1. DESCRIPTION
Viking Standard Response Concealed Pendent Sprinkler VK4921 is a small
thermosensitive, glass-bulb sprinkler designed for installation on concealed pipe
systems where the appearance of a smooth ceiling is desired. The low-profile
cover assemblies provide up to ½” (13 mm) of vertical adjustment.
Features:
• K5.6 (80.6 metric).
• Standard response glass bulb operating element.
• Integral threaded adapter cup accepts push-on or thread-on cover plates.
• Low-profile, small diameter, removeable cover plates offer almost flush
appearance upon installation and allow ease of maintenance.
• Protective cap prevents damage during installation and finishing and keeps
errant overspray from coating internal parts.
• Various finishes available to meet design requirements.
• Optional Electroless Nickel PTFE (ENT) coating provides corrosion resistance
(see Approval Chart).

2. LISTINGS AND APPROVALS

UL: Category VNIV

FM: Class 2015
Also approved for use in FM Approved vacuum dry sprinkler systems with
a maximum supervisory vacuum pressure of -3 psi (-207 mbar).
Refer to the Approval Charts and Design Criteria on for cULus Listing requirements
that must be followed.

3. TECHNICAL DATA
Specifications:
Minimum Operating Pressure: 7 psi (0.5 bar)
Maximum Working Pressure: FM - 175 psi (12 bar). UL - 250 psi (17.2 bar)
Factory tested hydrostatically to 500 psi (34.5 bar).
Thread size: 1/2” NPT or 15 mm BSPT
Nominal K-Factor: 5.6 U.S. (80.6 metric*)
Glass-bulb fluid temperature rated to -65 °F (-55 °C)

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

Material Standards:
Sprinkler body: QM Brass or DZR Brass
Deflector: Phosphor Bronze UNS-C51000
Deflector pins: Stainless steel UNS-S43000
Pip cap: Copper UNS-C11000
Pip cap insert: stainless steel UNS-S30400
Pip cap T-hinge ring: Stainless steel UNS-S31600
Compression screw: UNS-C36000
Belleville spring sealing assembly: Nickel alloy, coated on both sides with PTFE tape
Cover adapter: Cold rolled steel JIS G3141 and carbon steel UNS-G10100 (per JIS G3141)
Shipping cap: High-density polyethylene

Cover Plate Materials:
Cover plate assembly: Copper UNS-C11000 and brass UNS-C26800 or stainless steel UNS-S30400
Spring: Beryllium nickel
Solder: Eutectic

Ordering Information: Refer to Tables 1 and 2.

4. INSTALLATION
Refer to appropriate NFPA Installation Standards and installation instructions in this document.
5. **OPERATION**
During fire conditions, when the temperature around the sprinkler approaches its operating temperature, the cover plate detaches, releasing the deflector. Continued heating of the exposed sprinkler causes the heat-sensitive liquid in the glass bulb to expand, causing the glass to shatter, releasing the pip cap and sealing spring assembly. Water flowing through the sprinkler orifice strikes the deflector, forming a uniform spray pattern over a specific area of coverage determined by the water supply pressure at the sprinkler to extinguish or control the fire.

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

7. **AVAILABILITY**
Viking Sprinklers are available through a network of domestic and international distributors. See The Viking Corporation web site for the closest distributor contact The Viking Corporation.

