	<h2 style="margin: 0;">SYSTEM DATA</h2>	<h3 style="margin: 0;">FIRECYCLE® III CYCLING SINGLE INTERLOCKED PREACTION</h3>
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**A. SYSTEM DESCRIPTION**

(Refer to Figure 1 or 2, Page 425 d)  
 The Viking Firecycle® III Cycling Single Interlocked Preaction System utilizes a Viking Model H or J Flow Control Valve (A.1), a Viking Easy Riser™ Check Valve (A.2), and a Firecycle® III Control Panel (E.3), together with additional valves, devices and trim to form a unique operating system. The system piping is normally dry and may be installed in locations subject to freezing. The system piping is pneumatically pressurized (Minimum 30 psi (207 kPa)) to monitor the integrity of the piping, fittings and sprinklers and to act as a fail-safe emergency backup to the electrical detection system.

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, Firecycle® III will initiate the sequence again. This unique cycling 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. Batteries are available to 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 deluge system will "fail-safe", and continue flowing until A.C. Power is restored or the system is manually shut-off.

The Firecycle® III Cycling Single Interlocked Preaction system has several "fail-safe" features, some of which are not available on other preaction systems. Refer to Section B "System Operation" for details.

Preaction systems are commonly used to help minimize accidental water damage and still provide fast water discharge during a fire emergency. Consult all Authorities Having Jurisdiction prior to installing a Firecycle® III Preaction System. The system requires use of a Viking Flow Control Valve and trim kit with two electric Release Solenoid Valves (E.1) and (E.2) controlled by the Firecycle® III Control Panel (E.3), Firecycle® Detectors (E.4) and Detector Cable (E.5). The detector temperature must be lower than the lowest temperature rated sprinkler being used. For proper location, spacing and positioning of detectors, refer to Technical Data describing Viking Firecycle® Detectors.

**NOTE:**

Firecycle® III is a complete system, and is listed as a unit. As such, it is normally not possible to modify the components of the system controls or their inter-relation without compromising the listing.

**Approvals:**

UL Listed, Category VLLA  
 FM Approved  
 Accepted for use by City of New York  
 Department of Buildings,  
 MEA 89-92-E Vol. XIV

**B. SYSTEM OPERATION**

(Refer to Figure 1 or 2, Page 425 d.)

**In the SET condition:**

System water supply pressure enters the priming chamber of the Flow Control Valve (A.1) through the 1/4" (8 mm) priming line which includes a normally open priming valve (B.1), strainer (B.2), restricted orifice (B.3) and check valve (B.4). In the SET condition, water supply pressure is trapped in the priming chamber by check valve (B.4), normally closed Emergency Release (B.11), Pneumatic Actuator (B.6), and normally closed Release Solenoid Valve #1 (E.1). Water Supply pressure in the priming chamber holds the clapper of the Flow Control Valve (A.1) on the seat due to the differential design of the valve and spring pressure. The clapper separates the inlet chamber from the outlet chamber, keeping the outlet chamber and system piping dry.

**In Fire conditions:**

When the Firecycle® III detection system (E.4 and E.5) operates, the Firecycle® III Control Panel (E.3) activates a piezo sounder and energizes normally closed Release Solenoid Valve #1 (E.1) open and normally open Release Solenoid Valve #2 (E.2) closed. Pressure is released from the priming chamber faster than it is supplied through restricted orifice (B.3). The Flow Control Valve (A.1) clapper opens to allow water to flow into the system piping and to alarm devices, causing Alarm Pressure Switch (C.1) to activate. Water entering the system operates and hydraulically latches the Pressure Operated Relief Valve (PORV) (B.10) 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 Firecycle® III Control Panel (E.3) activates the "Soak Timer", allowing the system to continue discharging water for a preset time period. When the "Soak Timer" has expired, the Firecycle® III Control Panel (E.3) de-energizes normally closed Release Solenoid Valve #1 (E.1), allowing it to close. (The normally open Release Solenoid Valve #2 (E.2) remains energized closed until the Firecycle® III Control Panel is manually reset, or both A.C. Power and battery backup have failed.) The Flow Control Valve (A.1) re-primed and closes, stopping the flow of water through the system piping.

Should a Firecycle® Detector go into alarm, the Firecycle® III Control Panel (E.3) re-energizes normally closed Release Solenoid Valve #1 (E.1) open, and the entire cycle repeats.

