1. DESCRIPTION
(Refer to Figures 1-3.)
A Viking Non-Interlocked Preaction system utilizes a Viking Deluge Valve to control water flow into system piping equipped with closed sprinklers. Under normal operating conditions, the sprinkler piping is supervised with pressurized air or nitrogen to ensure against undetected leaks. Viking Non-Interlocked Preaction Systems are recommended for very large dry systems, which exceed the capacity normally permitted on a dry valve. Non-Interlocked Preaction Systems are designed so the deluge valve will open when EITHER the detection system operates OR a loss of pneumatic pressure in the sprinkler system occurs. When the deluge valve opens, water will flow into the sprinkler piping and out of any open sprinklers and any other opening on the system.

Release trim for the electrically operated Viking Non-Interlocked Preaction System utilizes an electric solenoid valve controlled by an approved system control panel with a compatible detection system. 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.

2. LISTINGS AND APPROVALS

3. SYSTEM OPERATION
(Refer to Figures 1-3.)

A. IN THE SET CONDITION
System water supply pressure enters the priming chamber of the deluge 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 the check valve and both the normally closed solenoid valve (F.1) and pneumatic actuator (F.2), which is held closed by pneumatic pressure maintained in the sprinkler piping. The pressure in the priming chamber holds the deluge valve clapper closed, keeping the outlet chamber and system piping dry.

B. IN FIRE CONDITIONS
In a fire condition, when the detection system operates, the system control panel (E.4) energizes the solenoid valve (F.1) open. Pressure is released from the priming chamber faster than it is supplied through restricted orifice (B.3). The deluge valve clapper opens to allow water to flow into the system piping, and alarm devices. When a sprinkler head opens, water will flow from the system.

If a sprinkler opens prior to operation of detector, OR ANY TIME PNEUMATIC PRESSURE IN THE SPRINKLER PIPING IS LOST, the pneumatic actuator (F.2) will open. When the pneumatic actuator opens, pressure is released from the priming chamber faster than it is supplied through the restricted orifice (B.3). The deluge valve clapper (A.1) opens to allow water to flow into the system piping and alarm devices. Water will flow from the open sprinkler(s) and/or any other opening in the sprinkler system piping.

When the deluge valve operates, the sensing end of the PORV (B.10) is pressurized, causing the PORV to operate. When the 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.

C. MANUAL OPERATION
Any time the handle inside the emergency release (B.11) is pulled, pressure is released from the priming chamber; the deluge valve will open, but the water will be contained in the sprinkler piping. The water motor alarm (C.2) and alarms connected to the alarm pressure switch (C.1) will activate. If a sprinkler head opens, water will flow from the system.

4. INSTALLATION
Refer to current Viking Technical Data describing individual components of the Viking Non-Interlocked Preaction System. Technical Data describing the Viking Deluge Valve and other system components are packed with product and in the Viking Engineering and Design Data book. Also, refer to applicable installation standards, codes, and Authorities Having Jurisdiction.

A. IMPORTANT SETTINGS
(Also refer to Table 1 on page 309b.)
1. Provide 30 PSI (2 bar) of pneumatic pressure to the pneumatic release system and pneumatic actuator for system water pressures of 175 PSI (12 bar) or less. For system water pressures above 175 PSI (12 bar), up to a maximum of 250 PSI (17.2 bar), provide 50 PSI (3.4 bar) of pneumatic pressure to the pneumatic release system and pneumatic actuator.
2. Set the release system air pressure supervisory switch to activate at 50 PSI (1.7 bar) on pressure drop for system water pressures of 175 PSI (12 bar) or less. For system water pressures above 175 PSI (12 bar), up to a maximum of 250 PSI

Form No. F_110289
Replaces page 309a-h, dated October 3, 2008. (Updated for the new PORV, new Pressure Supervisory Switch, and VFR-400 Release Control Panel part numbers.)