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

### TABLE 1: ORDERING INFORMATION

**Instructions:**
(1) Select a Sprinkler Base Part Number
(2) Add the suffix for the desired Finish
(3) Add the suffix for the desired Sprinkler Temperature Rating
(4) Order a cover plate (refer to Table 2)

**Example:**
24683AE = 200 °F (93 °C) Temperature Rated sprinkler with a standard Brass finish.

<table>
<thead>
<tr>
<th>Sprinkler Base Part No.</th>
<th>Size 1: Finishes</th>
<th>1: Finishes</th>
<th>2: Temperature Ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td>NPT BSPT</td>
<td>Description</td>
<td>Suffix¹</td>
<td>Nominal Rating</td>
</tr>
<tr>
<td>24683 1/2&quot; -- Brass A</td>
<td>Ordinary</td>
<td>A</td>
<td>155 °F (68 °C)</td>
</tr>
<tr>
<td>23116 -- 15 mm ENT 3,4,6</td>
<td>Intermediate</td>
<td>JN</td>
<td>175 °F (79 °C)</td>
</tr>
<tr>
<td></td>
<td>Intermediate</td>
<td></td>
<td>200 °F (93 °C)</td>
</tr>
</tbody>
</table>

**Accessories**

<table>
<thead>
<tr>
<th>Part number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>23143⁵</td>
<td>Installation wrench⁵,⁸</td>
</tr>
<tr>
<td>14417</td>
<td>Concealed cover plate installer tool (available since 2007)⁷</td>
</tr>
<tr>
<td>14867</td>
<td>Large concealed cover plate installer tool (available since 2007)⁷</td>
</tr>
<tr>
<td>01731A</td>
<td>Sprinkler cabinet; holds up to 6 sprinklers (available since 1971)</td>
</tr>
</tbody>
</table>

**Footnotes**

1. Where a dash (-) is shown in the finish suffix designation, insert the desired Temperature Rating suffix. See example above.
2. Based on NFPA 13, NFPA 13R, and NFPA 13D. Other limits may apply, depending on fire loading, sprinkler location, and other requirements of the Authority Having Jurisdiction. Refer to specific installation standards.
3. UL Listed as corrosion-resistant.
4. The corrosion-resistant coatings have passed the standard corrosion test required by the approving agencies indicated in the Approval Chart. 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.
5. Requires a 1/2” ratchet (not available from Viking).
6. FM Approved as a decorative finish.
7. The installer tool is for push-on style cover plates only.
8. The installation wrench is intended to be used for a maximum of 500 sprinkler installations at a maximum torque of 14 ft-lbs (19 Nm).
## TABLE 2: COVER PLATE ORDERING INFORMATION

Instructions:
1. Select a Cover Plate Base Part Number
2. Add the suffix for the desired Finish
3. Add the suffix for the required Cover Plate Nominal Rating.

Example:
23190MC/W = 165 °F (74 °C) Temperature Rated 2-3/4” (70 mm) diameter round cover plate with a painted white finish.

<table>
<thead>
<tr>
<th>Base Part Number</th>
<th>Size (Inch)</th>
<th>Type</th>
<th>Base Part Number</th>
<th>Size (Inch)</th>
<th>Type</th>
<th>Description</th>
<th>Suffix</th>
</tr>
</thead>
<tbody>
<tr>
<td>23174</td>
<td>3-5/16 (84)</td>
<td>Round</td>
<td>23463</td>
<td>3-5/16 (84)</td>
<td>Round</td>
<td>Brushed Chrome</td>
<td>F-/B</td>
</tr>
<tr>
<td>23179</td>
<td>3-5/16 (84)</td>
<td>Square</td>
<td>23482</td>
<td>3-5/16 (84)</td>
<td>Square</td>
<td>Bright Brass</td>
<td>B</td>
</tr>
<tr>
<td>23193</td>
<td>2-3/4 (70)</td>
<td>Stainless Steel Round</td>
<td>23455</td>
<td>2-3/4 (70)</td>
<td>Stainless Steel Round</td>
<td>B-/A</td>
<td></td>
</tr>
<tr>
<td>23183</td>
<td>3-5/16 (84)</td>
<td>Stainless Steel Round</td>
<td>23473</td>
<td>3-5/16 (84)</td>
<td>Stainless Steel Round</td>
<td>E-/B</td>
<td></td>
</tr>
</tbody>
</table>

