Advanced Integrated Fire Protection System

TOTAL PAC®

Owner's Operation
and
Maintenance Manual

DELUGE SYSTEM
PNEUMATIC RELEASE



FM-014M-0-10B

Integrated Fire Protection System

OWNER'S OPERATION & MAINTENANCE MANUAL

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Safety Guidelines

This manual contains safety information that is important to know and understand. This information is provided for the safety of installers, operators, and users of the FireFlex releasing panel as well as equipment. To help recognize this information, observe the following symbols.

⚠ DANGER

DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING

WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION

CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury

NOTICE

NOTICE indicates important information, that if not followed may cause damage to equipment or property.

SAFETY INSTRUCTIONS

SAFETY INSTRUCTIONS (or equivalent) indicate specific safety-related instructions or procedures.

INFORMATION

INFORMATION emphasizes useful tips and recommendations as well as information for efficient and trouble-free operation.

Integrated Fire Protection System

A

General Section – Deluge System - Pneumatic Release

1- General description

This **TOTALPAC®4** integrated fire protection system by FIREFLEX Systems Inc. consists of a deluge 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, the water discharge outlet, the main drain, the pneumatic release inlet and the electrical supervisory and alarm connections. The discharge outlet is connected to a fixed piping network, in parallel to the pneumatic release (pilot line) piping network. Water is the extinguishing agent.

On pneumatic release piping network, closed heat sensitive automatic sprinklers are spaced and located in accordance with recognized installation standards in order to detect a fire. Only those sprinklers immediately over or near to fire operate.

Deluge system with pneumatic release uses open type sprinklers and/or spray nozzles on the system piping network. The pneumatic release piping network uses automatic sprinklers. Pneumatic release system gives a supervisory signal when it operates.

Deluge system is designed so the deluge valve will open when a loss of pressure from the pneumatic release piping network occurs. When the deluge valve opens, water will flow into the system piping network and out of all open type sprinklers and/or spray nozzles.

INFORMATION

Every **TOTALPAC®4** unit is identified with its unique serial number. This number is located on an adhesive label inside the main door panel and is used to maintain a record in our computerized database. Have this serial number handy when calling for information on your unit (format is TOT4####).

2- Listings and approvals

In addition to being fabricated under tight ISO-9001 manufacturing and quality control procedures, your **TOTALPAC®4** unit has also been tested and approved by recognized laboratories.

Here is the list of Listings & Approvals it meets:

- Underwriters Laboratories Inc. (UL): Deluge **TOTALPAC®4** systems are UL Listed under "Special System Water Control Valves - Assembled Units, category # VKYL.EX4641" and "Assembled Units Certified for Canada, Category # VKYL7.EX4641 (c-UL)".
- Factory Mutual Research <FM>: Deluge **TOTALPAC®4** systems are FM Approved under the heading: "Automatic Water Control Valves" when installed with specific components.

⚠ CAUTION

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.

3- Environment

TOTALPAC®4 unit shall be installed in a dry and clean location. Verify that all equipment is properly heated and protected to prevent freezing and physical damage. Refer to section **E** CONTROL SECTION for environment data.

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 these 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 **B** MECHANICAL SECTION for maintenance instructions.

4- Features

The **TOTALPAC®4** unit is superior to many other products which are actually available on the fire protection market. It is manufactured by FIREFLEX Systems Inc. which has developed and introduced the concept of integrated fire protection systems.

Main features are:

- Trouble free design for safe and easy application
- Available in 5 sizes from 2" (50 mm) to 8" (200 mm) diameter
- Uses the Viking deluge valve Model VXD
- Unit is available either with or without 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
- Designed in accordance with NFPA Standards
- 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 both sides, and sprinkler riser on top of unit, all available with grooved end fittings
- No open drain cup inside unit
- Sturdy 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
- Separate unlocked access hatch to emergency manual release
- Key-alike locks on all cabinet doors
- Manufactured under ISO-9001 quality control procedures.

5- Configuration description

TOTALPAC®4 deluge system is built around the Viking trim using Viking Model VXD Deluge Valve.

The valve is rated up to a maximum of 250 PSI WWP (1724 kPa) and is available in the following diameters:

- ▶ 2" (50 mm)
- ▶ 4" (100 mm)
- ▶ 8" (200 mm)
- ▶ 3" (80 mm)
- ▶ 6" (150 mm)

TOTALPAC®4 deluge system is supplied with groove/ groove Model VXD Deluge Valve.

5.1 Deluge system

The pneumatic release piping network is pressurized with air or nitrogen gas. The deluge system uses the Viking deluge valve which opens by the releasing of the pneumatic release piping network, or anytime the handle of the emergency release valve is pulled.

6- System release

6.1 Pneumatic release

Deluge system with pneumatic release requires a pneumatic release piping network equipped with thermostatic (rate of rise) releases, and/or fixed temperature releases, and/or pilot heads. Release trim for the deluge valve requires a pneumatic actuator normally held closed by the pressure maintained in the pneumatic release piping network.

In fire condition, the activation of a releasing device on the pneumatic release piping network opens the deluge valve. Water will flow into the system piping network and out of all open type sprinklers and/or spray nozzles.

1- Installation, operation & maintenance instructions

INFORMATION

Numbers indicated between brackets refer to figure 1 DETAILED SYSTEM TRIM SCHEMATICS from this section.

1.1 Installation

1. Conform to local municipal or other codes regarding installations of fire protection systems.
2. Install the ***TOTALPAC®4*** unit and connect the system according to instruction manual and technical data supplied.

⚠ WARNING

The cabinet must be firmly anchored to the floor using all four (4) anchoring holes (see section **G** CABINET).

NOTICE

The drain collector shall be connected to an open drain. Do not restrict or reduce drain piping.

3. Install the system piping network and pneumatic piping network (pilot line) in accordance with applicable standards.
4. Connect supervisory and alarm signals according to electrical schematics (see section **F** ELECTRICAL).
5. Perform preliminary inspection prior to putting system in service (see paragraph 1.2 of the current section).
6. Place the system in service (see paragraph 1.3 of the current section).
7. Perform the annual inspection sequence (see paragraph 1.8 of the current section).
8. 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.
9. Make sure that building owner or a delegated representative has received instructions regarding the operation of the system.

⚠ CAUTION

TOTALPAC®4 unit must be installed in an area not subject to freezing temperatures or physical damage.

1.2 Preliminary inspection before placing the system in service

1. Open door to mechanical section.
   a) Main water supply valve *(D1)* must be CLOSED.
   b) Priming valve *(B1)* must be CLOSED.
   c) Air supply for pneumatic release piping network (pilot line) must be CLOSED (see section **D** AIR SUPPLY).
   d) Flow test valve *(B6)* and main drain valve *(D3)* must be CLOSED.
   e) Alarm test valve *(B5)* must be CLOSED.
   f) Gauges *(B11* and *B12)* should show 0 PSI (0 kPa).
   g) If applicable, the shut-off valve *(D4)* must be OPEN.
2. OPEN the manual emergency release valve *(B10)* and make sure the deluge valve *(A1)* is tripped.
3. Using the built-in contractor's hydrostatic test ports (see figure 1 of this section), fill system piping network with water and maintain pressure as per NFPA-13 requirements.

⚠ CAUTION

Do not subject the pressure gauges and pressure transducer to hydrostatic pressure above 250 PSI (1724 kPA). Close gauge valves before proceeding with hydrostatic test.

4. Correct leaks if any before completing test.
5. Verify that main water supply valve *(D1)* is still CLOSED.
6. OPEN main drain valve *(D3)* to completely drain the system piping network.