To return the system to "Normal" conditions, drain the system piping and replace any sprinklers which may have operated. Relieve the pressure on the Pressure Operated Relief Valve (PORV) (B.10) by draining the outlet chamber of the Flow Control Valve. (A.1) Replace any Firecycle® Detectors which have been damaged and re-establish system air pressure. Press the "System Reset" button on the Firecycle® III Control Panel (E.3) to clear all alarms.

**Trouble conditions:**

If the system piping and/or the sprinklers are damaged and either the AC Power and/or Standby Battery Power is available, the low air supervisory switch will activate a trouble alarm at the Firecycle® III Control Panel (E.3).

If the detection system is damaged or malfunctions, the Firecycle® III Control Panel will go into alarm and the Flow Control Valve will open. Water will fill the

**For Technical Data, Installation, Maintenance and Testing Instructions for individual system components, refer to current Viking Technical Data describing individual components of the system used.**

Viking Technical Data may be found on The Viking Corporation's Web site at <http://vikingcorp.com>. The Web site may include a more recent edition of this Technical Data Page.

AIR PRESSURE SETTINGS			
Water	System Air	Detection Circuit #1	Detection Circuit #2
0-175	30+	25	30
175-250	50+	40	50



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## FIRECYCLE® III CYCLING SINGLE INTERLOCKED PREACTION

system piping, activating any connected alarms, but will not discharge from any closed sprinklers attached to the system until a sprinkler has operated, as in a fire. The cycling function of the Firecycle® III System will not operate in this condition. All alarms will operate normally.

### Loss of Power Prior to Operation:

If the AC power fails, the Firecycle® III System continues to operate on the standby batteries. Should the AC power and the standby batteries fail prior to the operation of the system, all alarms will be lost. As long as air pressure remains in the system piping, the Pneumatic Actuator (B.6) will keep the Flow Control Valve (A.1) from opening. If the system air pressure is lost, the Flow Control Valve (A.1) will open, allowing water to flow into the system piping and be discharged from any open sprinklers. The cycling function of the system will not operate in this condition, and the system must be manually shut-off.

### Loss of Power During Operation:

If all power fails while the system is flowing water, the normally open Release Solenoid #2 will fail open. The P.O.R.V. (B.10) is already pressurized open, continually venting the priming chamber of the Flow Control Valve (A.1). The cycling function of the system will not operate in this condition, and the system must be manually shut-off.

### Manual Operation:

Any time the handle inside Emergency Release (B.11) is pulled, pressure is released from the priming chamber faster than it can be replaced through the priming line; the Flow Control Valve (A.1) will open. Water will fill the system piping, activating any connected alarms, but will not discharge from any closed sprinklers attached to the system until a sprinkler has operated, as in a fire. The cycling function of the Firecycle® III System will not operate in this condition, due to the open Emergency Release (B.11). All alarms will operate normally. After operating the Emergency Release (B.11), do not close the Emergency Release until the system is ready to be reset.

## C. INSTALLATION

Refer to current Viking Technical Data describing individual components of the Viking Firecycle® III System. Technical Data describing the Viking Flow Control Valve and other system components are packed with product and in the Viking Engineering Design Data book.

Also, refer to applicable installation standards, codes, and Authorities Having Jurisdiction.

1. The Flow Control Valve (A.1) and Trim must be installed only in areas where they will not be subjected to freezing temperatures or mechanical damage.
2. All indicating appliances and releasing devices must be compatible and approved for use with the Firecycle® III System. Refer to appropriate Fire Protection Equipment Approval Guides and current Viking Technical Data describing individual components of the Viking Firecycle® III System.
3. Use only Firecycle® Detectors (E.4) and Cable (E.5).

## D. EMERGENCY INSTRUCTIONS

(Refer to Figure 1 or 2, Page 425 d.)

### Taking 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 Authorities Having Jurisdiction. Consideration should be given to employment of 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 Authority Having Jurisdiction.

Sprinkler systems 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. If All System Components Are Operational:
  - A. Open Auxiliary Drain.
  - B. Silence alarms (optional).
    - 1: To silence electric alarms controlled by Firecycle® III Control Panel (E.3), open panel and press "ALARM SILENCE"
    - 2: To silence electric alarms not controlled by Firecycle® III Control Panel (E.1), close Alarm Shut-Off Valve (B.9).  
Note: Electric Alarms controlled by a pressure switch installed in the 1/2" (15 mm) NPT connection for a Non-interruptible Alarm Pressure Switch cannot be shut off until the Flow Control Valve is reset or taken out of service.
- C. To return to service immediately, (when no maintenance or repairs are required) :
  - 1: Close System Drain (D.3) if opened in step 1-A.. If necessary, open System Drain (D.3) to drain system and/or Test

Valve (B.15) to drain the inlet chamber of the Flow Control Valve (A.1).

