



FireFlex: Preaction Double /
Interlocked Electric / Pneumatic
Release Self Contained

Fire Protection Systems
O&M Manual

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The Leader in Nitrogen Generation Technology

FIREFLEX[®] N₂ BLAST[®]

Integrated Fire Protection System

OWNER'S OPERATION & MAINTENANCE MANUAL

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1. GENERAL

The FIREFLEX[®] N₂ Blast[®] integrated system consists of a self contained preaction automatic sprinkler system combined with a Nitrogen Generator, factory-assembled in a single cabinet. All the components necessary for both extinguishing systems are integrated.

1.1 APPLICABLE STANDARDS

In addition to being fabricated under stringent ISO-9001 manufacturing and quality control procedures, your FIREFLEX N₂ Blast[®] complies with the following standards:

NFPA-13 Sprinkler Systems

NFPA-70 National Electrical Code

NFPA-72 Fire Alarm Systems

Before the installation, the contractor installing the unit shall also be familiar with the following documents and standards:

Applicable Local & State Building Codes

Any additional requirements of the Local Authority Having Jurisdiction

1.2 LISTINGS & APPROVALS

In addition to being fabricated under tight ISO-9001 manufacturing and quality control procedures, the FIREFLEX[®] N₂ Blast[®] uses UL/ULC and/or FM approved components.

WARNING Any unauthorized modification or addition made on-site to a factory built unit will void the unit's warranty. Consult your nearest FireFlex Systems Authorized Distributor before proceeding with such modifications or additions.

1.3 ENVIRONMENT

FIREFLEX[®] N₂ Blast[®] unit shall be installed in a dry and clean location. Verify that all equipments are properly heated and protected to prevent freezing and physical damage.

The unit and its components must be kept free of foreign matter, freezing conditions, corrosive atmospheres, contaminated water supplies, and any condition that could impair its operation or damage the components.

1.4 GENERAL DESCRIPTION

The FIREFLEX[®] N₂ Blast[®] integrates the same type of preaction automatic sprinklers system as found in the renowned FIREFLEX Systems TOTALPAC[®]3 using top quality Viking Corporation components and the deluge valve model F-1.

The Nitrogen generator is a N₂ Blast[®] Type 1 FPS-250 or FPS-750 system, made by South-Tek Systems.

The N₂ Blast[®] FPS-250 and FPS-750 designed & manufactured by South-Tek Systems provide an economical, precise means of generating high purity Nitrogen. Since air is comprised of ~79% N₂ we simply and cost-effectively separate the N₂ from the air. Nitrogen is an inert gas (non-combustible) and widely used in thousands of industries along with Fire Protection Systems. The N₂ is "generated" by means of the air compressor pushing air into the simple, safe membrane element, which in turn mechanically separates N₂ molecules from other molecules found within air.

The FIREFLEX[®] N₂ Blast[®] cabinet is of the free-standing type and is made of robust 14 gauge steel with a rustproof fire red paint finish, polyester powder coated and oven baked on a phosphate base. Each cabinet is provided with two locked doors, reducing space requirements for ease of installation and maintenance.

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1.5 FEATURES

- Trouble-free design for safe and easy application
- Available in 2 cabinet sizes
- Uses South-Tek N₂ Blast[®]
- Best value in nitrogen generation technology
- Limits the liability of early pipe replacement
- Significant cost savings by using black pipe in combination with nitrogen
- Uses the Viking deluge valve
- Trim is fully assembled and tested at the factory
- All trims are galvanized steel, Listed and Approved for 250 psi (1724 kPa) service maximum
- Quick connections to water supply and drain on left side, and sprinkler riser on top of unit, all available with grooved end or flanged fittings
- No open drain cup inside unit
- Separate unlocked access hatch to emergency manual release
- Available with or without an integrated release control panel
- Compact, aesthetic and easy to move
- User-friendly standardized owner's manual with every unit
- Unique serial number on every unit
- Uses UL, ULC and/or FM Approved components
- Designed in accordance with NFPA Standards
- Sturdy 14 gauge steel cabinet painted fire red with oven baked polyester powder on phosphate base
- Textured rust proof finish
- Neoprene gasket on all doors to eliminate vibrations
- Key-alike locks on all cabinet doors
- Manufactured under ISO-9001 quality control procedures

1.6 CONFIGURATION

FIREFLEX[®] N₂ Blast[®] Preaction systems are built around the Viking trim using straight through deluge valves Model F-1.

All the valves are rated up to a maximum of 250 psi WWP (1724 kPa) max. and are available in the following diameters:

- ▶ 1½" (40 mm)
- ▶ 2" (50 mm)
- ▶ 3" (80 mm)
- ▶ 4" (100 mm)

FIREFLEX[®] N₂ Blast[®] Preaction systems are supplied with groove-groove deluge valves. Units with flange/flange deluge valves are also available on request.

The Nitrogen generator is a **N₂ Blast[®] Type 1** FPS-250 or FPS-750 system, made by **South-Tek Systems**.

1.7 RELEASING

Release trim for the double interlocked preaction system with electric / pneumatic release utilizes a normally closed solenoid valve (*F1*) controlled by the Viking VFR-400 integrated control panel with a compatible detection system (supplied by others) and a pneumatic actuator (*F3*) normally held closed by supervisory air pressure maintained in the sprinkler piping.

In fire condition, when the detection condition is fulfilled, the control panel energizes the solenoid valve (*F1*) and an open sprinkler releases the supervisory air pressure from the sprinkler piping. **Both** the electric detection condition **and** supervisory pressure relieved from the sprinkler piping are necessary before the deluge valve (*A1*) will open and fill the sprinkler piping with water. Water will flow from any opened sprinklers in the system piping.

2. Corrosion Inhibiting System

2.1 NITROGEN GENERATOR

The **N₂ Blast[®]** Corrosion Inhibiting System produces 98%+ pure Nitrogen on demand and introduces it to the preaction Fire Protection System. In doing so, Oxygen and moisture are displaced from the piping through the AutoPurge System™. The **N₂ Blast[®]** Nitrogen Generation System effectively inhibits Electrochemical, Galvanic and Microbiologically Influenced Corrosion (MIC), as well as freezeups and ice plugs.

All personnel involved with installation, operations, and maintenance of the **N₂ Blast[®]** must follow safe working practices, OHSA, and local health/safety code regulations during the installation, operation, and maintenance of the unit.

2.2 MODELS

FPS-250 "Type 1" Nitrogen Generator

- Handles up to **250 gallons** of sprinkler pipe capacity
- Fully automatic with pressure switch
- Pre-filters and pressure regulator
- Control panel with gauges, hourmeter and power switch

FPS-750 "Type 1" Nitrogen Generator

- Handles up to **750 gallons** of sprinkler pipe capacity
- Fully automatic with pressure switch
- Pre-filters and pressure regulator
- Control panel with gauges, hourmeter and power switch

2.3 POWER REQUIREMENTS

Connect the **N₂-BLAST[®]** to an electrical supply following all local safety regulations. Ensure the unit is supplied with 110V/60Hz power rated at 20 amp service. The unit must be grounded.

2.4 N₂ Blast[®] Nitrogen generator

South-Tek Systems utilizes Membrane technology in the N₂-Blast[®] Corrosion Inhibiting Systems in order to efficiently separate Nitrogen molecules from the air we breathe. Membrane technology, used in our smaller applications, has a simple air flow design, is wall-mounted and easy to service. PSA technology is more cost effective and energy efficient in larger Fire Protection Systems, those requiring more Nitrogen to compensate for the NFPA "acceptable leak rate".

2.5 BlastOff™ Leak Detection System

Unless the leak rate is catastrophic, the supervisory low pressure alarm on the FPS will not activate. Minor leaks cause the air compressor and **N₂ Blast[®]** to run excessively in order to maintain supervisory pressure. The unnecessary additional run-time decreases the lifespan of the equipment. The Patent Pending BlastOff™ Leak Detection System is designed to detect significant leaks before they compromise the Fire protection System and the Nitrogen Generation System. It has an internal audible alarm and dry contact for wiring into the Building Monitoring System (BMS) and will also alarm if the air compressor or the N₂-Blast[®] is not working properly.

2.6 N₂ Blast[®] AutoPurge System™

High purity Nitrogen must be equally distributed throughout the entire sprinkler piping system in order to effectively inhibit corrosion. The Patent Pending AutoPurge System™ provides a low volume, constant purge of Nitrogen within sprinkler piping. The rate in which gas is evacuated from the sprinkler piping is within NFPA guidelines and allows breathing to occur. The AutoPurge System™ also assists in drying out the residual water from a hydrotest. Computational Fluid Dynamics modeling proves that this is the most effective way to ensure that high purity Nitrogen reaches all branches within the sprinkler piping. Install one AutoPurge System™ per system at a high point .

2.7 Nitrogen generator

Air Pressure Maintenance Device

Nitrogen air pressure maintenance device is a Viking Model D-2 air pressure maintenance device. It is used to regulate the nitrogen pressure in the sprinkler piping at the specified system pressure for **FIREFLEX[®] N₂ Blast[®]** Double interlock preaction system.

The Viking Model D-2 air pressure maintenance device is a pressure regulator that automatically reduces the supply air pressure to a preset requirement when connected to a constantly maintained air supply.

3. PREACTION SYSTEM

3.1 DESCRIPTION

The preaction system in the FIREFLEX[®] N₂ Blast[®] integrated fire protection system by FIREFLEX Systems Inc. consists of a preaction system trim totally pre-assembled, pre-wired and factory tested. All electrical and mechanical components of the system are contained in one single unit.

The only connections required for installation are the water supply inlet, water discharge outlet, main drain, the electrical detection and alarm connections, as well as the AC power line(s). The discharge outlet is connected to a fixed piping system of automatic sprinklers. Water is the extinguishing agent.

The sprinklers network is supervised with compressed air or gas. If the sprinklers piping or sprinkler is broken, the deluge valve will not open.

