



## 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 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.

#### Features:

- K4.9 (70.6 metric)
- Fast 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 ceiling 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



**cULusEU Listed:** Category VKKW

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

### 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 rating: 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, QM brass, or DZR 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 Stainless Steel UNS-S30400

Compression Screw: 18-8 Stainless Steel

Yoke: Phosphor Bronze UNS-C51000

Belleville Spring Sealing Assembly: Beryllium 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

Vibration damper ring: Buna-N Rubber SAE AS-568-017

#### Cover Plate Materials:

Cover Plate Assembly: Copper UNS-C11000 and brass UNS-C26800 or stainless steel UNS-S30400

Spring: Beryllium Nickel

Solder: Eutectic

### 4. INSTALLATION

Refer to appropriate NFPA Installation Standards.

### 5. OPERATION

During fire conditions, when the temperature around the sprinkler approaches the cover plate's nominal temperature rating, the cover plate detaches and releases the deflector. Continued heating of the exposed sprinkler causes the heat-sensitive liquid in the glass bulb to expand. When the temperature reaches the sprinkler's nominal temperature rating, the glass bulb shatters releasing the yoke, pip cap assembly and sealing spring. Water begins flowing through the sprinkler orifice and strikes the deflector forming a uniform spray pattern over a specific area of coverage, which is determined by the water supply pressure at the sprinkler, in order to extinguish or control the fire.



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



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### 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: SPRINKLER ORDERING INFORMATION**

#### Ordering 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 (Must be ordered separately; refer to Table 2)

#### Example:

23707AE = 200 °F (93 °C) Temperature rated sprinkler with a standard brass finish.

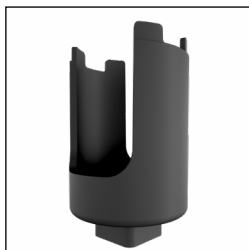
Sprinkler Base Part Number <sup>1</sup>	Size	1: Finishes		2: Temperature Ratings <sup>5</sup>			
	NPT Inch	Description	Suffix	Nominal Rating	Bulb Color	Max. Ambient Ceiling Temperature <sup>2</sup>	Suffix
23707	1/2	Brass	A	155 °F (68 °C)	Red	100 °F (38 °C)	B
		ENT <sup>3,4</sup>	JN	200 °F (93 °C)	Green	150 °F (65 °C)	E

#### Accessories

Part Number	Description
23143	Installation wrench <sup>6</sup>
14412	Small concealed cover plate installer tool; requires a piece of 1" PVC pipe or similar to attach (available since 2007).
14867	Large concealed cover plate installer tool; requires a piece of 1" PVC pipe or similar to attach (available since 2007).
01731A	Sprinkler cabinet; holds up to 6 sprinklers (available since 1971).

#### Footnotes

1. Part number shown is the base part number. For complete part number, refer to the current Viking price list schedule.
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. cULusEU listed as corrosion resistant.
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.
5. The sprinkler temperature rating is stamped on the deflector.
6. 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).



**Figure 1: Installation Wrench**



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### 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, thread-on style, round cover plate with a painted white finish.

1: Select a Cover Plate Base Part Number <sup>3</sup>						2: Select a Finish	
Thread-On Style			Push-On Style			Description	Suffix <sup>4</sup>
Base Part Number <sup>1</sup>	Size Inch (mm)	Type	Base Part Number	Size Inch (mm)	Type		
23190	2-3/4 (70)	Round	23447	2-3/4 (70)	Round	Polished Chrome	F
23174	3-5/16 (84)	Round	23463	3-5/16 (84)	Round	Brushed Chrome	F-/B
23179	3-5/16 (84)	Square	23482	3-5/16 (84)	Square	Bright Brass	B
23193 <sup>5</sup>	2-3/4 (70)	Stainless Steel Round	23455 <sup>5</sup>	2-3/4 (70)	Stainless Steel Round	Antique Brass	B-/A
						Brushed Brass	B-/B
23183 <sup>5</sup>	3-5/16 (84)	Stainless Steel Round	23473 <sup>5</sup>	3-5/16 (84)	Stainless Steel Round	Brushed Copper	E-/B
						Painted White	M-/W
						Painted Ivory	M-/I
						Painted Black	M-/B