January 27, 2012
(17.2 bar), set the air pressure supervisory switch to activate at 45 PSI (3.1 bar) on pressure drop. The air pressure supervisory switch should be wired to activate an alarm to signal a low air pressure condition. Activation of an alarm to signal a high pressure condition may be required. Refer to applicable installation standards and the Authority Having Jurisdiction.

3. The alarm pressure switch should activate when pressurized to 4 to 8 PSI (.3 to .6 bar) on pressure rise. The alarm pressure switch should be wired to activate the water flow alarm.

B. AIR SUPPLY DESIGN

The air supply compressor should be sized to establish total required air pressure in 30 minutes. The air supply must be regulated, restricted, and maintained automatically.

The air supply must be regulated to maintain the desired pneumatic pressure in the sprinkler piping. Pressures in excess of the pressure settings recommended in section 4. INSTALLATION, may affect operation of the system.

The air supply must be restricted to ensure that the automatic air supply cannot replace air as fast as it escapes when a releasing device or a sprinkler operates.

It is recommended practice to provide an inspector’s test connection on the supervised sprinkler piping. The sprinkler system inspector’s test connection should terminate in an orifice equal to the smallest sprinkler orifice provided. The inspector’s test connection should be equipped with a ball valve (normally locked closed) capable of being opened to simulate the opening of a sprinkler and should be installed at the most hydraulically demanding location of the system. Inspector’s test connections may be used to verify that the automatic air supply cannot replace air as fast as it escapes when a sprinkler operates. Refer to section 7. INSPECTIONS AND TESTS.

5. PLACING THE SYSTEM IN SERVICE

(Refer to Figures 1-3.)

NOTE: REFER TO INSTRUCTIONS PROVIDED IN TECHNICAL DATA DESCRIBING THE VIKING DELUGE VALVE AND OTHER SYSTEM COMPONENTS. (SEE SECTION 8.)

TO RETURN A SYSTEM TO SERVICE:

1. Verify that the system has been properly drained. The system main drain (D.3) and auxiliary drain (B.6) should be open.

2. Close the system main drain (D.3).

3. Restore pneumatic pressure to the release system. Maintain 30 PSI (2 bar) or 50 PSI (3.4 bar) as required by the pneumatic actuator (F.2). Refer to section 4. INSTALLATION.

   a. Verify that the 1/2” valve in the air maintenance device by-pass trim (G.6) is closed and that both 1/4” valves are open.

4. Open the priming valve (B.1).

   a. Verify that there is no flow from the open auxiliary drain (B.6).

5. Reset the system control panel.

6. Open the flow test valve (B.15).

7. Partially open the main water supply control valve (D.1).

8. When full flow develops from the flow test valve (B.13), close the flow test valve (B.15).

   a. Verify that there is no flow from the open auxiliary drain (B.6).

9. Close the auxiliary drain (B.6).

10. Fully open and secure the main water supply control valve (D.1).

11. Verify that the alarm shut-off valve (B.9) is open and that all other valves are in their normal operating position.

12. Depress the plunger of the drip check (B.7). No water should flow from the drip check when the plunger is pushed.

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<tr>
<th>TABLE 1: IMPORTANT SETTINGS</th>
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<td>Air Maintenance Device (G6)</td>
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6. EMERGENCY INSTRUCTIONS

(Refer to Figures 1-3.)

**WARNING**

Any system maintenance that involves placing a control valve or detection system out of service will impair the fire protection capabilities of that system. Prior to proceeding, appropriate impairment procedures per NFPA 25 shall be followed with the notification of all Authorities Having Jurisdiction. Consideration should be given to employment of a fire patrol in the affected areas.

Failure to follow these instructions could cause improper system operation, resulting in serious personal injury and/or property damage.

To Take System Out of Service:

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.

1. Close the water supply valve (D.1).
2. Open the system main drain (D.3).

**NOTE:** ELECTRIC ALARMS CONTROLLED BY A PRESSURE SWITCH INSTALLED IN THE ½” (15 MM) NPT CONNECTION FOR A NON-INTERRUPTIBLE ALARM PRESSURE SWITCH CANNOT BE SHUT OFF UNTIL THE DELUGE VALVE IS RESET OR TAKEN OUT OF SERVICE.