3.2 CONFIGURATION

The FIREFLEX[®] N₂ Blast[®] preaction system is built around the Viking trim using deluge valve model F-1.

The valve is rated up to a maximum of 250 psi (1724 kPa) working water pressure max. and is available in the following diameters:

- ▶ 1½" (40 mm)
- ▶ 2" (50 mm)
- ▶ 3" (80 mm)
- ▶ 4" (100 mm)

3.3 RELEASE

Release trim for the electric / pneumatic operated double interlocked preaction system utilizes a normally closed solenoid valve (F1) controlled by the Viking VFR-400 integrated control panel with a compatible detection system (supplied by others) and a pneumatic actuator (F3) normally held closed by supervisory air pressure maintained in the sprinkler piping.

In fire condition, the release control panel energizes the solenoid valve (F1) and an open sprinkler releases the supervisory air pressure from the sprinkler piping. **Both** the electric detection condition **and** supervisory pressure relieved from the sprinkler piping are necessary before the deluge valve (A1) will open and fill the sprinkler piping with water. Water will flow from any opened sprinklers in the system piping.

Note: If the detection system does not operate properly, the deluge valve (A1) will not open.

To prevent false discharge, if the detection system operates alone due to fire, damage or malfunction, the deluge valve (A1) will not open. If the sprinkler piping is damaged or a sprinkler is broken or fused, the deluge valve (A1) will not open either.

4. INSTALLATION, OPERATION & MAINTENANCE INSTRUCTIONS

4.1 INSTALLATION

IMPORTANT The FIREFLEX[®] N₂ Blast[®] unit IS NOT designed to be installed in area subject to freezing conditions. Refer to section 1.3 ENVIRONMENT for additional details.

1. Install the cabinet (refer to section 8 CABINET).

IMPORTANT THE CABINET MUST BE FIRMLY ANCHORED TO THE FLOOR USING ALL ANCHORING HOLES.

2. Install the automatic sprinkler piping, detection and signaling circuits (if applicable) in accordance with applicable standards.
3. Connect all detection and signaling devices, where applicable, according to electrical schematics (refer to section 7 WIRING DIAGRAMS).
4. Connect the AC power for the optional air compressor **and** the Corrosion Inhibiting System in the electric distribution panel (refer to section 7 WIRING DIAGRAMS).
5. Conform to local municipal or other codes regarding installations of fire protection systems.
6. Place the system in service (refer to chapters 4.2 PRELIMINARY INSPECTION & 4.3 PLACING SYSTEM IN SERVICE).
7. If the system does not operate as it should, make the necessary corrections according to manuals issued or consult your distributor or *FIREFLEX Systems Inc.*
8. Make sure that building owner or a delegated representative has received instructions regarding the operation of the system.

4.2 PRELIMINARY INSPECTION

See figures 4.3 & 4.4 at the end of the current section.

1. Cabinet shall be firmly anchored to the floor.
2. Open door to mechanical section.
3. N₂ Blast[®] air pressure maintenance device ball valve shall be close
4. Main water supply control valve (*D1*) should be closed.
5. Priming valve (*B1*) must be closed.
6. Air supply must be CLOSED (refer to section 5 PREACTION AIR SUPPLIES).
7. All indicating light shall be off, on the nitrogen generator.
8. Drain test valve (*B6*) and main drain valve (*D3*) must be closed.
9. Alarm test valve (*B5*) must be closed.
10. All gauges (*B11*, *B12* and *E3*) should read 0 psi.
11. Using the built-in contractor's hydrostatic test ports (see figure 4.3), fill sprinklers network with water and maintain pressure as per NFPA-13 requirements.

WARNING Do not subject the air pressure gauges to hydrostatic pressures above 250 psi (1724 kPa). Close gauge valves before proceeding with hydrostatic test.

12. Correct leaks if any before completing test. OPEN main drain valve (*D3*) to completely drain the sprinklers network.

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4.3 PLACING SYSTEM IN SERVICE

1. Verify that the system has been properly drained. Main water supply control valve (D1) is CLOSED. Main drain valve (D3) is OPEN. Emergency release valve (B10) is CLOSED.
2. CLOSE main drain valve (D3).
3. OPEN priming valve (B1).
4. Air supply shall be OPENED to restore supervisory pressure to sprinkler piping.

Note: On systems provided with an air pressure maintenance device (air option style "B"), verify that the ½" by-pass valve (E8) in the air pressure maintenance device trim is CLOSED and that both ¼" valves (E6 & E7) are OPEN.

5. Nitrogen generator compressor will come on and the "Operating" green light will illuminate until the N₂ storage tank pressure reaches maximum (approximately 75 Psi) and the compressor shuts off.
6. OPEN drain test valve (B6).
7. PARTIALLY OPEN main water supply control valve (D1).
8. When full flow develops from the drain test valve (B6), CLOSE the drain test valve and verify that there is no flow from the drip check valve (B7) when the plunger is pushed.
9. FULLY OPEN the main water supply control valve (D1).
10. Verify that the alarm test valve (B5) is CLOSED and that all other valves are in their "normal" operating position.
11. Depress the plunger of the drip check valve (B7). No water should flow when the plunger is pushed.
12. Check and repair all leaks.
13. When the N₂ storage tank pressure reaches maximum (approximately 75 Psi) Nitrogen generator compressor will come off and the "Standby" amber light will illuminate.
14. Make sure the Nitrogen generator air pressure maintenance device valve is open. (see figure 4.2 or 4.4)
15. Perform sequence of operation (refer to chapter 4.4).

4.4 AIR PRESSURE SETTINGS

- Preaction compressor start @ 20 Psi
- Preaction compressor stop @ 35 Psi
- Preaction low air pressure switch is set at 25 Psi
- Nitrogen generator storage tank is filled @ 75 Psi
- Nitrogen generator air pressure maintenance device is set @ 35 Psi

Note: all pressure setting has a 5% tolerance

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4.4 SEQUENCE OF OPERATION

4.4.1 Automatic release

1. Actuation of a detector from one detection zone:
 - a) "ZONE 1" (or "ZONE 2") activates.
 - b) "ALARM" audible devices activate.
 - c) "ALARM" contacts activate.
 - d) Preaction solenoid valve (F3) activates.

Note: Preaction piping network will not yet be filled with water.

2. After a preaction sprinkler head fuses:
 - a) Pneumatic actuator (F3) will operate
 - b) Deluge valve (A1) opens; water will flow into sprinkler piping network and out of sprinklers and any openings on the system.
 - c) Alarm devices (C1 & C2) will operate.
 - d) "WATERFLOW PREACTION" contact activates.

4.4.2 Manual release

Anytime the handle of the Emergency Release Valve (B10) is pulled, pressure is released from the priming chamber.

- a) Deluge valve (A1) opens; water will flow into sprinkler piping network and out of sprinklers and any openings on the system.
- b) Alarm devices (C1 & C2) will operate.
- c) "WATERFLOW PREACTION" contact activates.

4.4.4 System supervisory

Actuation of a supervisory device such as low pressure switch or valve in wrong position within the system:

- a) "SUPERVISORY" contact activates.

4.5 EMERGENCY INSTRUCTIONS

To take system out of service:

WARNING Placing a system out of service may eliminate the fire protection capabilities of the system. Prior to proceeding, notify all Authorities Having Jurisdiction. Consideration should be given to employ a fire patrol in the affected areas.

After placing the system out of service has been authorized by the appropriate Authority Having Jurisdiction:

1. Turn the **releasing circuit disable switch** to **DISABLED** before doing any tests on the system (see figure 4.2).
2. Close main water supply control valve (D1).
3. Open system main drain valve (D3).

Note: Electric alarms controlled by a pressure switch installed in the ½" (15mm) NPT connection (C2) for a non-interruptible alarm pressure switch cannot be shut-off until the deluge valve (A1) is reset or taken out of service.

4. Shut-off the air supply (refer to section 5 PREACTION AIR SUPPLIES).
5. Open drain test valve (B6).
6. Close priming valve (B1).
7. Sprinklers network that has been subjected to a fire must be returned to service as soon as possible. The entire system must be inspected for damage, and repaired or replaced as necessary.
8. Replace any sprinklers that have opened, been damaged, or have been exposed to fire conditions.
9. Replace any detectors that have been damaged.
10. Return the system to service as soon as possible. Perform chapter 4.3 PLACING SYSTEM IN SERVICE.
11. Turn the releasing circuit disable switch to NORMAL (see figure 4.2).

4.6 PLACING THE SYSTEM BACK IN SERVICE AFTER OPERATION

See figures 4.3 & 4.4 at the end of the current section.

1. Verify that the system has been properly drained. Main water supply control valve (D1) is CLOSED. Main drain valve (D3) is OPEN. Emergency release valve (B10) is CLOSED.
2. CLOSE main drain valve (D3).
3. OPEN priming valve (B1).
4. Restore supervisory pressure to sprinkler piping.

Note: On systems provided with an air pressure maintenance device (air option style "B"), verify that the ½" by-pass valve (E8) in the air pressure maintenance device trim is CLOSED and that both ¼" valves (E6 & E7) are OPEN.

5. Nitrogen generator compressor will come on and the "Operating" green light will illuminate until the N₂ storage tank pressure reaches maximum (approximately 75 Psi) and the compressor shuts off. Reset the remote release control panel. Solenoid valve (F1) should close.
6. OPEN drain test valve (B6).
7. PARTIALLY OPEN main water supply control valve (D1).
8. When full flow develops from the drain test valve (B6), CLOSE the drain test valve.
9. Verify that there is no flow from the drip check valve (B7) when the plunger is pushed.
10. FULLY OPEN the main water supply control valve (D1).
11. Verify that the alarm test valve (B5) is CLOSED and that all other valves are in their "normal" operating position.
12. Depress the plunger of the drip check valve (B7). No water should flow from the drip check when the plunger is pushed.
13. Check and repair all leaks.
14. Notify the Authority Having Jurisdiction, remote station alarm monitors, and those in the affected area that the system is back in service.

