

Integrated Fire Protection System

FIRE FLEX[®] DUAL

Owner's Operation and Maintenance Manual

Double Interlocked Preaction

NOVEC 1230

Remote Controlled



Integrated Fire Protection System
OWNER'S OPERATION & MAINTENANCE MANUAL

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1. GENERAL

The new **FIREFLEX® DUAL** integrated system consists of a remotely controlled integrated preaction automatic sprinkler system combined with a clean agent fire extinguishing system, factory-assembled in a single cabinet. All the components necessary for both extinguishing systems are integrated.

The **FIREFLEX® DUAL** system uses **3M™ NOVEC™ 1230** fire protection fluid combined with the **Viking** preaction system.

1.1 APPLICABLE STANDARDS

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

- NFPA-13 Sprinkler Systems
- NFPA-70 National Electrical Code
- NFPA-72 Fire Alarm Systems
- NFPA-2001 Clean agent fire extinguishing system

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

- Approbation Factory Mutual: **FIREFLEX® 1230** systems are FM Approved under the heading: "FIXED EXTINGUISHING SYSTEMS, CLEAN AGENT FIRE EXTINGUISHING SYSTEMS".
- Underwriters Laboratories Inc. (UL): **FIREFLEX® 1230** Systems are UL Listed under "Clean Agent Extinguishing System Unit" Category # GAQF-EX6174 and Category # GAQFC-EX6174 (ULC).

Warning ! Any unauthorized modification or addition made on-site to a factory built Listed Unit will void this Listing. Such modifications or additions may void the unit's warranty as well. Consult your nearest **FIREFLEX Systems** Authorized Distributor before proceeding with such modifications or additions.

1.3 ENVIRONMENT

FIREFLEX® DUAL unit shall be installed in a dry and clean location. Verify that all equipment 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.

The frequency of the inspections and maintenance will vary depending on the environmental conditions as well as the condition of the air supply to the system.

THE OWNER IS RESPONSIBLE FOR MAINTAINING THE FIRE PROTECTION SYSTEM AND DEVICES IN PROPER OPERATING CONDITION (REFER TO SECTION 4).

1.4 GENERAL DESCRIPTION

The **FIREFLEX® DUAL** system uses **SEVO®** cylinder designed for a high volume discharge rate in order to meet the rapid discharge requirements specified in the NFPA-2001 Standard. Discharge valve is of brass construction and is designed as per the pressure differential concept. The valve is equipped with a pressure-indicating gauge and an electric actuator. The cylinder is also provided with an integrated pressure safety device.

The **FIREFLEX® DUAL** system integrates the same type of preaction automatic sprinklers system as found in the renowned **FIREFLEX Systems TOTALPAC3**, using top quality Viking Corporation components and the deluge valve model F-1. **FIREFLEX® DUAL** system is provided with an integrated 2 or 3-inch diameter deluge valve.

The clean agent section of the **FIREFLEX® DUAL** system is engineered by **FIREFLEX Systems Inc.** (or an authorized contractor) to meet the specific protection requirements of the application for which it is being installed.

Detection is shared by both the preaction automatic sprinkler system and the clean agent fire extinguishing system.

All systems are designed per NFPA-2001 Standard and in compliance with instructions found in the following manufacturer design manuals:

- **SEVO Design Manual: SE 1230 500 ENG (latest rev.)**
- **Viking Corp. Form No F_070889 / Data Sheet 319, (latest rev.)**

The cylinder is filled with the extinguishing agent and then pressurized to 500 Psi at 70°F (34.5 bar at 21.1°C) with Nitrogen allowing maximum flexibility at the time of installation. Each cylinder is fabricated, tested and stamped according to D.O.T. 4BA500 or 4BW500 or TPED specifications depending on its size and capacity.

The **FIREFLEX® DUAL** 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 frontal locked doors, reducing space requirements for ease of installation and maintenance. Furthermore, all doors are provided with a neoprene gasket to reduce vibrations and can be removed without special tools for easier access.

Table 1.1 - FIREFLEX® DUAL capacity of cabinet (cylinder quantity)

Cabinet width	Size of cylinder (lbs)					
	40	76	164	322	601	850
36"	1	1	1	n/a	n/a	n/a
46"	n/a	n/a	n/a	1	1	n/a
54"	n/a	n/a	n/a	n/a	n/a	1

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1.5 FEATURES

FIREFLEX® DUAL main features are:

- Trouble-free design for safe and easy application
- Available in 3 cabinet sizes
- 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 (17.2 bar) 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
- 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

Configuration for **FIREFLEX® DUAL**:

- Engineered **NOVEC 1230** single cylinder with electric release
- Double interlocked preaction with electric / pneumatic release

1.7 RELEASING

1.7.1 Electric releasing conditions

The electric releasing condition is needed by an approved releasing control panel in order to operate the electric actuator (C) of the **NOVEC 1230** and the solenoid valve (F1) of the preaction system. It can be achieved as the following:

- a) Single zone detection activated by **either** Zone 1 or Zone 2.
- b) Cross zone detection activated by **both** Zone 1 and Zone 2.
- c) Manual pull station activated.

1.7.2 NOVEC 1230 electric release

Electric release is achieved with an electric actuator (C) installed on the discharge valve (B) of the cylinder (A). When the releasing conditions are fulfilled, a 24Vdc source is applied to the electric actuator (C) thereby venting the pressure on top of the discharge valve (B) thus allowing the extinguishing agent **NOVEC 1230** to be discharged through the piping and nozzles.

1.7.3 Double interlocked preaction electric release

Release trim for the double interlocked preaction system with electric / pneumatic release utilizes a normally closed solenoid valve (F1) controlled by control panel listed for releasing with a compatible detection system, 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.

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2. CLEAN EXTINGUISHING AGENT

2.1 AGENT

The clean extinguishing agent used in **FIRE FLEX® DUAL** total flooding system is **NOVEC 1230**.

Note: The term **NOVEC 1230** employed throughout this manual refers to the extinguishing agent Dodecafluoro-2-methylpentan-3-one known as SEVO 1230 Fire Protection Fluid (also known as FK-5-1-12, 3M™ NOVEC™ 1230 Fire Protection Fluid, C₆-F-ketone) produced by 3M™.

2.2 DESCRIPTION

NOVEC 1230 is a colorless fluid. It is stored as a pressurized liquid and injected into a room, area, or compartment that has the structural integrity to retain the agent that has been discharged.

NOVEC 1230 is dispensed as an odorless, electrically non-conductive vapor. It leaves no residue.

NOVEC 1230 is a clean, efficient fire-extinguishing agent that can be used on Class A, B, or C fires. It is a very stable, inert and electrically non-conductive gas. Its primary use is for energized electric equipment fire containment and preventing reigniting.

2.3 ENVIRONMENTAL

NOVEC 1230 does not contribute to depletion of the stratospheric ozone layer. **NOVEC 1230** has an atmospheric lifetime of 0.014 years. Its global warming potential is 1.

2.4 SAFETY CONSIDERATIONS

2.4.1 TOXICITY

The table 2.1 identifies the toxicological data on **NOVEC 1230** and compares this with **HALON 1301**.

Table 2.1 - Toxicological data

	NOVEC 1230	HALON 1301
No Observed Adverse Effect Level (NOAEL)	10%	5.0%
Low Observed Adverse Effect Level (LOAEL)	10%	7.5%
Acute Exposure LC50 (4 hour rate - ppm)	100,000	800,000
Design Concentration (minimum)	4.2%	4.3%

2.4.2 NOISE

Discharge of a **NOVEC 1230** system can cause noise loud enough to be startling but ordinarily insufficient to cause traumatic injury.

2.4.3 TURBULENCE

High velocity discharge from nozzles may be sufficient to dislodge substantial objects directly in the path of the discharge. General turbulence in the enclosure may be sufficient to move light objects, unsecured paper, etc. Ceiling tiles in the vicinity of the nozzles should be clipped in place to prevent them from being dislodged during the discharge.

2.4.4 COOLING

Direct contact with vaporizing liquid **NOVEC 1230** will have a strong chilling effect on objects and can cause frostbite burns to the skin. The liquid phase vaporizes rapidly when mixed with air and thus limits the hazard to the immediate vicinity of the discharge nozzle.

2.4.5 VISIBILITY

Upon discharge reduced visibility will be evident, especially in humid atmospheres, as a result of the condensations of vapor. The period of reduced visibility will normally be brief.

2.4.6 PRESSURE

The discharge nozzle is between 73 Psi and 290 Psi (5 bar and 20 bar).

