



## TECHNICAL DATA

### MIRAGE® STANDARD AND QUICK RESPONSE CONCEALED PENDENT SPRINKLER VK461 (K2.8)

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 Mirage® Standard and Quick Response Concealed Pendent Sprinkler VK461 is a thermosensitive glass-bulb spray sprinkler designed for installation on concealed pipe systems where the appearance of a smooth ceiling is desired.

The sprinkler is pre-assembled with a threaded adapter for installation with a low-profile cover assembly that provides up to ½" (12.7 mm) of vertical adjustment. 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.



For Light Hazard Occupancies Only

#### 2. LISTINGS AND APPROVALS

**cULus Listed:** Category VNIV

**FM Approved:** Class 2015

**NYC Approved:** MEA 89-92-E, Volume 38

Refer to Approval Chart 1 and Design Criteria on page 54j for cULus Listing requirements, and refer to Approval Chart 2 and Design Criteria on page 54k for FM Approval requirements that must be followed.

#### 3. TECHNICAL DATA

##### Specifications:

Available since 2006.

Minimum Operating Pressure: 7 psi (0.5 bar).

Maximum Working Pressure: 175 psi (12 bar). Factory tested hydrostatically to 500 psi (34.5 bar).

Testing: U.S.A. Patent No. 4,831,870

Thread size: 1/2" (15 mm) NPT

Nominal K-Factor: 2.8 U.S. (40.3 metric\*)

\*Metric K-factor measurement is shown 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)

Patents Pending

##### Material Standards:

Sprinkler Body: Brass UNS-C84400

Deflector: Copper UNS-C19500

Deflector Pins: Stainless Steel UNS-S30300

Bushing: Brass UNS-C36000

Bulb: Glass, nominal 3 mm diameter

Pip Cap and Insert Assembly: Copper UNS-C11000 and Stainless Steel UNS-S30400

Button: Brass UNS-C36000

Screws: 18-8 Stainless Steel

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

Yoke: Phosphor Bronze UNS-C51000

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

##### Cover Assembly Materials:

Cover: Copper UNS-C11000

Base: Brass UNS-C26000 or UNS-C26800

Springs: Nickel Alloy

Solder: Eutectic

**Ordering Information:** (Also refer to the current Viking price list.)

Viking Mirage® Concealed Pendent Sprinkler VK461 and Cover Plate Assembly must be ordered separately:

**Sprinkler:** Base Part No. 13831A

Specify sprinkler temperature rating by adding the appropriate suffix for the temperature rating to the base part number:

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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Temperature Suffix (°F/°C): 155°/68° = B, 175°/79° = D, 200°/93° = E

For example, sprinkler VK461 with a 155°F/68°C temperature rating = 13831AB.

**Cover Plate Assembly:** 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" 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, 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 (°F/°C): 135°/57° UL (139°/59° FM) = A, 165°/74° = C

For example, cover 13504 with a Polished Chrome finish and a 165°F/74°C temperature rating = 13504FC.

Note: Square cover plate 15394 cULus Listing is for the 135°F (57°C) temperature rated cover plate only. Refer to the Approval Charts.

**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. 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 for cover 13504, or Part No. 14867 for the large diameter cover (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 heat-sensitive liquid in the glass bulb to expand and the bulb to shatter, releasing the yoke, 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

Viking Mirage® Concealed Pendent Sprinkler VK461 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 Cover Assembly (Required)	Bulb Color
Ordinary	155°F (68°C)	100°F (38°C)	135°F (57°C) cULus, 139°F (59°C) FM	Red
Intermediate	175°F (79°C)	150°F (65°C)	165°F (74°C)	Yellow
Intermediate	200°F (93°C)	150°F (65°C)	165°F (74°C)	Green

**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 sprinkler deflector.

<sup>2</sup> 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.