1.3 Placing the system in service

1. Verify that the main water supply valve *(D1)* is CLOSED. Verify that the system has been properly drained.
2. Verify that all sprinklers are set and that inspector's test valve and/or piping auxiliary drain valves are CLOSED.
3. CLOSE main drain valve *(D3)*. Verify that the manual emergency release valve *(B10)* is CLOSED.
4. Air supply must be OPEN (see section **D** AIR SUPPLY).
5. Establish recommended supervisory pressure to the pneumatic release piping network (pilot line) (see paragraph 2.1 NORMAL CONDITION of the current section and section **D** AIR SUPPLY).
6. OPEN priming valve *(B1)*. Verify that the pressure indicated at the priming pressure gauge *(B11)* is equal to, or greater than the pressure indicated at the water supply pressure gauge *(B12)*.
7. OPEN flow test valve *(B6)*. PARTIALLY OPEN main water supply valve *(D1)*.
8. When full flow develops from the flow test valve *(B6)*, CLOSE the flow test valve.
9. FULLY OPEN the main water supply valve *(D1)*.
10. Verify that the alarm test valve *(B5)* is CLOSED and that all other valves are in their "normal" operating position (see paragraph 2.1 NORMAL CONDITION of the current section).
11. Check and repair all leaks.
12. On new installation, system that has been placed out of service, or where new equipment has been installed, trip test the system to verify that all equipment functions properly (see paragraph 1.7.2 FULL FLOW TRIP TEST of the current section).
13. Notify the AUTHORITY HAVING JURISDICTION, remote station alarm monitors, and those in the affected area that the system is in service.

⚠ CAUTION

When a valve has been removed from service and is subject to freezing or will be out of service for an extended period of time, all water must be removed from the priming chamber, trim piping, water supply piping and any other trapped areas.

1.4 System Operation

1.4.1 In the SET condition

System water supply pressure enters the priming chamber of the deluge valve *(A1)* through the priming line which includes a normally open priming valve *(B1)*, strainer *(B2)*, restricted orifice *(B3)* and spring loaded check valve *(B4)*.

Water pressure is trapped in the priming chamber of the deluge valve *(A1)* by a spring loaded check valve *(B4)*, pneumatic actuator (*F3*), PORV *(B9)* (pressure operated relief valve) and manual emergency release valve *(B10)*. The pressure in the priming chamber holds the deluge valve clapper closed, keeping the outlet chamber and system piping dry.

1.4.2 In a fire condition

When a releasing device operates from the pneumatic release piping network (pilot line), the low air pressure switch *(E14)* activates and pneumatic actuator *(F3)* opens.

Pressure from the priming chamber of the deluge valve *(A1)* is released to the open drain manifold faster than it is supplied through the restricted orifice *(B3)*. The deluge valve clapper opens to allow water to flow into the piping network and alarm devices, causing water flow alarms connected to the alarm pressure switch *(C1)* and the optional water motor alarm *(C2)* to activate. Water will flow from all open sprinklers/spray nozzles on the system piping network.

When the deluge valve *(A1)* opens, the sensing end of the PORV *(B9)* is pressurized, causing it to open. It then continually vent the priming chamber, preventing the closure of the deluge valve. The deluge valve can only be reset after the system is taken out of service.

⚠ CAUTION

If the pressure from the pneumatic release piping network (pilot line) is lost due to mechanical damage or malfunction of a release device, the deluge valve *(A1)* will open. Alarm devices (*C1* and optional *C2*) will operate. Water will flow from all open sprinklers/spray nozzles on the system piping network.

1.4.3 Manual operation

Anytime the handle of the manual emergency release valve (*B10*) is triggered, pressure is released from the priming chamber of the deluge valve (*A1*) causing deluge valve to open. Water will flow into the system piping network and alarm devices (*C1* and optional *C2*) will operate. The PORV (*B9*) will keep the deluge valve (*A1*) open. Water will flow from all open sprinklers/spray nozzles on the system piping network.

1.5 Emergency instructions

To take system out of service

⚠ WARNING

Placing a control valve or detection system out of service may eliminate the fire protection capabilities of the system. Prior to proceeding, notify all local AUTHORITIES HAVING JURISDICTION. Consideration should be given to employ a fire patrol in the affected areas.

After a fire, verify that the fire is OUT and that placing the system out of service has been authorized by the appropriate local AUTHORITY HAVING JURISDICTION.

Sprinkler piping that have 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.

1. CLOSE main water supply valve *(D1)*.
2. OPEN main drain valve *(D3)*.

NOTICE

Electric alarms controlled by a pressure switch installed at the ¾"-NPT (20mm) connection *(C1)* for a non-interruptible alarm signal cannot be shut-off until the deluge valve *(A1)* is reset or taken out of service.

3. Air supply must be CLOSED (see section **D** AIR SUPPLY).
4. OPEN flow test valve *(B6)*.
5. CLOSE priming valve *(B1)*.
6. Replace any sprinkler that have been damaged or exposed to fire conditions.
7. Return the system to service as soon as possible (see paragraph 1.6 PLACING THE SYSTEM BACK IN SERVICE AFTER OPERATION of the current section).
8. Perform all recommended maintenance procedures (see paragraph 1.8 MAINTENANCE in the current section).

⚠ CAUTION

When a system has been removed from service and is subject to freezing or will be out of service for an extended period of time, all water must be removed from the priming chamber, trim piping, water supply piping and any other trapped areas.

1.6 Placing the system back in service after operation

1. Verify that the system has been properly drained. Verify that all system piping auxiliary drain valves are CLOSED. Verify that all sprinklers are set.
2. Verify that the manual emergency release valve *(B10)* is CLOSED, and that the main water supply valve *(D1)* is CLOSED. CLOSE main drain valve *(D3)*.
3. Air supply must be OPEN (see section **D** AIR SUPPLY).
4. Restore supervisory pressure to the pneumatic release piping network (pilot line) (see section **D** AIR SUPPLY).
5. OPEN priming valve *(B1)*. Verify that the pressure indicated at the priming pressure gauge *(B11)* is equal to, or greater than the pressure indicated at the water supply pressure gauge *(B12)*.
6. OPEN flow test valve *(B6)*. PARTIALLY OPEN main water supply valve *(D1)*.

NOTICE

Do not open main water supply valve *(D1)* until gauge *(B11)* shows stabilized pressure.

7. When full flow develops from the flow test valve *(B6)*, CLOSE the flow test valve.
8. FULLY OPEN the main water supply valve *(D1)*.
9. Verify that the alarm test valve *(B5)* is CLOSED and that all other valves are in their "normal" operating position (see paragraph 2.1 NORMAL CONDITION of the current section).
10. Check and repair all leaks.
11. Notify the local AUTHORITY HAVING JURISDICTION, remote station alarm monitors, and those in the affected area that the system is back in service.

1.7 Inspections and tests

⚠ CAUTION

The owner is responsible for maintaining the fire protection system and devices in proper operating condition.

It is imperative that the system be inspected and tested on a regular basis in accordance with NFPA-25. Refer to Inspections and Tests recommended in Viking technical data describing individual components of the deluge system used.

The frequency of the inspections may vary due to contaminated or corrosive water supply, corrosive atmospheres, as well as the condition of the air supply to the system. For minimum maintenance and inspection requirements, refer to NFPA-25. 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 a control valve or detection system out of service may eliminate the fire protection capabilities of that system.

Prior to proceeding with any testing, notify all local AUTHORITIES HAVING JURISDICTION. Consideration should be given to the employment of a fire patrol in the affected areas.

1.7.1 Pneumatic release piping network (pilot line) low air supervisory test

1. To prevent operation of the deluge valve *(A1)* and filling of the piping network with water during the test, CLOSE main water supply valve (*D1*) and OPEN flow test valve *(B6)*.
2. FULLY OPEN the inspector's test valve on the piping network being tested.
3. Verify that low air supervisory signal operates within acceptable time period and continues without interruption.
4. CLOSE the inspector's test valve.
5. CLOSE priming valve *(B1)*.
6. Establish recommended supervisory pressure to the pneumatic release piping network (pilot line) (see section D AIR SUPPLY).
7. OPEN priming valve *(B1)*. Verify that the pressure indicated at the priming pressure gauge *(B11)* is equal to, or greater than the pressure indicated at the water supply pressure gauge *(B12)*.
8. PARTIALLY OPEN main water supply valve *(D1)*.
9. When full flow develops from the flow test valve *(B6)*, CLOSE the flow test valve.
10. FULLY OPEN the main water supply valve *(D1)*.