4. Shut off the air supply to the system (optional).
5. Open the auxiliary drain (B.6).
6. Close the priming valve (B.1).

**NOTE:** 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.

7. Replace any detectors that have been damaged.
8. Replace any sprinklers that have opened, been damaged, or have been exposed to fire conditions.
9. Perform all maintenance procedures recommended in Technical Data describing individual components of the system that has operated.
10. Return the system to service as soon as possible. Refer to section 5. PLACING THE SYSTEM IN SERVICE.

7. INSPECTIONS AND TESTS

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

It is imperative that the system is inspected and tested on a regular basis in accordance with NFPA 25. Refer to INSPECTIONS and TESTS recommended in current Viking Technical Data describing individual components of the Viking Non-Interlocked Preaction System used. (See section 8 for hyperlinks to Viking Technical Data.)

The frequency of the inspections may vary due to contaminated water supplies, corrosive water supplies, 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 will impair the fire protection capabilities of that system. Prior to proceeding, appropriate impairment procedures per NFPA 25 shall be followed with the notification of all Authorities Having Jurisdiction. Consideration should be given to employment of a fire patrol in the affected areas.

Failure to follow these instructions could cause improper system operation, resulting in serious personal injury and/or property damage.

**Low Air Pressure Alarm Test**

Quarterly testing of low air alarms is recommended.

**To Test Sprinkler System “Low Supervisory Air” Alarm:**

1. To prevent operation of the deluge valve during the test, CLOSE main water supply control valve (D.1) and open the auxiliary drain (B.6).
2. Fully open the inspector’s test valve to simulate operation of a sprinkler.
3. Verify that low air alarms operate within an acceptable time period and continue without interruption.
4. Close the inspector’s test valve.
5. Establish recommended pneumatic pressure to be maintained. Refer to section 4. INSTALLATION.
6. Open the system control panel and press RESET. Alarms should stop.

When testing is complete, return the system to service following steps 1 through 8 below.

**CAUTION! This procedure applies only when done in conjunction with "Low Air" Alarm testing described above.**

1. Verify that the pressure indicated on the priming pressure water gauge (B.12) indicates that the priming chamber is pressurized with system water supply pressure.
   a. Verify that the auxiliary drain (B.6) is open.
2. Open the flow test valve (B.15).
3. Partially open the main water supply control valve (D.1).
4. When full flow develops from the flow test valve, close the flow test valve (B.15).
   a. Verify that there is no flow from the open auxiliary drain (B.6).
5. Close the auxiliary drain (B.6).
6. Fully open and secure the main water supply control valve (D.1).
7. Verify that the alarm shut-off valve (B.9) is open and that all other valves are in their normal operating position.
8. Depress the plunger of drip check (B.7). No water should flow from the drip check (B.7) when the plunger is pushed.

**Full Flow Trip Test**
Performance of a trip test is recommended annually during warm weather. Consider coordinating this test with operation testing of the detectors.

**CAUTION! Performance of this test will cause the deluge valve to open and the sprinkler system to fill with water.**

**To Trip Test the Electrically Controlled Non-Interlocked Preaction System:**

1. Notify the Authority Having Jurisdiction and those in the area affected by the test.
2. Trip the deluge valve by performing option “a”, “b”, or “c” below.
   a. Operate a detector according to the manufacturer’s instructions.
   b. Open the sprinkler system inspector’s test connection.
   c. Open the door of the emergency release and pull the handle.
3. The deluge valve should open, filling the sprinkler system with water.
   a. Water flow alarms should operate.
4. Open the sprinkler system inspector’s test valve to verify adequate flow.

When trip testing is complete:
5. Perform steps 1 through 10 of section 6. EMERGENCY INSTRUCTIONS to take the system out of service.
6. Perform steps 1 through 12 of section 5. PLACING THE SYSTEM IN SERVICE to return the system to service.
7. Notify the Authority Having Jurisdiction and those in the affected area that testing is complete.