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3. PREACTION SYSTEM

3.1 DESCRIPTION

The preaction system in the **FIREFLEX® DUAL** 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 devices and alarm connections to an approved releasing control panel. 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® DUAL** 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 (17.2 bar) working water pressure max. and is available in the following diameters:

- 2" (50 mm)
- 3" (80 mm)

FIREFLEX® DUAL preaction system is supplied with flange-groove deluge valve.

3.3 RELEASE

Release trim for the electric / pneumatic operated double interlocked preaction system utilizes a normally closed solenoid valve (*F1*) controlled by an approved release control panel with a compatible detection system, and a pneumatic actuator (*F3*) normally held closed by supervisory air pressure maintained in the sprinkler piping. The **FIREFLEX® DUAL** system utilizes a detection system, the same as clean agent.

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.

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OWNER'S OPERATION & MAINTENANCE MANUAL**4. INSTALLATION, OPERATION & MAINTENANCE INSTRUCTIONS****4.1 INSTALLATION**

IMPORTANT! The **FIREFLEX® DUAL** unit IS NOT designed to be installed in area subject to freezing conditions. Refer to section 1.3 for additional details.

1. Install the **FIREFLEX® DUAL** cabinet (refer to section 8).

IMPORTANT! THE CABINET MUST BE FIRMLY ANCHORED TO THE FLOOR USING ALL FOUR (4) ANCHORING HOLES.

2. Install the automatic sprinkler piping and clean agent releasing piping, detection and signaling circuits (if applicable) in accordance with applicable standards.
3. Connect all devices and alarm devices to the remote releasing control panel, where applicable, according to electrical schematics (refer to section 7).
4. Connect the AC power for the remote releasing control panel and for the optional air compressor on two separate breakers in the electric distribution panel (refer to section 7).
5. Conform to local municipal or other codes regarding installations of fire protection systems.
6. Place the **FIREFLEX® DUAL** system in service (refer to chapters 4.2 & 4.3).
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 4.5 & 4.6 at the end of the current section.

1. **FIREFLEX® DUAL** cabinet shall be firmly anchored to the floor.
2. Open door to mechanical section.
3. Cylinder (A) shall be solidly fixed with brackets (F).
4. Check the pressure of the cylinder with pressure gauge (D) according to table 4.1. If the cylinder shows a loss in pressure of more than 10%, it shall be refilled or replaced.
5. Check that piping supports have been installed at the correct intervals and are adequate for the purpose.
6. The piping distribution system shall be inspected to determine that it is in compliance with the design and installation documents.
7. Nozzles and pipe size shall be in accordance with system drawings. Means of pipe size reduction and attitudes of tees shall be checked for conformance to the design.
8. Check that all nozzles are fitted in accordance with the design requirements and are aimed in the correct alignment away from obstructions or barriers that could prevent adequate distribution/mixing of the gas.
9. Protected area Integrity test shall be considered to locate and then effectively seal any significant air leaks that could result in a failure of the enclosure to hold the specified agent concentration level for the specified holding period. The currently preferred method is using a blower door fan unit and smoke pencil.
10. Main water supply control valve (D1) should be closed.
11. Priming valve (B1) must be closed.
12. Air supply must be CLOSED (refer to section 5).
13. Drain test valve (B6) and main drain valve (D3) must be closed.
14. Alarm test valve (B5) must be closed.
15. All gauges (B11, B12 and E3) should read 0 psi.
16. Using the built-in contractor's hydrostatic test ports (see figure 4.5), 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 (17.2 bar). Close gauge valves before proceeding with hydrostatic test.

17. 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. Check all connections to the remote releasing control panel.
2. Check all local audible devices.
3. Check all releasing conditions.
4. Check if **NOVEC 1230** electric actuator (C) operates after preset time delay.
5. Simulate a low cylinder pressure by shorting low cylinder pressure switch (D) terminals.
6. Verify the active installation supervision switch on the electric actuator (C).

CAUTION ! Activate the **releasing circuit disable switch** before doing any tests on the system (see figure 6.2).

7. 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.
8. CLOSE main drain valve (D3).
9. OPEN priming valve (B1).
10. Reset the release control panel.
11. 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.

12. OPEN drain test valve (B6).
13. PARTIALLY OPEN main water supply control valve (D1).
14. 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.
15. FULLY OPEN the main water supply control valve (D1).
16. Verify that the alarm test valve (B5) is CLOSED and that all other valves are in their "normal" operating position.
17. Depress the plunger of the drip check valve (B7). No water should flow when the plunger is pushed.
18. Check and repair all leaks.
19. Perform sequence of operation (refer to chapter 4.4).
20. Reset the remote releasing control panel.

Table 4.1 - Cylinder pressure versus temperature

Cylinder pressure	Temperature
413 psi (28.4 bar)	0°F (-17.8°C)
425 psi (29.3 bar)	10°F (-12.2°C)
438 psi (30.1 bar)	20°F (-6.67°C)
450 psi (31 bar)	32°F (0°C)
463 psi (31.9 bar)	40°F (4.4°C)
475 psi (32.7 bar)	50°F (10°C)
488 psi (33.6 bar)	60°F (15.6°C)
500 psi (34.5 bar)	70°F (21.2°C)
513 psi (35.3 bar)	80°F (26.7°C)
525 psi (36.2 bar)	90°F (32.2°C)
538 psi (37 bar)	100°F (37.8°C)
550 psi (37.9 bar)	110°F (43.3°C)
563 psi (38.8 bar)	120°F (48.9°C)

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The remote releasing control panel shall be configured for the following 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. Actuation of a detector from the other detection zone (for crossed zones configuration):
 - a) "ZONE 2" (or "ZONE 1") activates.
3. Discharge sequence occurs:
 - a) "PRE-DISCHARGE NOVEC 1230" contacts activate.
 - b) Pre-discharge delay starts (not exceeding 60 sec).
 - c) "SECOND STAGE ALARM" audible devices activate.

Note: The abort station from the remote releasing control panel will prevent the **NOVEC 1230** discharge as long as being maintained if activated during the pre-discharge delay.

4. After pre-discharge delay is completed:
 - a) **NOVEC 1230** electric actuator (C) activates.If **NOVEC 1230** discharge switch option is selected:
 - b) "DISCHARGE NOVEC 1230" contact activates.
5. After a preaction sprinkler head fuses:
 - a) Deluge valve (A1) opens; water will flow into sprinkler piping network and out of sprinklers and any openings on the system.
 - b) "WATERFLOW PREACTION" contact activates.

4.4.2 Manual release

1. Actuation of a manual release pull station within the system:
 - a) "ALARM" audible devices activate.
 - b) "ALARM" contacts activate.
 - c) Preaction solenoid valve (A1) activates.

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

- d) "PRE-DISCHARGE NOVEC 1230" contacts activate.
 - e) Pre-discharge delay starts (not exceeding 30 sec).
 - f) "SECOND STAGE ALARM" audible devices activate.
2. After pre-discharge delay is completed:
 - a) **NOVEC 1230** electric actuator (C) activates.If **NOVEC 1230** discharge switch option is selected:
 - b) "DISCHARGE NOVEC 1230" contact activates.
 3. After a preaction sprinkler head fuses:
 - a) Deluge valve (A1) opens; water will flow into sprinkler piping network and out of sprinklers and any openings on the system.
 - b) "WATERFLOW PREACTION" contact activates.

Note: At any time, if the optional mechanical activator (J) is activated, the **NOVEC 1230** will be released.

At any time, if the emergency release valve (B10) is activated, the preaction piping network will be filled with water. Only the "ALARM" audible devices will activate.

4.4.3 Abort Station

1. Actuation of an abort station within the system:
 - a) "TROUBLE" contact activates.

When abort release switch is activated, pre-discharge timer will continue to count down until it reaches 10 seconds and then wait. Releasing the abort release switch will allow the pre-discharge to continue its count down from 10 seconds. If the abort release switch is again activated before the pre-discharge timer reaches zero, the timer will reset to 10 seconds and wait.

4.4.4 System supervisory

1. Actuation of a supervisory device such as low pressure switch or valve in wrong position within the system:
 - a) "SUPERVISORY" contact activates.

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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 6.2).
2. Close main water supply control valve (*D1*).
3. Open system main drain valve (*D3*).
4. Silence alarms at the remote releasing control panel (refer to section 6).

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.

5. Shut-off the air supply (refer to section 5).
6. Open drain test valve (*B6*).
7. Close priming valve (*B1*).
8. 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.
9. Replace any sprinklers that have opened, been damaged, or have been exposed to fire conditions.
10. Replace any detectors that have been damaged.
11. Return the system to service as soon as possible. Perform steps 5 through 18 of chapter 4.3.
12. Turn the **releasing circuit disable switch** to **NORMAL** (see figure 6.2).