2. Restore system air pressure.
  3. Open Firecycle® III Control Panel (E.3) and press "RE-SET".
  4. Open Alarm Shut-Off Valve (B.9) (If it was closed in step B-2 above).
  5. Verify that all valves are secured in their normal operating position. (Refer to Figure 1 or 2, Page 425 d.)
2. If it is necessary to remove the Firecycle® III system from service:
    - A: Close the Main Water Supply control Valve (D.1).
    - B: Close Priming Valve (B.1) (optional). If necessary, open System Drain (D.3) to drain system and/or Test Valve (B.15) to drain the inlet chamber of the Flow Control Valve (A.1).
    - C: Disconnect all power sources to the Firecycle® III Control Panel prior to performing any maintenance or repairs to the detection system (E.4, E.5), the panel (E.3), solenoid valves (E.1, E.2), or any electrical component of the system.
  3. Perform all maintenance procedures recommended in Firecycle® III Owner's Manual and Technical Data Pages for the individual components of the system that has operated.
    - A. Replace any piping, detectors (E.4), or sections of detection cable (E.5) that have been damaged.  
**Note:** The complete system operation must be tested after servicing, changing programming, addition or deletion of system components or after any modification, repair, or adjustment to system hardware or wiring. All components, circuits, system operation or software functions known to be affected by a change must be 100% tested.
    - B. Replace any sprinklers and/or spray nozzles that have been damaged or exposed to fire conditions.
  4. Restore AC power to Firecycle® III Control Panel (E.3). Ensure that standby batteries are charged or charging.  
Always connect and turn on AC power source prior to connecting the standby batteries. Connecting the



## SYSTEM DATA

## FIRECYCLE® III CYCLING SINGLE INTERLOCKED PREACTION

standby batteries to the Firecycle® III Control Panel (E.3) before the AC power is connected and turned on may damage the panel.

- Return the system to service. Refer to Section E: "PLACING THE SYSTEM IN SERVICE".

### E. PLACING THE SYSTEM IN SERVICE AT INITIAL START-UP

(Refer to Figure 1 or 2, Page 425 d.)

Note: Refer to Firecycle® III Owner's Manual, and instructions provided in Technical Data describing the Viking Flow Control Valve and other system components.

#### To Place the System in Service:

- Verify that the Firecycle® III Control Panel (E.3), Detector Circuits and Detectors have been properly installed and energized according to instructions provided in Viking Technical Data and the Firecycle® III Owner's Manual.
- Verify that the system has been properly drained. (When plunger is depressed on drip check, (B.7) no water should flow.) System Drain (D.3) should be open. Verify that Emergency Release (B.11) is closed.
- Verify that the System Main Water Supply Control Valve (D.1) is closed and the Flow Control Valve (A.1) is trimmed according to current Viking Trim Charts and schematic drawings for the system used.
- Verify that the system water supply piping is pressurized up to the closed System Main Water Supply Control Valve (D.1) and the priming line is pressurized up to the closed Priming Valve (B.1).
- Restore system air pressure.
- Open Priming Valve (B.1).
- Reset the Firecycle® III Control Panel (E.3): Open panel and press "RESET".  
Release Solenoid Valve #1 (E.1) should close. Flow from Release Solenoid Valve #1 (E.1) to Drain Cup (B.14) should stop.
- Open Flow Test Valve (B.15).
- Partially open Main Water Supply Control Valve (D.1) (If closed).
- When full flow develops from Flow Test Valve (B.15), close the Flow Test Valve.
  - Verify that there is no flow from open Auxiliary Drain (B.6).
- Close Auxiliary Drain (B.6).
- Fully open and secure the Main Water Supply Control Valve. (D.1)
- Verify that the Alarm Shut-off Valve (B.9) is open and that all other

valves are in their normal operating position.

- Depress the plunger of Drip check (B.7). No water should flow from the Drip Check when the plunger is pushed.

### F. INSPECTIONS and TESTS

It is imperative that the system be inspected and tested on a regular basis. Refer to INSPECTIONS and TESTS recommended in current Viking Technical Data describing individual components of the Viking Firecycle® III System. Where difficulty in performance is experienced, the manufacturer or their authorized representative shall be contacted if any field adjustment is to be made.