**8. ORDERING INSTRUCTIONS**
To order a complete Non-Interlocked Preaction System with Electric Release, the following components must be purchased: Deluge Valve, Conventional Trim, Release Trim, Solenoid Valve and Release Control Panel.
## DELUGE VALVES, ANGLE STYLE

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## DELUGE VALVES, STRAIGHT THROUGH

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### Technical Data

**Non-Interlocked Preaction System with Electric Release**

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058

Telephone: 269-945-9501  Technical Services: 877-384-5464  Fax: 269-818-1680  Email: techsvcs@vikingcorp.com

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### Valve Trim Package Part Numbers

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### Release Trim Package Part Numbers

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### Easy Risers® Swing Check Valve

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### Check Valve Trim Package Part Numbers

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**Note:** When viewing this data page online, part numbers displayed in **Blue** are hyperlinks. Clicking the part number will open the corresponding technical data page.
TECHNICAL DATA

NON-INTERLOCKED PREACTION SYSTEM WITH ELECTRIC RELEASE

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

SYSTEM COMPONENTS

A. Valve
   A.1 Deluge Valve

B. Deluge Valve Conventional Trim *
   (See Deluge Valve Conventional Trim Charts)
   B.1 Priming Valve (Normally Open)
   B.2 Strainer
   B.3 1/16" Restricted Orifice
   B.4 Spring Loaded Check Valve
   B.5 Alarm Test Valve (Normally Closed)
   B.6 Auxiliary Drain Valve (Normally Closed)
   B.7 Drip Check Valve
   B.8 Drain Check Valve
   B.9 Alarm Shut-Off Valve (Normally Open)
   B.10 Pressure Operated Relief Valve (FORV)
   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)

C. Water Flow Alarm Equipment
   C.1 Alarm Pressure Switch and/or
   C.2 Water Motor Alarm (Strainer Required)
   C.3 Strainer
   C.4 Electric Alarm Bell

D. Riser
   D.1 Water Supply Control Valve
   D.2 Easy Riser Check Valve or rubber sealed check valve
   D.3 Sprinkler System Main Drain

E. Supervisory Air Supply
   E.1 System Pressure Gauge and Valve
   E.2 Soft Seat Swing Check Valve
   E.3 Air Pressure Supervisory Switch

F. Release System
   F.1 Solenoid Valve (Normally Closed)
   F.2 Pneumatic Actuator
   F.3 Electric/Pneumatic Release Trim
   F.4 System Control Panel configured for Non-Interlocked Preaction operation
   F.5 Electric Detection System. Heat Detector shown for clarity.
   F.6 Accelerator (Optional. See Inset.)
   F.7 Accelerator Isolation Valve. (See Inset.)

G. Air Supply
   G.1 Automatic Air Supply. Air Compressor and Tank shown for clarity.
   G.2 Air Supervisory Pressure Switch
      (Compressor On/Off Control Switch)
   G.3 Soft Seat Check Valve
   G.4 Shut Off Valve
      (Indicating Ball Valve recommended.)
   G.5 Dehydrator
   G.6 Air maintenance Device & By-Pass Trim

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FIGURE 1: ANGLE STYLE DELUGE VALVE WITH TANK MOUNTED COMPRESSOR
(6" VALVE SHOWN)
FIGURE 2: STRAIGHT THROUGH HORIZONTAL DELUGE VALVE
6” VALVE SHOWN