1.7.2 Full flow trip test

Performance of a full flow 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 water to flow through all open sprinklers/spray nozzles from the system piping network. If it is not required to have water flow from the system piping network, use the shut-off valve (if applicable) (see paragraph 1.7.4 OPERATION OF THE SHUT-OFF VALVE of the current section).

To trip test the deluge system with pneumatic release

1. Trip the deluge valve *(A1)* by performing the following paragraph “a” or “b”.
   a) Open the inspector's test valve from the pilot line or activate a pneumatic release device according to the manufacturer's instructions.
   b) Open the door of the manual emergency release valve *(B10)* and trigger the handle.
2. The deluge valve *(A1)* should open. Alarm devices *(C1* and optional *C2)* should operate. Water will flow from all open sprinklers/spray nozzles on the system piping network.

When trip testing is complete

1. Perform steps 1 through 6 of paragraph 1.5 EMERGENCY INSTRUCTIONS to take the system out of service.
2. Perform steps of paragraph 1.6 PLACING THE SYSTEM BACK IN SERVICE AFTER OPERATION.

1.7.3 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.

Test procedure

1. Record the pressure indicated by the water supply gauge *(B12)*.
2. If applicable, CLOSE the alarm control valve.
3. FULLY OPEN the flow test valve *(B6)*.
4. Record residual pressure.
5. CLOSE the flow test valve *(B6)* slowly.
6. Record the time taken for supply water pressure to return to the original pressure. Compare results from previous inspections or initial commissioning. Any important variation from those results must be investigated.

NOTICE

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

1.7.4 Operation of the optional shut-off valve

Inspection of the system can be implemented without filling the system piping network with water. The use of shut-off valve *(D4)* and sight glass assembly *(D5)* allows to verify the operation of the system and prevents water from reaching the piping network.

1. CLOSE the shut-off valve *(D4)* to isolate the system piping network.
2. Execute the full flow trip test (see paragraph 1.7.2 of the current section). The deluge valve *(A1)* should open.
3. Using a flashlight in one of the sight glasses, verify that water flows through the sight glass assembly *(D5)*.

When trip testing is complete

1. Perform steps 1 through 6 of paragraph 1.5 EMERGENCY INSTRUCTIONS to take the system out of service.
2. Perform steps of paragraph 1.6 PLACING THE SYSTEM BACK IN SERVICE AFTER OPERATION.

1.8 Maintenance

⚠ CAUTION

The owner is responsible for maintaining the fire protection system and devices in proper operating condition.

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.

Refer to MAINTENANCE INSTRUCTIONS provided in Viking Technical Data describing individual components of the system used.

The following requirements are based upon NFPA-25.

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: valves inspection; flow, drain, and pump tests, and trip test of the deluge valves.

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

1.8.1 Monthly

1. Inspection of gauges (water supply *(B12)* and priming chamber *(B11)* pressure) to ensure good condition and normal water supply pressure.
2. Control valve shall be externally inspected. The valve inspection shall verify the following:
   a) The gauges indicate that normal supply water pressure is being maintained.
   b) The valve is free of physical damage.
   c) All valves are in the appropriate open or closed position (see paragraph 2.1 of the current section).
   d) There is no leakage from the alarm drains.

1.8.2 Quarterly

1. Check alarm pressure switch *(C1)* and optional water motor gong *(C2)* by opening the alarm test valve *(B5)*.
2. Conduct pneumatic release piping network (pilot line) low air supervisory test (see paragraph 1.7.1 of the current section).

1.8.3 Semi-annually

1. Main water supply valve *(D1)* switch shall be operated to verify the switch actuation upon movement of the hand wheel.
2. Check alarm pressure switch *(C1)* and optional water motor gong *(C2)* by opening the alarm test valve *(B5)*.
3. Perform functional test of all components of the system.

1.8.4 Annually

1. Perform full flow trip test (see paragraph 1.7.2 of the current section).
2. Record indicating the date of the last trip, tripping time and name of the organization conducting the test shall be maintained at a location available for review by the AUTHORITY HAVING JURISDICTION.
3. Perform main drain test (see paragraph 1.7.3 of the current section).

1.8.5 Every 5 years

1. Test on gauge (gauge precision required: less than 3% of the full scale).
2. Perform test on control valve operation.
3. Deluge valve *(A1)* and their associated strainers, filters and restriction orifices shall be inspected internally.
4. Perform main drain test (see paragraph 1.7.3 of the current section).

2- Deluge system with pneumatic release

INFORMATION

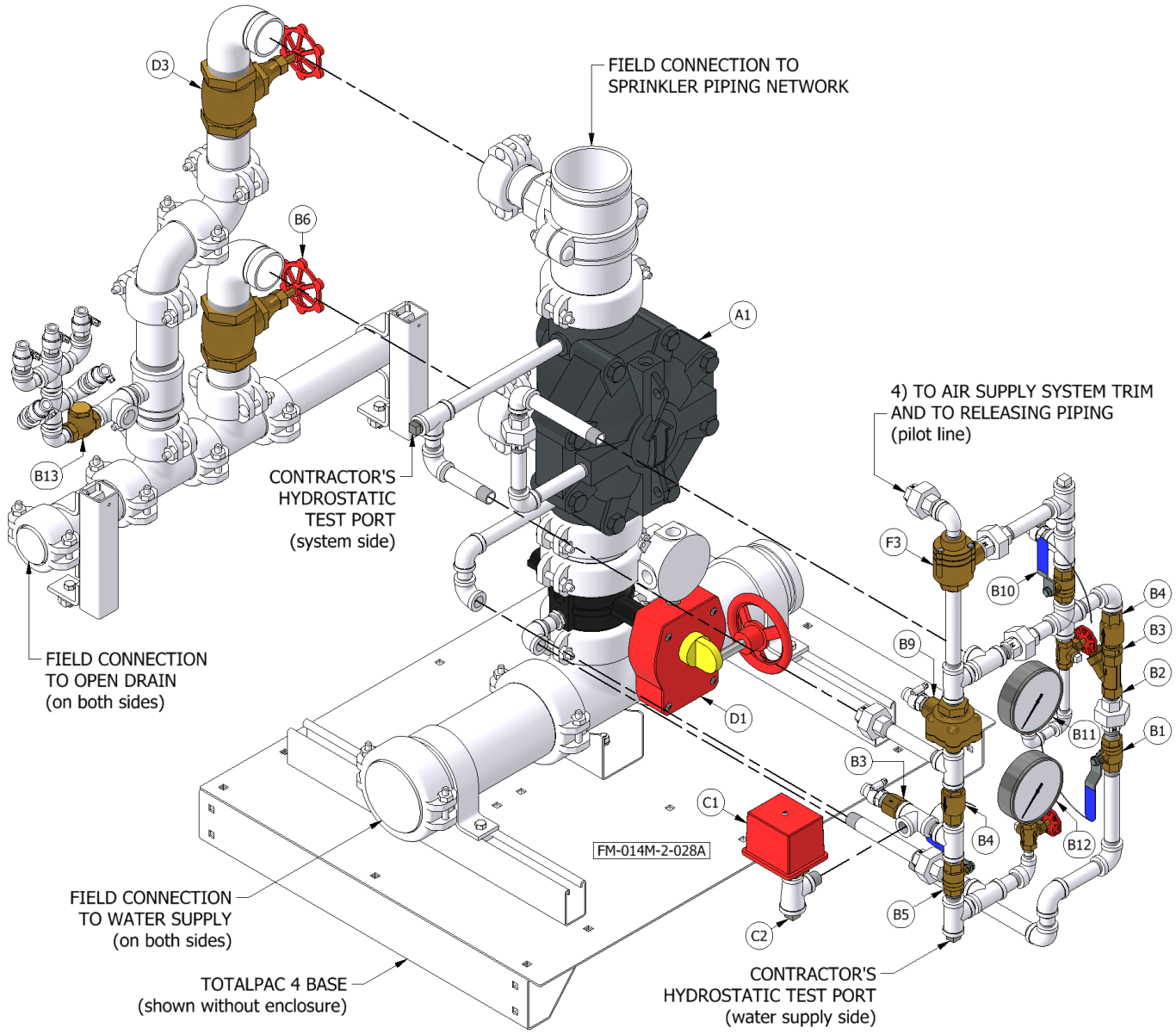
Numbers indicated between brackets refer to figure 1 DETAILED SYSTEM TRIM SCHEMATICS from this section and section **D** AIR SUPPLY.

