



## TECHNICAL DATA

## FREEDOM® RESIDENTIAL CONCEALED PENDENT SPRINKLER VK494 (K4.9)

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](http://www.vikinggroupinc.com)

### 1. DESCRIPTION

Viking Freedom® Residential Concealed Pendent Sprinkler VK494 is a small thermosensitive, glass-bulb residential sprinkler designed for installation on concealed pipe systems where the appearance of a smooth ceiling is desired. The orifice design, with a K-Factor of 4.9 (70.6 metric\*), allows the sprinkler's efficient use of available water supplies for the hydraulically designed fire-protection system. The fast response glass bulb operating element and special deflector characteristics meet the challenges of residential sprinkler standards.

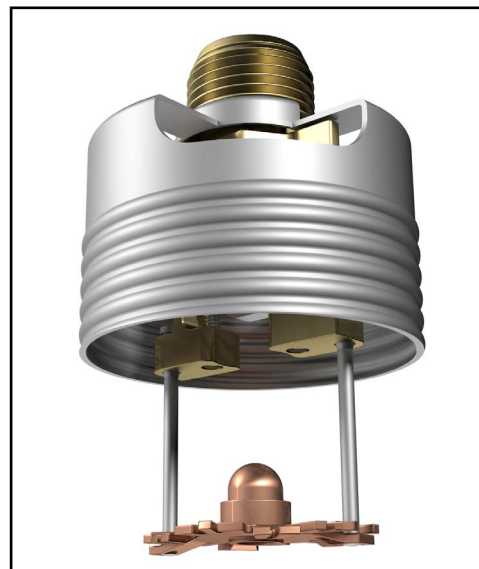
The sprinkler is pre-assembled with a threaded adapter for installation with a low-profile small-diameter cover assembly installed flush to the ceiling. The two-piece design allows installation and testing of the sprinkler prior to installation of the cover plate. The "push-on", "thread-off" design of 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, while also providing up to 1/2" (13 mm) of vertical adjustment. 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

Refer to the Approval Charts and Design Criteria on for C-UL-US-EU Listing requirements that must be followed.



**WARNING:** Cancer and Reproductive Harm-  
[www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

### 3. TECHNICAL DATA

#### Specifications:

Minimum Operating Pressure: Refer to the Approval Chart.

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: 4.9 U.S. (70.6 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: Brass UNS-C84400 or QM Brass

Deflector: Phosphor Bronze UNS-C51000

Deflector Pins: Stainless Steel UNS-S30200

Button: Brass UNS-C36000

Pip Cap and Insert Assembly: Copper UNS-C11000 and SS UNS-S30400

Compression Screw: 18-8 Stainless Steel

Yoke: UNS-S43000 Stainless Steel or Phosphor Bronze UNS-C51000

Belleville Spring Sealing Assembly: Nickel Alloy, coated on both sides with PTFE Tape

Cover Adapter: Cold Rolled Steel UNS-G10080, Finish: Clear Chromate over Zinc Plating

Shipping Cap: 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:** (Also refer to the current Viking price list.)

Viking Freedom® Residential Concealed Pendent Sprinkler VK494 and Cover Plate Assembly must be ordered separately:

**Sprinkler:** Order Sprinkler VK494 by first adding the appropriate suffix for the sprinkler finish and then the appropriate suffix for the temperature rating to the sprinkler base part number.

Finish Suffix: Brass = A and ENT = JN

Temperature Suffix: 155 °F (68 °C) = B, 200 °F (93 °C) = E

For example, sprinkler VK494 with a Brass finish and a 200 °F (93 °C) temperature rating = Part No. 20759AE.

**Standard Cover Plates:** Base Part No. 13504 (2-3/4" diameter), Base Part No. 13642 (3-5/16" diameter), or Base Part No. 15394 (square cover plate, 3-5/16")

**Stainless Steel Cover Plates (not available with any finish or paint):** Base Part No. 21876 (2-3/4" diameter) or Base Part No. 21875 (3-5/16" diameter).



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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 13504 with a Polished Chrome finish and a 135 °F/57 °C temperature rating = 13504FA.