4.8 INSPECTIONS & TESTS

NOTICE: THE OWNER IS RESPONSIBLE FOR MAINTAINING THE FIRE PROTECTION SYSTEM AND DEVICES IN PROPER OPERATING CONDITION.

The purpose of the periodic inspection and tests is to insure that the system is operating satisfactory and to identify problems that could adversely affect the performance of the system. Inspection and tests of the system shall be accomplished in accordance with NFPA-25 and NFPA-72. At least annually, the system shall be thoroughly inspected and tested for proper operation by competent personnel. In addition, the Authority Having Jurisdiction may have additional maintenance, testing, and inspection requirements that must be followed.

WARNING Any system maintenance that involves placing the system out of service may eliminate the fire protection capabilities of that system. Prior to proceeding, notify all Authorities Having Jurisdiction.

Records

Records of inspections, tests, and maintenance of the system and its components shall be made available to the Authority Having Jurisdiction upon request. Typical records include, but are not limited to, detection system, valve inspections, trip tests of deluge valve.

Acceptance test records should be retained for the life of the system. Subsequent test records should be retained for a period of 1 year after the next test. The comparison determines deterioration of system performance or condition and the need for further testing or maintenance.

4.8.1 Preaction low air pressure supervisory test

To test preaction system "low air" supervisory:

Note: To prevent operation of the deluge valve (A1) and filling of the sprinkler piping with water during the test, CLOSE main water supply control valve (D1) and OPEN drain test drain (B6).

1. Slowly open the Inspectors test valve or the main drain valve (D3).
2. Verify that low air supervisory operate within pressure setting from table 5.3.
3. Close the Inspectors test valve or the main drain valve (D3).
4. Establish recommended air pressure.
5. Reset the remote releasing control panel.

When testing is complete, return the system to service:

1. Verify that the pressure indicated on pressure gauge (B11) indicates that the priming chamber is pressurized with system water supply pressure indicated on pressure gauge (B12).
2. OPEN drain test valve (B6).
3. PARTIALLY OPEN main water supply control valve (D1).
4. When full flow develops from flow test valve, CLOSE the drain test valve (B6).
5. FULLY OPEN and secure the main water supply control valve (D1).
6. Verify that the alarm test valve (B5) is CLOSED and that all other valves are in their "normal" operating position (see figure 4.3).
7. Verify that there is no flow from the drip check valve (B7) when the plunger is pushed.

4.8.2 Preaction full flow trip test

Performance of a trip test is recommended annually during warm weather. Consider coordinating this test with operation testing of the releasing devices.

Caution Performance of this test will cause the deluge valve (A1) to open and the sprinkler system to fill with water.

To trip test the preaction system:

1. Notify the Authority Having Jurisdiction and those in the area affected by the test.
2. To trip the deluge valve (A1):
 - Fulfill the electric releasing condition (refer to chapter 1.7.1).
 - Open the sprinkler system inspectors test valve or the main drain valve (D3).
 - **OR** Open the door of emergency release (B10) and pull the handle.
3. The deluge valve (A1) should open, filling the sprinkler system with water. Water flow alarms should operate.
4. Verify adequate flow from the sprinkler system inspectors test valve within an acceptable time period.

When trip testing is complete:

Perform steps 5 through 7 of chapter 4.5 EMERGENCY INSTRUCTIONS.

Perform steps 7 through 20 of chapter 4.6 PLACING THE SYSTEM BACK IN SERVICE AFTER OPERATION.

Notify the Authority Having Jurisdiction and those in the affected area that testing is complete.

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4.8.3 Main drain test

A main drain test shall be conducted to determine whether there has been a change in the condition of the water supply piping and control valves (as per NFPA25).

1. Record the water supply pressure indicated by the pressure gauge (B12).
2. FULLY OPEN the drain test valve (B6).
3. Record residual water supply pressure indicated by the pressure gauge (B12).
4. SLOWLY CLOSE the drain test valve (B6).
5. Record the water supply pressure indicated by the pressure gauge (B12).
6. Readings shall be compared with those made at the time of the original acceptance tests or with those made at the time of the last test to determine whether there has been any deterioration of the water supply.

Note: A main drain test shall be conducted any time the water supply control valve (D1) is closed and reopened at the system.

4.8.4 Monthly inspection

1. Gauges on preaction system shall be inspected to ensure that normal air and water pressures are being maintained.
2. Verify that the control valves are in the following condition:
 - In the normal open or closed position.
 - Properly supervised.
 - Accessible.
 - Free from external leaks.
3. The deluge valve (A1) and associated components shall be externally inspected to verify the following:
 - The valve is free from physical damage.
 - All trim valves are in the appropriate open or closed position.
 - The valve seat is not leaking.
 - Electrical components are in service.
4. Check alarm device (C1) switch by opening the alarm test valve (B5).
5. Conduct low air pressure supervisory test (refer to chapter 4.8.1).
6. Refer any noted problems or deficiencies to authorized service personnel for correction.

4.8.5 Semi-annual inspection

1. Check main water supply control valve (D1) switch upon movement of the hand wheel.
2. Check alarm device (C1) switch by opening the alarm test valve (B5).
3. Check the sprinklers piping for corrosion and damage.

4. Check all piping supports to insure they are tight and properly secured.
5. Perform functional test of all components of the system.

WARNING Prior to any functional tests, the actuator (C) must be removed to prevent cylinder (A) discharge.

4.8.6 Annual inspection

1. Perform semi-annual inspection.
2. Check all detectors at the remote releasing control panel.
3. Check all releasing conditions.
4. Check all audible & visual devices at the remote releasing control panel.
5. Perform sequence of operation (refer to chapter 4.4).
6. Perform manual emergency release test of the preaction system.
7. Perform full trip test.
8. Perform drain test.

4.8.7 Long term inspection

1. Alarm valves and their associated strainers, filters, and restriction orifices shall be inspected internally every 5 years unless tests indicate a greater frequency is necessary.
2. Riser check (D2) shall be inspected internally every 5 years unless tests indicate a greater frequency is necessary.
3. Test on gauge (gauge precision required: less than 3% of the full scale).

4.9 MAINTENANCE

The system shall be maintained in full operation condition at all times.

All troubles or impairments shall be corrected promptly consistent with the hazard being protected.

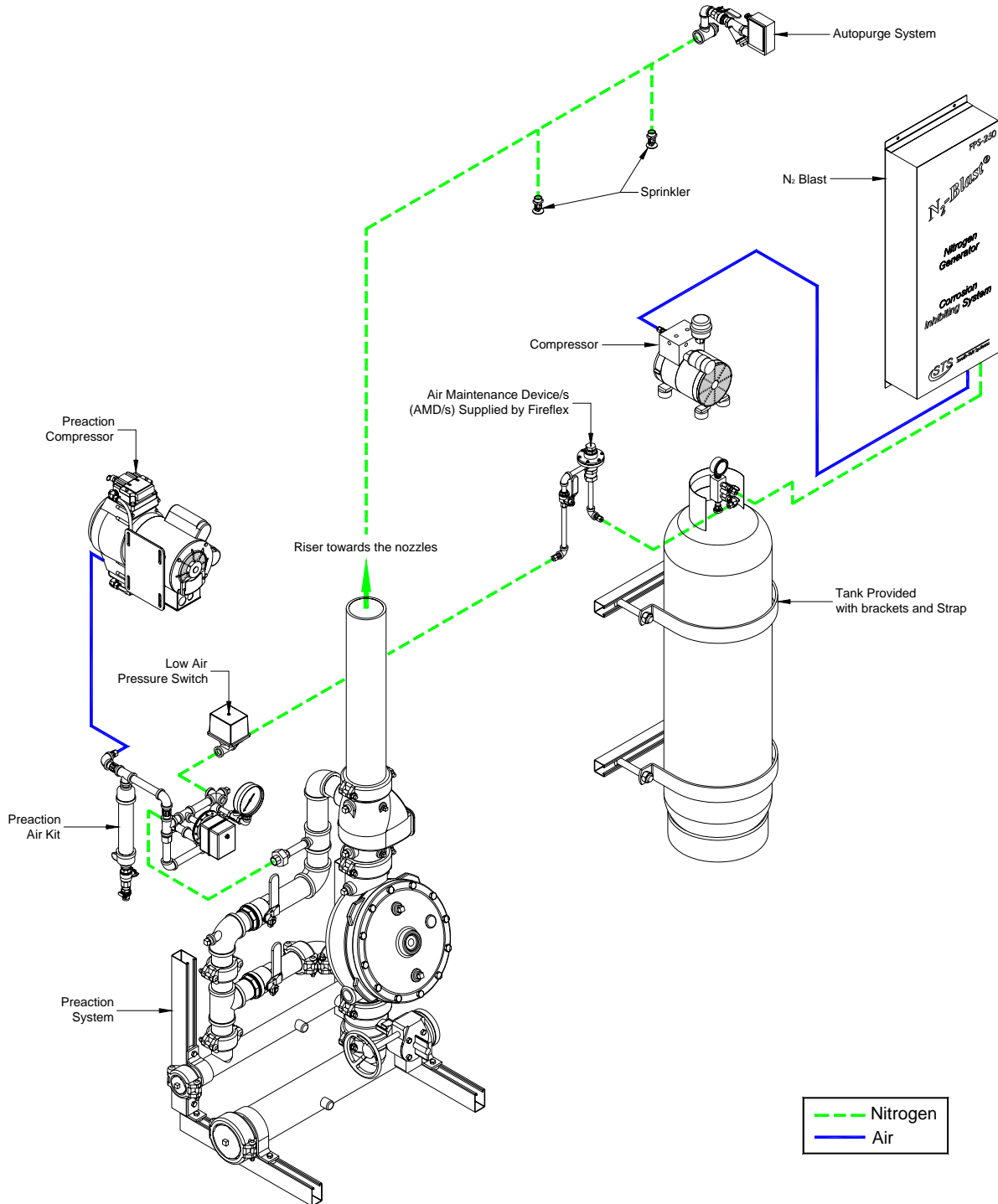
The N₂ Blast[®] FPS-250 and FPS-750 utilize three different filters, seen in the figure to the right. The filters must be changed out annually or every 1000 hours (hour meter located on the outside bottom right corner of the cabinet) of operating time, whichever comes first. (please refer to South-Tek manual for details)

