi - 24 psi (0.6 bar - 1.7 bar) System Air/Nitrogen Pressure

#### General Description

The Reliable Model DDX-LP PrePak with integrated nitrogen generation (Sizes 2" (50mm), 2½" (65 mm), 3" (80 mm) and 4" (100 mm)) is a completely self-contained, supervised dry pipe system that can be readily installed within a floor space of less than 7 ft<sup>2</sup> (0.65 m<sup>2</sup>). Refer to Fig. 1 for cabinet dimensions. Installation of the DDX-LP PrePak requires just 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) and the nitrogen generator (115 VAC).

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

The Reliable Model DDX-LP 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, AutoPurge™. The nitrogen generator is completely wired, tested, and integrated with the Model DDX-LP 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 heart of the Reliable Model DDX-LP PrePak is the Model DDX-LP Dry Pipe Valve. The Reliable Model DDX-LP Dry Pipe Valve is a hydraulically operated, mechanical valve designed for use as a primary control valve in a low pressure dry pipe valve system. The trim set used with the Model DDX-LP Dry Pipe Valve contains the Reliable Model LP Dry Pilot Actuator releasing device. This Actuator allows the system air or nitrogen pressure to be considerably less than the water supply pressure (see Table A). The following benefits are a direct result of lower air pressure:

1. In refrigerated area systems, lower air pressure decreases the possibility of ice plugs that could impede or prevent the flow of water to fire sprinkler heads in the event of fire.



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

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2. Lower air pressure allows for smaller capacity, lower cost dehydration equipment, where required.
3. Lower air or nitrogen pressure can reduce water delivery time when the system actuates, and in some cases, may eliminate the need for an accelerator.
4. For systems supplied with nitrogen, low supervisory pressure reduces the quantity of nitrogen required to maintain the system pressure.

The Model DDX-LP PrePak system is initially pressurized with air provided by the factory-installed air compressor. Supervisory pressure is provided and maintained by the integral nitrogen generator and is monitored by a system pressure switch.

**Note:** Compressed air is not to be considered dry air and may contribute to internal corrosion of piping, and/or ice plugs in system piping. The factory-installed air compressor should be utilized for initial fill only and make-up air only when the nitrogen generator is not active.

When a fire sprinkler operates, there will be a loss of air or Nitrogen pressure in the sprinkler system piping which will cause the Model LP-Dry Pilot Actuator to open. The opening of this device allows the Model DDX-LP valve to flow water into the system piping.

A Model B Hydraulic Manual Emergency Releasing station is standard equipment in the Reliable DDX-LP 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 DDX-LP 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-LP N2-Blast PrePak dry-pipe system is FM Approved as a factory-assembled Dry-pipe System to Approval Standard 1011/1012/1013, Deluge and Preaction Sprinkler Systems.
- The Model DDX-LP dry-pipe valve and 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.

## Technical Data

1. The Reliable Model DDX-LP PrePak is rated for a minimum water supply pressure of 20 psi (1.4 bar). The 2", 2-1/2", 3", and 8" sizes are rated for a maximum pressure of 250 psi (17.2 bar), and the 4" and 6" sizes are rated for a maximum pressure of 300 psi (20.7 bar). Water temperature must be maintained between 40°F and 140°F (4°C and 60°C).

2. Friction loss, expressed in equivalent length of Schedule 40 pipe and based on Hazen-Williams Formula is:

System Size	Equivalent Length
2" (50 mm)	19.4 ft (1.3 m)
2½" (65 mm)	24.5 ft (1.8 m)
3" (80 mm)	28.9 ft (3.8 m)
4" (100 mm)	32.8 ft (17.7 m)

The equivalent length in the table above includes the Model DDX-LP valve, supply manifold tee, supply side control valve, and the section of pipe above the Model DDX-LP 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. Refer to 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
Model DDX-LP Dry Pipe System	Reliable Bulletin 338
Low Air Pressure Switch	Potter, 5401564
Alarm Pressure switch	Potter, 5400928

## Installation Requirements

The automatic sprinklers utilized with the DDX-LP 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 Model DDX-LP PrePak operation is controlled by the Model LP Dry Pilot Actuator. The 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 air supply 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 "Installation Guidelines for Refrigerated Storage" may need to be incorporated.

