



## TECHNICAL DATA

### FREEDOM® RESIDENTIAL CONCEALED PENDENT SPRINKLER VK456 (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

#### 1. DESCRIPTION

Viking Freedom® Residential Concealed Pendent Sprinkler VK456 is a small high-sensitivity solder link and lever 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 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 ½" (12.7 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.



#### 2. LISTINGS AND APPROVALS

**cULus Listed:** Category VKKW

**NYC Approved:** MEA 89-92-E, Volume 36

**NSF Certified:** NSF/ANSI Standard 61, Drinking Water System Components

Refer to the Approval Chart on page 147g and Design Criteria on page 147h for cULus Listing requirements that must be followed.

#### 3. TECHNICAL DATA

##### Specifications:

Available since 2006.

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\*)

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

Patents Pending

##### Material Standards:

Sprinkler Body: Brass UNS-C84400

Deflector: Phosphor Bronze UNS-C51000

Deflector Pins: Stainless Steel UNS-S30200

Button: Brass UNS-C36000

Seat Assembly: Brass UNS-C31400 or UNS-C31600

Compression Screw: Brass UNS-C36000

Fusible Element Assembly: Beryllium Nickel, coated with black acrylic paint

Levers: Stainless Steel UNS-S31600

Lever Bar: Copper Alloy UNS-C72500

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

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

##### Cover Plate 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 Freedom® Residential Concealed Pendent Sprinkler VK456 and Cover Plate Assembly must be ordered separately:

Viking Technical Data may be found on  
The Viking Corporation's Web site at  
<http://www.vikinggroupinc.com>.  
The Web site may include a more recent  
edition of this Technical Data Page.



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**Sprinkler:** Part No. 13620AJ (includes a 140°F (60°C) rated sprinkler with a protective plastic cap covering the unit).

**Cover Plate Assembly:** Base Part No. 13750 (2-3/4" diameter), Base Part No. 14934 (3-5/16" diameter), or Base Part No. 15394 (square cover plate, 3-5/16" diameter)

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, Painted White = M-/W, Painted Ivory = M-/I, Painted Black = M-/B

Temperature Suffix (°F/°C): 135°/57° = A

For example, cover 13750 with a Polished Chrome finish and a 135°F/57°C temperature rating = 13750FA.

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

**Accessories:** (Also refer to the "Sprinkler Accessories" section of the Viking data book.)

**Sprinkler Wrenches\*\*:**

A. Heavy Duty Wrench Part No. 13623W/B (available since 2006), or

B. Head Cabinet Wrench Part No. 13619\*\*\* (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 1/2" 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. Continued heating of the exposed sprinkler causes the fusible element to disengage, releasing the deflector and sealing 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 VK456 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>	Required Cover Assembly Temp. Rating	Cover Plate Base Part Number <sup>3</sup>	Large Cover Plate Base Part No. <sup>3</sup>	Square Cover Plate Base Part No. <sup>3</sup>
Ordinary	140°F (60°C)	100°F (38°C)	135°F (57°C)	13750	14934	15394


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

**Footnotes**

<sup>1</sup> The sprinkler temperature rating is stamped on the deflector.

<sup>2</sup> 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.

<sup>3</sup> Part number shown is the base part number. For complete part number, refer to current Viking price list schedule.