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Figure 4.1 – P&ID

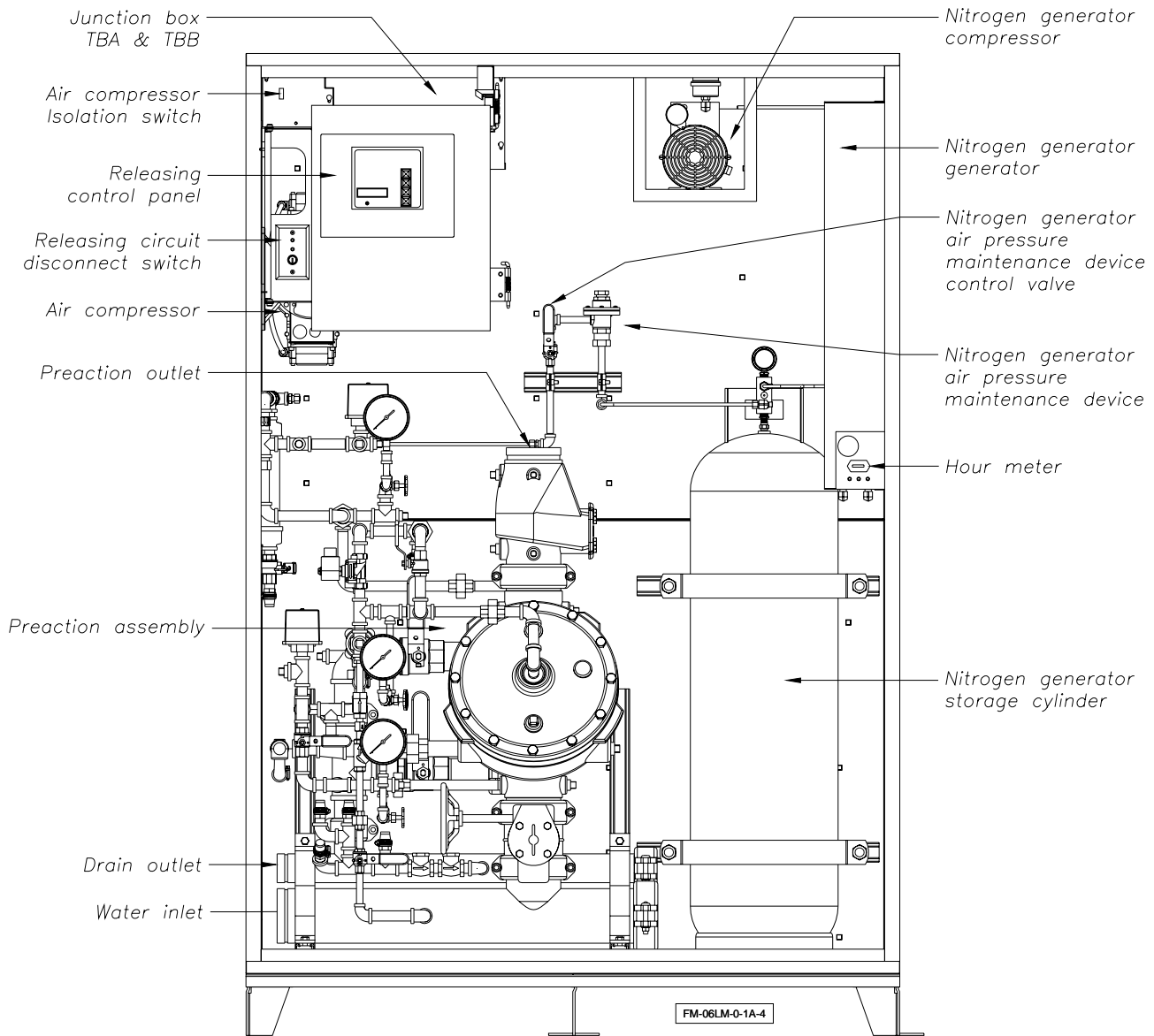


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Figure 4.2 - FIREFLEX[®] N₂ Blast[®] (shown without doors)



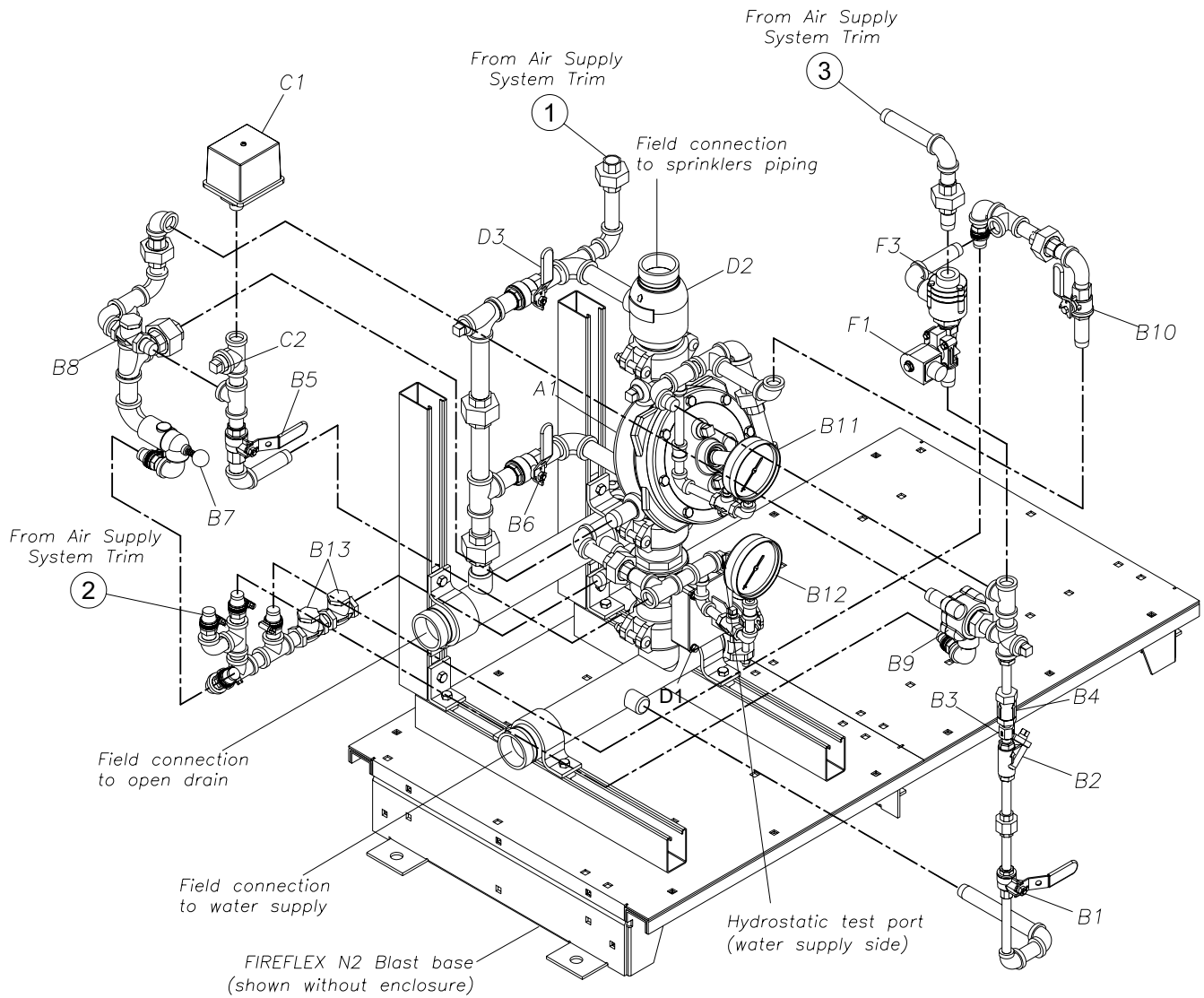
See figures 4.3 & 4.4 for additional details.

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Figure 4.3 - FIREFLEX[®] N₂ Blast[®] - Double interlocked Electric/Pneumatic preaction trim



FM-06LM-0-1A-1

Components:

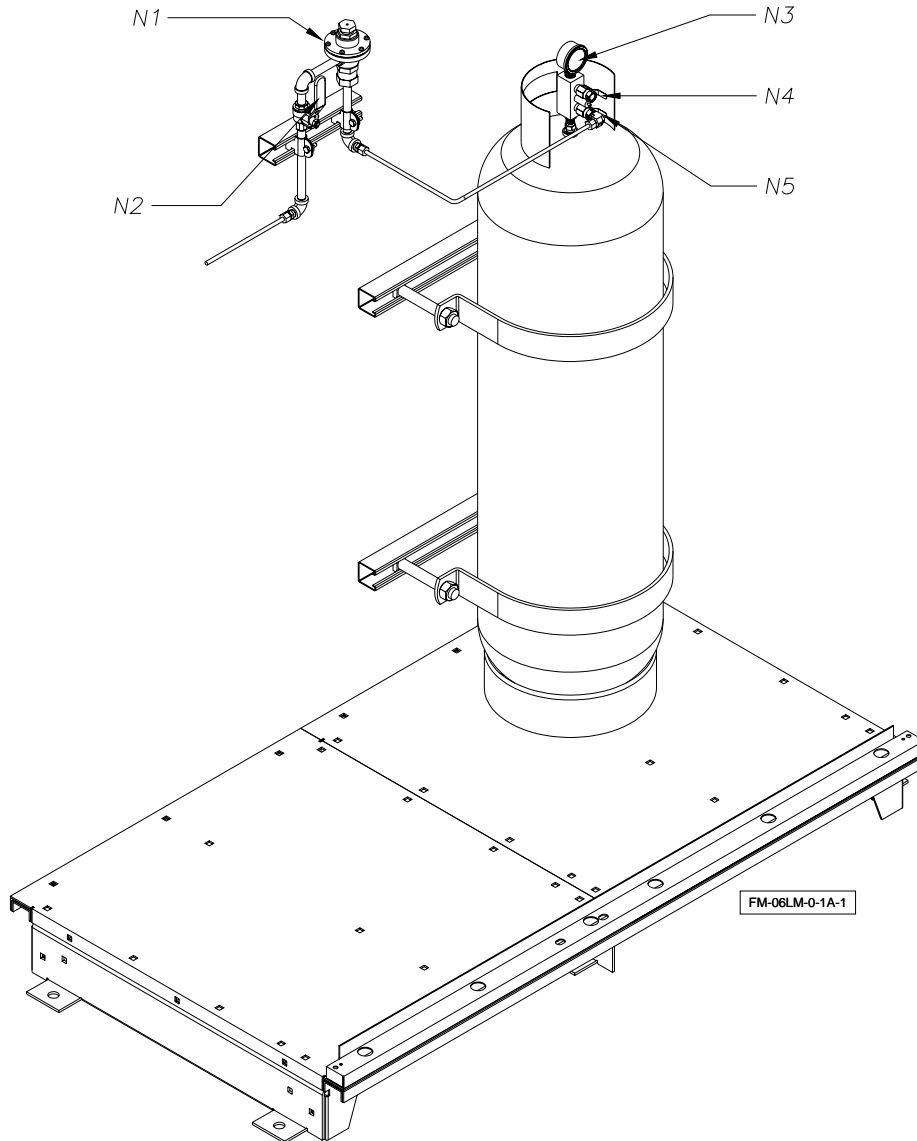
A1	Deluge valve	B12	Water supply pressure gauge & valve
B1	Priming valve	B13	Clapper check valve
B2	Strainer	C1	Alarm pressure switch
B3	1/16" Restricted orifice	C2	Connection to water motor gong (strainer supplied by contractor)
B4	Spring loaded check valve	D1	Water supply control valve
B5	Alarm test valve	D2	Riser check valve
B6	Drain test valve	D3	Main drain valve
B7	Drip check valve	F1	N.C solenoid valve (24Vdc)
B8	Drain check valve	F3	Pneumatic actuator
B9	Pressure operated relief valve (PORV)		
B10	Emergency release valve		
B11	Prime pressure water gauge & valve		

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Figure 4.4 - FIREFLEX[®] N₂ Blast[®] - storage tank



- N1 Nitrogen generator air pressure maintenance device
- N2 Nitrogen generator air pressure maintenance device control valve
- N3 Storage cylinder pressure gauge
- N4 Storage cylinder outlet valve
- N5 Storage cylinder inlet valve

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4.10 OPTIONAL SHUT-OFF VALVE AND SIGHT GLASS

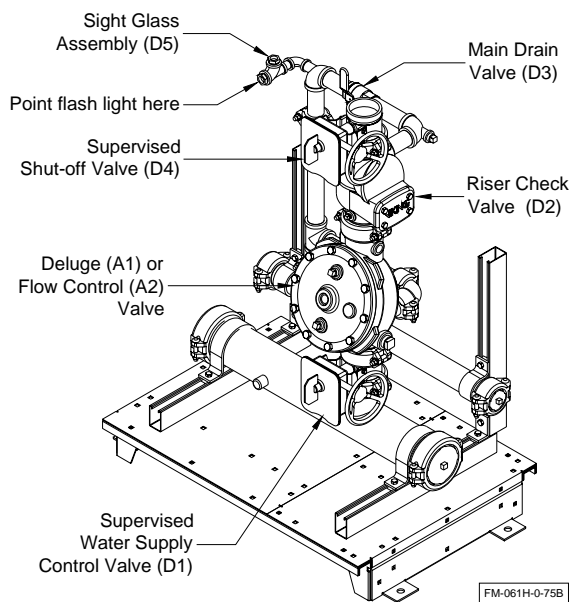
The shut-off valve & sight glass option is intended to be used for applications where testing of the system operation without filling the sprinkler piping network is desirable and where it is critical that all functions of the preaction system be tested under actual discharge conditions.

Operation of the shut-off valve

Inspection of the system can be implemented without filling the sprinkler piping system with water.

1. CLOSE the shut-off valve (D4).
2. OPEN the main drain valve (D3).
3. Simulate the operation of the system to open the deluge valve (A1) (refer to chapter 4.8.6 ANNUAL INSPECTION). Verify that water flows through the sight glass assembly (D5).
4. Once tests are completed, make sure the main drain valve (D3) is completely CLOSED. Reset the system (refer to chapter 4.6 PLACING THE SYSTEM BACK IN SERVICE AFTER OPERATION).
5. FULLY OPEN the system shut-off valve (D4). Reset the remote releasing control panel.

Figure 4.7 - Shut-off valve option

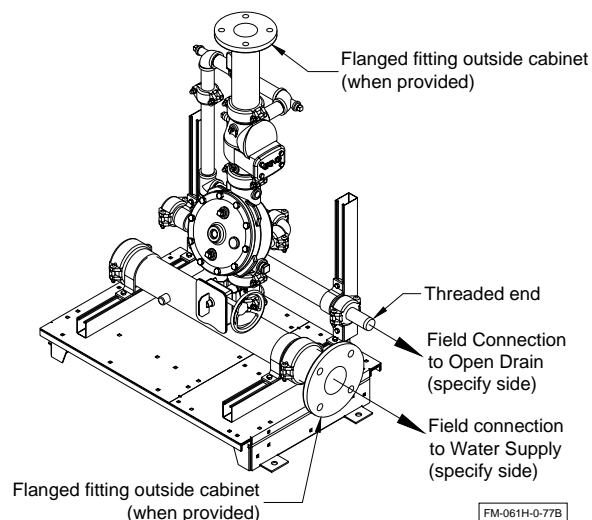


4.11 OPTIONAL SEMI-FLANGED INLET/OUTLET

When required by the user, FIREFLEX[®] N₂ Blast[®] unit can be provided in a semi-flanged configuration.

The semi flanged option provides flanged fittings only on the water inlet pipe (left side) and on the system riser outlet. The drain manifold is provided with a threaded connection (left side). The rest of the fittings are the same as usual with the main components being provided in the standard flanged / grooved configuration.

Figure 4.8 - Semi-flange option



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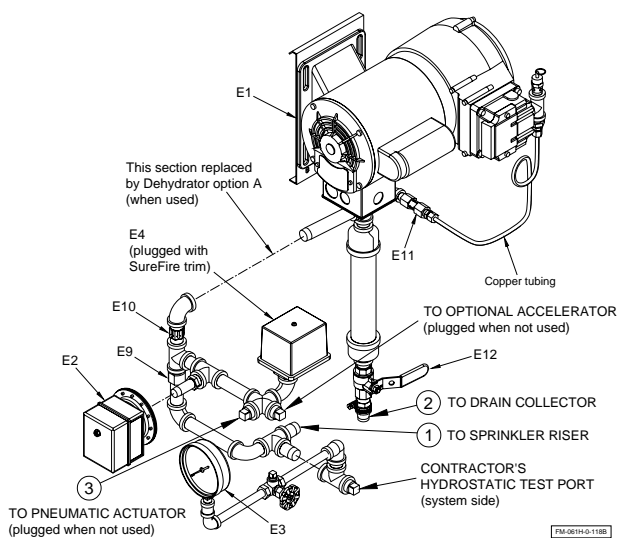
5. PREACTION AIR SUPPLIES

5.1 Direct air compressor (Style "A")

Used only for the sprinkler piping network of the preaction system. Air supply style "A" includes the air compressor mounted inside the FIREFLEX[®] N₂ Blast[®] cabinets with its supervisory trim and options. Compressors are of the tankless, oilless piston type and are factory piped to the sprinkler system riser, all within the FIREFLEX[®] N₂ Blast[®] cabinets.

Compressors are available in four (4) sizes:

- 1/6HP 1/2HP
 1/3HP 1HP



Compressor Service Factor Amp (S.F.A) rating

Compressor Size (HP)	115Vac / 60Hz	230Vac / 60Hz	220Vac / 50Hz
1/6	5.0 Amp.	2.5 Amp.	1.3 Amp.
1/3	7.4 Amp.	3.7 Amp.	2.5 Amp.
1/2	10.0 Amp.	5.0 Amp.	4.0 Amp.
1	18.0 Amp.	9.0 Amp.	6.0 Amp.

115 / 230 Vac – 60Hz air compressor selection Table:

H.P	CFM @ 40 PSI	System capacity to fill system to 35 PSI in 30 minutes *	System capacity to fill system to 55 PSI in 30 minutes **
1/6	1.33	142 gal.	90 gal.
1/3	2.61	285 gal.	181 gal.
1/2	4.06	417 gal.	265 gal.
1	7.40	702 gal.	447 gal.

* For systems with maximum water supply pressure of

175 PSI (1206 kPa)

** For systems with water supply pressure between

175 PSI (1207 kPa) and 250 PSI (1724 kPa)

WARNING The information contained herewith is for estimation and evaluation purposes only. Its use remains the responsibility of the designer.