## Hydrostatic Testing of DDX-LP Valves and DDX-LP 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 systems require an additional low pressure air test.

# ASSEMBLY DIMENSIONS

SYSTEM SIZE	A	B	C	D	E	F	G	H	J	K (RIGHT)	K (LEFT)	L	
												WITHOUT SYSTEM SIDE VALVE	WITH SYSTEM SIDE 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]	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]	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]	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]	29.5 [74.9]

SOME COMPONENTS OMITTED FOR CLARITY

DIMENSIONS: INCHES  
[CM]

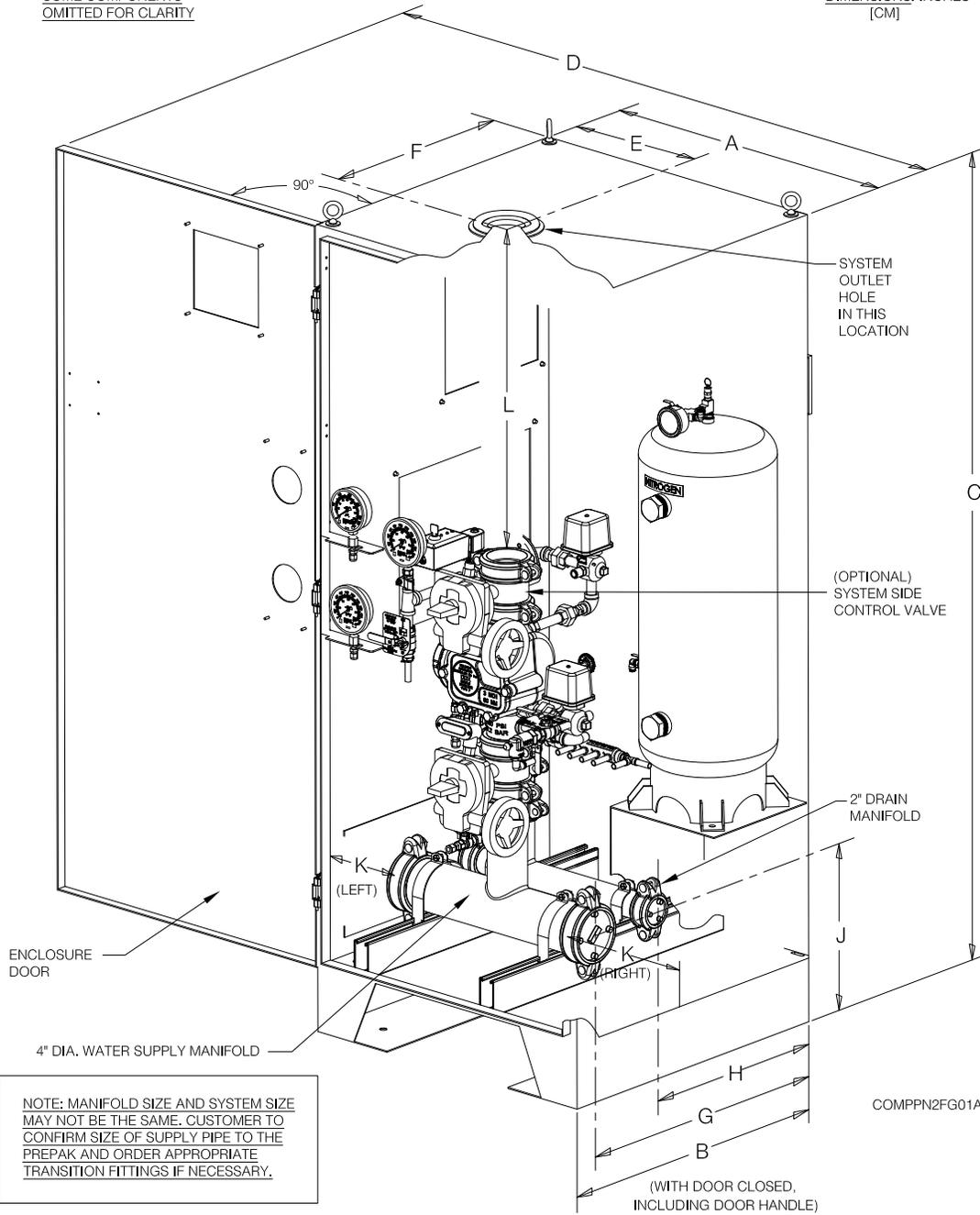


Fig. 1

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.