2.1 Normal condition

1. Valves
   a) Main water supply valve *(D1)* is OPEN.
   b) All upstream water supply valves are OPEN.
   c) Priming valve *(B1)* is OPEN.
   d) Flow test valve *(B6)* is CLOSED.
   e) Main drain valve *(D3)* is CLOSED.
   f) Alarm test valve *(B5)* is CLOSED.
   g) Manual emergency release valve *(B10)* is CLOSED (handle in vertical position).
   h) Air supply is OPEN (see section **D** AIR SUPPLY).
   i) All gauge valves are OPEN.
   j) Shut-off valve *(D4)* is OPEN (if applicable).
2. Gauges
   a) Water supply pressure *(B12)* shall not exceed 175 PSI (1207 kPa) or 250 PSI (1724 kPa).
   b) Priming chamber pressure *(B11)* should be equal to, or higher than, water supply pressure *(B12)*.
   c) Pneumatic release piping network (pilot line) *(E13)* shall be 35 PSI (241 kPa) or 55 PSI (379 kPa) (see section **D** AIR SUPPLY).
3. Pressure switches & settings (factory set)
   a) Alarm pressure switch *(C1)* should activate when pressurized higher than 5 PSI (34 kPa).
   b) Pilot line low air pressure switch *(E14)* should activate when pressurized lower than 25 PSI (172 kPa) or 45 PSI (310 kPa) (see section **D** AIR SUPPLY).

Figure 1 - Detailed system trim schematic

Typical deluge system with pneumatic release (4" (100 mm) system shown)



Trim components

- A1 Deluge valve
- B1 Priming valve (N.O.)
- B2 Strainer
- B3 1/8" (3.2 mm)) Restricted orifice
- B4 Spring loaded check valve
- B5 Alarm test valve (N.C.)
- B6 Flow test valve (N.C.)
- B9 PORV (pressure operated relief valve)
- B10 Manual emergency release valve (N.C.) (shown in closed position)
- B11 Priming pressure water gauge & valve (N.O.)
- B12 Water supply pressure gauge & valve (N.O.)
- B13 Swing check valve
- C1 Alarm pressure switch (PS10-1)
- C2 ¾"-NPT (20 mm) connection to optional water motor gong (strainer to be supplied by contractor)
- D1 Main water supply valve (N.O.)
- D3 Main drain valve (N.C.)
- F3 Pneumatic actuator

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Deluge trim options

1. Shut-off valve & sight glass

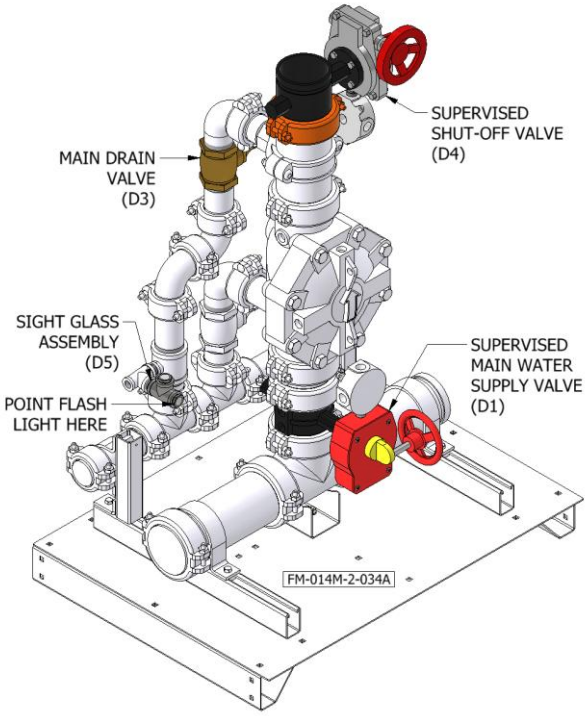
The shut-off valve & sight glass option is intended to be used for applications where testing of the system operation without filling the sprinkler piping network is desirable and where it is critical that all functions of the deluge system be tested under actual discharge conditions. Examples of such applications are freezers, ovens, museums, data processing and other hazards where the possibility of water leaking from the piping system is to be avoided at all costs.

Operation of the shut-off valve

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

1. CLOSE the sprinkler piping network shut-off valve *(D4)*; the valve is supervised on the same circuit as the main water supply valve *(D1)*.
2. OPEN the main drain valve *(D3)*.
3. Simulate the operation of the system to open the deluge valve *(A1)*; see annual test under section **B** INSPECTION AND MAINTENANCE. Using a flashlight in the sight glasses, 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. Return the system in service as per section **B** PLACING THE SYSTEM BACK IN SERVICE.
5. Fully OPEN the shut-off valve *(D4)*. Reset the release control panel as per section **E** CONTROL BUTTONS.

Figure 1 – Shut-off valve & sight glass
(system is shown without cabinet for clarity)



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Integrated Fire Protection System

D

Air Supply - Deluge – Pneumatic Release

1. Cabinet Air Supplies

Deluge sprinkler system using air pressure for pneumatic release piping network is provided with external supervised air supply.

⚠ CAUTION

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

This air supply is factory assembled, mounted in the cabinet and pressure tested.

1.1 Air supply Style "C" (refer to figure 1)

Used only for the pneumatic release piping network of pneumatically operated deluge system. An external air supply has to be provided by others (compressor, plant air or nitrogen cylinders) and piped to the air inlet port of the unit. Air supply style "C" provides an APMD (air pressure maintenance device) trim, factory mounted in the ***TOTALPAC®4*** cabinet).

⚠ CAUTION

When air supply style "C" is selected, the air supply should be provided and installed by the sprinkler contractor OUTSIDE of the ***TOTALPAC®4*** cabinet. Air supply is NOT provided with the unit.

2. Operation

2.1 Air supply Style "C"

To apply air supply

1. Turn on upstream air supply.
2. OPEN APMD (air pressure maintenance device) input valve *(E6)* by placing handle in line with valve body.
3. OPEN APMD output valve *(E7)* by placing handle in line with the valve body.
4. OPEN bypass valve *(E8)* by placing handle in line with valve body in order to accelerate filling of sprinkler piping network by air pressure, while piping is initially filled.
5. Once the piping network pressure is reached, CLOSE the bypass valve *(E8)* by placing handle crossways to valve body, and kept in this position.

NOTICE

The bypass valve *(E8)* must be kept closed once the system is filled with air.

To close air supply

1. CLOSE APMD output valve *(E7)* by placing handle crossways to valve body.
2. CLOSE APMD input valve *(E6)* by also placing handle crossways to the valve body.
3. Be sure bypass valve *(E8)* is CLOSED (handle crossways to valve body).

To adjust air supply

1. Verify that APMD input valve *(E6)* and APMD output valve *(E7)* are both OPEN (handle in line with the valve body).
2. Be sure that bypass valve *(E8)* is CLOSED (handle crossways to valve body) prior to performing this operation.
3. Loosen lock nut of the APMD *(E5)* and turn pressure adjustment nut clockwise to increase air pressure or counter-clockwise to decrease pressure.
4. Tighten lock nut.

NOTICE

Depending on site conditions, the internal filter of the APMD may need maintenance on a regular basis. Refer to Viking data sheet #127 for more details.

3. Maintenance and inspection

⚠ WARNING

Advise local authorities of the necessary work over the fire protection equipment. In order to avoid accidental water release, it is considered good practice to completely close the main water supply valve *(D1)* while doing maintenance work.