Table 5. - Pressure adjustments

System type	Air supply style	Air regulator	Compressor Start	Compressor Stop	Low air supervisory
Double interlocked electric/pneumatic Water pressure up to 175 psi (12.1 bar)	A	n/a	20 psi (1.38 bar)	35 psi (2.42 bar)	25 psi (1.73 bar)
	B	35 psi (2.42 bar)	n/a	n/a	25 psi (1.73 bar)
Double interlocked electric/pneumatic Water pressure 175 to 250 psi (12.1 to 17.2 bar)	A	n/a	40 psi (2.76 bar)	55 psi (3.80 bar)	45 psi (3.11 bar)
	B	55 psi (3.80 bar)	n/a	n/a	45 psi (3.11 bar)

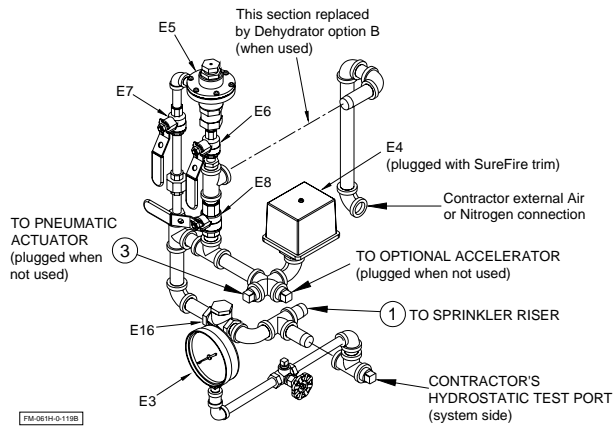
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5.2 Air Pressure Maintenance Device (Style "B")

Used only for the sprinkler piping network of the preaction system, when an external air supply is provided by others (tank mounted compressor, plant air or dry nitrogen cylinders) and piped to the air inlet port of the unit. Air supply style "B" provides an Air Pressure Maintenance Device (APMD) trim, factory mounted in the FIREFLEX[®] N₂ Blast[®] cabinets.



5.3 OPERATION

5.3.1 Air supply Style "A"

See figure 5.3.

To apply air pressure:

Establish AC power for the air compressor by activating the correspondent circuit breaker at the electrical distribution panel. Close the air inlet drain valve (E12). Start compressor by activating the compressor isolating switch (E15) located within the unit (see figure 4.4).

If the air compressor motor fails to start or slows down under load, shut the compressor off. Check that the supply voltage agrees with the motor nameplate.

To close the air supply:

Turn off the compressor isolating switch (E15) (see figure 4.4).

To adjust system air pressure (air compressor switch):

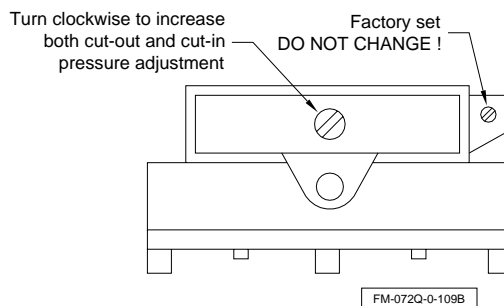
WARNING ! The cut-out/cut-in differential switch adjustment screw (small screw to the right) is factory set. **DO NOT CHANGE ITS SETTING.** Any unauthorized modification of this setscrew adjustment will void the system warranty and may also prevent the system from operating normally.

The air compressor cut-off pressure switch (E2) (shown in figure 5.1 with its cover removed) has its air compressor cut-out adjustment screw (middle screw) factory set. This switch should not need any adjustment but if necessary, follow the instructions below:

1. Remove the cover of the air compressor cut-off pressure switch (E2).
2. To raise the cut-out pressure of the air compressor, turn the cut-out adjustment screw (middle screw) half a turn **CLOCKWISE**.
3. Open the main drain valve (D3) and let the pressure drop until the air compressor (E1) restarts. Check pressure reading on the system pressure gauge (E3) when the air compressor stops. Repeat until the desired pressure is reached (refer to table 5). Once all is done, replace the cover on the switch (E2).

Note: Do not turn the cut-out adjustment screw (middle screw) all the way down in one shot. Proceed by steps. Use the same method turning the cut-out adjustment screw **COUNTER-CLOCKWISE** to lower the air compressor cut-out pressure.

Figure 5. - Front view of the air compressor cut-off pressure switch



5.3.2 Air supply Style "B"

See figure 5.4.

To apply air pressure:

Turn on upstream air supply. If the unit is equipped with the optional dehydrator (refer to section 5.5), close the air inlet drain valve (E12) and open the air shut-off valve (E14).

Open APMD (E5) input valve (E6) by placing handle in line with valve body then open APMD (E5) output valve (E7) by placing handle in line with the valve body.

In order to accelerate filling of sprinkler piping by air pressure, bypass valve (E8) can be opened by placing handle in line with valve body while piping is initially filled by the air compressor. This valve (E8) must then be closed (handle crossways to valve body) and kept in this position once the system is filled with air.

To close the air supply:

Close APMD output valve (E7) by placing handle crossways to valve body then close APMD (E5) input valve (E6) by also placing handle crossways to the valve body. Be sure bypass valve (E8) is closed (handle crossways to valve body).

To adjust system air pressure:

Be sure APMD (E5) input valve (E6) and output valve (E7) are both open (handle in line with the valve body), and bypass valve (E8) is closed (handle crossways to valve body) prior to performing this operation. Loosen lock nut of the DMPA (E5) and turn pressure adjustment nut clockwise to increase air pressure or counter-clockwise to decrease pressure. Tighten lock nut.

Note: Depending on site conditions, the internal filter of the APMD (E5) may need maintenance on a regular basis. Refer to Viking Data Sheet #127 for more details.

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5.4 MAINTENANCE AND INSPECTION

5.4.1 Air supply style "A"

To close the air supply:

This procedure requires turning OFF the air compressor's AC power by switching off the compressor isolating switch (E15) located within the unit before servicing (see figure 4.4).

Note: The air compressor motor is equipped with thermal protectors that reset automatically. These thermal protectors will stop the motor in case it overheats and can automatically start the motor when they reset.

Compressor's air inlet filter:

Intake filters are standard on most compressors and will provide adequate filtration for most applications. Check filters periodically and replace when necessary. Initial inspection is suggested at 500 hours, and then the user should determine the frequency. Most problems can be prevented by keeping filters clean. Dirty filters decrease compressor performance and can decrease compressor service life.

Maintain a clean air filter cartridge to insure best flow and performance. The location and the quality of the air being ingested indicate the frequency for inspection and replacement. A dirty filter restricts air flow, causes the pump to run hotter and results in longer operating cycles.

N₂ Blast[®] Nitrogen generator Intake filters

The N₂-BLAST[®] FPS-250 and FPS-750 utilize three different filters. The filters must be changed out annually or every 1000 hours (hour meter located inside FIREFLEX[®] N₂ Blast[®] cabinet) of operating time, whichever comes first. Filter Replacement Kits can be purchased from South Tek Systems that include the Filter Elements for the specified unit (STS Part # FRP-007).

Please refer to South -Tek N₂ Blast[®] Nitrogen generator Owner's Manual for instructions.

To drain the air supply accumulator (E13):

The amount of moisture pumped into the system and how quickly it accumulates is proportional to the amount of humidity in the air and how long the compressor is in operation.

At least once a year, open air inlet drain valve (E12) until all condensate water is drained from the air receiver. Close air option drain valve.

WARNING The relief valve and outlet pipe of the air compressor may become very hot during normal operation. Do not touch the valve, compressor heads or outlet piping until the compressor has been turned off and allowed to cool.

A safety relief valve is provided on standard compressors and is preset at the factory. Do not exceed or adjust safety relief pressures other than those preset at the factory.

WARNING Do not unscrew relief valve head entirely off while the compressor is operating. Ejection of valve parts could cause severe injury.

5.4.2 Air supply Style "B"

See figure 5.4.

The Viking model D-2 air pressure maintenance device (APMD) (E5) is a pressure regulator that automatically reduces the supply air pressure to a pre-set requirement when connected to a constantly maintained air supply (plant air, external tanked air compressor or dry nitrogen tank).

Features:

- Replaceable air inlet filter
- Outlet pressure range is 5 to 75 psi (± 2 psi) (0.345 to 5.17 bar). Air pressure setting can be readjusted after installation (refer to chapter 5.3.2 TO ADJUST SYSTEM AIR PRESSURE for air supply Style "B").
- Ball check to prevent back flow
- Restriction orifice 1/16" (1,59mm) to prevent rapid re-pressurization of a system. The Viking model D-2 APMD (E5) regulates and restricts air flow.
- The air or nitrogen supply provided to the APMD (E5) must be continuous, clean, dry and oil free.
- Bypass piping is provided to allow initial pressurization of system piping more rapidly than the restricted air flow through the APMD (E5) will allow.
- Determine the appropriate pressure to be maintained in the system (refer to table 5).

The APMD (E5) should be checked after installation or repair and adjusted as required for correct pressure reading (refer to chapter 5.3.2 TO ADJUST SYSTEM AIR PRESSURE). The filter should also be inspected and replaced or cleaned as required.

To clean the APMD (E5):

1. This procedure requires turning OFF the compressor's power.
2. Do not disconnect or disassemble the APMD (E5) without closing the outlet (E7) and inlet (E6) isolation valves. System air pressure will be trapped between the outlet of the APMD (E5) and the downstream control valve. Relieve pressure before proceeding with disassembly.
3. Carefully loosen the union between the outlet of APMD (E5) and the outlet isolation valve (E7) to relieve pressure.
4. Remove and clean APMD (E5) filter. If admission filter is blocked, replace with filter kit (part # 03007 A).

Refer to Viking Technical Data Sheet #127 for additional details.

To close the air supply:

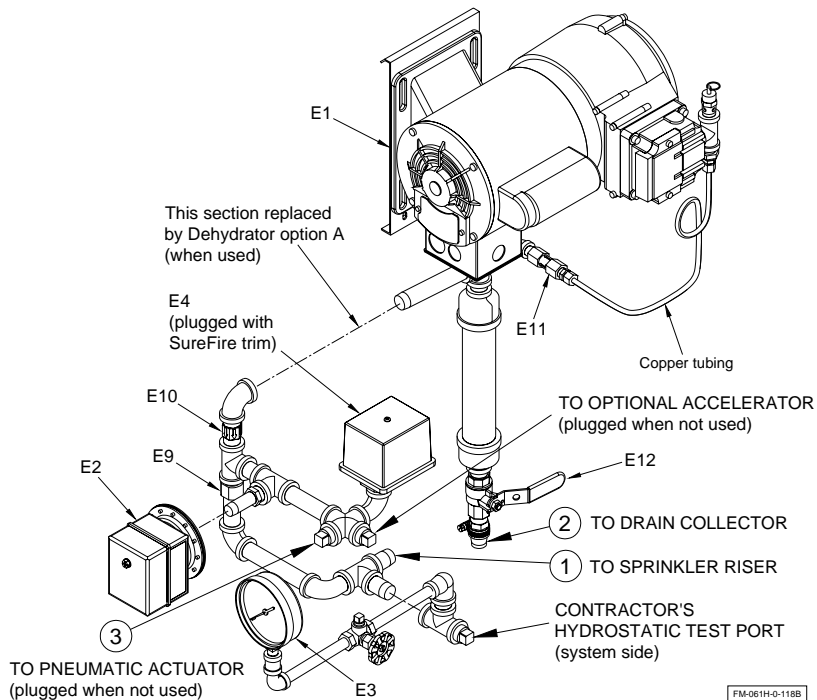
Close APMD (E5) output isolation valve (E7) by placing handle crossways to the valve body. Make sure the APMD (E5) input valve (E6) is open (handle in line with valve body) and the bypass valve (E8) is closed (handle crossways to valve body).