	<h2 style="margin: 0;">TECHNICAL DATA</h2>	<h3 style="margin: 0;">FREEDOM® RESIDENTIAL CONCEALED PENDENT SPRINKLER VK456 (K4.9)</h3>
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Approval Chart						
Residential Concealed Pendent Sprinkler VK456 For systems designed to NFPA 13D or NFPA 13R. For systems designed to NFPA 13, refer to the design criteria on page 147h.						
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>	
13620A	VK456	1/2	15	4.9	70.6	175 psi (12 bar)
Maximum Areas of Coverage <sup>8</sup>		Minimum Water Supply Requirements <sup>8</sup>		Listings and Approvals <sup>3</sup> (Refer also to Design Criteria on page 147h.)		
				cULus <sup>4</sup>	NYC <sup>5</sup>	NSF <sup>7</sup>
<b>Installed below smooth, flat, horizontal ceilings, including ceilings with slopes up to and including 2/12 (9.5°).</b>						
12 ft. x 12 ft. (3.7 m x 3.7 m)		13 gpm @ 7.0 psi (49.2 L/min @ 0.48 bar)		AX1	AX1	AX1
14 ft. x 14 ft. (4.3 m x 4.3 m)		13 gpm @ 7.0 psi (49.2 L/min @ 0.48 bar)		AX1	AX1	AX1
16 ft. x 16 ft. (4.9 m x 4.9 m)		14 gpm @ 8.2 psi (53.0 L/min @ 0.56 bar)		AX1	AX1	AX1
18 ft. x 18 ft. (5.5 m x 5.5 m)		17 gpm @ 12.0 psi (64.4 L/min @ 0.83 bar)		AX1	AX1	AX1
20 ft. x 20 ft. (6.1 m x 6.1 m)		23 gpm @ 22.0 psi (87.1 L/min @ 1.52 bar)		AX1	AX1	AX1
<b>Installed below ceilings with slopes<sup>9</sup> up to and including a 8/12 (33.7°) pitch. Refer to Figure 5 on page 147j.</b>						
				UL	NYC	NSF <sup>7</sup>
16 ft. x 16 ft. (4.9 m x 4.9 m)		17 gpm @ 12.0 psi (64.4 L/min @ 0.83 bar)		AX1	See Footnote 6.	AX1
20 ft. x 20 ft. (6.1 m x 6.1 m)		26 gpm @ 28.2 psi (98.4 L/min @ 1.94 bar)		AX1	See Footnote 6.	AX1
Sprinkler Temperature Ratings A - 140°F (60°C)		Cover Temperature Rating X - 135°F (57°C) 13750 <sup>1</sup> , 14934 <sup>1</sup> (large diameter), or 15394 <sup>1</sup> (square cover plate)		Cover Plate Finishes 1 - Polished Chrome, Brushed Chrome, Bright Brass, Antique Brass, Brushed Brass, Brushed Copper, Painted White, Painted Ivory, or Painted Black <sup>10</sup>		
<b>Footnotes</b>						
<sup>1</sup> Part number shown is the base part number. For complete part number, refer to current Viking price list schedule. <sup>2</sup> 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. <sup>3</sup> 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. <sup>4</sup> Listed by Underwriter's Laboratories for use in the U.S. and Canada. <sup>5</sup> Accepted for use, City of New York Department of Buildings, MEA Number 89-92-E, Vol. 36. <sup>6</sup> Meets New York City requirements, effective July 1, 2008. <sup>7</sup> Tested and Certified by NSF (National Sanitation Foundation) to NSF/ANSI Standard 61, Drinking Water System Components. <sup>8</sup> For areas of coverage smaller than shown, use the "Minimum Water Supply Requirement" 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 Water Supply Requirement" used. <sup>9</sup> Areas under sloped ceilings must be measured along the ceiling slope. Actual floor coverage in the horizontal plane under sloped ceilings will be less than the listed area of coverage. <sup>10</sup> Other paint colors are available on request with the same listings as the standard finish colors. 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.						





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**DESIGN CRITERIA**

(Also refer to the Approval Chart on page 147g.)

