1. DESCRIPTION

Viking Freedom® Residential Concealed Pendent Sprinkler VK466 is a small high-sensitivity glass bulb residential sprinkler for use with a domed cover assembly. The sprinkler orifice design, with a K-Factor of 5.2 (74.9 metric*), allows the sprinkler’s efficient use of available water supplies for the hydraulically designed fire-protection system. The glass bulb operating element and special deflector characteristics meet the challenges of residential sprinkler standards.

Concealed sprinkler VK466 is pre-assembled with a threaded adapter for installation with the domed cover that provides up to ½” (12.7 mm) of vertical adjustment. The cover plate is available with several decorative finishes to meet design requirements. The two-piece design allows installation and testing of the sprinkler prior to installation of the cover plate. The push-on, thread-off design of the concealed cover plate assembly allows easy installation of the cover plate after the system has been tested and the ceiling finish has been applied. The cover assembly can be removed and reinstalled, allowing temporary removal of ceiling panels without taking the sprinkler system out of service or removing the sprinkler. The Electroless Nickel PTFE (ENT) coating has been investigated for installation in corrosive atmospheres and is C-UL-US-EU Listed as corrosion resistant as indicated in the Approval Charts. The ENT finish is only available for the sprinkler assembly, the cover plate is not plated.

2. LISTINGS AND APPROVALS

UL Listed (C-UL-US-EU): Category VKKW
UL Classified to: NSF/ANSI Standard 61, Drinking Water System Components (MH48034)
Refer to the Approval Charts and Design Criteria for C-UL-US-EU Listing requirements that must be followed.

3. TECHNICAL DATA

Specifications:
Available since 2006.
Minimum Operating Pressure: Refer to the Approval Charts.
Maximum Working Pressure: 175 psi (12 bar). Factory tested hydrostatically to 500 psi (34.5 bar).
Thread size: 1/2” (15 mm) NPT
Nominal K-Factor: 5.2 U.S. (74.9 metric*)
* Metric K-factor measurement shown is in Bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.
Glass-bulb fluid temperature rated to -65 °F (-55 °C)
Overall Length: 2-1/4” (58 mm)

Material Standards:
Frame Casting: Brass UNS-C84400 or QM Brass
Deflector: Brass UNS-C23000 or Phosphor Bronze UNS-C51000
Bulb: Glass, nominal 3 mm diameter
Belleville Spring Sealing Assembly: Nickel Alloy, coated on both sides with PTFE Tape
Compression Screw: Brass UNS-C36000
Pip Cap and Insert Assembly: Copper UNS-C11000 and Stainless Steel UNS-S30400
Cover Adapter: Cold Rolled Steel UNS-G10080, Finish: Clear Chromate over Zinc Plating

Cover Assembly Materials:
Cover Plate Assembly: Copper UNS-C11000 and Brass UNS-C26800
Spring: Beryllium Nickel
Solder: Eutectic

Ordering Information: (Also refer to the current Viking price list.)
Viking Residential Concealed Pendent Sprinkler VK466 and Cover Plate Assembly must be ordered separately:
Sprinkler: Base Part Nos. 13781A-X for Brass finish and 13781JN-X for ENT finish (includes sprinkler and adapter pre-assembled, with a protective plastic cap covering the unit)
Specify sprinkler temperature rating by adding the appropriate suffix for the temperature rating to the base part number:
Temperature Suffix: 155 °F (68 °C) = B, 175 °F (79 °C) = D
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

For example, sprinkler VK466 with a 155°F/68°C temperature rating = 13781ABX.

Note: When ordering this sprinkler using the SIN, add suffix -D. For example, concealed sprinkler VK466 = VK466-D.

**Cover Plate Assembly:** Base Part No. 12207
Specify finish and temperature rating of the cover plate assembly by adding the appropriate suffixes for the finish and the cover temperature rating to the base part number:
Finish Suffix: Polished Chrome = F, Brushed Chrome = F-/B, Bright Brass = B, Antique Brass = B-/A, Brushed Brass = B-/B,
Brushed Copper = E-/B, Painted White = M-/W, Painted Ivory = M-/I, Painted Black = M-/B
Temperature Suffix: 135 °F (57 °C) = A
For example, cover 12207 with a Polished Chrome finish and a 135 °F (57 °C) temperature rating = 12207FA.