3.1 Air supply Style "C" (refer to figure 1)

The Viking Model D-2 APMD (air pressure maintenance device) *(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.

Determine the appropriate pressure to be maintained in the system. Refer to table 1 or table 2 of the current section. If adjustment is necessary, refer to paragraph 2.1 of the current section.

To clean APMD (air pressure maintenance device)

1. Turn off external air supply.
2. CLOSE APMD output valve *(E7)* by placing handle crossways to valve body.
3. CLOSE APMD input valve *(E6)* by also placing handle crossways to the valve body.

NOTE : Never disconnect or disassemble the APMD *(E5)* without closing those isolation valves.

4. Carefully loosen the union between the outlet of APMD *(E5)* and the APMD output valve *(E7)* to relieve pressure.
5. Remove and clean air pressure maintenance device APMD *(E5)* filter. If admission filter is blocked, replace with filter kit (part #03007 A).

Refer to Viking data sheet #127 for additional details.

Table 1 - Water pressure up to 175 PSI (1207 kPa)

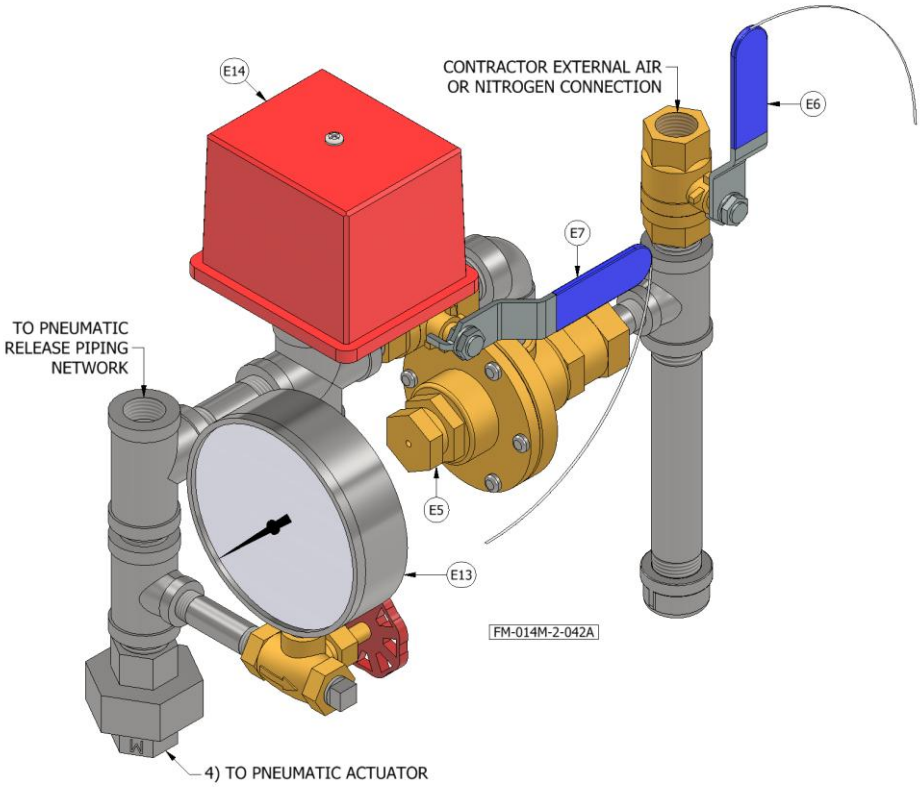
System type	Air supply Style	Air regulator	Compressor start	Compressor stop	Low air supervisory	Very low air supervisory
Deluge Pneumatic release	C	35 PSI (241 kPa)	n/a	n/a	25 PSI (172 kPa)	20 PSI (NYC)

Table 2 - Water pressure from 175 PSI to 250 PSI (1207 kPa to 1724 kPa)

System type	Air supply Style	Air regulator	Compressor start	Compressor stop	Low air supervisory	Very low air supervisory
Deluge Pneumatic release	C	55 PSI (379 kPa)	n/a	n/a	45 PSI (310 kPa)	40 PSI (NYC)

Figure 1 - Air supply Style "C"

APMD for pilot line release only.



Air style components

E5 APMD (air pressure maintenance device)

E6 APMD input valve (N.O.)

E7 APMD output valve (N.O.)

E13 Pneumatic release piping air pressure gauge & valve (N.O.)

E14 Air pressure supervisory switch

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1. Remotely controlled unit without release control panel

1.1 Product description

The ***TOTALPAC®4*** deluge unit is provided without release control panel. A field wiring electrical junction box is integrated within the cabinet for connection of pressure switches, supervisory switches, etc. They are factory wired to a terminal strip (TBA & TBC) for contractor's field wiring (see figure 6 and the section **F** ELECTRICAL).

1.2 Technical data

Steel enclosure: Refer to section **G** CABINET SECTION for further details.

Environment (electrical section): 39°F (4°C) minimum.