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4.6 PLACING THE SYSTEM BACK IN SERVICE AFTER OPERATION

See figures 4.5 & 4.6 at the end of the current section.

1. Remove the electric actuator (C) from the cylinder (A).
2. Remove cylinder (A) and send it to an authorized agent for filling.
3. Reinstall the cylinder (A) inside the cabinet.
4. Reset the electric actuator (C) (refer to chapter 4.7).
5. Install the electric actuator (C) on the cylinder (A).
6. Check that the piping and nozzles have not been altered.

WARNING ! the optional mechanical release (J) SHALL be in NORMAL position, handle upwards and safety pin installed BEFORE installing it on the cylinder valve (B).

7. 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.
8. CLOSE main drain valve (D3).
9. OPEN priming valve (B1).
10. Restore supervisory pressure to sprinkler piping.

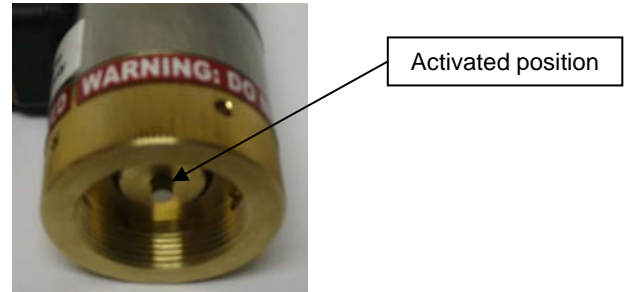
Note: On systems provided with an air pressure maintenance device (air option style "B"), verify that the ½" by-pass valve (E8) in the air pressure maintenance device trim is CLOSED and that both ¼" valves (E6 & E7) are OPEN.

11. Reset the release control panel. Solenoid valve (F1) should close.
12. OPEN drain test valve (B6).
13. PARTIALLY OPEN main water supply control valve (D1).
14. When full flow develops from the drain test valve (B6), CLOSE the drain test valve.
15. Verify that there is no flow from the drip check valve (B7) when the plunger is pushed.
16. FULLY OPEN the main water supply control valve (D1).
17. Verify that the alarm test valve (B5) is CLOSED and that all other valves are in their "normal" operating position.
18. Depress the plunger of the drip check valve (B7). No water should flow from the drip check when the plunger is pushed.
19. Check and repair all leaks.
20. Notify the Authority Having Jurisdiction, remote station alarm monitors, and those in the affected area that the system is back in service.

4.7 ELECTRIC ACTUATOR

When the electric actuator (C) gets energized, it stays in the activated position (see figure 4.1).

Figure 4.1



Reset the actuator (C) to normal position by turning or pushing the resetting tool (see figures 4.2 & 4.3).

Figure 4.2

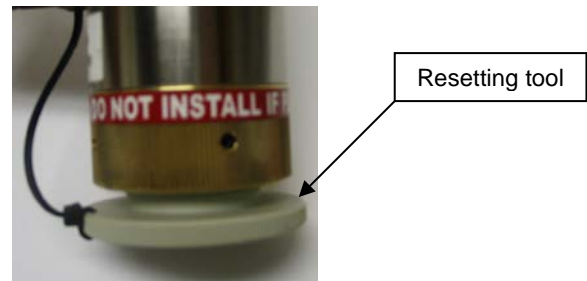
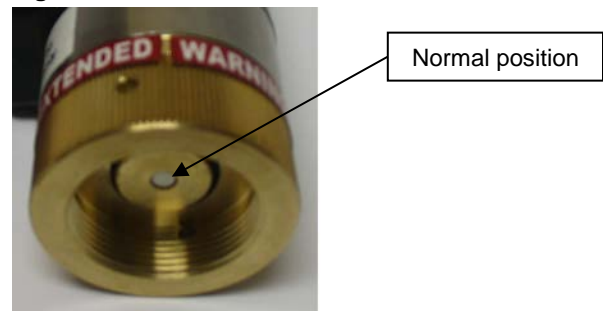


Figure 4.3



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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, NFPA-72 and NFPA-2001. 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, **NOVEC 1230** cylinder inspections, valve inspections, trip tests of preaction 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 Praction 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 4.5).
7. Verify that there is no flow from the drip check valve (B7) when the plunger is pushed.

4.8.2 Praction 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.

Perform steps 7 through 20 of chapter 4.6.

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

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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:
 - (1) In the normal open or closed position.
 - (2) Properly supervised.
 - (3) Accessible.
 - (4) Free from external leaks.
3. The deluge valve (A1) and associated components shall be externally inspected to verify the following:
 - (1) The valve is free from physical damage.
 - (2) All trim valves are in the appropriate open or closed position.
 - (3) The valve seat is not leaking.
 - (4) 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. Visually inspect all **NOVEC 1230** system components and cylinder pressure.
7. 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. Check the discharge nozzle orifice(s) to see if they are clear with no obstructions.
6. Check to insure that the nozzles are positioned correctly.
7. Check the quantity of liquid and pressure in the cylinder (A). If a loss in net weight of more than 5% or a loss in pressure of more than 10% (refer to table 4.1), it shall be refilled or replaced.
8. 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. Check all HVAC shut down, etc. from the remote releasing control panel.
6. Check if extinguishment electric actuator (C) operates after pre-discharge delay.
7. Simulate a low pressure of cylinder (A) by shorting low cylinder pressure switch (D) terminals.
8. Perform sequence of operation (refer to chapter 4.4).
9. Perform manual emergency release test of the preaction system.
10. Perform full trip test.
11. 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

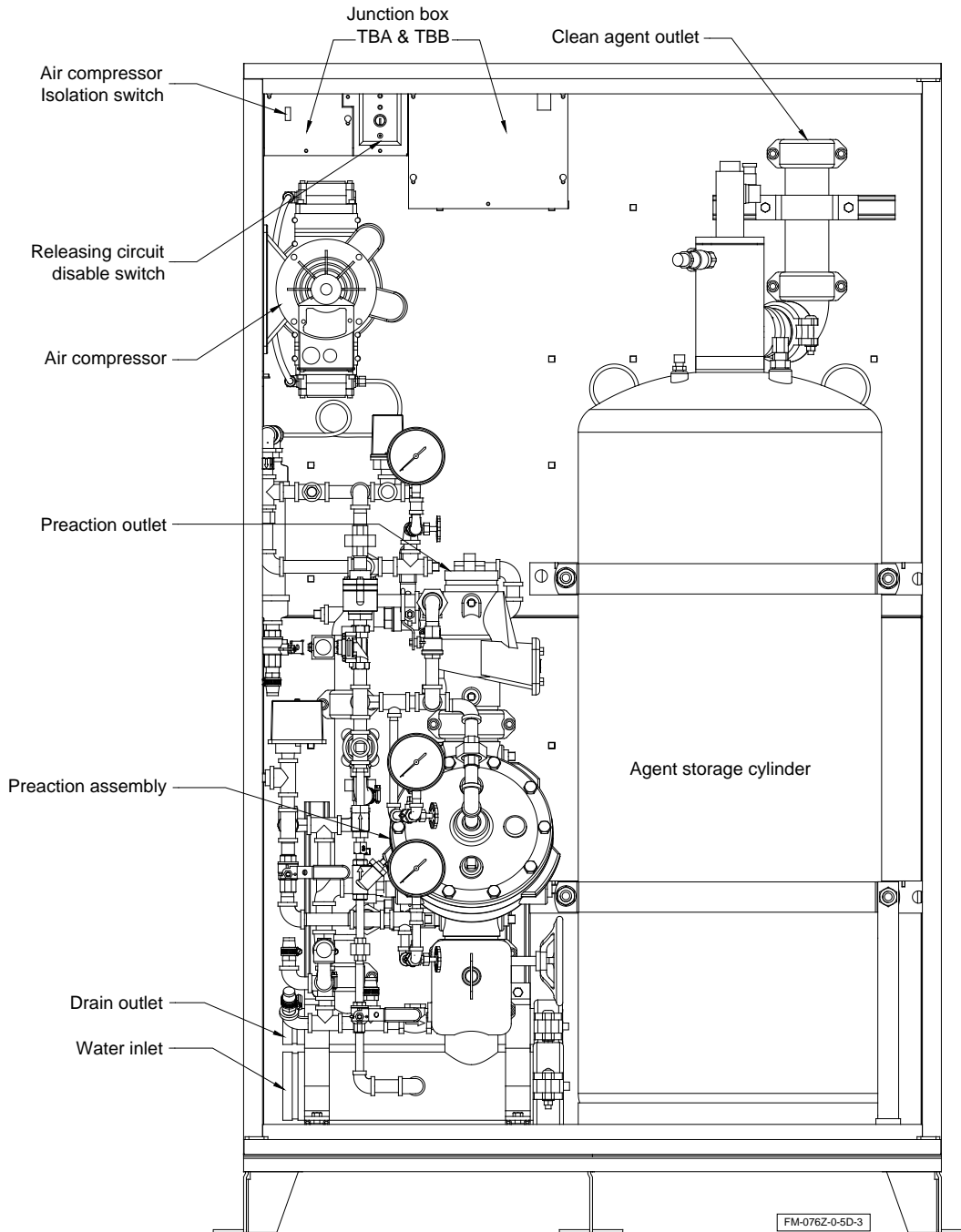
The system shall be maintained in full operation condition at all times.