Subjecting 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 of a “water hammer” effect, which may 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 Supervisory Pressure Requirements

The DDX-LP PrePak includes gauges indicating the air/nitrogen and water pressures on the Model DDX-LP system. Table A specifies the air or nitrogen pressure to be maintained in the sprinkler system piping based on the water supply pressure. The factory installed Pressure Maintenance Device in the unit automatically regulates makeup air or nitrogen flow to maintain pressure with normal leakage from system piping, while restricting the flow of makeup air or nitrogen to the system. Please note that when the optional Model B1 Accelerator is to be utilized to expedite water-delivery time, the air or nitrogen 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.

The factory-installed system low 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 24 VDC electrical connections in the Reliable Model DDX-LP PrePak are translated to a water tight terminal box mounted on the inside of the enclosure. All field wiring connections are made at this terminal box.

A separate power connection is provided for the optional air compressor.

**Note:** The air compressor must be connected to a grounded metallic, permanent wiring system, or an equipment grounding terminal or lead on the product. Power supply wiring must conform to all required safety codes and be installed by a qualified person. Check that the supply voltage agrees with that listed on compressor nameplate.

### Maintenance

The Reliable DDX-LP PrePak and associated equipment shall periodically be given a thorough inspection and test. NFPA 25, Standard for 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 condensate drain valve beneath the air tank to drain any condensate accumulation. Reliable Technical Bulletins 338 and 519 provide additional information for maintaining the Model DDX-LP Deluge Valve.

### System Setup (Refer to Figure 2)

- Close the main valve controlling water supply to the Model DDX-LP deluge valve. Also, close the two ¼” valves supplying air or nitrogen to the system.
- Close the pushrod chamber supply valve.
- Open the main drain valve and drain the system.
- 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.
- Push in the plunger of ball drip valve to force the ball from its seat, and drain any water in the alarm line.
- Push in and rotate the deluge valve’s external reset knob counter-clockwise (when facing valve) until you hear a distinct clicking noise, indicating that the clapper has reset. **Note:** The reset knob can be rotated only after pressure in the pushrod chamber is reduced to atmospheric conditions (0 psig).
- Inspect and replace any portion of the sprinkler system subjected to fire conditions.

9. Verify that the following valves are in their respective positions prior to continuing:  
Manual Emergency Release - open  
Main Drain Valve - open  
Alarm Line Valve - open  
Alarm Test Valve - closed  
Condensate Drain valve - closed  
Air/Nitrogen Supply Valves - closed
10. Open pushrod chamber supply valve and allow water to fill the pushrod chamber. Close the Manual Emergency Release valve after any trapped air has had a chance to escape from the deluge valve's pushrod chamber.
11. Upon seeing this solid flow of water coming out of the Model LP Dry Pilot Actuator, open the Rapid-Air Fill Valve thereby rapidly applying compressed air or nitrogen into the Model LP Dry Pilot Actuator and the sprinkler system until the pressure conforms to Table A levels, as indicated by the system air pressure gauge. The Model LP Dry Pilot Actuator will eventually close during this pressurizing process and water will stop flowing through the drain tube. At this point, the pressure gauge on the pushrod chamber pressure will equalize to the available water supply pressure. Once the actuator is set up correctly, close the Rapid-Air Fill Valve and open the Regulated Air Shutoff Valve.  
**Note:** For systems using nitrogen as the primary source, the system may be set up using the nitrogen source following the steps above. The air compressor, if present, may then be placed into operation as the backup pneumatic source.
12. Open the alarm line valve.
13. If the Model B1 Accelerator Kit is installed, open valve P. Prior to opening valve P, be sure that the Model B1 Accelerator has been successfully reset per Reliable Technical Bulletin 323.  
**Note:** The B1 Accelerator requires a minimum of 15 psi (1,0 bar) supervisory air or nitrogen pressure for proper operation.
14. Slightly open the main valve controlling water supply to the Model DDX-LP Deluge Valve. This will begin to fill the deluge valve beneath the clapper with water. Once any trapped air has been vented, close the main drain valve. Observe if water leaks through the ball drip valve into the 1" drain manifold through the clear tubing. If no leakage occurs, the deluge valve clapper is sealed. Fully open the main valve controlling the water supply to the Model DDX-LP Deluge Valve and that it is properly monitored
15. Verify that the pushrod chamber supply valve is open.
16. Secure the handle of the Model B Manual Emergency Station in the OFF position with a nylon tie (supplied with the assembly).