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Figure 5.3 – Air supply Style "A"
(Cabinet mounted air compressor)



Air option components:

- | | | | |
|----|--|-----|---|
| E1 | Air compressor | E10 | Soft-seat check valve |
| E2 | Air compressor "Cut-off" pressure switch | E11 | Air compressor check valve |
| E3 | System air pressure gauge | E12 | Air option drain valve |
| E4 | Air supervisory pressure switch | E13 | Air supply accumulator |
| E9 | Float check valve | E15 | Compressor isolating switch (not shown) |

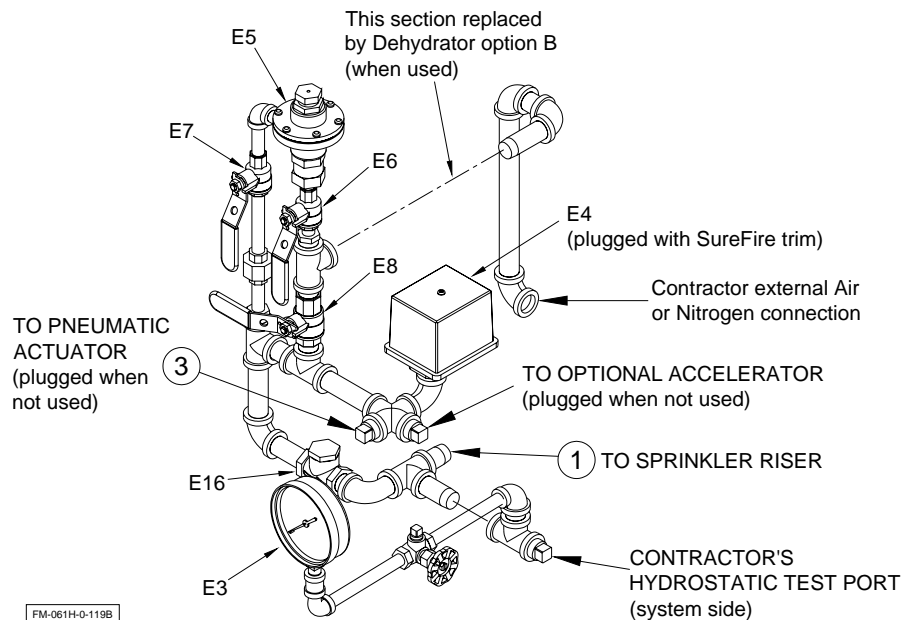
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Figure 5.4 – Air supply Style "B"

(APMD without air compressor)



Note: The external air supply must be restricted to insure that it cannot replace air as fast as it escapes when a releasing device or sprinkler operates. When the system is put in service, open the input valve (E6) first

Air option components:

- | | | | |
|----|--|----|-------------------|
| E3 | System air pressure gauge | E6 | APMD input valve |
| E4 | Air supervisory pressure switch | E7 | APMD output valve |
| E5 | Air pressure maintenance device (APMD) | E8 | APMD bypass valve |

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6. CONTROLS

6.1 PRODUCT DESCRIPTION

The FIREFLEX[®] N₂ Blast[®] cabinet is made of sturdy 14 gauge steel. Refer to figure 6.4 for dimensions.

All surfaces are rust proof coated, inside and outside, with fire red, oven baked polyester powder on phosphate base. Cabinet is provided with two doors, all provided with a neoprene gasket to avoid vibrations, giving the access to the pressure gauges reading and the manual emergency release.

Cabinet doors are provided with hinges that can easily be disassembled on site to remove the door assemblies for installation and servicing. The cabinet assembly is pre-assembled, pre-wired, and factory tested under ISO-9001 conditions. Refer to figures 6.2 & 6.3 for installation and clearances details.

Electrical junction boxes are integrated inside the cabinet for connection of the supervisory and alarm devices contacts. Knockouts are pre-punched for the installing contractor as indicated on figure 6.1.

6.2 REMOTE CONTROLLED FIREFLEX[®] N₂ Blast[®]

(Without integrated releasing control panel)

For application with FIREFLEX[®] N₂ Blast[®] unit provided without integrated releasing control panel, such as in retrofit application where the unit is connected and controlled by a central control panel already installed in the building or premises, a field wiring junction box (see figure 6.1) is provided. All electrical components in the trim (pressure switches, solenoid valve, etc.) are factory wired to a terminal strip (TBA) for contractor's field wiring. The junction box access is protected by a cover plate maintained in place with screws.

The installing contractor should make sure the remote control panel being used is both listed and programmed to handle the required sequence of operation necessary to operate the FIREFLEX[®] N₂ Blast[®] system.

Refer to section 1 GENERAL, appropriate standards and Authority Having Jurisdiction for additional information.

Figure 6.1 - knockouts details

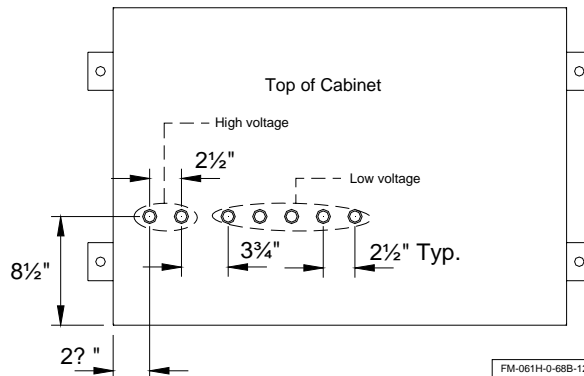
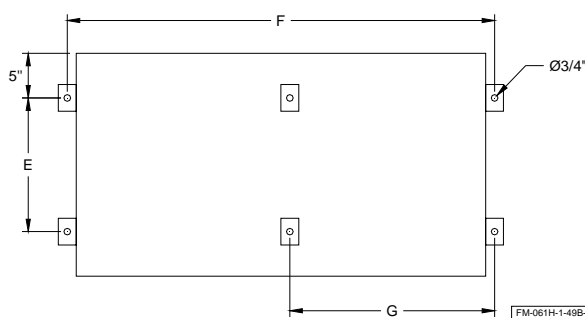
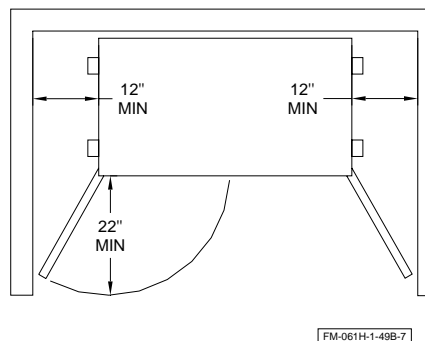


Figure 6.2 - Floor anchoring template



Size	E	F	G
46"	15"	48"	23"
52"	21"	54"	26"