The frequency of the inspections may vary due to contaminated or corrosive water supplies or corrosive atmospheres. For minimum maintenance and inspection requirements, refer to the National Fire Protection Association Pamphlet that describes care and maintenance of sprinkler systems. In addition, the Authority Having Jurisdiction may have additional maintenance, testing, and inspection requirements which must be followed.

**WARNING:** Any system maintenance which involves placing a control valve or detection system out of service may eliminate the fire protection capabilities of that system. Prior to proceeding, notify all Authorities Having Jurisdiction. Consideration should be given to employment of a fire patrol in the affected areas.

### G. MAINTENANCE

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

#### Repairs

To perform maintenance on Detection cable or Detectors without taking the entire system out of service, disable input zone #1. Disabling Input zone #1 disables the detection cable and detectors, leaving the ability to operate the Deluge System manually by use of the Emergency Release or any manual pull stations (if provided) connected to input circuit 2.

Note: When zone #1 is disabled, if it is necessary to activate the system using the Emergency Release or a manual pull station connected to input circuit #2, do not reset the Emergency Release or manual pull station used or the system may cycle off.

When input zone #1 is disabled, the Firecycle® III Detector Cable remains charged with with a maximum short cir-

cuit current of 40mA of 24 VDC. When disabled, an open circuit condition on input circuit #1, will cause the trouble relay to activate and the system trouble LED to activate but will not activate any output circuit associated with input #1.

To disable input circuits and associated output circuits for maintenance: (Refer to Firecycle® III Owner's Manual and applicable Firecycle® III wiring diagram to determine which output circuits are activated by each input circuit.)

- Open the Firecycle® III Control Panel. (E.3)
- Press and hold TONE SILENCE button
- While holding the TONE SILENCE button, press in sequence, the following buttons: ALARM SILENCE, ALARM ACTIVATE, and SYSTEM RESET.

A: The zone #1 LED will flash indicating Zone #1 is selected. To disable zone #1, continue holding the TONE SILENCE button and press SYSTEM RESET once (again). The yellow LED will flash indicating zone #1 is disabled.

B: To disable subsequent zones, continue holding the TONE SILENCE button, and press the ALARM SILENCE button to select the next zone (the LED will flash on the zone selected) or ALARM ACTIVATE button to select the previous zone. Continue to holding ALARM SILENCE and press SYSTEM RESET to disable a selected zone. When disabled, the yellow LED will flash indicating the zone is disabled.

- When desired zones are disabled, release the TONE SILENCE button. The Piezo sounder will sound.
- To silence the Piezo, press TONE SILENCE.
- To re-enable a disabled zone, repeat the procedure.

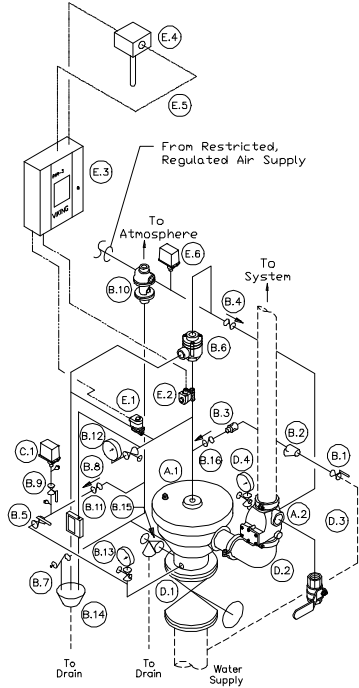
Note: If any zone has been disabled, the Trouble Relay will activate and the System Trouble LED will flash. If a zone has been disabled, an alarm that occurs on that zone will flash the red zone LED, but will not sound the Piezo or activate any output circuit. If both power sources are removed from the system, all zones will be re-enabled upon restoration of power. Disable status is lost.

Refer also to MAINTENANCE INSTRUCTIONS provided in current Viking Technical Data describing individual components of the Viking Firecycle® III System.



