This TotalPac®X integrated fire protection system by FireFlex Systems Inc. consists of a SUREFIRE® system trim totally pre-assembled, pre-wired and factory tested. All electrical and mechanical components of the system are contained in one single unit.

TotalPac®X SUREFIRE® preaction systems are built around the Viking trim using deluge valves model E-3 for 1½” (40 mm) diameter and model E-1 for 2” (50 mm) diameter and up.

SUREFIRE® double interlock preaction systems use closed automatic sprinklers in the sprinkler piping. A detection network is used in parallel with the automatic sprinkler system and is designed to operate before a sprinkler head fuses. This network is electric and may be actuated by manual, fixed temperature, rate-of-rise temperature, smoke or other means. Detection system operates before the sprinkler fuses and gives an alarm. In fire conditions, when the detection system operates AND a sprinkler head opens, the system control panel (supplied by others) activates the deluge valve.

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 environment with or without electrical power. If a condition occurs that removes both the primary and secondary power supplies, the pneumatic actuator becomes the release mechanism and the system will operate as a dry pipe system.

The SUREFIRE® preaction system requires a VIKING VFR-400 control panel (supplied by others).

All the valves are rated up to a maximum of 250 psi WWP (1724 kPa) max. and are available in the following diameters:

- 1½” (40 mm)
- 2” (50 mm)
- 3” (80 mm)
- 4” (100 mm)
- 6” (150 mm)
Cabinet

- **NEMA 3**
  Enclosures constructed for either indoor or outdoor use to provide a degree of protection of the equipment inside the enclosure against ingress of solid foreign objects (falling dirt and windblown dust); to provide a degree of protection with respect to harmful effects on the equipment due to the ingress of water (rain, sleet, snow); and that will be undamaged by the external formation of ice on the enclosure.

- **NEMA 4**
  Enclosures constructed for either indoor or outdoor use to provide a degree of protection of the equipment inside the enclosure against ingress of solid foreign objects (falling dirt and windblown dust); to provide a degree of protection with respect to harmful effects on the equipment due to the ingress of water (rain, sleet, snow, splashing water, and hose directed water); and that will be undamaged by the external formation of ice on the enclosure.

- **NEMA 3X**
  Enclosures constructed for either indoor or outdoor use to provide a degree of protection of the equipment inside the enclosure against ingress of solid foreign objects (falling dirt and windblown dust); to provide a degree of protection with respect to harmful effects on the equipment due to the ingress of water (rain, sleet, snow); that provides an additional level of protection against corrosion and that will be undamaged by the external formation of ice on the enclosure.

- **NEMA 4X**
  Enclosures constructed for either indoor or outdoor use to provide a degree of protection of the equipment inside the enclosure against ingress of solid foreign objects (windblown dust); to provide a degree of protection with respect to harmful effects on the equipment due to the ingress of water (rain, sleet, snow, splashing water, and hose directed water); that provides an additional level of protection against corrosion; and that will be undamaged by the external formation of ice on the enclosure.

### COMPARISON OF SPECIFIC NON-HAZARDOUS APPLICATIONS

<table>
<thead>
<tr>
<th>Provide a degree of protection against the following environmental conditions</th>
<th>Type of enclosure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Incidental contact with enclosed equipment</td>
<td>●</td>
</tr>
<tr>
<td>Rain, snow and sleet</td>
<td>●</td>
</tr>
<tr>
<td>Hose down and splashing water</td>
<td>●</td>
</tr>
<tr>
<td>Corrosive agents</td>
<td>●</td>
</tr>
<tr>
<td>Ingress of solid foreign object (circulating or setting airborne dust, lint, fibers, and flyings) (^b)</td>
<td>●</td>
</tr>
<tr>
<td>Ingress of solid foreign objects (windblown dust, lint, fibers, and flyings) (^b)</td>
<td>●</td>
</tr>
</tbody>
</table>

\(^a\): these cabinets may be ventilated.