SYSTEM COMPONENTS
A. Valve
   A.1 Deluge Valve
B. Deluge Valve Conventional Trim*
   (See Deluge Valve Conventional Trim Charts)
   B.1 Priming Valve (Normally Open)
   B.2 Strainer
   B.3 1/16” Restricted Orifice
   B.4 Spring Loaded Check Valve
   B.5 Alarm Test Valve (Normally Closed)
   B.6 Auxiliary Drain Valve (Normally Closed)
   B.7 Drip Check Valve
   B.8 Drain Check Valve
   B.9 Alarm Shut-Off Valve (Normally Open)
   B.10 Pressure Operated Relief Valve (PORV)
   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)
C. Water Flow Alarm Equipment
   C.1 Alarm Pressure Switch and/or
   C.2 Water Motor Alarm (Strainer Required)
   C.3 Strainer
   C.4 Electric Alarm Bell
D. Riser
   D.1 Water Supply Control Valve
   D.2 Easy Riser Check Valve or rubber seated check valve
   D.3 Sprinkler System Main Drain
E. Supervisory Air Supply
   E.1 System Pressure Gauge and Valve
   E.2 Soft Seat Swing Check Valve
   E.3 Air Pressure Supervisory Switch
F. Release System
   F.1 Solenoid Valve (Normally Closed)
   F.2 Pneumatic Actuator
   F.3 Pneumatic Release Trim
   F.4 System Control Panel configured for Non-Interlocked Preaktion operation,
   F.5 Electric Detection System. Heat Detector shown for clarity.
   F.6 Accelerator (Optional. See Inset.)
   F.7 Accelerator Isolation Valve. (See Inset.)
G. Air Supply
   G.1 Automatic Air Supply, Air Compressor and Tank shown for clarity.
   G.2 Air Supervisory Pressure Switch
      (Compressor On/Off Control Switch)
   G.3 Soft Seat Check Valve
   G.4 Shut Off Valve
      (Indicating Ball Valve recommended.)
   G.5 Dehydrator
   G.6 Air maintenance Device & By-Pass Trim

---

NON-INTERLOCKED PREACTION SYSTEM WITH ELECTRIC RELEASE

SYSTEM COMPONENTS
A. Valve
   A.1 Deluge Valve
B. Deluge Valve Conventional Trim *
   (See Deluge Valve Conventional Trim Charts)
   B.1 Priming Valve (Normally Open)
   B.2 Strainer
   B.3 1/16" Restricted Orifice
   B.4 Spring Loaded Check Valve
   B.5 Alarm Test Valve (Normally Closed)
   B.6 Auxiliary Drain Valve (Normally Closed)
   B.7 Drip Check Valve
   B.8 Drain Check Valve
   B.9 Alarm Shut-Off Valve (Normally Open)
   B.10 Pressure Operated Relief Valve (PORV)
   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)
C. Water Flow Alarm Equipment
   C.1 Alarm Pressure Switch and/or
   C.2 Water Motor Alarm (Strainer Required)
   C.3 Strainer
   C.4 Electric Alarm Bell
D. Riser
   D.1 Water Supply Control Valve
   D.2 Easy Riser Check Valve or rubber seated check valve
   D.3 Sprinkler System Main Drain
E. Supervisory Air Supply
   E.1 System Pressure Gauge and Valve
   E.2 Soft Seat Swing Check Valve
   E.3 Air Pressure Supervisory Switch
F. Release System
   F.1 Solenoid Valve (Normally Closed)
   F.2 Pneumatic Actuator
   F.3 Electric/Pneumatic Release Trim
   F.4 System Control Panel configured for Non-Interlocked Preaction operation.
   F.5 Electric Detection System. Heat Detector shown for clarity.
   F.6 Accelerator (Optional. See Inset.)
   F.7 Accelerator Isolation Valve. (See Inset.)
G. Air Supply
   G.1 Automatic Air Supply. Air Compressor and Tank shown for clarity.
   G.2 Air Supervisory Pressure Switch (Compressor On/Off Control Switch)
   G.3 Soft Seat Check Valve
   G.4 Shut Off Valve
   (Indicating Ball Valve recommended.)
   G.5 Dehydrator
   G.6 Air maintenance Device & By-Pass Trim

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** FIGURE 3: STRAIGHT THROUGH VERTICAL DELUGE VALVE
6" VALVE SHOWN **

Form No. F_110289

Replaces page 309a-h, dated October 3, 2008. (Updated for the new PORV, new Pressure Supervisory Switch, and VFR-400 Release Control Panel part numbers.)