	<h2 style="margin: 0;">TECHNICAL DATA</h2>	<h3 style="margin: 0;">MIRAGE® STANDARD AND QUICK RESPONSE CONCEALED PENDENT SPRINKLER VK461 (K2.8)</h3>
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<b>Approval Chart 1 (UL)</b> Mirage® Quick Response Concealed Pendent Sprinkler VK461 For Light Hazard Occupancies Only Maximum 175 PSI (12 bar) WWP													
Sprinkler Base Part Number <sup>1</sup>	SIN	NPT Thread Size		Nominal K-Factor		Overall Length (Sprinkler Body)		Listings and Approvals <sup>3</sup> (Refer also to Design Criteria below.)					
		Inch	mm	U.S.	metric <sup>2</sup>	Inches	mm	cULus <sup>4</sup>	NYC <sup>5</sup>	VdS	LPCB	CE	
13831A	VK461	1/2"	15	2.8	40.3	2-3/16"	56	AW1, BX1	AW1, BX1	--	--	--	--
<b>Sprinkler Temperature Ratings</b> A - 155°F (68°C) B - 175°F (79°C) and 200°F (93°C)		<b>Cover Plate Assembly Temperature Ratings<sup>6</sup></b> W - 135°F (57°C) cULus Listed cover 13504 <sup>1</sup> , 13642 <sup>1</sup> (large diameter), or 15394 <sup>1</sup> (square cover plate) <i>FM Approved as 139°F (59°C)</i> X - 165°F (74°C) cover 13504 <sup>1</sup> or 13642 <sup>1</sup> (large diameter)						<b>Finishes of the Cover Plate Assembly<sup>7</sup></b> 1 - Polished Chrome, Brushed Chrome, Bright Brass, Antique Brass, Brushed Brass, Brushed Copper, Painted White, Painted Ivory, or Painted Black					
<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 is shown 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. 38. <sup>6</sup> The 135/139°F cover has an orange label. The 165°F cover has a white label. <sup>7</sup> Standard painted finishes consist of Polyester Baked Enamel. 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. NOTE: Custom colors are indicated on a label inside the cover assembly. Refer to Figure 1.													



<b>DESIGN CRITERIA - UL</b> (Also refer to Approval Chart 1 above.)
<p><b>cULus Listing Requirements:</b> Mirage® Concealed Pendent Sprinkler VK461 is cULus Listed as a quick response sprinkler for installation in accordance with the latest edition of NFPA 13 for standard coverage pendent spray sprinklers as indicated below:</p> <ul style="list-style-type: none"> <li>• Limited to Light Hazard Occupancies where allowed by the installation standards being applied, with hydraulically calculated wet systems only.</li> <li>• Maximum spacing allowed is 15 ft. (4.6 m).</li> <li>• Minimum spacing allowed is 6 ft. (1.8 m) unless baffles are installed in accordance with NFPA 13.</li> <li>• Minimum distance from walls is 4 in. (102 mm).</li> <li>• 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.</li> <li>• The sprinkler obstruction rules contained in NFPA 13 for standard coverage pendent spray sprinklers must be followed.</li> </ul> <p><b>NOTE: Concealed sprinklers must be installed in neutral or negative pressure plenums only.</b></p> <p><b>IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. Also refer to page SR1-3 or QR1-3 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, Assemblée Plenièrre, VdS or other similar organizations, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable.</b></p>

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Approval Chart 2 (FM)								
Mirage® Standard Response Concealed Pendent Sprinkler VK461								
Maximum 175 PSI (12 bar) WWP								
Sprinkler Base Part Number <sup>1</sup>	SIN	NPT Thread Size		Nominal K-Factor		Overall Length (Sprinkler Body)		FM Approvals <sup>3,4</sup> (Refer also to Design Criteria below.)
		Inch	mm	U.S.	metric <sup>2</sup>	Inches	mm	
13831A	VK461	1/2"	15	2.8	40.3	2-3/16"	56	AW1, BX1
<b>Sprinkler Temperature Ratings</b> A - 155°F (68°C) B - 175°F (79°C) and 200°F (93°C)		<b>Cover Plate Assembly Temperature Ratings<sup>5</sup></b> W - 135°F (57°C) cULus Listed cover 13504 <sup>1</sup> , 13642 <sup>1</sup> (large diameter), or 15394 <sup>1</sup> (square cover plate) <i>FM Approved as 139°F (59°C)</i> X - 165°F (74°C) cover 13504 <sup>1</sup> , 13642 <sup>1</sup> (large diameter), or 15394 <sup>1</sup> (square cover plate)				<b>Finishes of the Cover Plate Assembly<sup>6</sup></b> 1 - Polished Chrome, Brushed Chrome, Bright Brass, Antique Brass, Brushed Brass, Brushed Copper, Painted White, Painted Ivory, or Painted Black		
Footnotes								
<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 is shown in Bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0. <sup>3</sup> This chart shows the FM Approvals available at the time of printing. Other approvals may be in process. Check with the manufacturer for any additional approvals. <sup>4</sup> FM Approved as a standard response <b>Non-Storage</b> concealed pendent sprinkler. For specific application and installation requirements, reference the latest applicable FM Loss Prevention Data Sheets (including Data Sheet 2-0). <sup>5</sup> The 135/139°F cover has an orange label. The 165°F cover has a white label. <sup>6</sup> Standard painted finishes consist of Polyester Baked Enamel. 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. NOTE: Custom colors are indicated on a label inside the cover assembly. Refer to Figure 1.								



