



# FDNY

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## **CERTIFICATE OF APPROVAL # 6164**

**THIS CERTIFICATE IS REVOCABLE, NOT TRANSFERABLE**  
**and EXPIRES on MAY 7, 2020**

By order of Fire Commissioner Daniel A. Nigro, and pursuant to Section FC 112 of the New York City New Fire Code, the following equipment or system is accepted for use provided the conditions as outlined below are in full compliance.

**Manufacturer of component:** The Viking Corporation

**Manufacturer of cabinet:** Fireflex Systems Inc.

**Trade Name:** TotalPac3 Integrated Fire Protection Systems

**Product:** TotalPac3 with VFR400 Releasing Control Panel

**Pertinent Code Section(s):** Section FC 901 of the New York City New Fire Code

**Prescribed Tests:** FM Class 1011, 1012, 1013

**Laboratories:** Factory Mutual Approvals

**Report(s):** 3049157, 3005859, 3012863, 3017826, 3018875, 3022001

### **Description:**

#### **Deluge System, Electric Release**

A deluge system is a fixed fire-protection system which totally floods an area with pressurized water through a system piping of open nozzles or sprinklers. The system piping remains empty until the deluge valve is activated by operation of the release system. Deluge systems are commonly used where it is desirable to simultaneously spray water from all open sprinklers and/or nozzles on the system when it operates. Electrically controlled deluge systems require an electric solenoid valve controlled by an approved system control panel with compatible detection system.

When the detection system operates, the system control panel energizes the solenoid valve open, causing the deluge valve to open and allow water to enter the system piping. Water will flow from any open sprinklers and/or spray nozzles on the system.

#### **Firecycle® III Deluge**

A deluge system is a fixed fire-protection system which totally floods an area with pressurized water through a system piping of open nozzles or sprinklers. The system piping is empty until the flow control valve is activated by an electric or manual release system.

The Viking Firecycle® III Deluge System utilizes a Viking Flow Control Valve in lieu of the deluge valve and a Viking Model VFR-400 Release Control Panel, together with additional valves, devices and trim to form a unique operating system. The Viking Flow Control Valve is a deluge valve that is capable of on/off operation. In addition to automatically detecting a fire and turning the system on, Firecycle® III has the added ability to sense when the fire has been controlled, and automatically turn off the water flow once a preprogrammed "Soak Timer" has been satisfied. Should the fire rekindle, the control panel will initiate the sequence again. This unique Firecycle® III feature will repeat as long as power is available to the panel, helping to minimize water usage, water damage, and the danger of pollution to surrounding areas.

**Fire Department, City of New York**

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When the Firecycle<sup>®</sup> III detection system operates, the VFR400 Release Control Panel activates the system alarm and energizes normally closed release solenoid valve #1 open and normally open release solenoid valve #2 closed. Pressure is released from the priming chamber faster than it is supplied through restricted orifice. The flow control valve clapper opens to allow water to flow into the system piping and to alarm devices, causing alarm pressure switch to activate. Water entering the system operates and hydraulically latches the pressure operated relief valve (PORV) open. Water will flow from any open sprinklers or nozzles. Water discharges until all Firecycle<sup>®</sup> Detectors have reset (cooled below their set point). After all detectors have reset, the VFR-400 Release Control Panel activates the "Soak Timer", allowing the system to continue discharging water for a preset time period. Should a Firecycle<sup>®</sup> Detector go into alarm, the VFR-400 Release Control Panel re-energizes normally closed release solenoid valve #1 open, and the entire cycle is repeated.

#### **Non-Interlocked Preaction**

This preaction system utilizes a Viking Deluge Valve which may be opened either by the fusing of a sprinkler in the sprinkler piping, by the operation of the detection system or anytime the handle of the emergency release valve is pulled. The sprinkler piping contains air or nitrogen gas under pressure. If the detection system does not operate, the sprinkler system will operate as a dry pipe system. If the sprinkler piping is broken or the sprinkler operates, the pneumatic actuator will operate and the valve open, flowing water. If the detection system operates due to fire, damage or malfunction, the valve will open but the water will be contained in the sprinkler piping. The system is supervised to indicate low air pressure.