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CYCLING SINGLE  
INTERLOCKED PREACTION



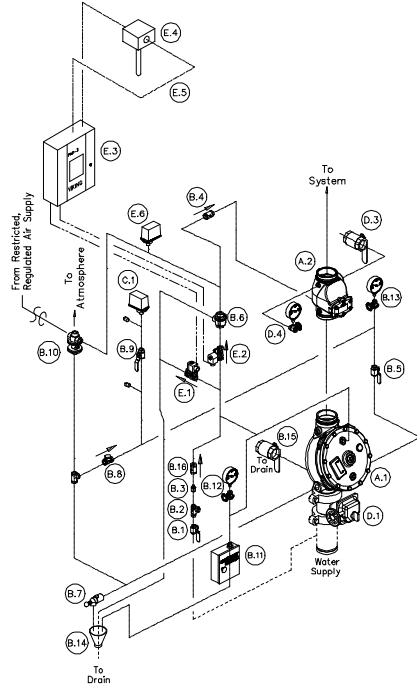
Dashed lines indicate pipe required but not included in Firecycle® III Trim Kit  
Phantom lines indicate electrical detection wiring required but not listed in "System Components" Table. Refer to Technical Data Sheets for wiring requirements of individual components used.

Firecycle® III  
Cycling Single Interlocked  
Preaction System

System Components

- A. Valves
  - A. 1 Flow Control Valve
  - A. 2 Easy Riser™ Check Valve
- B. Firecycle® III Trim
  - B. 1 Priming Valve (Normally Open)
  - B. 2 Strainer
  - B. 3 1/8" Restricted Driftice
  - B. 4 Spring Loaded Check Valve
  - B. 5 Alarm Test Valve (Normally Closed)
  - B. 6 Pneumatic Actuator
  - B. 7 Drip Check Valve
  - B. 8 Drain Check Valve
  - B. 9 Alarm Shut-Off Valve (Normally Open)
  - B. 10 Pressure Operated Relief Valve (PDRV)
  - B. 11 Emergency Release
  - B. 12 Priming Pressure Water Gauge and Valve
  - B. 13 Water Supply Pressure Gauge and Valve
  - B. 14 Drain Cup
  - B. 15 Flow Test Valve (Normally Closed)
  - B. 16 In-Line Check Valve
- C. Water Flow Alarm Equipment
  - C. 1 Water Flow Alarm Pressure Switch
- D. Riser
  - D. 1 Water Supply Control Valve
  - D. 2 90° Ell. (Grooved Ell Shown. Flow Control Valve also available with Flanged Outlet.)
  - D. 3 System Drain
  - D. 4 System Water Pressure Gauge
- E. Release System
  - E. 1 Release Solenoid Valve # 1 (Normally Closed)
  - E. 2 Release Solenoid Valve # 2 (Normally Open)
  - E. 3 Firecycle® III Control Panel
  - E. 4 Firecycle® Detector
  - E. 5 Firecycle® III Detector Cable
  - E. 6 Air Pressure Supervisory Switch

Figure 1



Dashed Lines indicate pipe required but not included in Firecycle® III Trim Kit  
Phantom lines indicate electrical detection wiring required but not listed in "System Components" Table. Refer to Technical Data Sheets for wiring requirements of individual components used.

Firecycle® III  
Cycling Single Interlocked  
Preaction System

System Components

- A. Valves
  - A. 1 Flow Control Valve
  - A. 2 Easy Riser™ Check Valve
- B. Firecycle® III Trim
  - B. 1 Priming Valve (Normally Open)
  - B. 2 Strainer
  - B. 3 1/8" Restricted Driftice
  - B. 4 Spring Loaded Check Valve
  - B. 5 Alarm Test Valve (Normally Closed)
  - B. 6 Pneumatic Actuator
  - B. 7 Drip Check Valve
  - B. 8 Drain Check Valve
  - B. 9 Alarm Shut-Off Valve (Normally Open)
  - B. 10 Pressure Operated Relief Valve (PDRV)
  - B. 11 Emergency Release
  - B. 12 Priming Pressure Water Gauge and Valve
  - B. 13 Water Supply Pressure Gauge and Valve
  - B. 14 Drain Cup
  - B. 15 Flow Test Valve (Normally Closed)
  - B. 16 In-Line Check Valve
- C. Water Flow Alarm Equipment
  - C. 1 Water Flow Alarm Pressure Switch
- D. Riser
  - D. 1 Water Supply Control Valve
  - D. 2 Not used
  - D. 3 System Drain
  - D. 4 System Water Pressure Gauge
- E. Release System
  - E. 1 Release Solenoid Valve # 1 (Normally Closed)
  - E. 2 Release Solenoid Valve # 2 (Normally Open)
  - E. 3 Firecycle® III Control Panel
  - E. 4 Firecycle® Detector
  - E. 5 Firecycle® III Detector Cable
  - E. 6 Air Pressure Supervisory Switch

Figure 2