Figure 1 – Cabinet layout

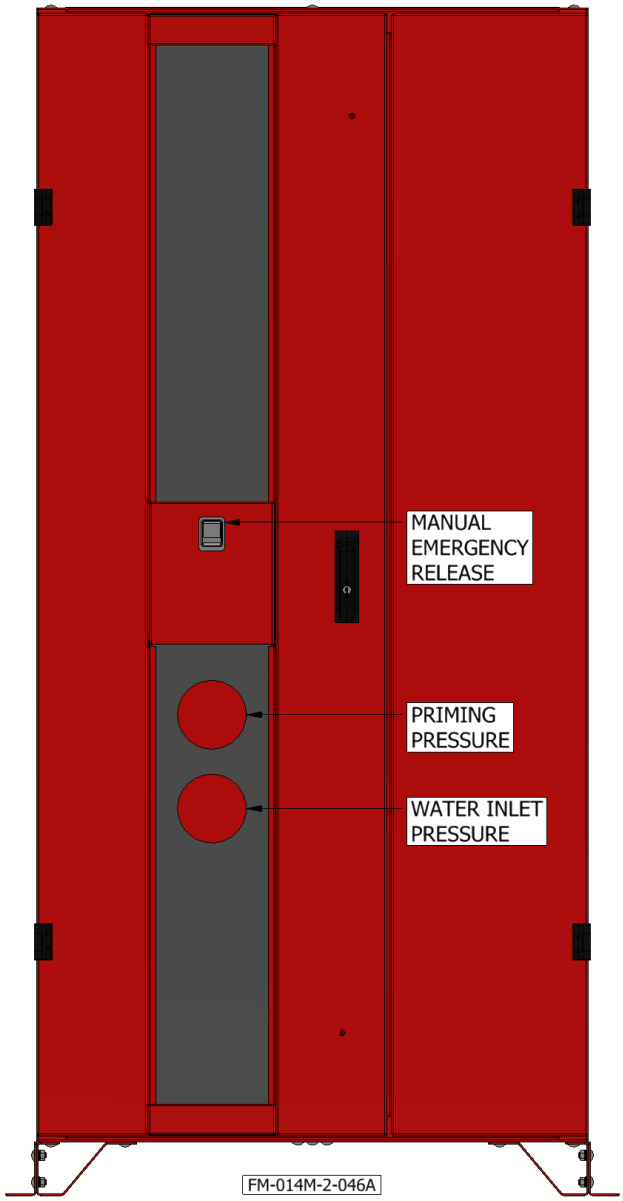
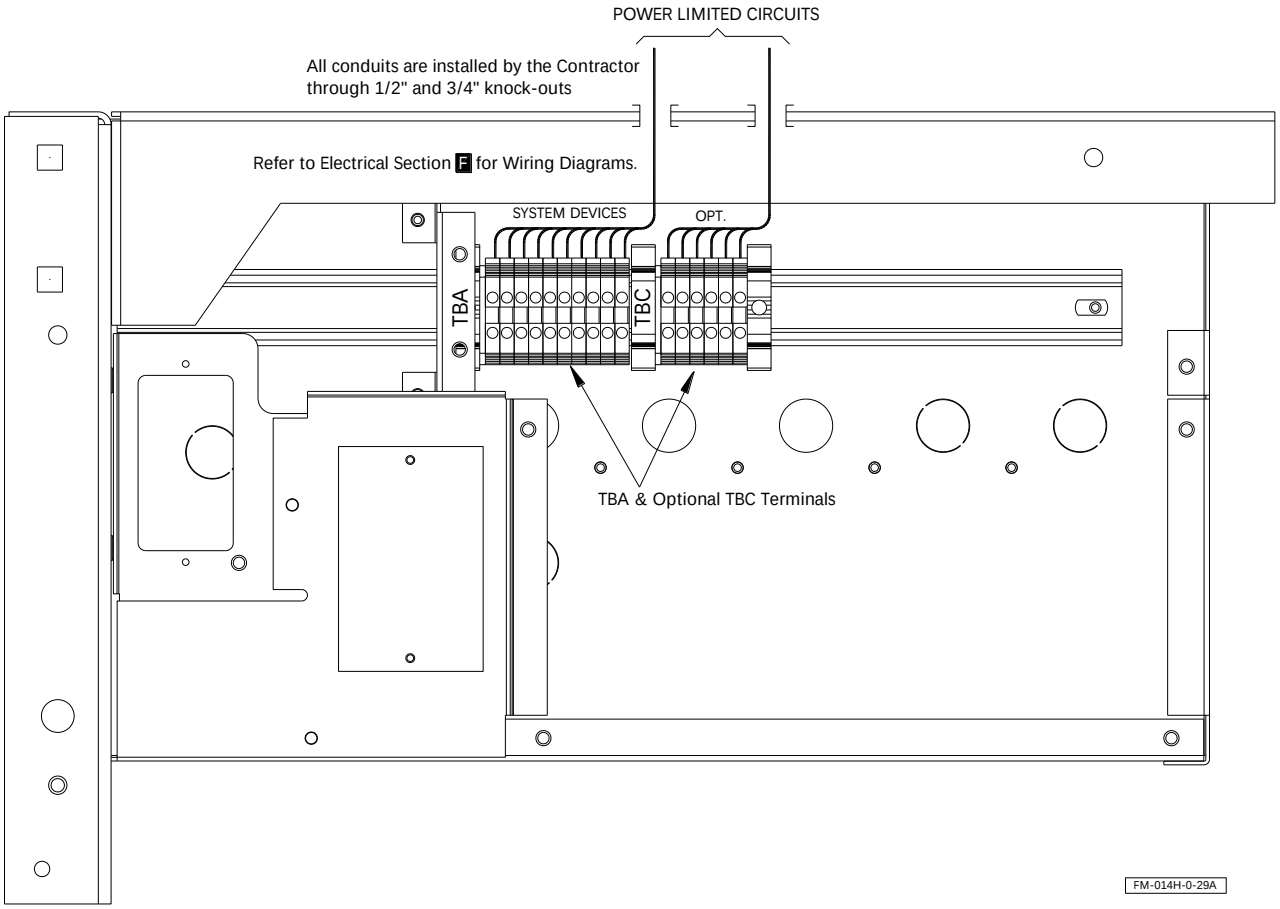


Figure 2 - Junction box layout for system without release control panel



1. Remotely controlled configuration

The ***TOTALPAC®4*** remote controlled unit is provided without an integrated control panel since all internal supervisory are to be connected and supervised from a remote fire alarm control panel.

The remote fire alarm control panel shall be Listed and be compatible for supervisory and alarm contact devices.

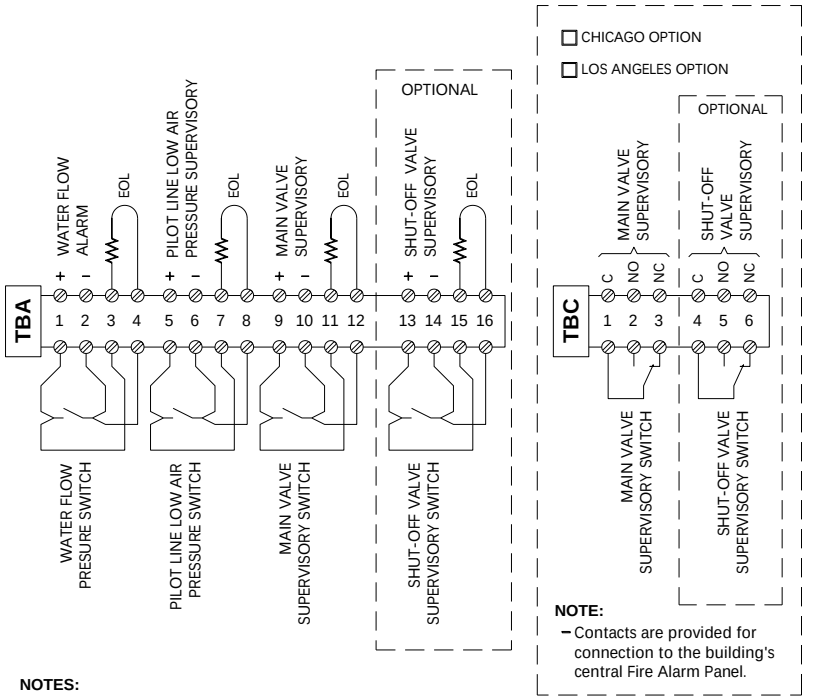
The remote fire alarm control panel is to be wired to the contractor wiring junction box and terminals provided (TBA & optional TBC) as shown in figure 1.

Make sure the system will perform as required and is tested to confirm it meets all requirements, as described in section **B** MECHANICAL SECTION).

⚠ WARNING

No connection should be made directly in the trim components as this would void warranty and might prevent the normal operation of the unit.

Figure 1 –Field wiring diagrams



NOTES:

- All devices are factory wired.
- All devices are shown in their normal supervisory state.
- Contacts are rated:
  Pressure switches: 2A, 30VDC 10A, 125/250VAC
  Supervisory switches: 0.5A, 125VDC 0.25A, 250VDC 5A, 1/6HP, 125/250VAC
- Use dry contacts with power limited circuits only.
- EOL devices (not included) must be compatible with the Release Control Panel used.

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1- Cabinet for *TotalPac®4* unit

The ***TotalPac®4*** cabinet is available in three (3) sizes:

- 23" x 27" x 77" (584mm x 686mm x 1956mm) for 2" (50mm) and for 3" (80mm) system
- 36" x 27" x 77" (908mm x 686mm x 1956mm) for 4" (100mm) and for 6" (150mm) system
- 46" x 27" x 77" (1170mm x 686mm x 1956mm) for 8" (200mm) system

All external and internal surfaces are rust proof coated, inside and outside, with fire red, oven baked polyester powder on phosphate base. Cabinet is provided with two doors, both provided with a neoprene gasket to absorb vibrations.

The cabinet unit is pre-assembled, pre-wired and factory tested under ISO-9001 specifications. Each cabinet door is provided with hinges that can be disassembled on site to remove the door assemblies for servicing.

⚠ CAUTION

Ground wire has to be disconnected prior to removing a door. It must be reconnected once the door is reinstalled.

Gauges to indicate water supply pressure, priming water pressure and pilot line air pressure are all visible through clear Lexan windows.

Multiple units installation is easily achieved by joining manifold sections together at their water inlets. Drain outlet shall remain separate and open for each unit. Refer to figure 6 OPEN DRAIN DETAILS FOR MULTIPLE UNITS.

⚠ WARNING

TotalPac®4 unit is NOT designed to be installed where it will be subjected to outdoors and/or freezing conditions. Refer to paragraph 3 ENVIRONMENT in section **A** GENERAL DESCRIPTION for additional details. Subjecting the unit to conditions outside these limitations might hamper the normal operation of the system.