Release trim for the electrically operated Viking Non-Interlocked Preaction system utilizes an electric solenoid valve controlled by an approved system release control panel with a compatible detection system. When the detection condition is satisfied, the system release control panel energizes the solenoid valve open, causing the deluge valve to open. The sprinkler system will fill with water. A Viking Pneumatic Actuator is also required. In the event of non-operation of the release system, the system will operate as a dry system. In the event of damage to the sprinkler piping or a sprinkler, the deluge valve will open; water will flow from any open sprinklers and any other opening in the sprinkler system piping.

#### **Single Interlocked Preaction**

This preaction system utilizes a Viking Deluge Valve which may be opened by the operation of the detection system or anytime the handle of the emergency release valve is pulled. The sprinkler piping contains air or nitrogen gas under pressure. This preaction system requires the operation of the detection system to trip the Viking Deluge Valve and fill the system with water. Water will then be discharged on the fire when the sprinklers fuse. If the sprinkler piping or sprinkler is broken, the valve will not open. If the detection system operates due to fire, damage or malfunction, the valve will open but the water will be contained in the sprinkler piping. Release trim for the electrically operated Viking Single-Interlocked Preaction system utilizes an electric solenoid valve controlled by an approved system control panel with a compatible detection system.

When the detection system operates, the system control panel activates an alarm and energizes the normally closed solenoid valve open. Pressure is released from the priming chamber to the open drain cup faster than it is supplied through the restricted orifice. The deluge valve clapper opens to allow water to flow into the system piping and alarm devices, causing the water motor alarm and water flow alarms connected to the alarm pressure switch to activate. When a sprinkler head opens, water will flow from the system.

When the deluge valve operates, the sensing end of the pressure operated relief valve (PORV) is pressurized, causing the pressure operated relief valve (PORV) to operate. When the pressure operated relief valve (PORV) operates, it continually vents the priming chamber to prevent the deluge valve from resetting even if the open releasing devices close. The deluge valve can only be reset after the system has been taken out of service, and the outlet chamber of the deluge valve and associated trim piping are depressurized and drained.

#### **Firecycle<sup>®</sup> III Single Interlocked Preaction**

This preaction system requires the operation of the detection system to trip the Viking Flow Control Valve and fill the system with water. Water will then be discharged on the fire when the sprinklers fuse. If the sprinkler piping or sprinkler is broken, the valve will not open. If the detection system operates due to fire, damage or malfunction, the valve will open but the water will be contained in the sprinkler piping. If the



detection system does not operate, the flow control valve will not open. Supervision is generally used since control of accidental discharge is usually desired.

The Viking Firecycle<sup>®</sup> III preaction system utilizes a Viking Flow Control Valve in lieu of the deluge valve and a Viking Model VFR-400 Release Control Panel, together with additional valves, devices and trim to form a unique operating system. The Viking Flow Control Valve is a deluge valve that is capable of on/off operation. In addition to automatically detecting a fire and turning the system on, Firecycle<sup>®</sup> III has the added ability to sense when the fire has been controlled, and automatically turn off the water flow once a preprogrammed "Soak Timer" has been satisfied. Should the fire rekindle, the control panel will initiate the sequence again. This unique Firecycle<sup>®</sup> III feature will repeat as long as power is available to the panel, helping to minimize water usage, water damage, and the danger of pollution to surrounding areas.