## Inspection And Testing Of The DDX-LP PrePak Systems (Refer to Figure 2)

1. **Water supply** — Verify that the valve controlling water supply to the deluge valve is opened fully and properly monitored.
2. **Pushrod Chamber supply** — Verify that the valve supplying water to the pushrod chamber is open.
3. **Other trimming valves** — Verify that the alarm line valve is open as well as all of the pressure gauge valves. The main drain valve, alarm test valve, and condensate drain valve should be closed.
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's water seat is tight. Inspect the small bleed hole located on the underside of the Model DDX-LP Deluge Valve pushrod chamber for leakage.
5. **System air pressure** — Verify that system air pressure is in conformance with the values posted in Table A for the supply water pressure.
6. **Releasing device** — Check the outlet of the (Model LP Dry Pilot Actuator and 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 or, alternatively, reduce air/nitrogen pressure on the 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 a nylon tie (included with the assembly) after the deluge valve is reset.

## Testing the Model DDX-LP Deluge Valve Without Flowing Water (Refer to Figure 2)

1. Close the valve controlling water supply to deluge valve and open the main drain.
2. Verify that the pushrod chamber supply valve is open, allowing water to enter the pushrod chamber.
3. Close the air/nitrogen supply to the sprinkler system.
4. Decrease pneumatic pressure in the system by opening the condensate drain valve, until the Model LP Dry Pilot Actuator operates. Doing so will result in a sudden drop of water pressure in the deluge valve pushrod chamber.
5. Reset the system per the directions listed in "System Setup" section of this bulletin.

(cont. bottom of page 8)