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

Any penetration made through the enclosure protected by the clean agent shall be sealed immediately. The method of sealing shall restore the original fire resistance rating of the enclosure.

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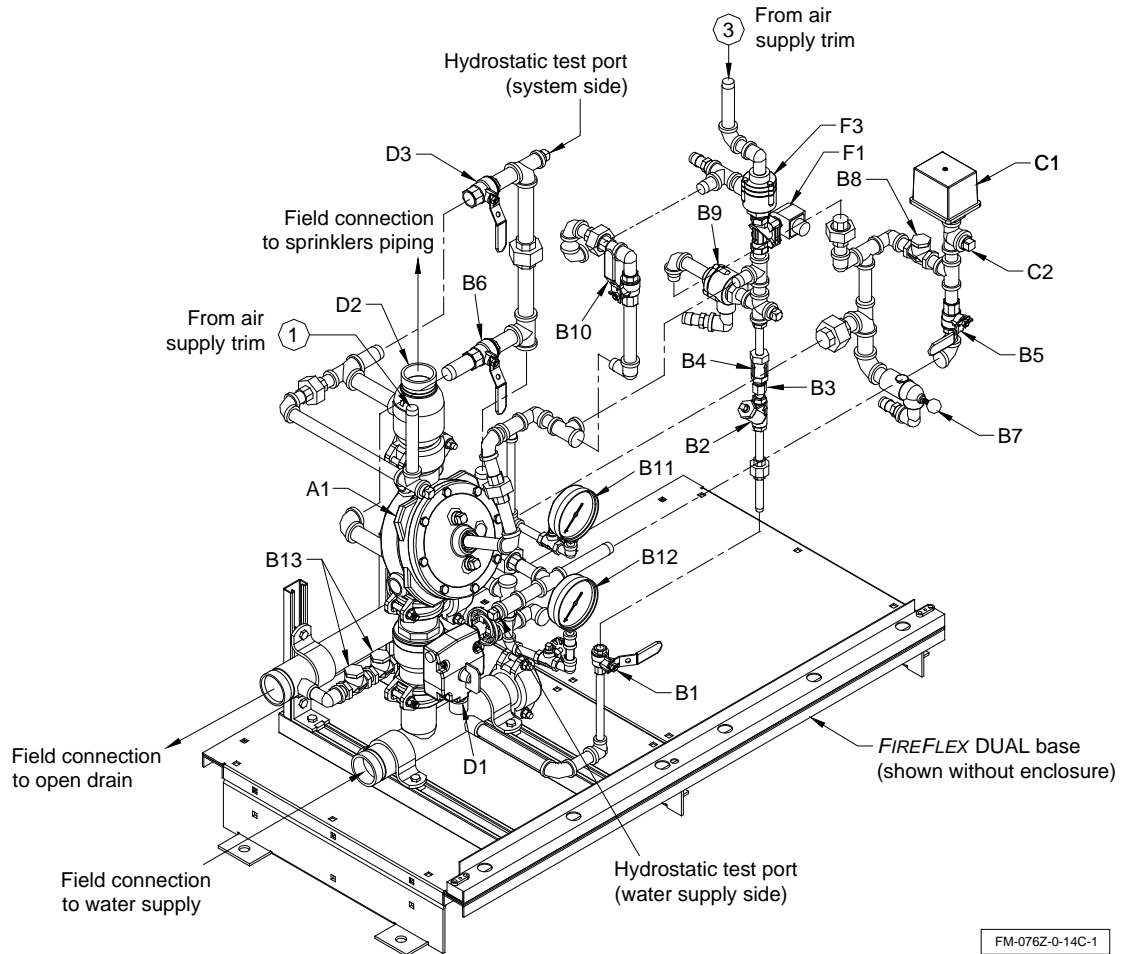
Figure 4.4 - FIREFLEX® DUAL (shown without doors)



See figures 4.5 & 4.6 for additional details.

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Figure 4.5 - FIREFLEX® DUAL - Double interlocked preaction trim



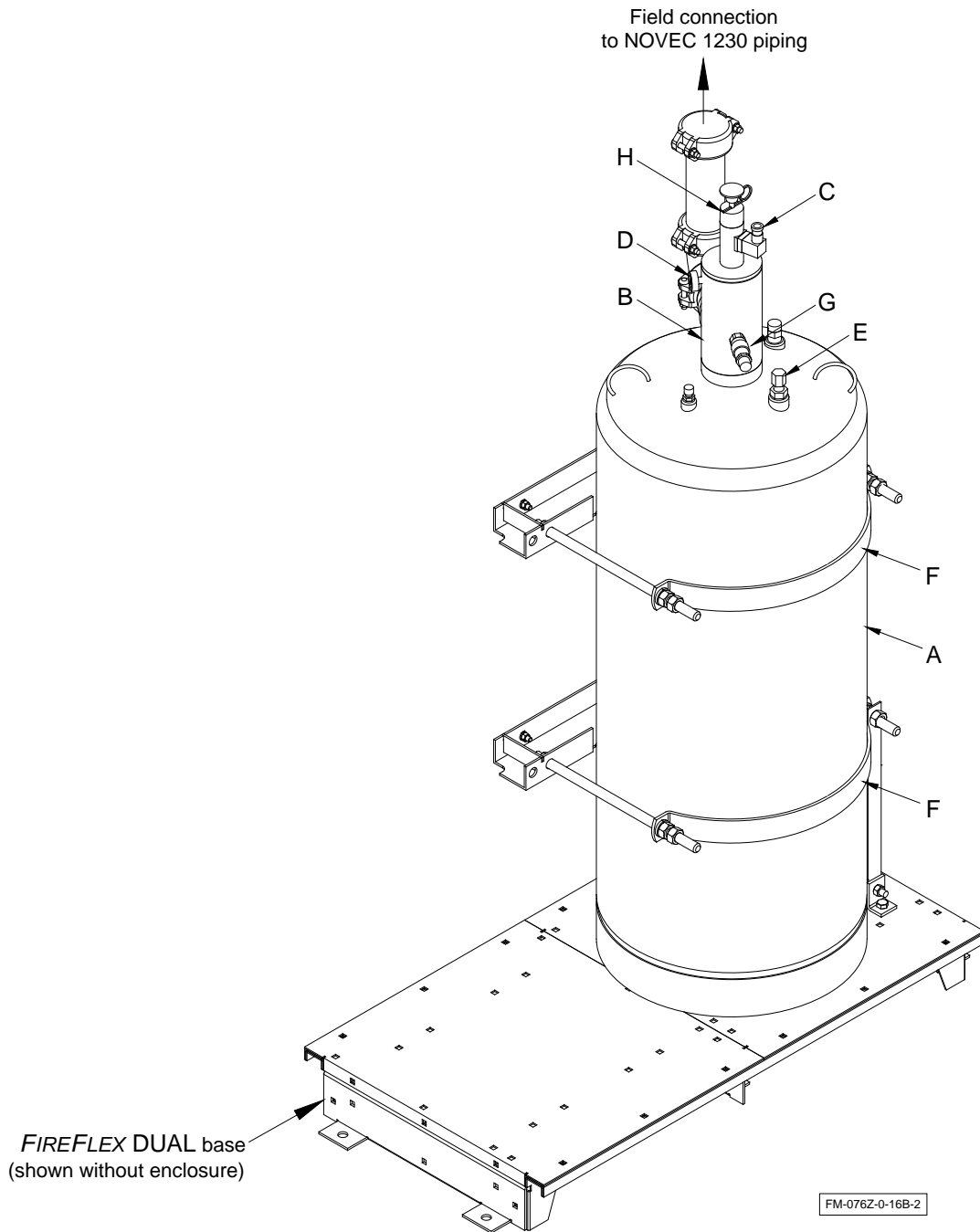
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Components:

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

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Figure 4.6 - FIREFLEX® DUAL - NOVEC 1230 trim



Components:

- | | |
|---|--|
| A Cylinder | E Liquid level indicator |
| B Cylinder valve | F Bracket |
| C Electric actuator | G Discharge pressure switch (optional) |
| D Pressure gauge c/w Low cylinder pressure switch | H Mechanical actuator (optional) |

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4.10 OPTIONAL SHUT-OFF VALVE AND SIGHT GLASS

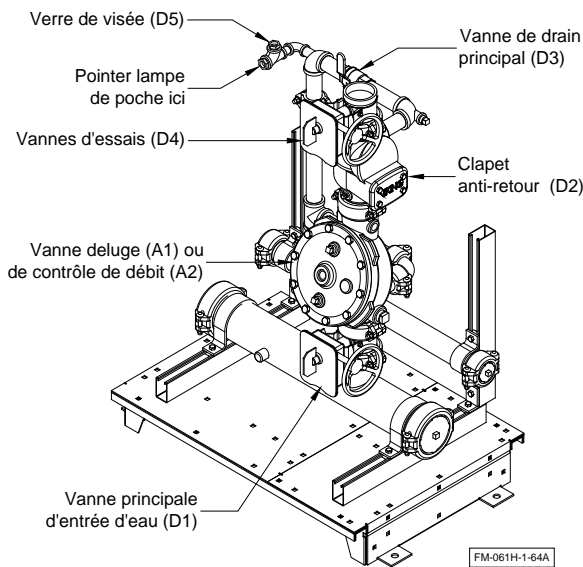
The shut-off valve & sight glass option is intended to be used for applications where testing of the system operation without filling the sprinkler piping network is desirable and where it is critical that all functions of the preaction system be tested under actual discharge conditions.

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). 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).
5. FULLY OPEN the system shut-off valve (D4). Reset the remote releasing control panel.

Figure 4.7 - Shut-off valve option

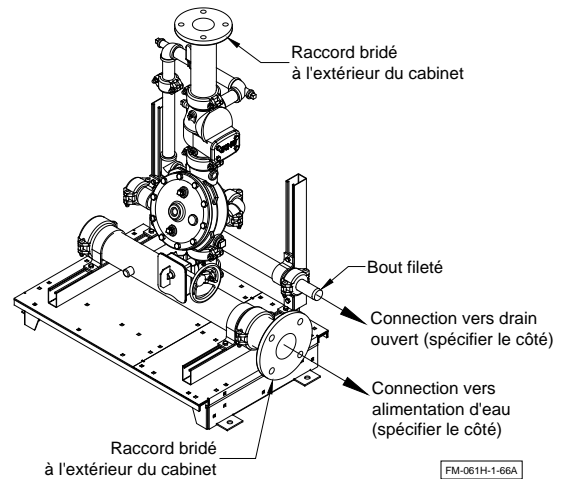


4.11 OPTIONAL SEMI-FLANGED INLET/OUTLET

When required by the user, FIREFLEX® DUAL 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

The sprinklers network of the preaction system uses air pressure for supervisory purposes. The air supply can be provided with either internal or external supervised air supplies.

Two (2) styles of air supplies are available for the **FIREFLEX® DUAL** unit depending on needs or configurations. These air supplies are all factory assembled, mounted in the cabinet and pressure tested. They are all located in the top part of the cabinet, hung on mounting rails above the valve trim. Here is the description of those options:

◆ **Air supply Style "A"**

See figure 5.3.

Used only for the sprinkler piping network of the preaction system. Air supply Style "A" includes the air compressor mounted inside the **FIREFLEX® DUAL** cabinet with its supervisory trim and options. Compressor is factory piped to the sprinkler piping system riser. It is available in three (3) sizes:

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

All the above air compressors are oilless piston type without reservoir and have open, single phase motor with internal thermal protection and supply voltage of 120Vac, 60Hz or 220Vac, 50/60Hz.

◆ **Air supply Style "B"**

See figure 5.4.

Used only for the sprinkler piping network of the preaction system, when an external air supply is provided by others (either a 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) (E5) trim, factory mounted in the **FIREFLEX® DUAL** cabinet.

Note: When air supplies Style "B" is selected, the air supply should be provided and installed by the sprinkler contractor OUTSIDE of the **FIREFLEX® DUAL** cabinet. It IS NOT provided with the unit.

5.1 AIR SUPPLY DESIGN AND SELECTION

The air supply compressor should be sized to automatically establish the total required air pressure in 30 minutes. External air supply should be provided with an air pressure maintenance device (air supply Style "B") to regulate and restrict the flow of supervisory air into the sprinkler system piping.

WARNING ! Pressures other than the factory pressure settings may affect the operation of the system.

Note: Selection of the proper air compressor size is the responsibility of the installing contractor.

Table 5.1 - Compressor selection

Compressor size	CFM @ 40 psi	120VAC System capacity to pump 40 psi in 30 minutes	220VAC System capacity to pump 40 psi in 30 minutes
1/6 HP	1.33 CFM	110 gallons	90 gallons
1/3 HP	2.61 CFM	215 gallons	170 gallons
1/2 HP	4.06 CFM	335 gallons	270 gallons

5.2 Air compressor AC power connection

(Air supply Style "A" only)

The motor must be protected against short circuit, overload and excessive temperature rise. Fuses, motor protective switches and thermal protective switches provide the necessary protection in these circumstances.

Fuses only serve as a short circuit protection of the motor (wiring fault), not as protection against overload. Those are provided and wired by the electrical contractor.

An isolation switch (E15) is also provided in the **FIREFLEX® DUAL** cabinet (see figure 6.2) and is factory wired, allowing powering off the air compressor while some maintenance work on the unit is done, without disturbing the rest of the system.

Connect non-energized AC power to the air compressor input circuit (see figure 5.1).

Figure 5.1 - Wiring of power source

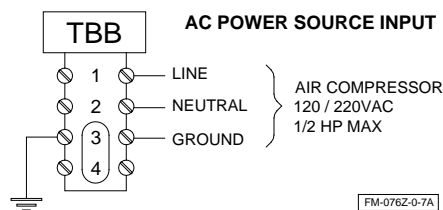


Table 5.1 - Compressor Amp rating

Compressor size	Amp rating @ 120VAC, 60Hz	Amp rating @ 220VAC, 50/60Hz
1/6 HP	6.6 A	3.3 A
1/3 HP	6.6 A	3.3 A
1/2 HP	8 A	4 A

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5.3 OPERATION

◆ 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 6.2).

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 6.2).

To adjust system air pressure (air compressor switch):

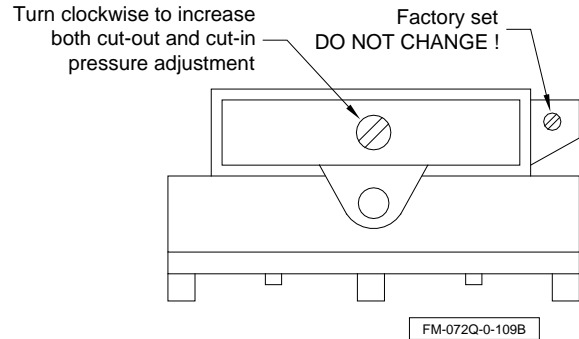
WARNING ! The cut-out/cut-in differential switch adjustment screw (small screw to the right) is factory set. DO NOT CHANGE ITS SETTING. Any unauthorized modification of this setscrew adjustment will void the system warranty and may also prevent the system from operating normally.

The air compressor cut-off pressure switch (E2) (shown in figure 5.2 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 5.3). 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 5.2 - Front view of the air compressor cut-off pressure switch



◆ 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).

If the unit is equipped with optional dehydrator (refer to section 5.5), close the air shut-off valve (E14).

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

◆ Air supply style "A"

See figure 5.3.

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 6.2).

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.

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.

◆ 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 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 repressurization 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 5.3).