When the Firecycle<sup>®</sup> III or Firecycle<sup>®</sup> III-OH detection system operates, the VFR400 Release Control Panel activates the system alarm and energizes normally closed release solenoid valve #1 open and normally open release solenoid valve #2 closed. Pressure is released from the priming chamber faster than it is supplied through the restricted orifice. The flow control valve clapper opens to allow water to flow into the system piping and to alarm devices, causing alarm pressure switch to activate. Water entering the system operates and hydraulically latches the pressure operated relief valve (PORV) open. Water will flow from any open sprinklers or nozzles. Water discharges until all Firecycle<sup>®</sup> Detectors have reset (cooled below their set point). After all detectors have reset, the VFR400 Release Control Panel activates the "Soak Timer", allowing the system to continue discharging water for a preset time period. When the "Soak Timer" has expired, the VFR400 Release Control Panel de-energizes normally closed release solenoid valve #1, allowing it to close. (The normally open release solenoid valve #2 remains energized closed until the VFR400 Release Control Panel is manually reset, or both A.C. Power and battery backup have failed.) The flow control valve re-primers and closes, stopping the flow of water through the system piping.

#### **SUREFIRE<sup>®</sup> Single Interlocked Preaction**

This preaction system requires the operation of the detection system to trip the Viking Deluge Valve and fill the system with water. Water will then be discharged on the fire when the sprinklers fuse. If the sprinkler piping or sprinkler is broken, the valve will not open. If the detection system operates due to fire, damage or malfunction, the valve will open but the water will be contained in the sprinkler piping. If the detection system does not operate, the deluge valve will not open. Supervision is generally used since control of accidental discharge is usually desired.

The system piping is pneumatically pressurized to monitor the integrity of the piping, fittings and sprinklers and act as a fail-safe emergency backup to the electrical detection system. The system piping is normally dry and may be installed in locations subject to freezing. Built in with special features to minimize accidental water damage, unlike other systems, it can be installed where the detector and/or sprinklers are easily damaged or broken accidentally. In addition to special features that offer perfect fail-safe modes, the Viking SUREFIRE<sup>®</sup> □ Preaction Systems also provide excellent fire protection in environments with or without electrical power and is equipped with batteries that provide up to ninety (90) hours of emergency power. If the A.C. power fails and the battery backup power expires while the system is operating, the preaction system will "fail-safe", and continue flowing until A.C. power is restored or the system is manually shut-off. If the VFR400 Control Panel indicates circuit trouble, the system will act as a dry system.

When the detection system operates, the VFR400 Release Control Panel activates the system alarm and energizes normally closed release solenoid valve open. Pressure is released from the priming chamber faster than it is supplied through the restricted orifice. The deluge valve clapper opens to allow water to flow into the system piping and to alarm devices. Water enters the system piping and increases pressure on the pressure operated relief valve (PORV), which vents the water supplies to the prime chamber. Water will flow from any open sprinklers or nozzles.

#### **Double Interlocked Preaction (REFRIGERATED AREAS ONLY)**

This preaction system utilizes a detector system and pressurized air or gas in the sprinkler piping. This system utilizes the Viking Deluge Valve and is arranged so that the valve will open only when pressure is reduced in the sprinkler piping AND the detection system operates, or anytime the handle of the emergency release valve



is pulled. If the detection system operates due to fire, damage or malfunction, the valve will not open. If the sprinkler piping is damaged or a sprinkler is broken or fused, the valve will not open. The operation of both a sprinkler and a detector (or release) is required before the valve will open, allowing water to enter the system piping. Since pressurized air or nitrogen gas is available in the output piping, the system is usually supervised.

**Electric/Pneumatic** controlled preaction systems use a pneumatic actuator, normally held closed by supervisory pressure maintained in the sprinkler system AND a normally closed electric solenoid valve controlled by an approved system release control panel with compatible detection system. BOTH the electric detection system AND supervisory pressure must be relieved from the sprinkler system before the deluge valve will open and fill the sprinkler system with water.

**Electric/Pneu-Lectric** controlled preaction systems use pneumatic supervision of the automatic sprinkler system, and an electric detection system. The deluge valve release trim uses a normally closed electric solenoid valve controlled by an approved system control panel with two initiating circuits configured for "cross-zoned" operation. One initiating circuit is connected to the electric detection system; the other to a "Low-Air" alarm switch. BOTH the electric detection system AND supervisory pressure must be relieved from the sprinkler system before the deluge valve will open and fill the sprinkler system with water.