Remote controlled

A field wiring electrical junction box is integrated within the cabinet for connection of all electrical components in the trim to remotely controlled release control panel. Pressure switches, supervisory switches, etc. are all factory wired to a terminal strip (TBA and optional TBC) for contractor's field wiring. Refer to section **F** ELECTRICAL for additional information.

Table 1 - System weight in cabinet

System size	Weight
2" (50mm)	455 lb (206 kg)
3" (80mm)	655 lb (297 kg)
4" (100mm)	730 lb (331 kg)
6" (150mm)	1080 lb (490 kg)
8" (200mm)	1445 lb (655 kg)

Figure 1 - Cabinet and inlets/outlets dimensions

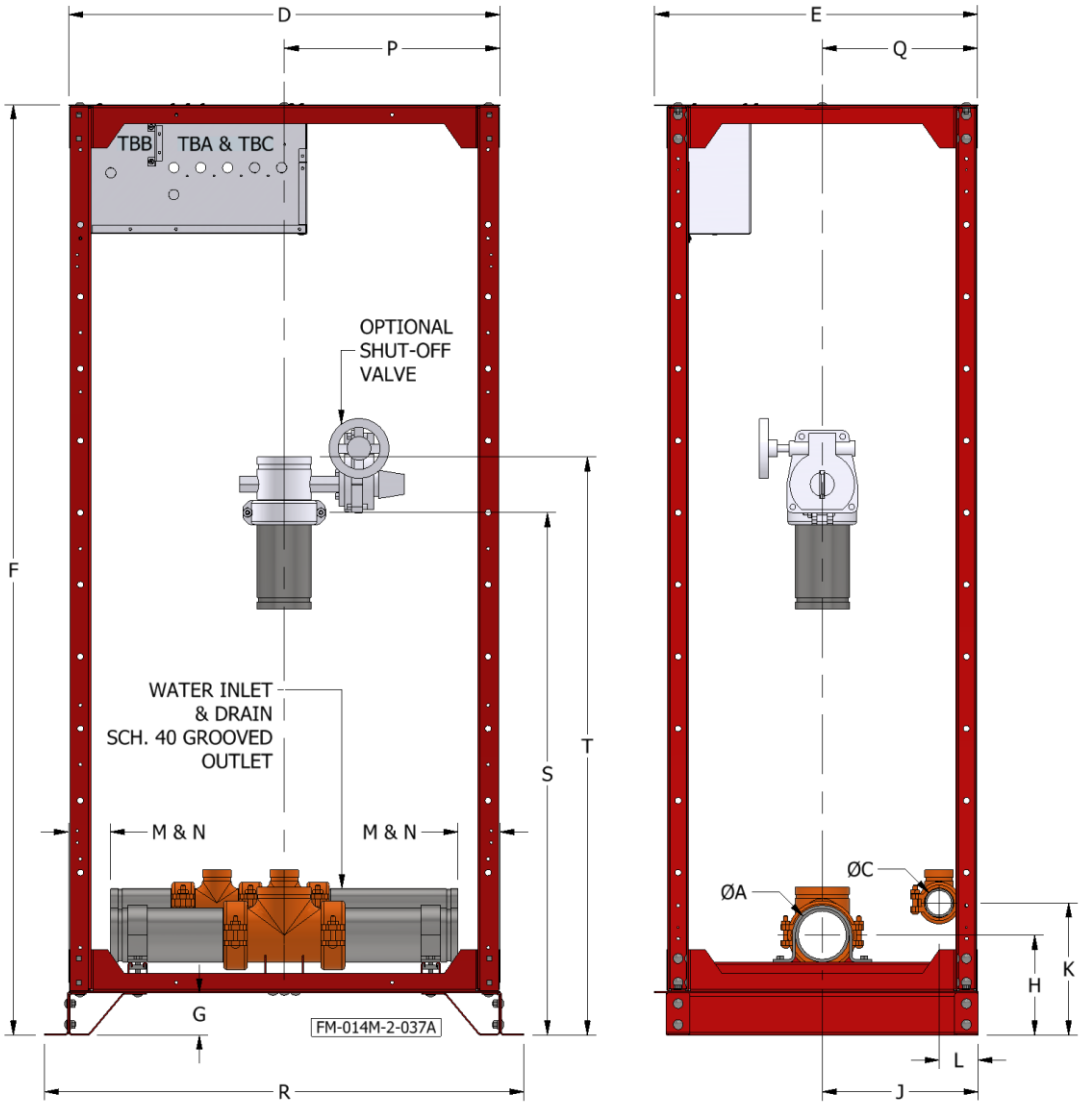


Table 2 - Cabinet dimensions - dimensions are in inches (mm)

Unit size	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
2" (50)	2" (51)	2" (51)	2" (51)	23" (584)	27" (686)	77½" (1969)	3½" (89)	7¼" (184)	13" (330)	11" (279)	3¼" (83)	3½" (89)	3½" (89)	11½" (292)	13" (330)	27" (686)	35¼" (895)	39½" (1003)
3" (80)	3" (76)	3" (76)	2" (51)	23" (584)	27" (686)	77½" (1969)	3½" (89)	7¾" (197)	13" (330)	11" (279)	3¼" (83)	3½" (89)	3½" (89)	11½" (292)	13" (330)	27" (686)	43" (1092)	47" (1194)
4" (100)	4" (102)	4" (102)	2" (51)	36" (914)	27" (686)	77½" (1969)	3½" (89)	8¼" (210)	13" (330)	11" (279)	3¼" (83)	3½" (89)	3½" (89)	18" (457)	13" (330)	40" (1016)	43½" (1105)	48" (1219)
6" (150)	6" (152)	6" (152)	2" (51)	36" (914)	27" (686)	77½" (1969)	3½" (89)	9½" (241)	13" (330)	11" (279)	3¼" (83)	3½" (89)	3½" (89)	18" (457)	13" (330)	40" (1016)	52" (1321)	58" (1473)
8" (200)	8" (203)	8" (203)	2" (51)	46" (1168)	27" (686)	77½" (1969)	3½" (89)	10½" (267)	13" (330)	11" (279)	3¼" (83)	3½" (89)	3½" (89)	23" (584)	13" (330)	50" (1270)	59¾" (1518)	65" (1651)

Notes:

1. Dimensions are nominal and may vary ±¼" (±5mm).

Figure 2 - Floor anchoring dimensions

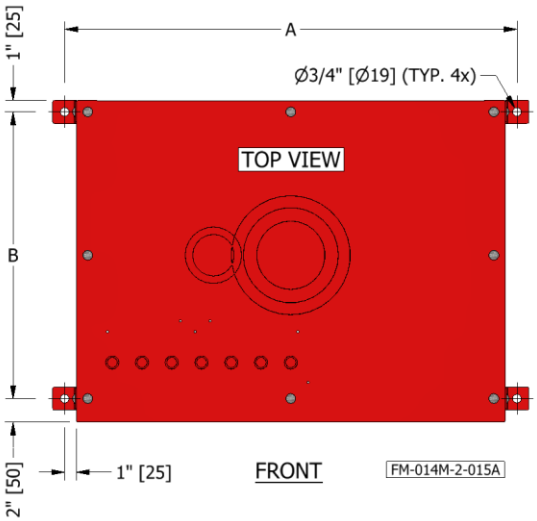


Table 3 - Floor anchoring dimensions

Dimensions are in inches (mm)

Unit size	A	B
2" (50)	25" (635)	24" (610)
3" (80)	25" (635)	24" (610)
4" (100)	38" (965)	24" (610)
6" (150)	38" (965)	24" (610)
8" (200)	48" (1219)	24" (610)