**Available Finishes And Temperature Ratings:** Refer to Table 1.

**Accessories:** (Also refer to the “Sprinkler Accessories” section of the Viking data book.)
Sprinkler **Wrench:** Part No. 13577W/B** (available since 2006)
**A ½” ratchet is required (not available from Viking).**
Sprinkler **Cabinet:** Part No. 01731A (available since 1971)

4. **INSTALLATION**
Refer to appropriate NFPA Installation Standards.

5. **OPERATION**
During fire conditions, when the temperature around the sprinkler approaches its operating temperature, the cover plate detaches. Continued heating of the exposed sprinkler causes the heat-sensitive liquid in the glass bulb to expand and the bulb to shatter, releasing the pip cap and sealing spring assembly. Water flowing through the sprinkler orifice strikes the sprinkler deflector, forming a uniform spray pattern to extinguish or control the fire.

6. **INSPECTIONS, TESTS AND MAINTENANCE**
Refer to NFPA 25 for Inspection, Testing and Maintenance requirements.

7. **AVAILABILITY**
The Viking Model VK466 Sprinkler is available through a network of domestic and international distributors. See The Viking Corporation web site for the closest distributor or contact The Viking Corporation.

8. **GUARANTEE**
For details of warranty, refer to Viking’s current list price schedule or contact Viking directly.

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**TABLE 1: AVAILABLE SPRINKLER TEMPERATURE RATINGS AND FINISHES**

<table>
<thead>
<tr>
<th>Sprinkler Temperature Classification</th>
<th>Sprinkler Nominal Temperature Rating¹</th>
<th>Maximum Ambient Ceiling Temperature²</th>
<th>Temperature Rating of the Cover Assembly (Required)</th>
<th>Cover Plate Base Part Number³</th>
<th>Bulb Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ordinary</td>
<td>155 °F (68 °C)</td>
<td>100 °F (38 °C)</td>
<td>135 °F (57 °C)</td>
<td>12207</td>
<td>Red</td>
</tr>
<tr>
<td>Intermediate</td>
<td>175 °F (79 °C)</td>
<td>150 °F (65 °C)</td>
<td>135 °F (57 °C)</td>
<td>12207</td>
<td>Yellow</td>
</tr>
</tbody>
</table>

**Sprinkler Finishes:** Brass or ENT (See Ordering Information Section)

**Cover Plate Finishes:** Polished Chrome, Brushed Chrome, Bright Brass, Antique Brass, Brushed Brass, Brushed Copper, Painted White, Painted Ivory, or Painted Black

**Corrosion Resistant Coatings⁴:** ENT

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**Footnotes**

¹ The sprinkler temperature rating is stamped on the deflector.
² Based on NFPA-13. Other limits may apply, depending on fire loading, sprinkler location, and other requirements of the Authority Having Jurisdiction. Refer to specific installation standards.
³ Part number shown is the base part number. For complete part number, refer to current Viking price list schedule.
⁴ The corrosion resistant coatings have passed the standard corrosion test required by the approving agencies indicated in the Approval Charts. These tests cannot and do not represent all possible corrosive environments. Prior to installation, verify through the end-user that the coatings are compatible with or suitable for the proposed environment. For automatic sprinklers, the ENT coating is applied to all exposed exterior surfaces, including the waterway. For ENT coated sprinklers, the Belleville spring is exposed.
# Approval Chart 1

Viking VK466, 5.2 K-Factor Residential Concealed Pendent Sprinkler

For systems designed to NFPA 13D or NFPA 13R. For systems designed to NFPA 13, refer to the design criteria. For Ceiling types refer to NFPA 13, 13R or 13D 2013 Editions

<table>
<thead>
<tr>
<th>Sprinkler Base Part Number ¹</th>
<th>SIN</th>
<th>NPT Thread Size</th>
<th>Nominal K-Factor</th>
<th>Maximum Water Working Pressure</th>
<th>Overall Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>13781A-X</td>
<td>VK466</td>
<td>1/2</td>
<td>15</td>
<td>5.2</td>
<td>74.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>175 psi (12 bar)</td>
</tr>
</tbody>
</table>