**cULus Listing Requirements:**

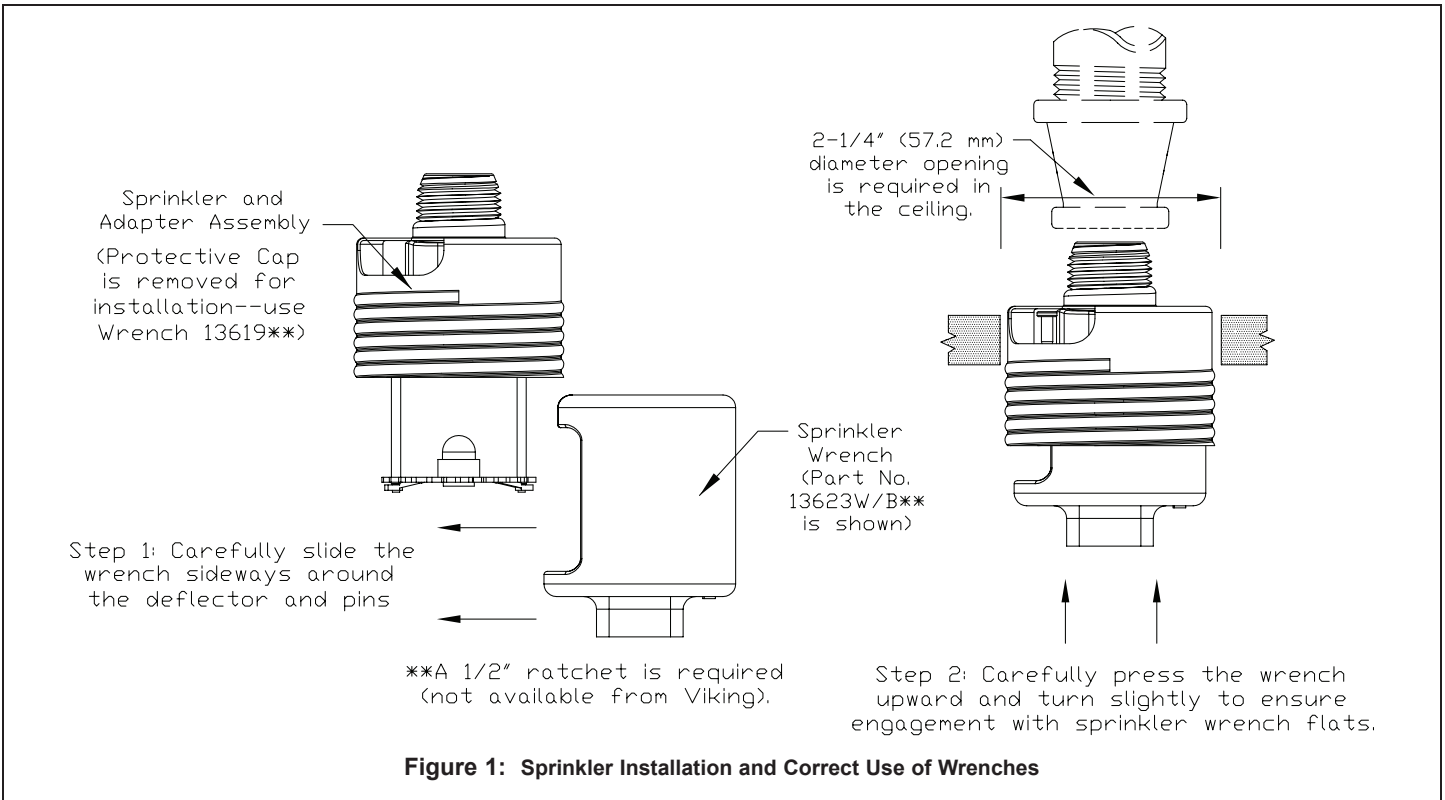
When using Viking Residential Concealed Pendent Sprinkler VK456 for systems designed to NFPA 13D or NFPA 13R, apply the listed areas of coverage and minimum water supply requirements shown in the Approval Chart on page 147g.

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 on data page 147g 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\_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.**





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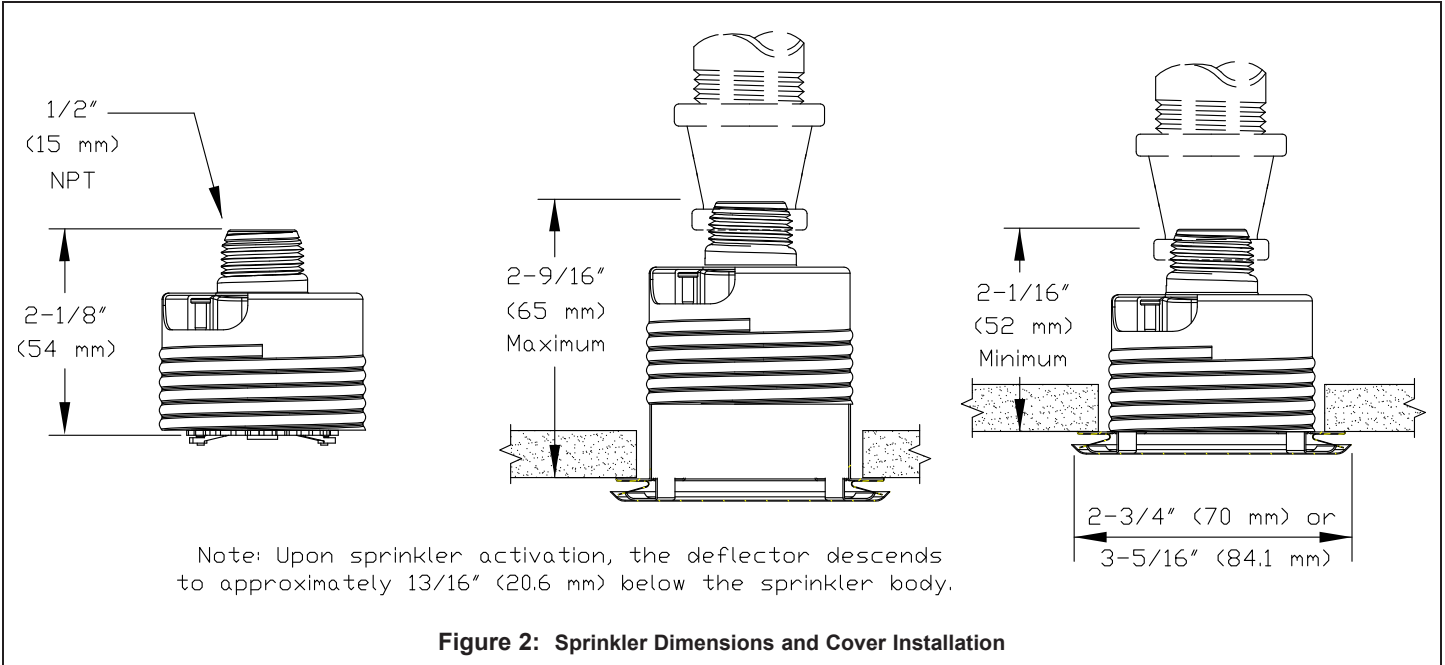