The APMD (E5) should be checked after installation or repair and adjusted as required for correct pressure reading (refer to chapter 5.3 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:

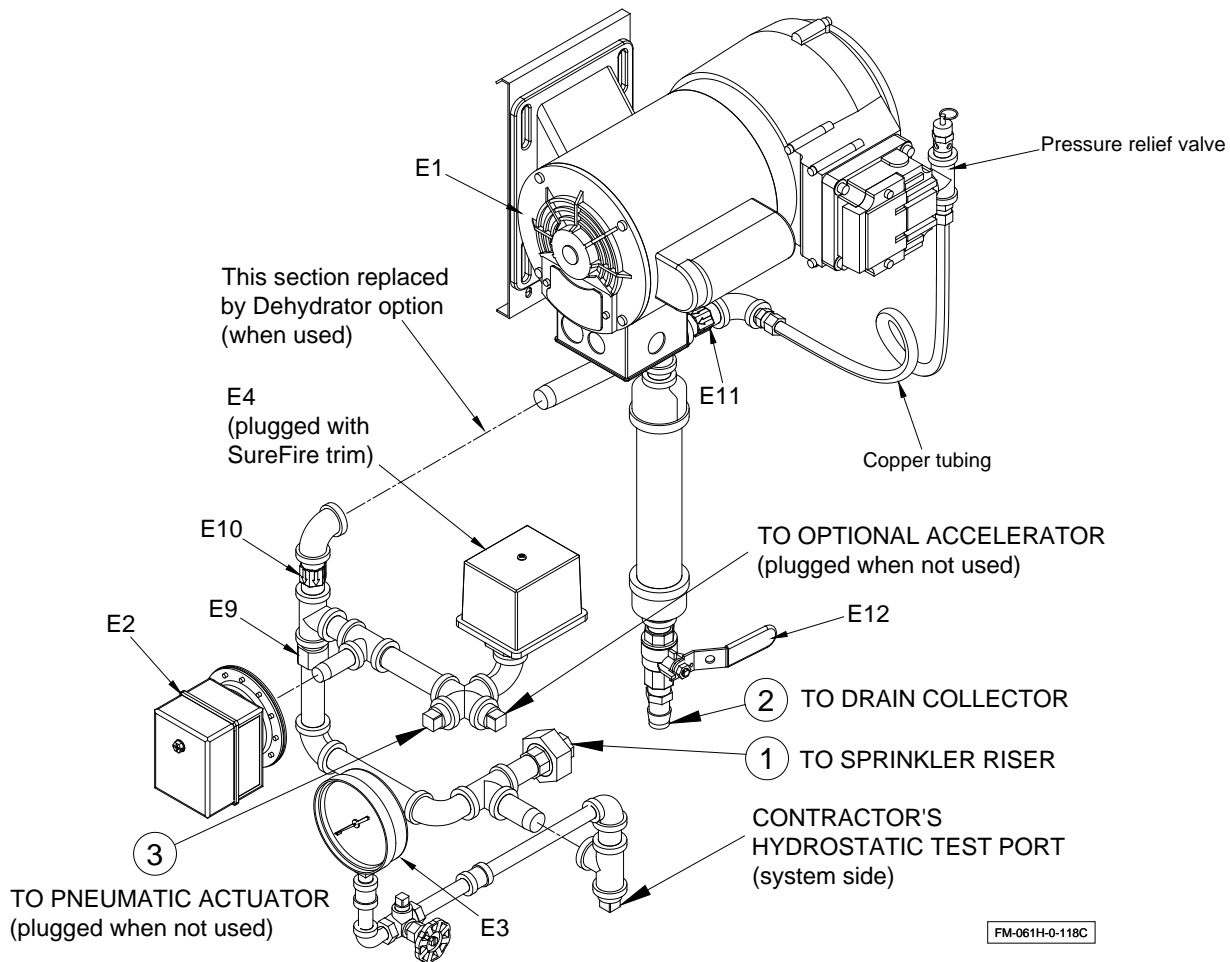
Close APMD (E5) output isolation valve (E7) by placing handle crossways to the valve body. Make sure the APMD (E5) input valve (E6) is open (handle in line with valve body) and the bypass valve (E8) is closed (handle crossways to valve body).

**Integrated Fire Protection System
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System type	Air supply style	Air regulator	Compressor Start	Compressor Stop	Low air supervisory	Low air alarm
Double interlocked electric/pneumatic Water pressure up to 175 psi (12.1 bar)	A	n/a	30 psi (2.07 bar)	35 psi (2.42 bar)	25 psi (1.73 bar)	n/a
	B	30 psi (2.07 bar)	n/a	n/a	25 psi (1.73 bar)	n/a
Double interlocked electric/pneumatic Water pressure 175 to 250 psi (12.1 to 17.2 bar)	A	n/a	50 psi (3.45 bar)	55 psi (3.80 bar)	45 psi (3.11 bar)	n/a
	B	50 psi (3.45 bar)	n/a	n/a	45 psi (3.11 bar)	n/a

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

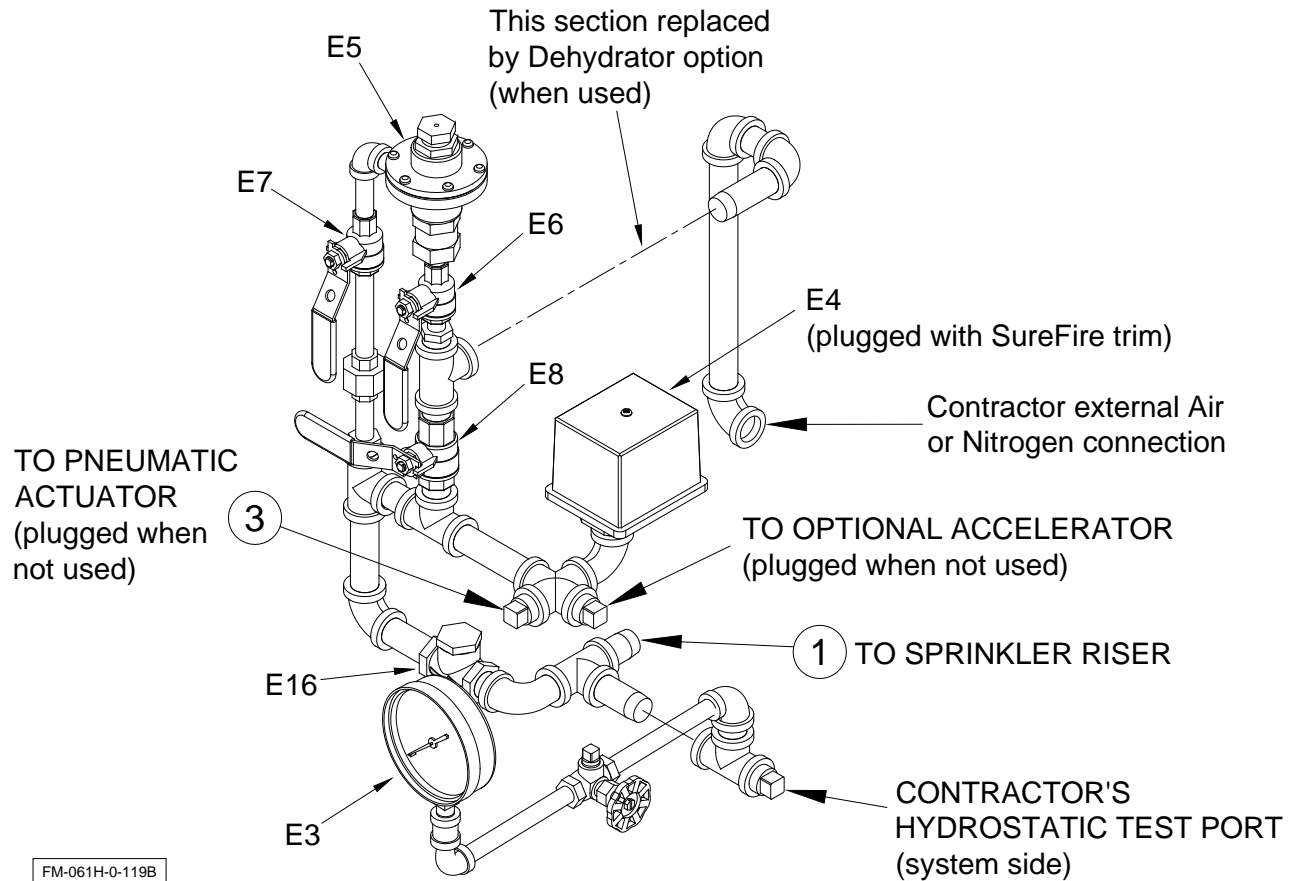


Air option components:

- | | | | |
|----|--|-----|---|
| 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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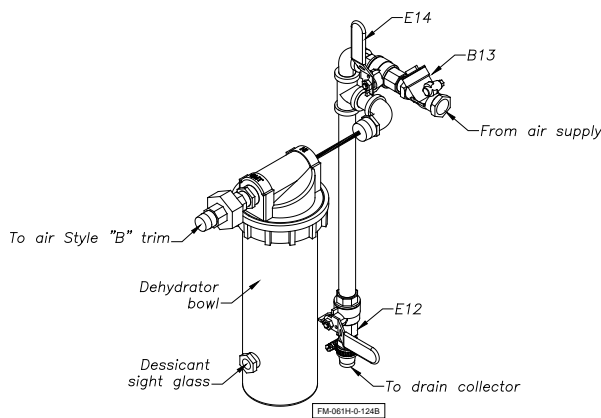
5.5 DEHYDRATOR OPTION

The Viking dehydrator is a manually regenerated desiccant-type air dryer. The desiccant acts as a moisture indicator by changing color, and is visible through the sight glass gauge.