DESIGN CRITERIA - FM
(Also refer to Approval Chart 2 above.)
<p><b>FM Approval Requirements:</b></p> <p>Viking Concealed Pendent Sprinkler VK461 is FM Approved as a standard response <b>Non-Storage</b> 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.</p> <p><b>NOTE: The FM installation guidelines may differ from cULus and/or NFPA criteria.</b></p>
<p><b>IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. Also refer to page SR1-3 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, FM Global, LPCB, Assemblée Pleniére, VdS or other similar organizations, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable.</b></p>



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

Figure 1: Identification of Custom Paint Color for Concealed Covers

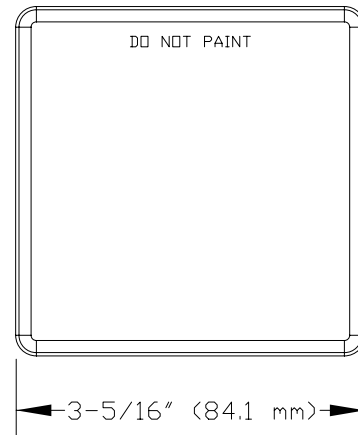
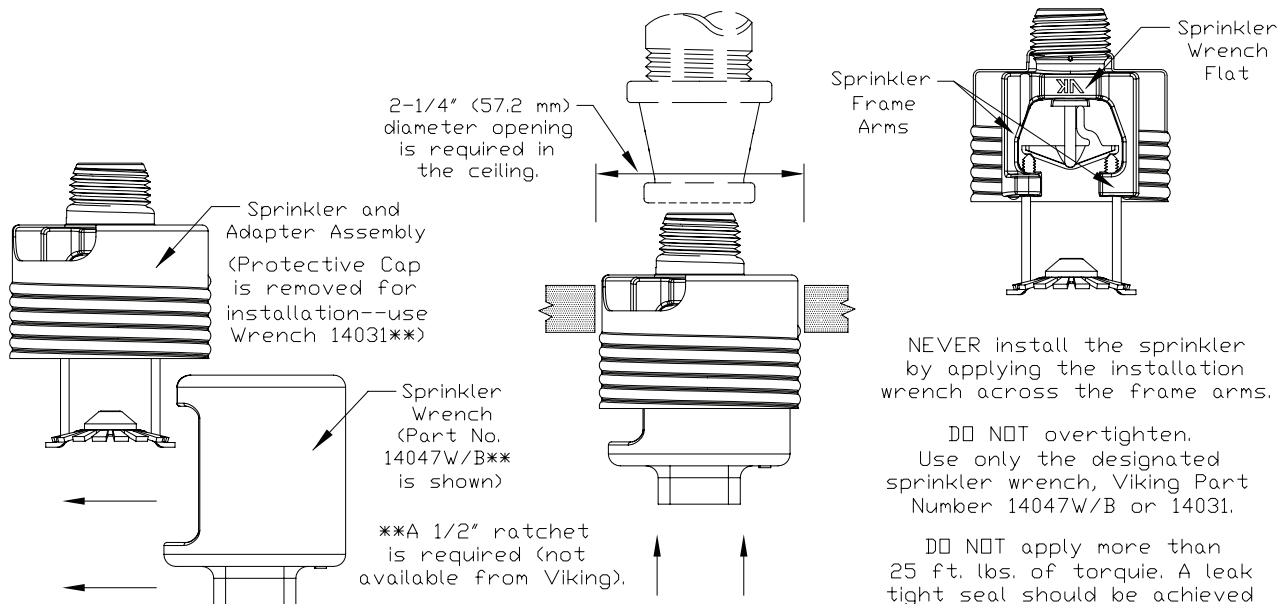


Figure 2: Square Cover Assembly 15394



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.

Figure 3: Sprinkler Installation and Correct Use of Wrenches



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