3: Temperature Rating Matrix <sup>1,2</sup>				
Cover Plate Nominal Rating (Required)	Temperature Classification	Sprinkler Nominal Rating	Sprinkler Maximum Ambient Ceiling Temperature <sup>2</sup>	Suffix
139 °F (59 °C)	Ordinary	155 °F (68 °C)	100 °F (38 °C)	<b>A</b>
165 °F (74 °C)	Intermediate	200 °F (93 °C)	150 °F (65 °C)	<b>C</b>

#### Footnotes

1. Part number shown is the base part number. For complete part number, refer to the current Viking price list schedule.
2. The sprinkler temperature rating is stamped on the deflector.
3. 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.
4. Where a dash (-) is shown in the Finish suffix designation, insert the desired Temperature Rating suffix. See example above.
5. 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	Thread Size			Nominal K-factor		Maximum Water Working Pressure
		NPT	BSPT		U.S.	metric <sup>2</sup>	
23707	VK494	1/2"	15 mm		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)
	155 °F (68 °C), 200 °F (93 °C) Temperature Rated Sprinklers					cULusEU <sup>4</sup>	
12 X 12 (3.7 X 3.7)	13 (49.2)	7.0 (0.48)	Refer to Figure 5	Concealed with Cover Plate As- sembly. See Footnote 7.	See Footnotes 8, & 9	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 the 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.
- 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 2.
- 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>7</sup>.
- cULusEU Listed as corrosion-resistant - Electroless Nickel PTFE (ENT)

### DESIGN CRITERIA

(Also refer to the Approval Chart.)

#### 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 9.5.2.1 or 10.2.4.1.2 of the current edition 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.**

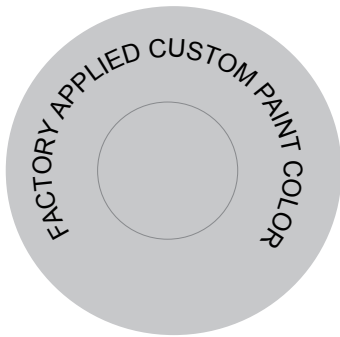
**IMPORTANT: Always refer to Bulletin Form No. F\_080415 - Best Practices for Residential Sprinkler Handling and Installation. Also refer to Form No. F\_080614 for general care, installation, and maintenance information. Viking sprinklers are to be installed in accordance with the latest edition of Viking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



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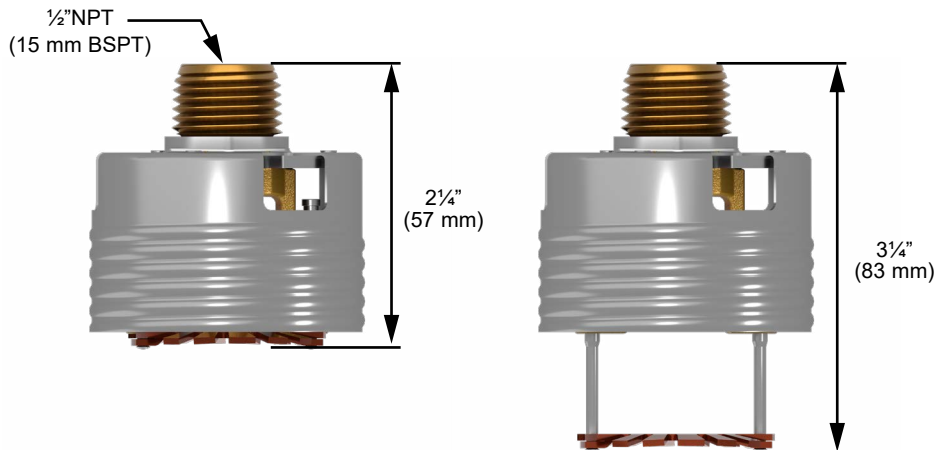


All custom color painted cover plates will have an identifying label affixed to the inside of the cover that indicates the custom color and will have a representative sample (a paint dot) of the paint on the label.