When the detection system operates, the VFR400 Release Control Panel energizes the solenoid valve open. Alarms activate, but the deluge valve will **NOT** open until a sprinkler opens relieving supervisory pressure from the sprinkler system. When a sprinkler opens, supervisory pressure in the sprinkler piping is reduced causing the pneumatic actuator to open. After **BOTH** the electric detection system activates AND supervisory pressure in the sprinkler system have been lost, pressure is released from the priming chamber to open drain cup faster than it is supplied through restricted orifice. The deluge valve clapper opens to allow water to flow into the system piping and alarm devices, causing water motor alarm and water flow alarms connected to alarm pressure switch to activate.

When the deluge valve operates, the sensing end of pressure operated relief valve (PORV) is pressurized, causing the pressure operated relief valve (PORV) to operate. When the pressure operated relief valve (PORV) operates, it continually vents the priming chamber to prevent the deluge valve from resetting even if the open releasing devices close. The deluge valve can only be reset after the system has been taken out of service, and the outlet chamber of the deluge valve and associated trim piping are depressurized and drained.

#### **Firecycle® III Double Interlocked Preaction (REFRIGERATED AREAS ONLY)**

This preaction system utilizes a detector system and pressurized air or gas in the sprinkler piping. This system utilizes the Viking Deluge Valve and is arranged so that the valve will open only when pressure is reduced in the sprinkler piping AND the detection system operates, or anytime the handle of the emergency release valve is pulled. If the detection system operates due to fire, damage or malfunction, the valve will not open. If the sprinkler piping is damaged or a sprinkler is broken or fused, the valve will not open. The operation of both a sprinkler and a detector is required before the valve will open, allowing water to enter the system piping. Since pressurized air or nitrogen gas is available in the output piping, the system is usually supervised. The double interlocked system is commonly used where it is important to control accidental discharge of the system.

The Viking Firecycle® III Double Interlocked Preaction System utilizes a Viking Flow Control Valve in lieu of the deluge valve and a Viking Model VFR-400 Release Control Panel, together with additional valves, devices and trim to form a unique operating system. The Viking Flow Control Valve is a deluge valve that is capable of on/off operation. In addition to automatically detecting a fire and turning the system on, Firecycle® III has the added ability to sense when the fire has been controlled, and automatically turn off the water flow once a preprogrammed "Soak Timer" has been satisfied. Should the fire rekindle, the control panel will initiate the sequence again. This unique Firecycle® III feature will repeat as long as power is available to the panel, helping to minimize water usage, water damage, and the danger of pollution to surrounding areas. When the Firecycle® III or Firecycle® III-OH detection system operates and supervisory pressure in the sprinkler system has been lost, the VFR400 Release Control Panel activates the system alarm and energizes normally closed release solenoid valve #1 open and normally open release solenoid valve #2 closed. Pressure



is released from the priming chamber faster than it is supplied through the restricted orifice. The flow control valve clapper opens to allow water to flow into the system piping and to alarm devices, causing alarm pressure switch to activate. Water entering the system operates and hydraulically latches the pressure operated relief valve (PORV) open. Water will flow from any open sprinklers or nozzles. Water discharges until all Firecycle® Detectors have reset (cooled below their set point). After all detectors have reset, the VFR400 Release Control Panel activates the "Soak Timer", allowing the system to continue discharging water for a preset time period. When the "Soak Timer" has expired, the VFR400 Release Control Panel de-energizes normally closed release solenoid valve #1, allowing it to close. (The normally open release solenoid valve #2 remains energized closed until the VFR400 Release Control Panel is manually reset, or both A.C. Power and battery backup have failed.) The flow control valve re-primed and closes, stopping the flow of water through the system piping.