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

**Accessories:** (Also refer to the Viking website.)

**Sprinkler Wrenches\*\*:**

A. Heavy Duty Part No. 14047W/B\*\* (available since 2006), or

B. Head Cabinet Wrench Part No. 14031\*\*\* (available since 2006)

C. Optional Concealed Cover Plate Installer Tool Part No. 14412 (available since 2007)

D. Optional Large Concealed Cover Plate Installer Tool Part No. 14867 (available since 2007)

\*\*Requires a ½" ratchet (not available from Viking). \*\*\*Also optional for removal of the protective cap. Ideal for sprinkler cabinets.

**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, 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 yoke and 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 Sprinkler Model VK494 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.

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

Sprinkler Temperature Classification	Sprinkler Nominal Temperature Rating <sup>1</sup>	Maximum Ambient Ceiling Temperature <sup>2</sup>	Temperature Rating of the Cover Assembly (Required) <sup>3</sup>	Cover Plate Base Part Number <sup>4</sup>	Large Cover Plate Base Part Number <sup>4</sup>	Square Cover Plate Base Part Number <sup>4</sup>	Bulb Color
Ordinary	155 °F (68 °C)	100 °F (38 °C)	135 °F (57 °C)	13504 or 21876 <sup>6</sup>	13642 or 21875 <sup>6</sup>	15394	Red
Intermediate	200 °F (93 °C)	150 °F (65 °C)	135 °F (57 °C)	13504 or 21876 <sup>6</sup>	13642 or 21875 <sup>6</sup>	15394	Green

**Sprinkler Finishes:** Brass and ENT

**Cover Plate Finishes<sup>6</sup>:** Polished Chrome, Brushed Chrome, Bright Brass, Antique Brass, Brushed Brass, Brushed Copper, Painted White, Painted Ivory, or Painted Black

**Corrosion Resistant Coatings<sup>5</sup>:** ENT

#### Footnotes

- The sprinkler temperature rating is stamped on the deflector.
- 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.
- Maximum ambient temperature for cover assembly is 100 °F (38 °C).
- Part number shown is the base part number. For complete part number, refer to current Viking price list schedule.
- 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.
- Stainless Steel versions are not available with any finishes or paint.




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### Approval Chart Viking VK494, 4.9 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 current editions of NFPA 13, 13R or 13D

Sprinkler Base Part Number <sup>1</sup>	SIN	NPT Thread Size		Nominal K-Factor		Maximum Water Working Pressure
		Inches	mm	U.S.	metric <sup>2</sup>	
20759	VK494	1/2	15	4.9	70.6	175 psi (12 bar)
Max. Coverage Area <sup>6</sup> W X L Ft. X Ft. (m X m)	Flow GPM (LPM)	Pressure PSI (bar)	Deflector to Ceiling	Installation Type	Listings and Approvals <sup>3,5</sup> 	Minimum Spacing Ft. (m)
12 X 12 (3.7 X 3.7)	13 (49.2)	7.0 (0.48)	Refer to Figure 2	Concealed with Cover Plate Assembly. See Footnote 8.	See Footnotes 7,9, 10, & 11	8 (2.4)
14 X 14 (4.3 X 4.3)	13 (49.2)	7.0 (0.48)				
16 X 16 (4.9 X 4.9)	13 (49.2)	7.0 (0.48)				
18 X 18 (5.5 X 5.5)	17 (64.4)	12.0 (0.83)				
20 X 20 (6.1 X 6.1)	20 (75.7)	16.7 (1.15)				

#### Footnotes

- Part number shown is the base part number. For complete part number, refer to current Viking price schedule.
- 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.
- 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.
- Listed by Underwriter's Laboratories, Inc. for use in the U.S., Canada, and European Union.
- Meets New York City requirements, effective July 1, 2008.
- 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.
- Cover Temperature Rating is 135 °F (57 °C). Cover Part No. 13504<sup>1</sup>, 13642<sup>1</sup> (large diameter), or 15394<sup>1</sup> (square cover plate).
- Other paint colors are available on request with the same listings as the standard finish colors. Stainless Steel cover plates are not available with any finishes or paint. Listings and approvals apply for any paint manufacturer. Contact Viking for additional information. Custom colors are indicated on a label inside the cover assembly. Refer to Figure 3.
- Accepted Cover Plate Finishes are: Polished Chrome, Brushed Chrome, Bright Brass, Antique Brass, Brushed Brass, Brushed Copper, Painted White, Painted Ivory, or Painted Black <sup>9</sup>.
- C-UL-US-EU Listed as corrosion resistant - Electroless Nickel PTFE (ENT)
- Stainless Steel Cover plate temperature rating is 135 °F (57 °C). Stainless Steel Cover Part Numbers: 21876<sup>1</sup> and 21875<sup>1</sup> (large diameter).