\(^b\): these fibers and flyings are non-hazardous materials and are not considered class III type ignitable fibers or combustible flyings.
**Sequence of operation (see trim diagram)**

In a fire condition, operation of the detection system activates the first initiating circuit in the system control panel (supplied by others), causing an alarm to activate. When a sprinkler operates, air pressure escapes from the sprinkler piping. The air supervisory switch activates the second initiating circuit in system control panel. When BOTH initiating circuits have been activated, system control panel energizes solenoid valve (F1) open.

Pressure is released from the priming chamber of the deluge valve (A1) 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 system piping and alarm devices, causing the alarm pressure switch (C1) and optional water motor alarm (C2) to activate. Water will flow from any open sprinklers and/or other opening in the sprinkler piping.

When the deluge valve operates, the sensing end of the PORV (B9) is pressurized, causing the PORV to open. When the PORV opens, it drains the priming water pressure to the priming chamber, preventing the deluge valve (A1) from resetting, even if the open releasing devices close. The deluge valve can only be reset after the system is taken out of service, and the outlet

**Systems hydraulic limitations**

**WARNING** The information contained herewith is for estimation and evaluation purposes only. Its use remains the responsibility of the designer. Designers should refer to the appropriate NFPA Standards and any other applicable codes for their final design. Also refer to FireFlex Systems Inc. appropriate user manuals and to manufacturer's data sheets for additional details. Systems limitations indicated below are nominal flow limitations.

<table>
<thead>
<tr>
<th>System size (in.)</th>
<th>Usage Range (gpm)</th>
<th>Piping Equivalent Lengths w/o shut off valve</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>(m.)</td>
</tr>
<tr>
<td>1½</td>
<td>0 – 200</td>
<td>8.6</td>
</tr>
<tr>
<td>2</td>
<td>0 – 330</td>
<td>12.9</td>
</tr>
<tr>
<td>3</td>
<td>125 – 700</td>
<td>19.8</td>
</tr>
<tr>
<td>4</td>
<td>250 – 1200</td>
<td>27</td>
</tr>
<tr>
<td>6</td>
<td>750 – 2800</td>
<td>31.2</td>
</tr>
</tbody>
</table>
Standard equipment

**Deluge valve**
The Viking Model deluge valve is a quick-opening, differential diaphragm, flood valve with one moving mechanism. The deluge valve is used to control water flow in deluge and preaction sprinkler systems. The valve is held closed by system water pressure trapped in the priming chamber, keeping the outlet chamber and system piping dry. In fire conditions, when the releasing system operates, pressure is released from the priming chamber. The deluge valve clapper opens to allow water to flow into the system piping.

**Water supply control valve**
The water inlet control valve is a supervised, indicating butterfly valve. Purpose of this valve is to manually shutoff the preaction system.

**Solenoid valve**
The high pressure solenoid valve is a two-way type with one inlet and one outlet. It is a packless, internal pilot operated valve, suitable for use in releasing water pressure from the priming chamber of Viking deluge valves. The solenoid valve has floating diaphragm construction, which requires a minimum pressure drop across the valve to operate properly.

**Pneumatic actuator**
Used in conjunction with the solenoid valve, the Viking Pneumatic Actuator is a spring loaded, rolling diaphragm and piston operated valve. It is used wherever a combination is required between the detection and system’s loss of air.

**Preaction riser check valve**
The Viking spring loaded In-Line check valve is a general purpose rubber-faced check valve approved for use in fire-service systems. The Spring Loaded In-Line check valve is manufactured with a brass body, brass seat, and a rubber-faced clapper assembly.
The Viking Easy Riser® Swing check valve is a general purpose rubber-faced check valve approved for use in fire service systems. The valve is for use in preaction system risers.
**Standard equipment (continued)**

**Alarm pressure switch**
The alarm pressure switch monitors the water flow within the sprinkler piping. Should the Deluge Valve clapper open to allow water to flow into the sprinkler piping, the alarm pressure switch will activate, indicating a water flow signal.