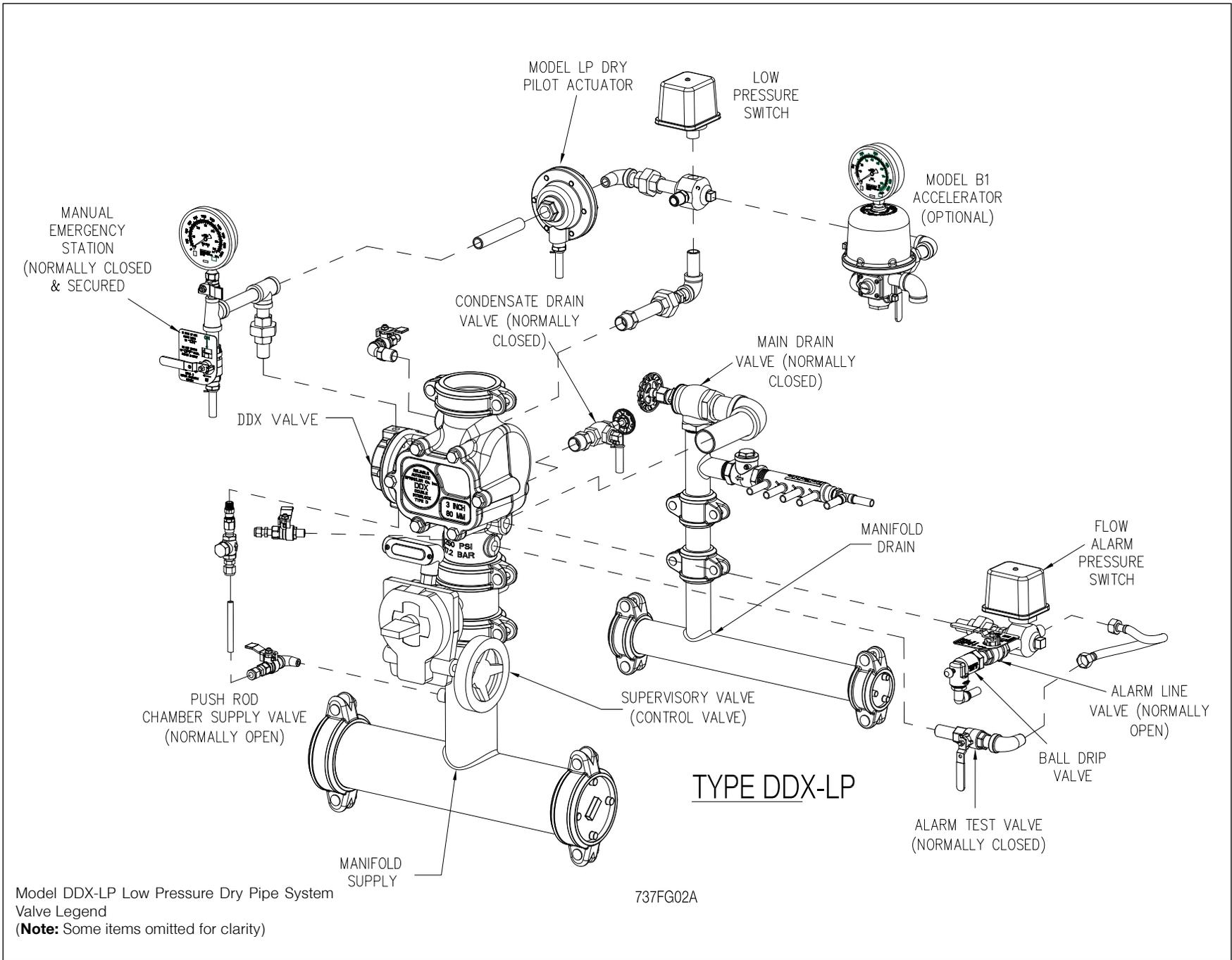
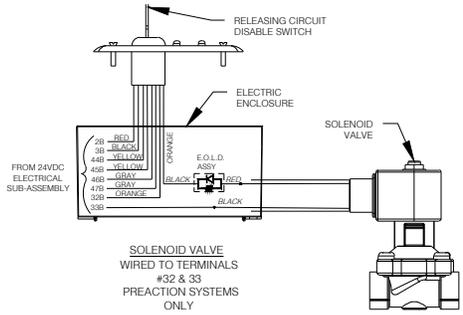