Figure 3 - Cabinet & doors clearance detail

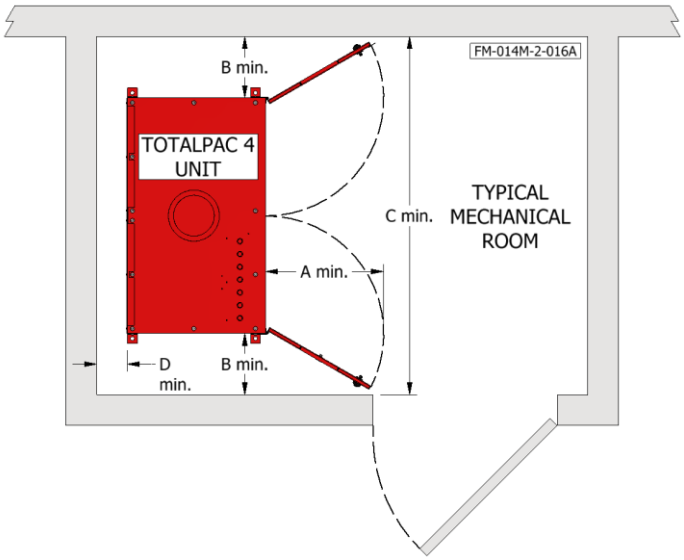


Table 4 - Cabinet clearance dimensions

Dimensions are in inches (mm)

Unit size	A	B	C	D
2" (50)	24" (610)	12" (305)	48" (1219)	4" (102)
3" (80)	24" (610)	12" (305)	48" (1219)	4" (102)
4" (100)	24" (610)	12" (305)	60" (1524)	4" (102)
6" (150)	24" (610)	12" (305)	60" (1524)	4" (102)
8" (200)	24" (610)	12" (305)	72" (1829)	4" (102)

Note : Minimum dimensions are according to door clearance and external piping requirements.

Figure 4 - Knockouts details

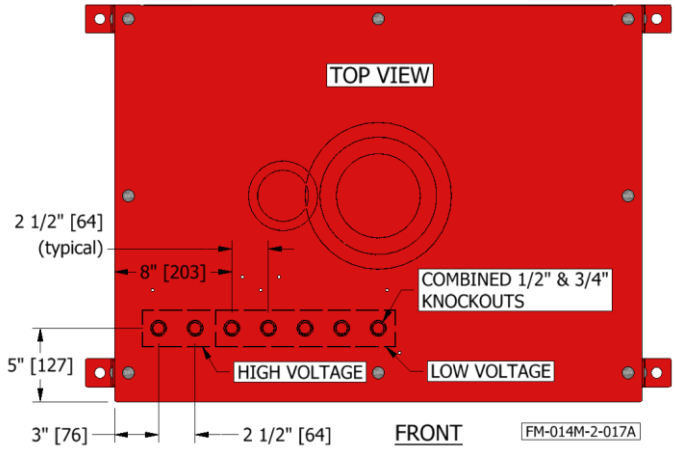


Figure 5 - Open drain details for single unit

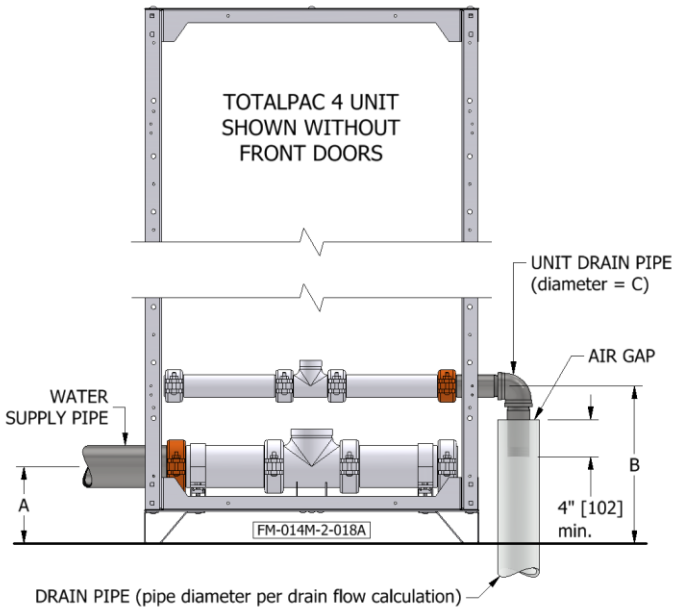
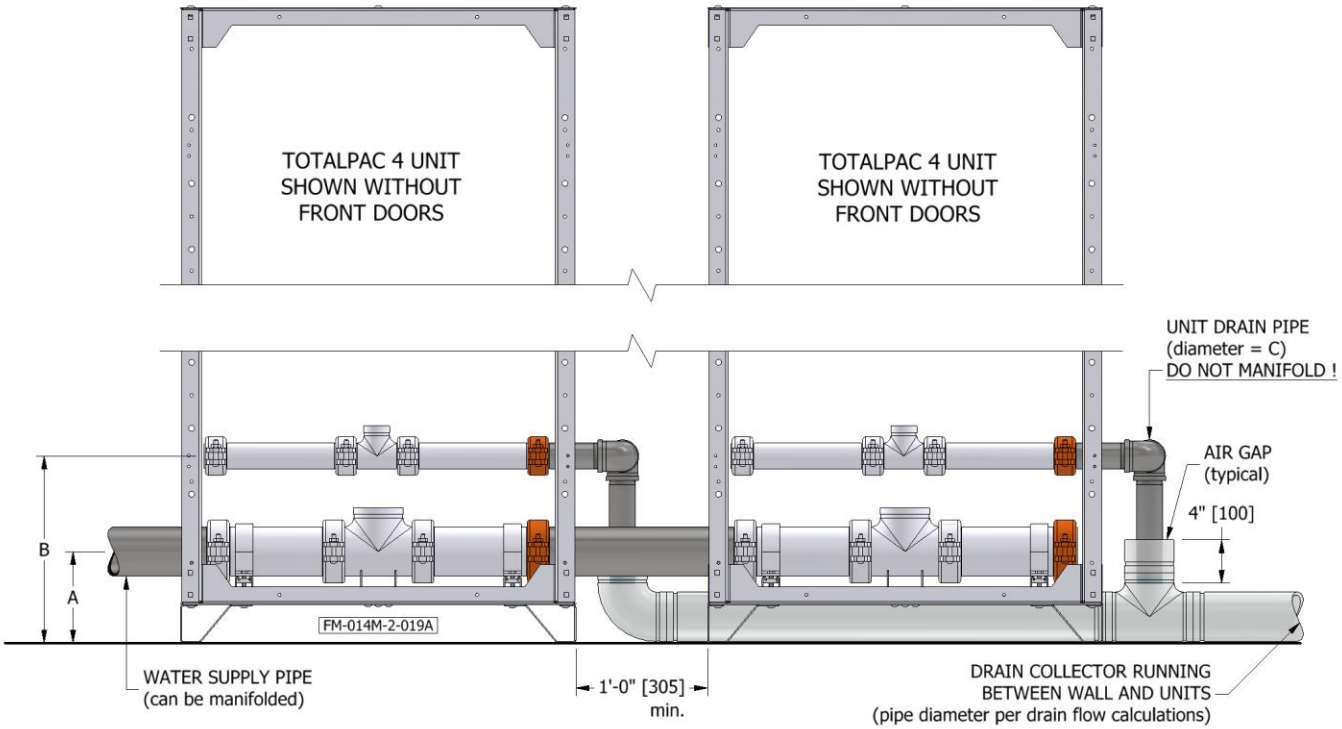


Table 5 - Manifold dimensions

Dimensions are in inches (mm)

Unit size	A	B	C
2" (50)	7¼" (184)	11" (279)	2" (51)
3" (80)	7¾" (197)	11" (279)	2" (51)
4" (100)	8¼" (210)	11" (279)	2" (51)
6" (150)	9½" (241)	11" (279)	2" (51)
8" (200)	10½" (267)	11" (279)	2" (51)

Figure 6 - Open drain details for multiple units
(refer to dimensions in table 5)



Notes:

1. Water supply and drain pipes can be connected on either side of cabinet.
2. All pipes and fittings should meet applicable codes.
3. Actual drain collector diameter shall be determined with detailed hydraulic calculations and is the responsibility of the system designer.

Integrated Fire Protection System

Limited Warranty

H

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 original shipping date, 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.

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User Notes