#### **SUREFIRE® Double Interlocked Preaction (REFRIGERATED AREAS ONLY)**

This preaction system utilizes a detector system and pressurized air or gas in the sprinkler piping. This system utilizes the Viking Deluge Valve and is arranged so that the valve will open only when pressure is reduced in the sprinkler piping **AND** the detection system operates, or anytime the handle of the emergency release valve is pulled. If the detection system operates due to fire, damage or malfunction, the valve will not open. If the sprinkler piping is damaged or a sprinkler is broken or fused, the valve will not open. The operation of both a sprinkler and a detector is required before the valve will open, allowing water to enter the system piping. Since pressurized air or nitrogen gas is available in the output piping, the system is usually supervised. The double interlocked system is commonly used in freezers where flooding of the pipe can have serious consequences and in system applications where it is important to control accidental discharge of the system.

The system piping is pneumatically pressurized to monitor the integrity of the piping, fittings and sprinklers and act as a fail-safe emergency backup to the electrical detection system. The system piping is normally dry and may be installed in locations subject to freezing. Built in with special features to minimize accidental water damage, unlike other systems, it can be installed where the detector and/or sprinklers are easily damaged or broken accidentally. In addition to special features that offer perfect fail-safe modes, the Viking SUREFIRE® □ Preaction Systems also provide excellent fire protection in environments with or without electrical power and is equipped with batteries that provide up to ninety (90) hours of emergency power. If the A.C. power fails and the battery backup power expires while the system is operating, the preaction system will "fail-safe", and continue flowing until A.C. power is restored or the system is manually shut-off.

When the detection system operates, the VFR400 Release Control Panel activates the system alarm and initiates the appropriate detection alarms. No water enters the system piping at this time. When a sprinkler operates, as caused by the heat of a fire, system supervisory air is lost, and the low air pressure switch is activated. Only after both indicating circuits have operated, the VFR-400 Release Control Panel energizes normally closed release solenoid valve open and normally open release solenoid valve closed. Pressure is released from the priming chamber faster than it is supplied through restricted orifice. The deluge valve clapper opens to allow water flow into the system piping and to alarm devices. Water entering the system piping increases pressure on the pressure operated relief valve (PORV), which vents off the water supply to the priming chamber. Water will flow from any open sprinklers or nozzles.

#### **Firecycle® III Wet**

A wet pipe system is a fixed fire-protection system using piping filled with pressurized water, supplied from a dependable source. Closed heat sensitive automatic sprinklers spaced and located in accordance with recognized installation standards are used to detect a fire. Upon operation the sprinklers discharge water over a specific area to control or extinguish the fire. As the water flows through the system an alarm is activated to indicate the system is operating. Only those sprinklers immediately over or adjacent to the fire operate, minimizing water damage.

The summary of different type application of the TotalPack3 is shown in the Table 1.



Table 1.

Model	Description
TotalPack3	Deluge, Electric Release, Self-Contained Unit
	Deluge, Firecycle <sup>®</sup> Release, Self-Contained Unit
	Non-Interlocked Preaction, Electric Release, Self-Contained Unit
	Single Interlocked Preaction, Electric Release, Self-Contained Unit
	Single Interlocked Firecycle <sup>®</sup> Release, Self-Contained Unit
	Single Interlocked SUREFIRE <sup>®</sup> Release, Self-Contained Unit
	Double Interlocked Preaction, Electric-Pneu-Lectric Release, Self-Contained Unit
	Double Interlocked Preaction, Electric-Pneumatic Release, Self-Contained Unit
	Double Interlocked Firecycle <sup>®</sup> Release, Self-Contained Unit
	Double Interlocked SUREFIRE <sup>®</sup> Release, Self-Contained Unit
	Wet Pipe, Firecycle <sup>®</sup> Release, Self-Contained Unit