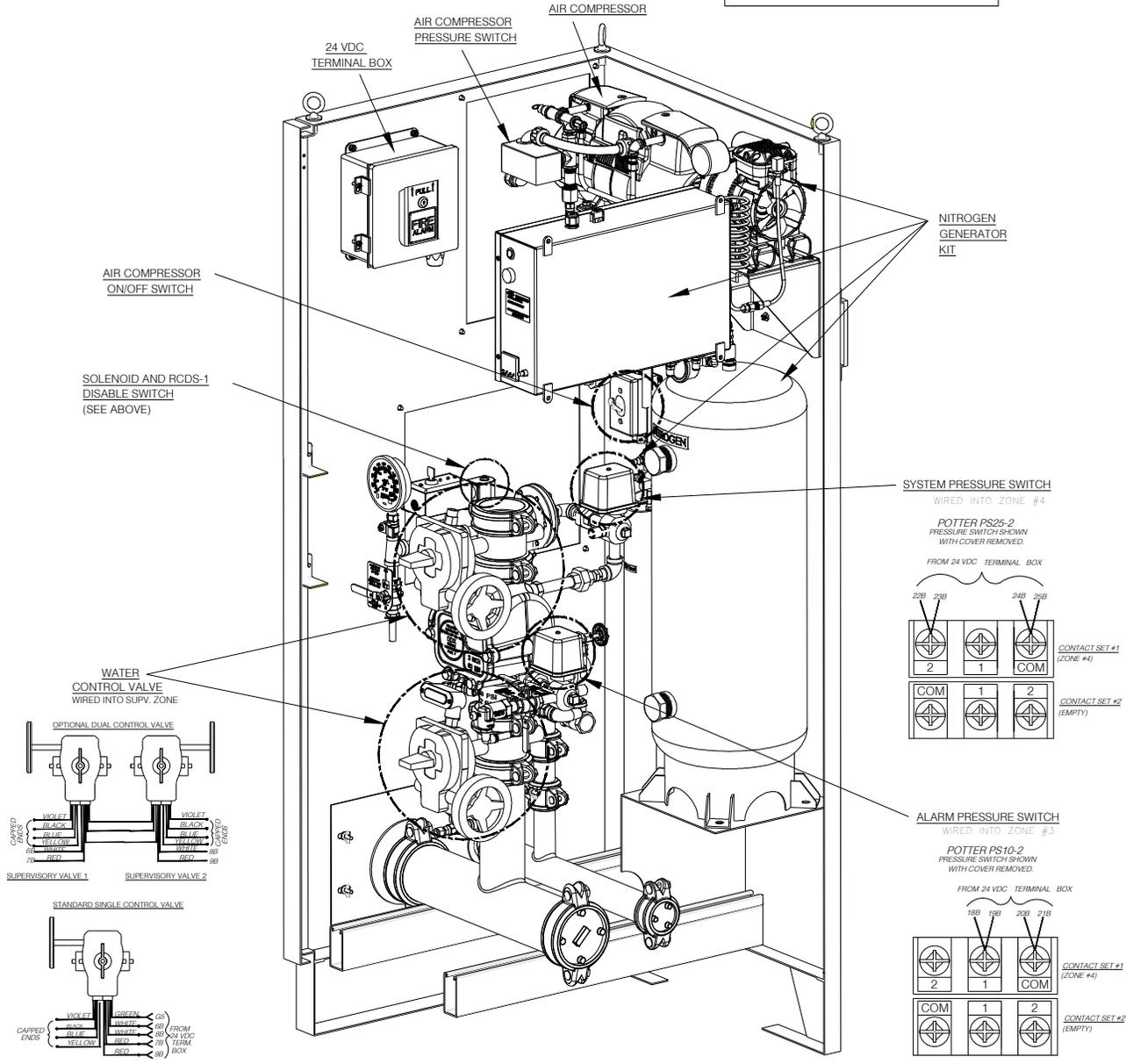