### 3: Temperature Rating Matrix

<table>
<thead>
<tr>
<th>Cover Plate Nominal Rating (Required)</th>
<th>Temperature Classification</th>
<th>Sprinkler Nominal Rating</th>
<th>Sprinkler Maximum Ambient Ceiling Temperature</th>
<th>Suffix</th>
</tr>
</thead>
<tbody>
<tr>
<td>UL: 135 °F (57 °C) FM: 139 °F (59 °C)</td>
<td>Ordinary</td>
<td>155 °F (68 °C)</td>
<td>100 °F (38 °C)</td>
<td>A</td>
</tr>
<tr>
<td>165 °F (74 °C)</td>
<td>Intermediate</td>
<td>175 °F (79 °C)</td>
<td>150 °F (65 °C)</td>
<td>C</td>
</tr>
<tr>
<td>165 °F (74 °C)</td>
<td>Intermediate</td>
<td>200 °F (93 °C)</td>
<td>150 °F (65 °C)</td>
<td>C</td>
</tr>
</tbody>
</table>

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. Stainless Steel versions are not available with any finishes or paint.
5. Where a dash (-) is shown in the Finish suffix designation, insert the desired Temperature Rating suffix. See example above.
## Approval Chart

### Concealed Pendent Sprinkler VK4921

<table>
<thead>
<tr>
<th>Sprinkler Base Part No.</th>
<th>SIN</th>
<th>Thread Size</th>
<th>Nominal K-factor</th>
<th>Maximum Water Working Pressure</th>
<th>Listings and Approvals¹ (Refer also to Design Criteria)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Base Part No.</td>
<td>U.S. metric²</td>
<td>cULus</td>
</tr>
<tr>
<td>24683A</td>
<td>1/2&quot;</td>
<td>-</td>
<td>5.6</td>
<td>250 psi (17.2 bar)</td>
<td>175 psi (12 bar)</td>
</tr>
<tr>
<td>24683JN²</td>
<td>1/2&quot;</td>
<td>-</td>
<td>5.6</td>
<td>250 psi (17.2 bar)</td>
<td>175 psi (12 bar)</td>
</tr>
<tr>
<td>23116A</td>
<td>--</td>
<td>15 mm</td>
<td>5.6</td>
<td>250 psi (17.2 bar)</td>
<td>175 psi (12 bar)</td>
</tr>
<tr>
<td>23116JN²</td>
<td>--</td>
<td>15 mm</td>
<td>5.6</td>
<td>250 psi (17.2 bar)</td>
<td>175 psi (12 bar)</td>
</tr>
</tbody>
</table>

### Sprinkler Temperature Ratings

- **A** = 155 °F (68 °C)
- **B** = 175 °F (79 °C) and 200 °F (93 °C)
- **C** = 235 °F (113 °C)
- **X** = 165 °F (74 °C)

### Cover Plate Temperature Ratings

- **S** - 135 °F (57 °C) cULus Listed or 139 °F (59 °C) FM Approved Stainless Steel cover 23193 and 23455, or 23183 and 23473 (large diameter)
- **T** - 165 °F (74 °C) Stainless Steel cover 23193 and 23455 or 23183 and 23473 (large diameter)
- **V** - 135 °F (57 °C) cULus Listed or 139 °F (59 °C) FM Approved cover 23190 and 23447, 23174 and 23463 (large diameter), or 23179 and 23482 (square cover plate)
- **X** - 165 °F (74 °C) cover 23190 and 23447, or 23174 and 23463 (large diameter)

### Cover Plate Assembly Finishes

1. Polished Chrome,
2. Stainless Steel
3. Brushed Chrome
4. Bright Brass, Antique Brass
5. Brushed Copper
6. Painted White, Painted Ivory, or Painted Black

### Footnotes

1. Part number shown is the base part number. For complete part number, refer to current Viking price list 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.
4. Listed by Underwriter’s Laboratories for use in the U.S. and Canada.
5. The 135 °F (57 °C) [139 °F (59 °C)] covers have an orange label. The 165 °F (74 °C) covers have a white label.
6. Other paint colors are available on request with the same listings as the standard paint colors. Listings and approvals apply for any paint manufacturer. Contact Viking for additional information.
7. cULus Listed as corrosion-resistant.
8. FM Approved as a decorative finish.