**Figure 2: Identification of Custom Paint**



**Figure 3: Square Cover Assembly**



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

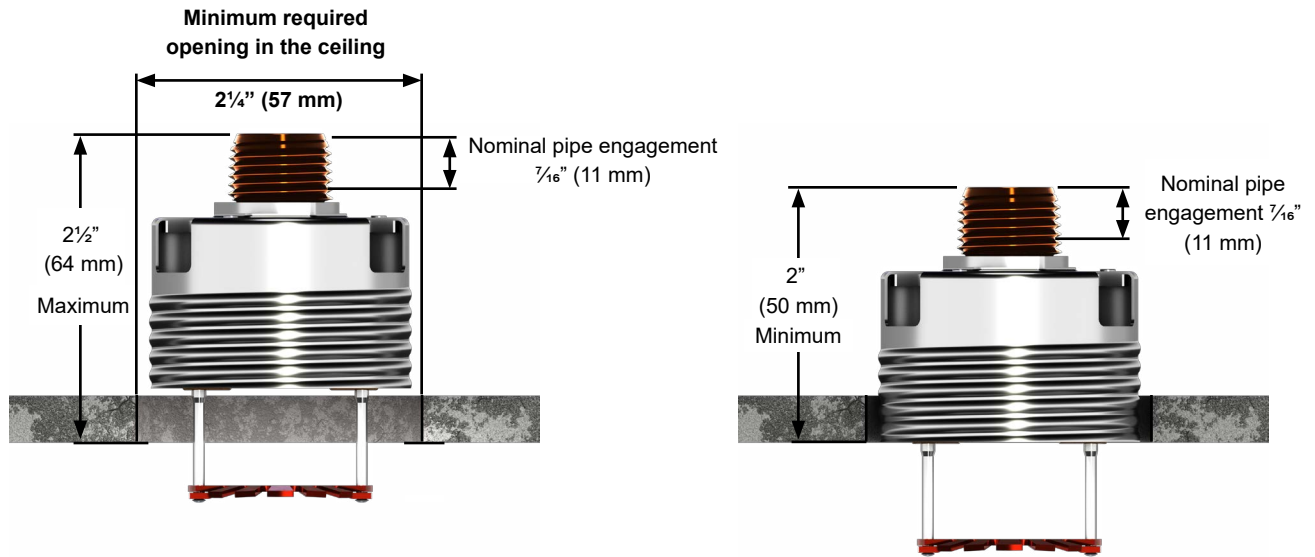
**Figure 4: Sprinkler Dimensions**



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

**Figure 5: Sprinkler Installation Dimensions**



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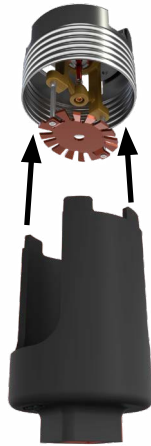


**NOTICE: USE ONLY** the designated sprinkler wrenches shown in this document. Permanent damage to the sprinkler assembly can occur if the proper wrench is not used. Other sprinkler wrenches available from Viking may fit into the sprinkler adapter cup; however, only the wrenches shown here are designed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

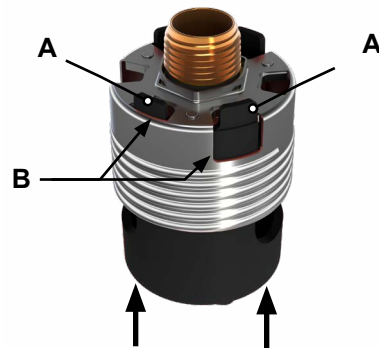
Step 1:  
Remove the protective cap.



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.



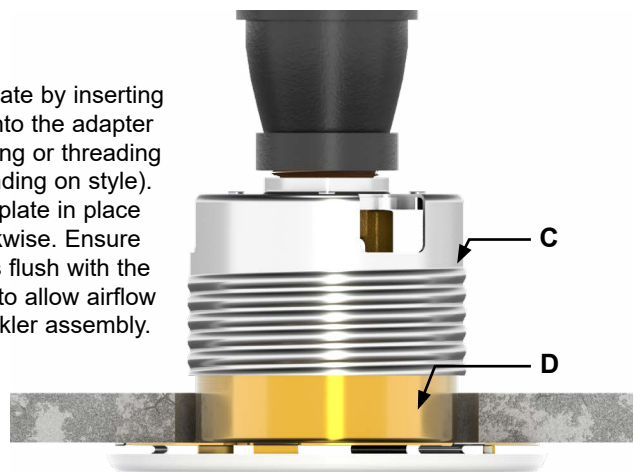
NOTE: Image is representative only. Actual product may vary.

**Figure 6: Using the Sprinkler Wrench**



**Minimum**

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.



**Maximum**

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

**Figure 7: Installing the Cover Plate**