Fig. 2



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 wiring does not void listing, approval, and/or warranty.



COMP2NF603A

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

Fig. 3

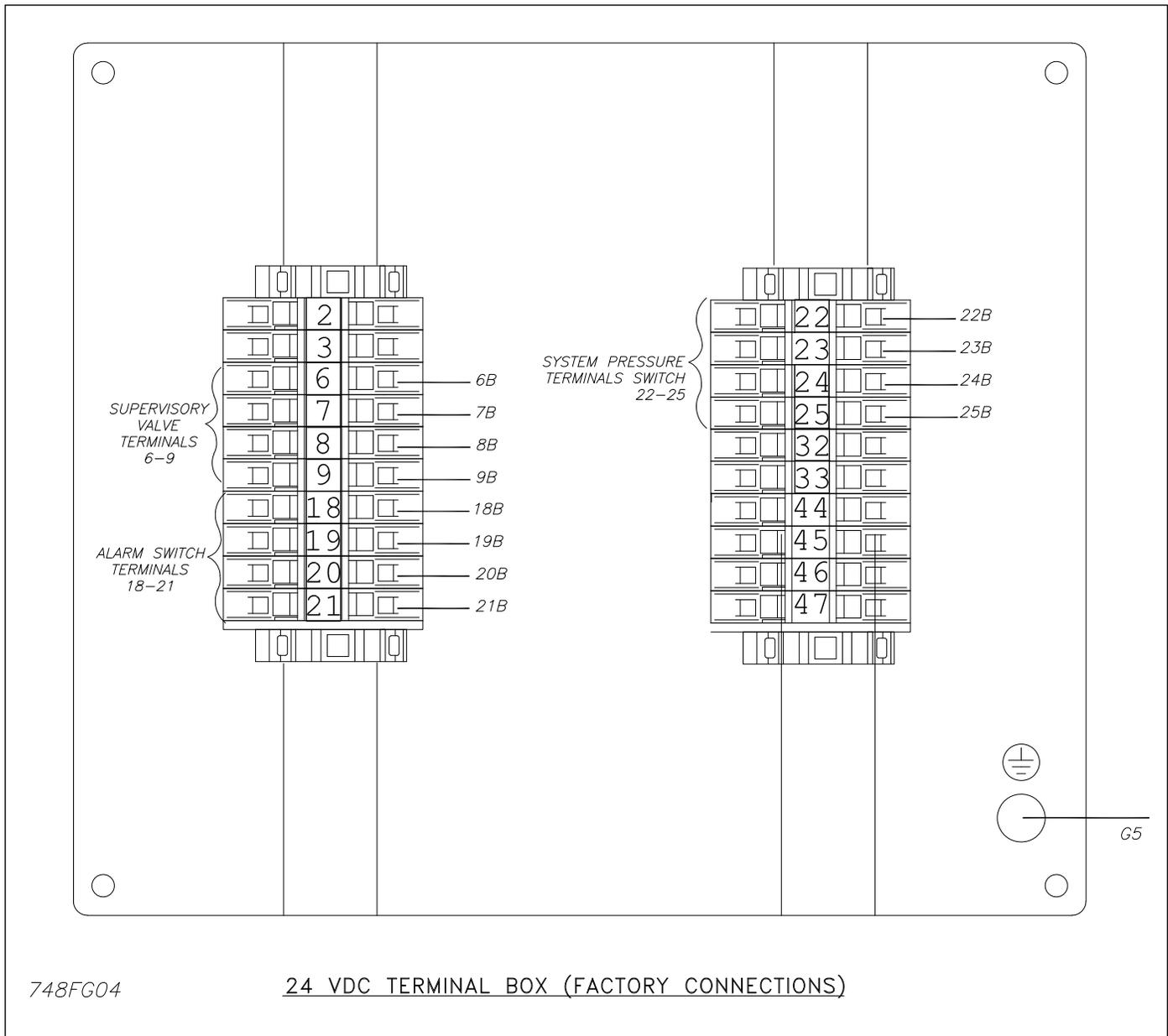


Fig. 4

### Draining Excess/Condensate Water From System

1. Close the main valve controlling water supply to the Model DDX-LP system.
2. Close the pushrod chamber supply valve, and open the main drain valve.
3. Slightly open the condensate drain valve until all water has drained, then close.

**Note:** Leaving the condensate drain open for an extended period of time may allow excess air/nitrogen to bleed off and result in accidental release of the Model LP Dry Pilot Actuator and/or the Model DDX-LP valve.

4. Close the main drain valve. Allow the system air/nitrogen pressure to return to its previous level. Open the pushrod chamber supply valve first, and then open the main valve controlling water supply to the system.

# 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:

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## 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 should be used to fill the system.

## Electrical Requirements

The N2-Blast<sup>®</sup> 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 overdrawn. 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.
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.