**NOTE:** Custom colors are indicated on a label inside the cover assembly. Refer to Figure 2.
DESIGN CRITERIA - UL
(Also refer to Approval Chart)

cULus Listing Requirements:
Concealed pendent sprinkler VK4921 is cULus Listed as standard response for installation in accordance with the latest edition of NFPA 13 for standard coverage pendent spray sprinklers as indicated below.
- For hazard occupancies up to and including Ordinary Hazard, Group II.
- Protection areas and maximum spacing shall be in accordance with the tables provided in NFPA 13. Minimum spacing allowed is 6 ft. (1.8 m) unless baffles are installed in accordance with NFPA 13.
- Minimum distance from walls is 4 in. (102 mm).
- Maximum distance from walls shall be no more than one-half of the allowable distance between sprinklers. The distance shall be measured perpendicular to the wall.
- Minimum distance from walls is 4 in. (102 mm).
- The sprinkler obstruction rules contained in NFPA 13 for standard coverage pendent spray sprinklers must be followed.
- Venting is required.
- 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 Form No. F_080614 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, LPCB, APSAD, VdS or other similar organizations, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable.

DESIGN CRITERIA - FM
(Also refer to Approval Chart)

FM Approval Requirements:
Viking Concealed Pendent Sprinkler VK4921 is FM Approved as a standard response Non-Storage concealed pendent sprinkler as indicated in the FM Approval Guide. For specific application and installation requirements, reference the latest applicable FM Loss Prevention Data Sheets (including Data Sheet 2-0). FM Global Loss Prevention Data Sheets contain guidelines relating to, but not limited to: minimum water supply requirements, hydraulic design, ceiling slope and obstructions, minimum and maximum allowable spacing, and deflector distance below the ceiling.

NOTE: The FM installation guidelines may differ from cULus and/or NFPA criteria.

IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. Also refer to Form No. F_080614 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, LPCB, APSAD, VdS or other similar organizations, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable.
All custom color painted cover plates will have an identifying label affixed to the inside of the cover that indicates the custom color and will have a representative sample (a paint dot) of the paint on the label.

Figure 2: Identification of Custom Paint

Figure 3: Square Cover Assembly
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
Visit the Viking website for the latest edition of this technical data page www.vikinggroupinc.com

Figure 4: Sprinkler Dimensions

NOTE: Image is representative only. Actual product may vary.

Figure 5: Sprinkler Installation Dimensions

NOTE: Image is representative only. Actual product may vary.
NOTICE: USE ONLY the designated sprinkler wrenches shown in this document. Permanent damage to the sprinkler assembly can occur if the proper wrench is not used. Other sprinkler wrenches available from Viking may fit into the sprinkler adapter cup; however, only the wrenches shown here are designed to properly install this sprinkler.

Step 1: Remove the protective cap.

Step 2: Insert the wrench into the sprinkler adapter.

Step 3: Rotate the wrench slightly in either direction until the tines on the wrench (A) line up with the vent openings (B) on the adapter cup and lock into place. NOTE: A leak tight seal must be achieved. Turn the sprinkler clockwise 1 to 1-½ turns past finger-tight.

Install the cover plate by inserting the adapter (D) into the adapter cup (C) and pushing or threading into place (depending on style). Snug the cover plate in place by rotating clockwise. Ensure the cover plate is flush with the ceiling as shown to allow airflow through the sprinkler assembly.

NOTE: Image is representative only. Actual product may vary.

Figure 6: Using the Sprinkler Wrench

Figure 7: Installing the Cover Plate