Max. Coverage Area ⁶

<table>
<thead>
<tr>
<th>Ft. X Ft. (m X m)</th>
<th>Ordinary Temp Rating (155 °F/68 °C)</th>
<th>Intermediate Temp Rating (175 °F/79 °C)</th>
<th>Deflector to Ceiling</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 X 12 (3.7 X 3.7)</td>
<td>14 GPM (53.0 L/min) 7.2 PSI (0.50 bar)</td>
<td>14 GPM (53.0 L/min) 7.2 PSI (0.50 bar)</td>
<td>3/8 to 7/8 inch</td>
</tr>
<tr>
<td>14 X 14 (4.3 X 4.3)</td>
<td>14 GPM (53.0 L/min) 7.2 PSI (0.50 bar)</td>
<td>14 GPM (53.0 L/min) 7.2 PSI (0.50 bar)</td>
<td></td>
</tr>
<tr>
<td>16 X 16 (4.9 X 4.9)</td>
<td>14 GPM (53.0 L/min) 7.2 PSI (0.50 bar)</td>
<td>14 GPM (53.0 L/min) 7.2 PSI (0.50 bar)</td>
<td></td>
</tr>
<tr>
<td>18 X 18 (5.5 X 5.5)</td>
<td>17 GPM (64.4 L/min) 10.7 PSI (0.74 bar)</td>
<td>17 GPM (64.4 L/min) 10.7 PSI (0.74 bar)</td>
<td></td>
</tr>
<tr>
<td>20 X 20 (6.1 X 6.1)</td>
<td>20 GPM (75.7 L/min) 14.8 PSI (1.02 bar)</td>
<td>20 GPM (75.7 L/min) 14.8 PSI (1.02 bar)</td>
<td></td>
</tr>
</tbody>
</table>

Footnotes

1. Part number shown is the base part number. For complete part number, refer to Viking’s current price schedule.
2. Metric K-factor measurement shown is when pressure is measured in Bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.
3. This chart shows the listings and approvals available at the time of printing. Other approvals may be in process. Check with the manufacturer for any additional approvals. Refer also to Design Criteria.
4. Listed by Underwriter’s Laboratories, Inc. for use in the U.S. and Canada.
5. Meets New York City requirements, effective July 1, 2008.
6. For areas of coverage smaller than shown, use the “Flow” and “Pressure” for the next larger area listed. Flows and pressures listed are per sprinkler. The distance from sprinklers to walls shall not exceed one-half the sprinkler spacing indicated for the minimum “Flow” and “Pressure” used.
7. UL Classified to: NSF/ANSI Standard 61, Drinking Water System Components (MH48034).
8. Cover Temperature Rating is 135 °F (57 °C).
9. Other paint colors are available on request with the same listings as the standard finish colors.
10. Accepted Cover Plate Finishes are: Polished Chrome, Brushed Chrome, Bright Brass, Antique Brass, Brushed Brass, Brushed Copper, Painted White, Painted Ivory, or Painted Black.

Form No. F_091606 Rev 14.1
## Approval Chart 2

**Viking VK466, 5.2 K-Factor Residential Concealed Pendent Sprinkler**

For systems designed to NFPA 13D or NFPA 13R. For systems designed to NFPA 13, refer to the design criteria. For Ceiling types refer to NFPA 13, 13R or 13D 2013 Editions.

<table>
<thead>
<tr>
<th>Sprinkler Base Part Number ¹</th>
<th>SIN</th>
<th>NPT Thread Size</th>
<th>Nominal K-Factor</th>
<th>Maximum Water Working Pressure</th>
<th>Overall Length</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Inches</td>
<td>mm</td>
<td>U.S.</td>
<td>metric ²</td>
</tr>
<tr>
<td>13781JN-X</td>
<td>VK466</td>
<td>1/2</td>
<td>15</td>
<td>5.2</td>
<td>74.9</td>
</tr>
</tbody>
</table>