## 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 6).
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.



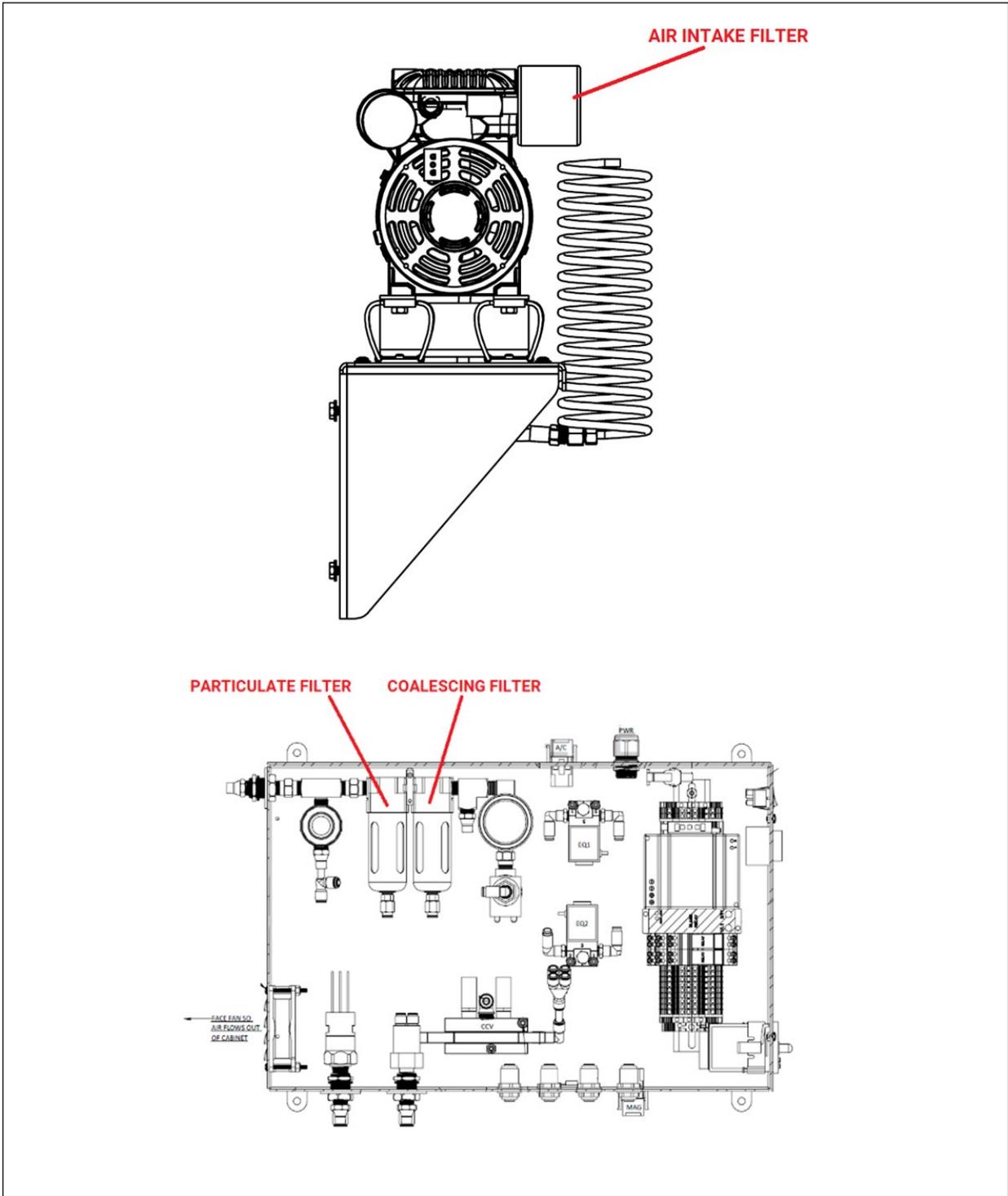


Fig. 6 - Nitrogen Generator Filter Locations

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

PREPAK	SIZE <sup>(1)</sup>	SYSTEM TYPE	SOLENOID	RELEASE CONTROL PANEL	AIR COMPRESSOR <sup>(2)(3)</sup>	GENERATOR OPTION	FUTURE
655	<b>Select Below</b>	3	0	0	<b>Select Below</b>	<b>Select Below</b>	0
	2 = 2"				0 = None	8 = FPS 900 Nitrogen Generator	
	0 = 2-1/2"				1 = 1/2 HP 115VAC 60HZ QRM2-50115T	9 = FPS 900 Nitrogen Generator W/ B-1 Accelerator	
	3 = 3"				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						
	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						

14.

**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. Air compressor size is a recommendation only. Final selection depends on system capacity and normal system pressure.
3. 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).