◆ Technical information

1. The desiccant is silica gel having a -40°F (-40°C) dew point at a maximum of 180°F (82°C) temperature with a regeneration temperature of 275°F (135°C). When the silica gel color changes from dark blue to light pink or clear, it has become saturated with moisture and must be changed.
2. Each unit has a standard air drying capacity of 8100 ft^3 (229.3 m^3) at an -40°F (-40°C) atmospheric dew point at inlet condition of 100 psi (6.89 bar), 5% relative humidity, 70°F (21°C) and $15\text{ ft}^3/\text{minute}$ ($0.425\text{ m}^3/\text{minute}$) before the desiccant becomes saturated.

Figure 5.5 — Dehydrator option (style "B" shown)



Dehydrator option components:

- E12 Air inlet drain valve
- E14 Air shut-off valve
- E16 Dehydrator unit

3. The maximum air flow rating is $15\text{ ft}^3/\text{minute}$ ($0.425\text{ m}^3/\text{minute}$) at 100 psi (6.89 bar) for each unit.
4. All ratings are based on 100°F (38°C) saturated inlet air temperature at 100 psi (6.89 bar).
5. The aluminum bowl holds 2.5 pound (1.13 kg) of desiccant and is rated for a maximum temperature and pressure at 180°F (82°C) and 300 psi (20.7 bar).
6. The silica gel desiccant is provided in a sealed 2.5 pound (1.13 kg) bag and is shipped in a box inside the unit cabinet.

Note: The dehydrator unit is to be used on compressed air service only.

◆ Operation of dehydrator

The aluminum bowl of dehydrator is filled with silica gel. As the relative humidity increases, the silica gel absorbs the moisture and begin to change color from dark blue to light pink, indicating the desiccant must be replaced.

To make dehydrator functional:

Follow instructions TO APPLY AIR PRESSURE at section 5.3 OPERATION.

To drain dehydrator input line:

Follow instructions TO CLOSE THE AIR SUPPLY at section 5.3 OPERATION. OPEN air inlet drain valve (E12) until line pressure is relieved then close it.

Follow instructions TO APPLY AIR PRESSURE at section 5.3 OPERATION.

To replace dehydrator charge:

Follow instructions TO CLOSE THE AIR SUPPLY at section 5.3 OPERATION. OPEN air inlet drain valve (E12) until line pressure is relieved then close it.

Unscrew both the bowl guard and the aluminum bowl. Replace desiccant with a fresh charge. Reinstall in reverse order. Be sure to align both gaskets.

Follow instructions TO APPLY AIR PRESSURE at section 5.3 OPERATION.

Follow instructions described on Viking data sheet #276 (Form No. F_011711) provided with the silica gel recharge.

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6. CONTROLS

6.1 PRODUCT DESCRIPTION

Once the left door opened, it give access to the electrical junctions box and the releasing circuit disabled switch of the **NOVEC 1230** (refer to figure 7.1 FIELD WIRING DIAGRAM for additional details).

6.2 REMOTE CONTROLLED FIREFLEX® DUAL

(Without integrated releasing control panel)

For application with **FIREFLEX® DUAL** 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 6.2) is provided. All electrical components in the trim (pressure switches, electric actuator, 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® DUAL** system.

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

Figure 6.2 - Equipment layout

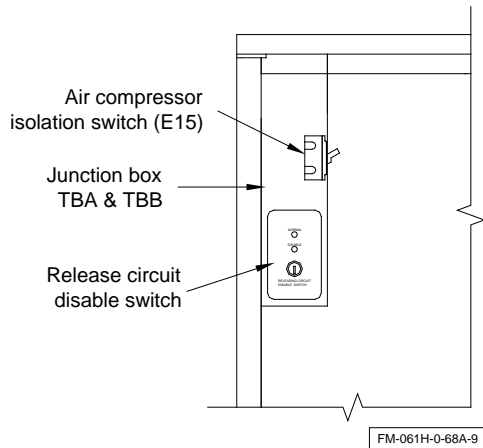
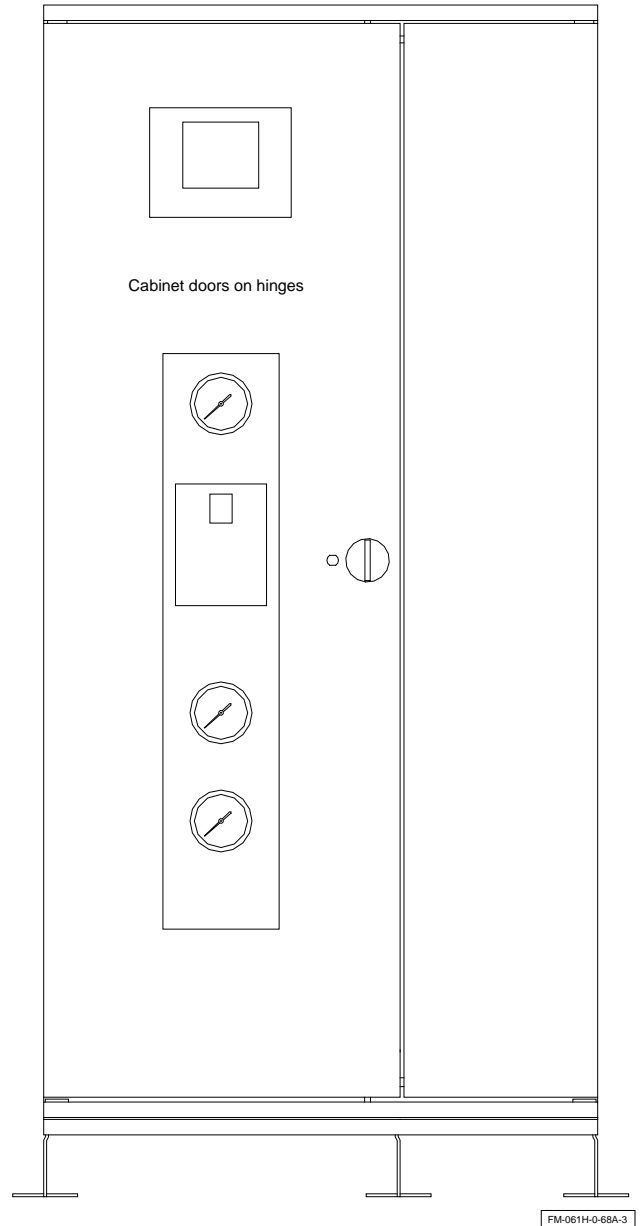


Figure 6.1 - Cabinet doors assembly



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7. WIRING DIAGRAMS

7.1 REMOTE CONTROLLED FIREFLEX® DUAL

FIREFLEX® DUAL unit provided without integrated releasing control panel is factory wired for the following configurations:

7.1.1 NOVEC 1230 electric release

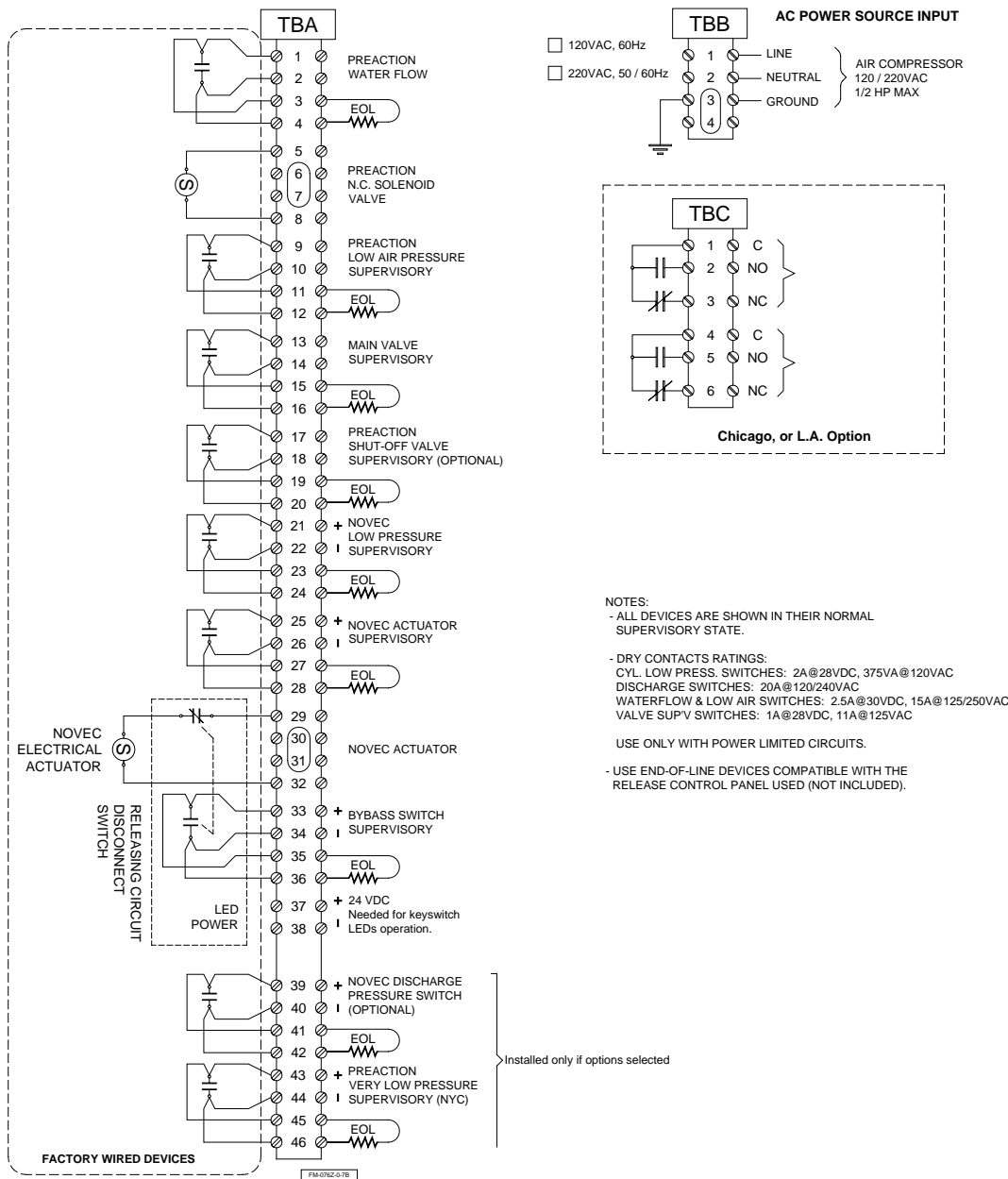
Electric release is achieved with an electric actuator (C) installed on the cylinder valve (B) of the cylinder (A). When the conditions of release are fulfilled, a 24Vdc source is applied to the electric actuator (C), which will vent the pressure on top of the cylinder valve (B) allowing the extinguishing agent **NOVEC 1230** to be discharged through the nozzles.

7.1.2 Double interlocked preaction electric release

Release trim for the double interlocked preaction system utilizes a normally closed solenoid valve (F1) connected to an approved release control panel.

When the conditions of release are fulfilled, a 24Vdc source is applied to the solenoid valve (F1). Upon the opening of a sprinkler, the pneumatic actuator (F3) will release, allowing the opening of the deluge valve (A1). The water will enter the sprinklers network and water will flow through opened sprinkler heads.

Figure 7.1 – Remote controlled field wiring diagram for FIREFLEX® DUAL



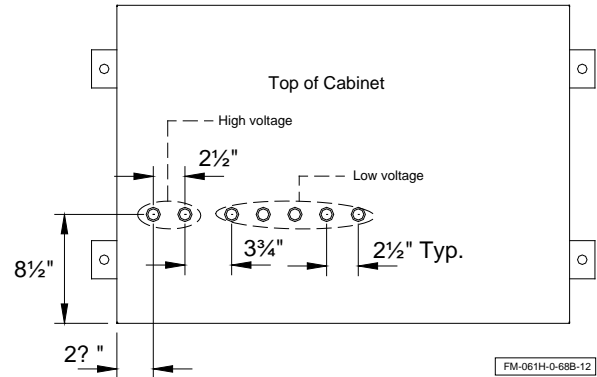
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The **FIRE FLEX® DUAL** cabinet is made of sturdy 14 gauge steel. Refer to table 8.1 and figure 2 for dimensions.

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 tables 8.2 & 8.3 for installation and clearances details.

Electrical junction boxes are integrated inside the cabinet for connection of detection system, auxiliary contacts and signaling devices. Knockouts can be drilled by the installing contractor on-site but must adhere to the restrictions indicated on figure 8.1.

Figure 8.1 - Drilling details

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Figure 2 - Cabinet dimensions

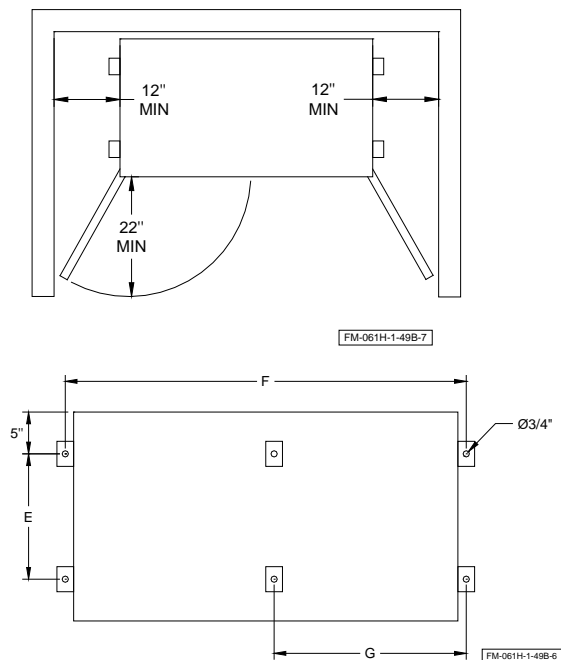
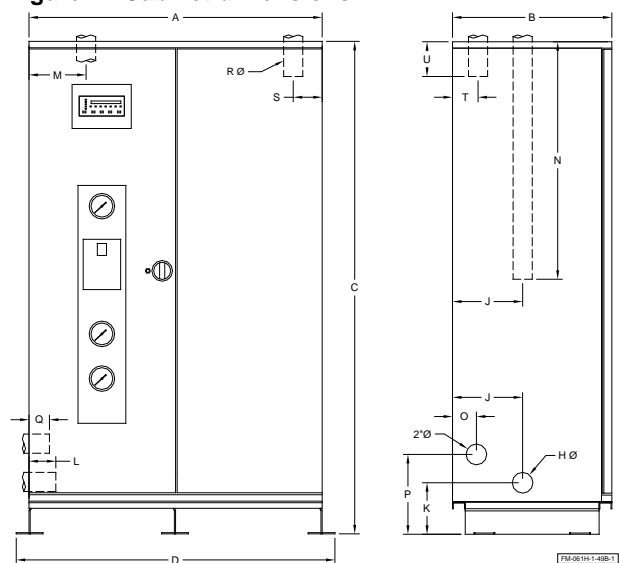


Table 8.1 - Cabinet dimensions

Size	A	B	C	D	E	F	G
36"	35¾"	25"	77⅞"	39¾"	15"	37¾"	12¾"
46"	46"	25"	77⅞"	50"	15"	48"	23"
54"	54"	31"	81"	58"	21"	56"	26"

Table 8.2 - Preaction piping installation

H	J	K	L	M	N1	N2	O	P	Q
2"	11½"	8"	5"	9¾"	45"	48⅞"	4"	11½"	3½"
3"	11½"	9"	4"	9½"	45"	48⅞"	4"	12¾"	3"

Table 8.3 - NOVEC 1230 piping installation

Lbs	R	S	T	U
40	1"	2¾"	6"	3¼"
76	1¼"	2¾"	6"	3¼"
164	1½"	2¾"	6"	1¼"
322	2"	6¾"	6"	4¾"
601	2½"	6½"	6"	3¾"
850	3"	9"	7"	5"

Notes:

1. N1 refers to 36" or 46" cabinet. N2 refers to 54" cabinet.
2. Dimensions may slightly differ from real unit.

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9. 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.

Special Limitation: Due to their self-discharge characteristics when not charged during extended storage periods, Batteries supplied with integrated Releasing Control Panels are covered by the above warranty for a period limited to three (3) months only.

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.

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