**Low air supervisory switch**
The low air supervisory switch monitors the pressure within the sprinkler piping should a loss pressure of the air below 25 PSI occur. The pressure switch contacts transfer indicating supervisory signal. Should a loss pressure of the air below 23 PSI occur, the pressure switch contacts transfer indicating alarm signal.
Optional equipment

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

- **Heater option**
  Heater option is recommended where ambient temperatures can drop below 40°F (4.5°C). The cabinet’s electric heater temperature cut-out point is set at 50°F (10°C). The heater option is equipped with a low temperature sensor that will activate a supervisory signal when temperature drops below 40°F±5°F (4.5°C±3°C).

  Heater option can be ordered in two supply voltage settings:
  - 120Vac-60Hz. 400Watts.
  - 220Vac-50Hz. 400Watts.

- **Insulated enclosure (standard with heater option)**
  Insulation is made on foam core 2” thick R13 and have a foil-faced sheathing board composed of a uniform closed cell polyisocyanurate foam core bonded on each side to a trimate foil facer. One side has a foil reflective facer and the other side has a non-reflective foil facer.

- **Low temperature sensor (standard with heater option)**
  The low temperature sensor will close the normally open contact when the temperature drops below 40°F (4.5°C). The sensor will automatically reset to its normal state when the temperature rises above 40°F (4.5°C).

- **Light option**
  Optional fluorescent enclosure light is available for all cabinet configurations. Remote door switch activates the light when the door is opened.

  Light option can be ordered in two supply voltage settings:
  - 120Vac-60Hz.
  - 220Vac-50Hz.

---

**Warning:** *TOTALPac®X cabinet is rated to provide freeze protection down to a minimum temperature of 14°F (-10°C).*
**Air supply**

**Direct air compressor (Style “A”)**

Used only for the sprinkler piping network of the preaction system. Air supply style “A” includes the air compressor mounted inside the **TOTALPac®X** cabinet with its supervisory trim and options. Compressors are of the tankless, oilless piston type and are factory piped to the sprinkler system riser, all within the **TOTALPac®X** cabinet.

**Note:** Direct air compressor is available only with NEMA 3, 3X cabinet.

Compressors are available in four (4) sizes:
- 1/6HP
- 1/3HP
- 1/2HP
- 1HP

<table>
<thead>
<tr>
<th>Compressor Size</th>
<th>Amp. Rating at 120Vac – 60Hz</th>
<th>Amp. Rating at 220Vac – 50Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/6</td>
<td>6.6 A</td>
<td>3.3 A</td>
</tr>
<tr>
<td>1/3</td>
<td>6.6 A</td>
<td>3.3 A</td>
</tr>
<tr>
<td>1/2</td>
<td>8 A</td>
<td>4 A</td>
</tr>
<tr>
<td>1</td>
<td>12.4 A</td>
<td>6.2 A</td>
</tr>
</tbody>
</table>

**Air Pressure Maintenance Device (Style “B”)**

Used only for the sprinkler piping network of the preaction system, when an external air supply is provided by others (tank mounted compressor, plant air or dry nitrogen cylinders) and piped to the air inlet port of the unit. Air supply style “B” provides an Air Pressure Maintenance Device (APMD) trim, factory mounted in the **TOTALPac®X** cabinet.

**Direct air, external compressor (Style “D”)**

Mainly used with Preaction systems protecting refrigerated spaces and freezers, where a special dry external air supply unit is piped directly to the system riser inside the freezer itself, as shown in NFPA-13. Air supply Style “D” provides only an air supervisory and shut-off trim.

**Note:** The external air supply must be restricted to insure that it cannot replace air as fast as it escapes when a releasing device or sprinkler operates.

**Warning:** When air supplies style “B” or “D” is selected, the air supply should be provided and installed by the sprinkler contractor OUTSIDE of the **TOTALPac®X** cabinet. It is NOT provided with the unit.
Details & field wiring diagrams

Cabinet with main components, shown without door

- Light (optional)
- Isolating switch (for optional compressor)
- Door light switch (for optional light)
- Junction box TBA & TBB
- Compressor (optional)
- Riser check valve
- Heater (optional)
- Drain outlet
- Deluge valve
- Water supply control valve
- Water inlet
Components:

A1 Deluge valve
B1 Priming valve
B2 Strainer
B3 1/16" Restricted orifice
B4 Spring loaded check valve
B5 Alarm test valve
B6 Flow test valve
B7 Drip check valve
B8 Drain check valve
B9 Pressure operated relief valve (PORV)
B10 Emergency release valve
B11 Priming pressure water gauge & valve
B12 Water supply pressure gauge & valve
B13 Clapper check valve
C1 Alarm pressure switch
C2 Connection to water motor gong (strainer supplied by contractor)
D1 Water supply control valve
D2 Riser check valve
D3 Main drain valve
E4 Air supervisory pressure switch
E9 Float-check assembly
F1 N.C. Solenoid valve – 24Vdc
F2 N.O. Solenoid valve – 24Vdc
F3 Pneumatic actuator
F4 Pneumatic actuator pressure gauge
F5 5/64" Restricted orifice
Wiring diagram

NOTES:
- ALL DEVICES ARE SHOWN IN THEIR NORMAL SUPERVISORY STATE.
- DRY CONTACTS RATINGS:
  PRESS. SWITCHES: 2.0A. 30VDC / 10A. 125/250 VAC
  SUPV. SWITCHES: 0.5A. 125 VDC / .025A. 250 VAC / 10A 125/250VAC
  USE ONLY WITH POWER LIMITED CIRCUITS
- USE END-OF-LINE DEVICES COMPATIBLE WITH THE RELEASE CONTROL PANEL USED (NOT INCLUDED).

SOLENOID VALVE ELECTRICAL RATINGS

<table>
<thead>
<tr>
<th>Viking P/N</th>
<th>Description</th>
<th>Voltage</th>
<th>Watts</th>
<th>DC Amps</th>
<th>Pressure Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>11591</td>
<td>N.C. 24 Vdc</td>
<td>10</td>
<td>416</td>
<td></td>
<td>300 psi (2008 kPa)</td>
</tr>
<tr>
<td>11596</td>
<td>N.O. 24 Vdc</td>
<td>10</td>
<td>416</td>
<td></td>
<td>300 psi (2008 kPa)</td>
</tr>
</tbody>
</table>

Notes:
1. Solenoid Valve is UL Listed as Fire Protection Special System Water Control Release Service (UL 429A Product category VLTR).
2. Voltage Drop: For proper operation, make sure that voltage at the solenoid valve is at least 85% of nameplate rating.
**Dimensions**

Dimensions are nominal and may vary ±¼".

| Size | A   | B   | C   | D   | E   | F   | G   | H   | J   | K   | L   | M   | N   | NN  | O   | Q   | R   | S   | T   | U   | V   | W   | X   | Y   |
|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1.5" | 2"  | 1.5"| 2"  | 50" | 24.5"| 14.5"| 74" | 11.5"| 11" | 66" | 25" | 5.5"| 25" | 25" | 11" | 60" | 4.75"| 6"  | 9.5"| 10.5"| 4"  | 5"  | 9.5"| 7.75"|
| 2"  | 2"  | 2"  | 2"  | 50" | 23" | 12" | 74" | 11" | 66" | 25" | 5"  | 25" | 25" | 11" | 60" | 4.75"| 6"  | 9.5"| 10.5"| 4"  | 5"  | 9.5"| 8"  |
| 3"  | 4"  | 3"  | 2"  | 50" | 23" | 12.5"| 74" | 8.5"| 11" | 66" | 25" | 5.5"| 28.5"| 22"| 11" | 60" | 4.75"| 6"  | 9.5"| 10.5"| 4"  | 5"  | 9.5"| 8.5"|
| 4"  | 4"  | 4"  | 2"  | 50" | 22.5"| 12.5"| 74" | 8"  | 12" | 68" | 25" | 5.5"| 25.5"| 25.5"| 12"| 60" | 4.75"| 6"  | 9.5"| 10.5"| 4"  | 5"  | 9.5"| 9"  |
| 6"  | 6"  | 6"  | 2"  | 50" | 21" | 12" | 74" | 8"  | 12" | 68" | 25" | 5"  | 25" | 25" | 12" | 60" | 4.75"| 6"  | 9.5"| 10.5"| 4"  | 5"  | 9.5"| 9"  |