Figure 2: Sprinkler Dimensions and Cover Installation

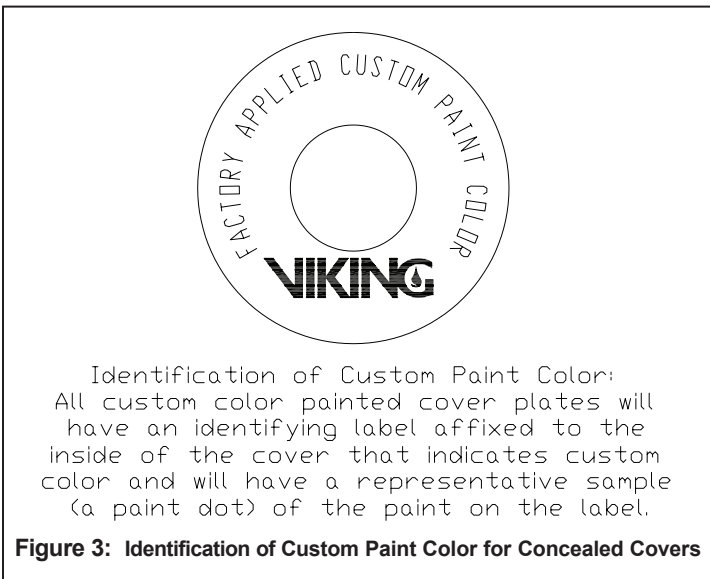


Figure 3: Identification of Custom Paint Color for Concealed Covers

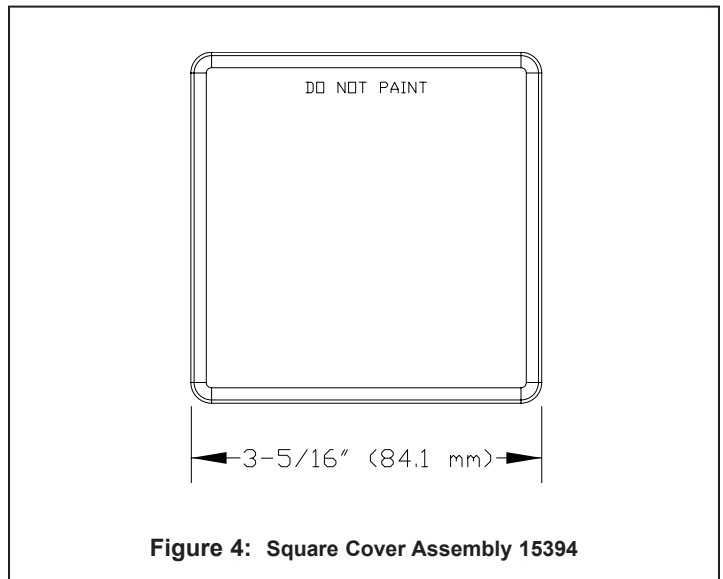


Figure 4: Square Cover Assembly 15394



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