## Conditions of Approval:

1. All uses, configurations, arrangements and functions, applications and installations shall comply with the provisions of New York City Construction Codes, specifically Building Code Chapter 9 & 1RCNY §3616-04. Further, the installation shall be in accordance with applicable provisions of New York City Fire Code, New York City Electrical Code, manufacturer's installation requirements, and UL Standards 25, 864.
2. When used with a central office control communicator or a transmitter, the installation and operation of the equipment and devices shall comply with 3RCNY §901-01. It shall have the capability of transmitting separate and distinct signals to indicate manual pull station alarm, automatic detection alarm, sprinkler waterflow alarm, supervisory signal indications, and trouble indications.
3. Installation of interlock pre-action systems when programmed to operate as double interlock shall be installed only for applications such as refrigerated rooms.
4. TotalPack3 On-Off Multi-cycle Sprinkler Systems that are programmed to operate as an "on/off" so as to stop water flow after the fire subsides and re-starts automatically if the fire is rekindled shall not be installed in New York City except for sprinkler systems installed under the following conditions:
  - 4.1. TotalPac3 On-Off Multi-cycle Sprinkler Systems shall be installed as a subsystem in occupancies and enclosures such as libraries, museums, and cultural properties as defined by NFPA 909 publication, where water damage to collections is of a significant concern.

- 4.2. TotalPac3 On-Off Multi-cycle Sprinkler Systems shall be installed as a subsystem in occupancies and enclosures where the Engineer of Record confirms that excessive water runoff could cause an environmental impact.
- 4.3. A sign posted in a conspicuous area shall identify the location of the manual override on the TotalPac3 On-Off Multi-cycle Sprinkler Systems Unit.
5. Installation of above double interlock and multi-cycle sprinkler systems shall be subject of further site-specific review and approval.
6. Only enclosures painted red in color shall be used.
7. The above referenced Release Control Panel shall be used only with listed fire alarm equipment and devices with which the compatibility has been determined by Factory Mutual Approvals reports.
8. Factory Mutual Approvals' listing/approval requirements and limitations shall be complied with.
9. Inspection, testing, and maintenance of TotalPac3 shall be performed in accordance with NYC Fire Code, Rules, and NFPA 25.
10. Certificate of Approval number shall be plainly stamped or otherwise fixed upon each product by the applicant.
11. The Fire Department's conditions of approval shall be enumerated in the installation manuals and brochures that will be provided to all New York City buyers and users.
12. Fire Department Certificate of Approval does not constitute an endorsement or recommendation of your product by the Fire Department, but is a certification that your product is acceptable as of the date of issuance.
13. The Fire Department reserves the right to withdraw this approval at any time in the event there is a reasonable doubt that the product does not operate or perform as required by code, the conditions of this resolution or as represented in your application.
14. As the manufacturer of this equipment, you should be aware that any end user who fails to comply with the condition as outlined in the approval would be subject to enforcement action, which may include fines and imprisonment.
15. This Certificate of Approval does not grant the right to use any trademark associated with the New York City Fire Department (the letters FDNY, the FDNY Shield design, the FDNY Maltese Cross design, and the seal of the City of New York). The unauthorized use of trademarks in connection with the sale of commercial goods or services violates federal and state laws.
16. Products marked to indicate the Certificate of Approval number might refer to the "NYC Fire Department" or "NYC Fire Dept" (e.g., "NYC Fire Dept Certificate of Approval #XXXX").

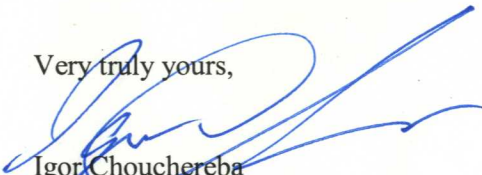


**Expires on May 7, 2020**  
**COA #6164 for Viking Corp.**  
**F.P. Index#:1311031D**  
**FPIMS#: 37089554**  
**May 8, 2017**  
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Any change in company name or ownership, product name, design or model number of any product included on this certificate must be immediately reported to this Department in writing.

When responding to this Department regarding this subject matter, kindly refer to F.P. Index #1311031D and to Igor Chouchereba attention, 9 MetroTech Center #1S-43-K, phone (718) 999-1997

Very truly yours,



Igor Chouchereba  
Supervisor of Electrical Installation, II  
Technology Management

c: Tamara Saakian, P.E., Director of Technology Management.  
cc: Trushant Shah, Deputy Director of Engineering, Technology Management