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**DESIGN CRITERIA**

(Also refer to the Approval Chart on page 3.)

**UL Listing Requirements (C-UL-US-EU):**

When using Viking Residential Concealed Pendent Sprinkler VK494 for systems designed to NFPA 13D or NFPA 13R, apply the listed areas of coverage and minimum water supply requirements shown in the Approval Chart.

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:

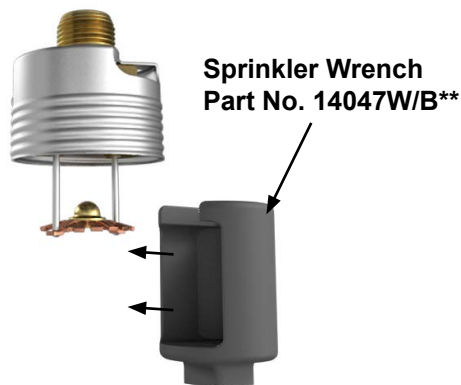
- The flow rates given in the Approval Chart for NFPA 13D and NFPA 13R applications for each listed area of coverage, or
- Calculated based on a minimum discharge of 0.1 gpm/sq. ft. over the "design area" in accordance with sections 8.5.2.1 or 8.6.2.1.2 of NFPA 13.
- Minimum distance between residential sprinklers: 8 ft. (2.4 m).

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

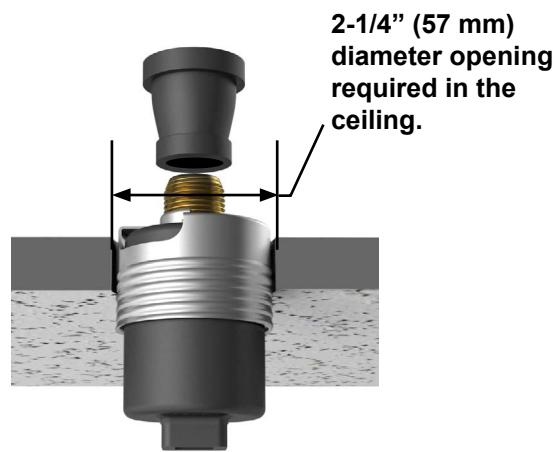
**IMPORTANT: Always refer to Bulletin Form No. F\_080415 - Best Practices for Residential Sprinkler Handling and Installation. Also refer to Form No. F\_080614 for general care, installation, and maintenance information. Viking sprinklers are to be installed in accordance with the latest edition of Viking technical data, the appropriate standards of NFPA 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.**

**Sprinkler and Adapter Assembly**

- Protective cap removed
- Use wrench 14047W/B\*\*

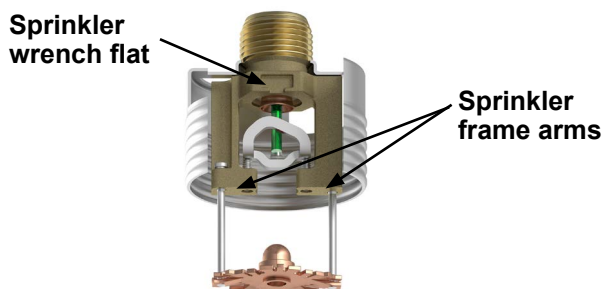


**Step 1:**  
Carefully slide the wrench sideways around the deflector and pins



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

**NEVER** install the sprinkler by applying the installation wrench across the frame arms. **DO NOT** overtighten. Use only the designated sprinkler wrenches, Viking Part Numbers 14047W/B\*\* or 14031\*\*. A leak tight seal should be achieved by turning the sprinkler clockwise 1 to 1-1/2 turns beyond finger tight.



**Figure 1: Sprinkler Installation and Proper Wrench Usage**  
**\*\* A 1/2" ratchet is required (Not available from Viking)**



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