Figure 6.3 - Required clearance

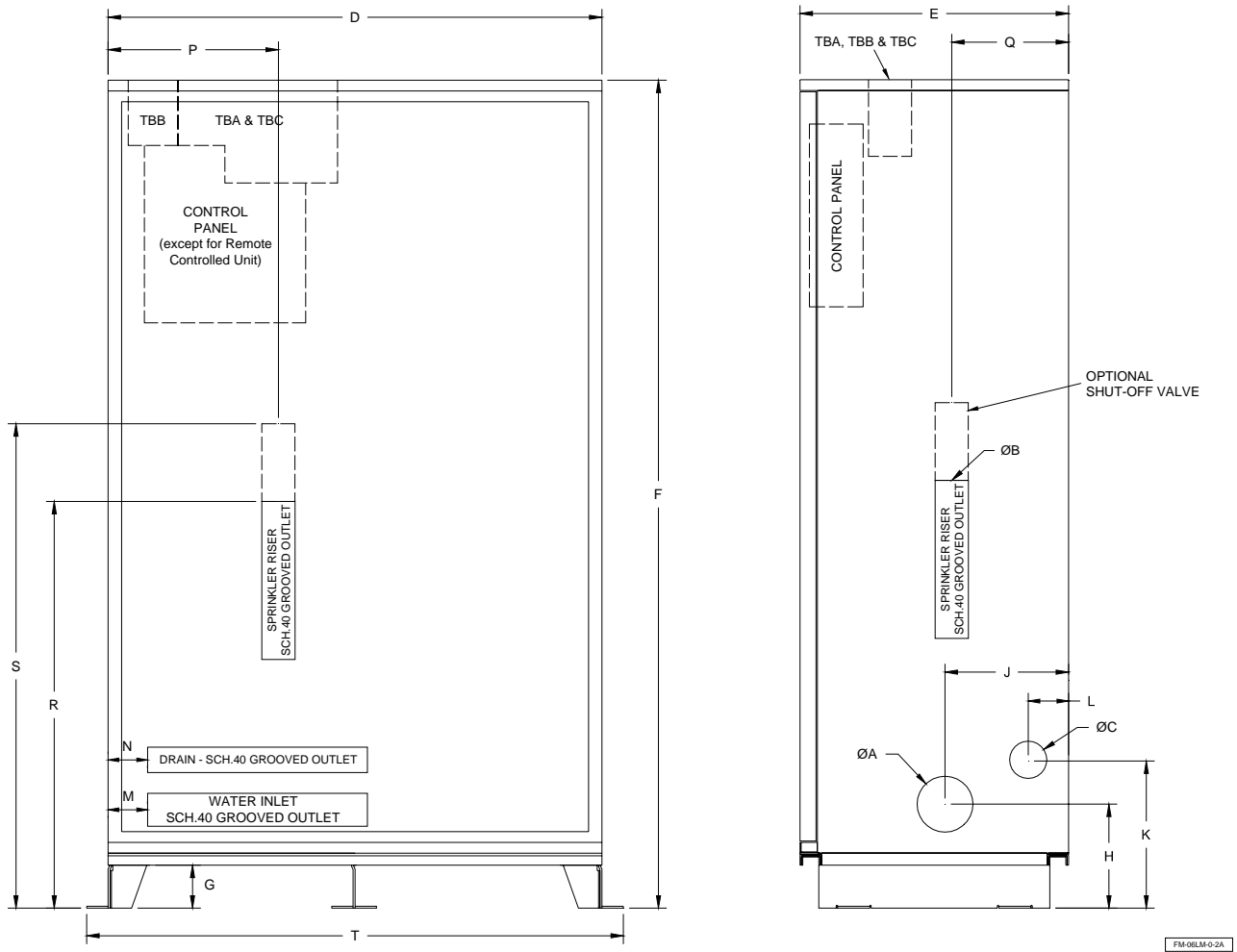


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Figure 6.4 - Cabinet dimensions



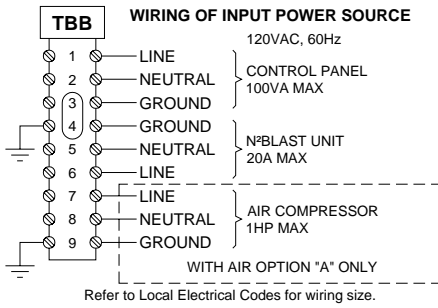
System Size	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	U
1½"	2"	1½"	2"	46"	25"	77"	4"	8¾"	11½"	13½"	¾"	2¾"	2¾"	15"	11"	37½"	44¾"	50"
2"	2"	2"	2"	46"	25"	77"	4"	8¾"	11½"	13½"	¾"	2¾"	2¾"	15"	11"	38"	45"	50"
3"	4"	3"	2"	46"	25"	77"	4"	10"	11½"	13½"	¾"	2½"	2½"	15"	11½"	44"	47¾"	50"
4"	4"	4"	2"	54"	31"	81"	4"	10"	11½"	13½"	¾"	2½"	2½"	19¾"	11½"	48½"	53"	58"

FIREFLEX[®] N₂ BLAST[®]

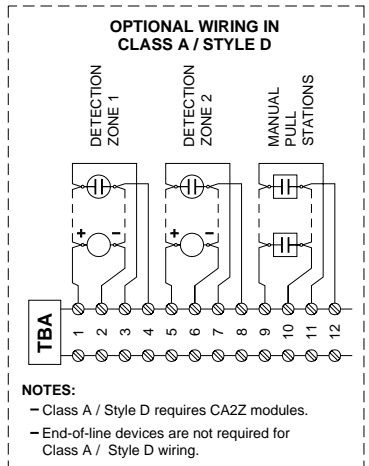
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7. WIRING DIAGRAMS

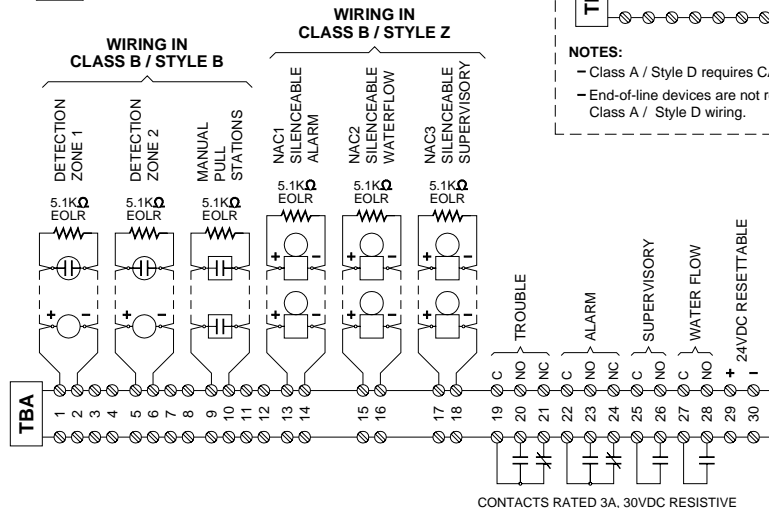
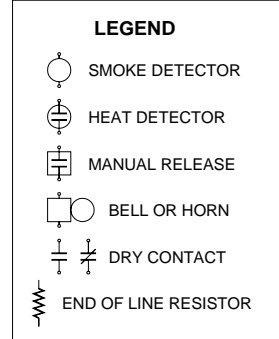


! Branch circuit for air compressor shall not be the same as the control panel power source.

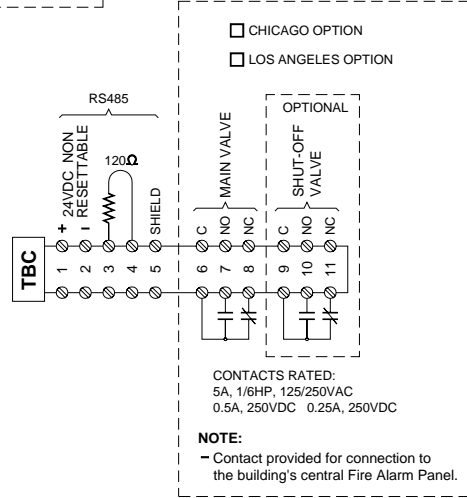


NOTES:

- Class A / Style D requires CA2Z modules.
- End-of-line devices are not required for Class A / Style D wiring.

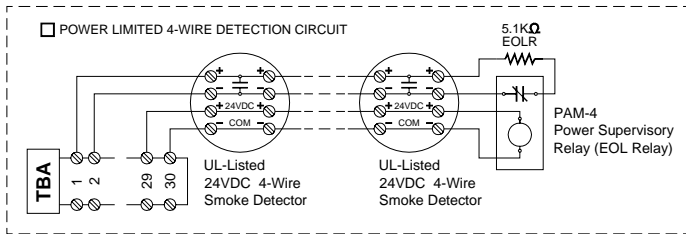


CONTACTS RATED 3A, 30VDC RESISTIVE



CONTACTS RATED:
5A, 1/6HP, 125/250VAC
0.5A, 250VDC 0.25A, 250VDC

NOTE:
- Contact provided for connection to the building's central Fire Alarm Panel.



NOTES:

- Control panel AC power source is supervised and non-power limited.
- All devices are shown in their normal supervisory state.
- Use dry contacts with power limited circuits only.

FM-061H-G-210A

8. Limited Warranty

FireFlex® Systems Inc. (known herein as "the Manufacturer") warrants to its customer that its products shall be free of defects in material or part(s) and workmanship for a period of twelve (12) months from the date of original delivery, under normal use and service by the Customer (and provided that the product has been properly installed and maintained).

The obligation of the Manufacturer in case of a claim made by the Customer hereunder, shall be, at the Manufacturer's option, limited to repair or replace, free of charge for parts or his labor, any product or part, which in the opinion of the Manufacturer, shall be proven to be defective. The Manufacturer will NOT accept labor back-charges incurred by the Customer to repair or replace said product or part.

The present warranty shall be void should the product or part(s) be altered by anyone other than the Manufacturer. In case of a claim under the present warranty, the Customer must contact the Manufacturer's Customer Service Department as soon as he is aware of a claim and, subject to the authorization of the manufacturer, return the defective product or part(s), transportation prepaid, to the address listed below.

This warranty constitutes the entire warranty given by the Manufacturer to the Customer with respect to the product. The present warranty is non-transferable and non-assignable. The Manufacturer does not represent that the products will prevent any loss by fire or otherwise or that the product will in all cases provide the protection for which it has been installed or intended.

The Customer acknowledges that the Manufacturer is not an insurer. The manufacturer shall not be liable for any loss or damages of any nature whatsoever, including but not limited to incidental or special or consequential damages including but not limited to, property damages, personal injury, revenue loss or lost profits, inconveniences, transportation charges or other damages suffered by anyone.

There are no other warranties, expressed or implied with regard to the products, other than those contained herein.

Some jurisdictions may not allow limitations on how long an expressed warranty lasts, so the above limitations may not apply to you. Under no circumstances, shall the Manufacturer be liable for any loss of, or damage to property, direct or indirect, incidental or special or consequential damages, arising out of the use or inability to use the Manufacturer's products. The Manufacturer shall not be liable for any personal injury which may arise in the course of or as a result of the use of the manufacturer's products.

This warranty replaces all previous warranties and is the only warranty given by the Manufacturer with respect to its products. This warranty shall not be modified, unless such modification is made in writing by an executive officer of the Manufacturer.

In consideration of the warranty provisions contained herein, the Customer hereby waives the benefit of any statutory warranty or protection or remedy to which he may be entitled under the terms of any sales of goods act or similar legislation available to him in any jurisdiction in which the Customer carries on business.

Defective part(s) must be returned to the address listed below within (30) days of receiving replacement parts(s). If defective part(s) is not returned before delay expires, an invoice will be issued for replacement part(s) and shipping. On reception, an extended analysis will be performed on the said part(s). If proven to be defective, no invoice will be issued. If the part(s) is proven to be in working condition an invoice will be issued for replacement part(s) and shipping.

Product Support

1-866-347-3353

Our Product Support Organization is dedicated to assisting you regarding our products, warranty and service procedures.

The number above is a toll free number to Product Support.

Manufactured by **FIREFLEX Systems Inc.**

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