### Max. Coverage Area ⁵

<table>
<thead>
<tr>
<th>Ft. X Ft. (m X m)</th>
<th>Ordinary Temp Rating (155 °F/68 °C)</th>
<th>Intermediate Temp Rating (175 °F/79 °C)</th>
<th>Deflector to Ceiling</th>
<th>Installation Type</th>
<th>Listings and Approvals ³</th>
<th>Minimum Spacing Ft. (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Flow² GPM (L/min)</td>
<td>Pressure² PSI (bar)</td>
<td>Flow² GPM (L/min)</td>
<td>Pressure² PSI (bar)</td>
<td>C-UL-US-EU⁴</td>
<td>NYC</td>
</tr>
<tr>
<td>12 X 12 (3.7 X 3.7)</td>
<td>14 (53.0)</td>
<td>7.2 (0.50)</td>
<td>14 (53.0)</td>
<td>7.2 (0.50)</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>14 X 14 (4.3 X 4.3)</td>
<td>14 (53.0)</td>
<td>7.2 (0.50)</td>
<td>14 (53.0)</td>
<td>7.2 (0.50)</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>16 X 16 (4.9 X 4.9)</td>
<td>14 (53.0)</td>
<td>7.2 (0.50)</td>
<td>14 (53.0)</td>
<td>7.2 (0.50)</td>
<td>3/8 to 7/8 inch</td>
<td>Concealed with Cover Plate Assembly</td>
</tr>
<tr>
<td>18 X 18 (5.5 X 5.5)</td>
<td>17 (64.4)</td>
<td>10.7 (0.74)</td>
<td>17 (64.4)</td>
<td>10.7 (0.74)</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>20 X 20 (6.1 X 6.1)</td>
<td>20 (75.7)</td>
<td>14.8 (1.02)</td>
<td>20 (75.7)</td>
<td>14.8 (1.02)</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

### Footnotes

¹ Part number shown is the base part number. For complete part number, refer to Viking's current price schedule.

² Metric K-factor measurement shown is when pressure is measured in Bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.

³ This chart shows the listings and approvals available at the time of printing. Other approvals may be in process. Check with the manufacturer for any additional approvals. Refer also to Design Criteria.

⁴ Listed by Underwriter’s Laboratories, Inc. for use in the U.S., Canada, and European Union.

⁵ For areas of coverage smaller than shown, use the “Flow” and “Pressure” for the next larger area listed. Flows and pressures listed are per sprinkler. The distance from sprinklers to walls shall not exceed one-half the sprinkler spacing indicated for the minimum “Flow” and “Pressure” used.

⁶ Cover Temperature Rating is 135 °F (57 °C).

⁷ Other paint colors are available on request with the same listings as the standard finish colors.

⁸ Accepted Cover Plate Finishes are: Polished Chrome, Brushed Chrome, Bright Brass, Antique Brass, Brushed Brass, Brushed Copper, Painted White, Painted Ivory, or Painted Black.

⁹ C-UL-US-EU Listed as corrosion resistant.
DESIGN CRITERIA
(Also refer to the Approval Charts.)

UL Listing Requirements (C-UL-US-EU):
When using Viking Residential Concealed Pendent Sprinkler VK466 for systems designed to NFPA 13D or NFPA 13R, apply the listed areas of coverage and minimum water supply requirements shown in the Approval Charts.

For systems designed to NFPA 13:
The number of design sprinklers is to be the four contiguous most hydraulically demanding sprinklers. The minimum required discharge from each of the four sprinklers is to be the greater of the following:

- The flow rates given in the Approvals Charts for NFPA 13D and NFPA 13R applications for each listed area of coverage, or
- Calculated based on a minimum discharge of 0.1 gpm/sq. ft. over the “design area” in accordance with sections 8.5.2.1 or 8.6.2.1.2 of NFPA 13.
- Minimum distance between residential sprinklers: 8 ft. (2.4 m).
- DEFLECTOR POSITION: Install Residential Concealed Pendent Sprinkler VK466 with the deflector 3/8” (9.5 mm) to 7/8” (22.2 mm) below the ceiling. Refer to Figure 3.

NOTE: Concealed sprinklers must be installed in neutral or negative pressure plenums only.

IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. Also refer to pages RES1-17 for general care, installation, and maintenance information. Viking sprinklers are to be installed in accordance with the latest edition of Viking technical data, the appropriate standards of NFPA and any other similar Authorities Having Jurisdiction, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable. Final approval and acceptance of all residential sprinkler installations must be obtained from the Authorities Having Jurisdiction.
Figure 2:
Sprinkler Installation and Correct Use of Sprinkler Wrench 13577W/B

Step 1: Carefully slide the wrench sideways around the deflector.

Step 2: Carefully press the wrench upward and turn slightly to ensure engagement with the sprinkler wrench flats.

Figure 3:
Sprinkler Dimensions and Cover Installation

1/2" NPT (15 mm)
2-1/4" (57 mm)
1-3/8" (34.3 mm) Minimum
7/8" (22.2 mm) Maximum
3/8" (9.5 mm) Minimum
1-7/8" (47 mm) Maximum
3-1/8" (80 mm)
1" (25.4 mm)