



## TECHNICAL DATA

### HORIZON® MIRAGE® STANDARD AND QUICK RESPONSE CONCEALED PENDENT SPRINKLERS

The Viking Corporation, 210 N Industrial Park Road, Hastings MI 49058

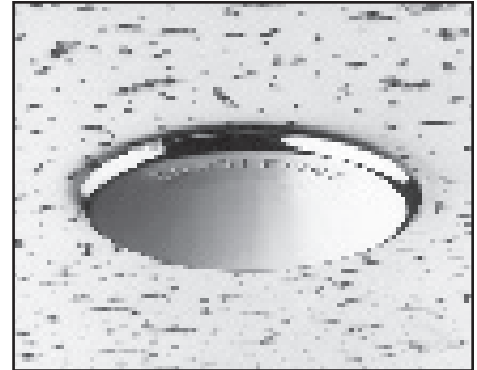
Telephone: 269-945-9501 Technical Services 877-384-5464 Fax: 269-945-4495 Email: techsvcs@vikingcorp.com

#### 1. DESCRIPTION

Viking Horizon® Mirage® Standard and Quick Response Concealed Pendent Sprinklers are small solder link and lever spray sprinklers designed for installation on concealed pipe systems where the appearance of a smooth ceiling is desired.

Horizon® Mirage® Standard and Quick Response Concealed Sprinklers are hidden from view by low-profile cover plates installed flush to the ceiling. The cover plates are available with various decorative finishes to meet design requirements.

The two-piece design of the unit allows installation and testing of the sprinklers prior to installation of the cover plates. After the system has been tested and the ceiling finish applied, the "push-on", "thread-off" design of the cover plate assemblies allows easy installation of the cover plates with up to 1/2" (12.7 mm) adjustment available. The "thread-off" feature is designed to prevent unwanted disengagement of the cover assemblies. This feature also permits temporary removal of ceiling panels without taking the sprinkler system out of service or removing the sprinkler.



#### 2. LISTINGS AND APPROVALS

**cULus Listed:** Category VNIV

**FM Approved:** Class 2015

**NYC Approved:** MEA 89-92-E, Volume 27 and 28

**NOTE:** International approval certificates are available upon request.

Refer to the Approval Chart on page 20d and Design Criteria on page 20e for cULus Listing and FM Approval requirements that must be followed.

#### 3. TECHNICAL DATA

##### Specifications:

Minimum Operating Pressure: 7 psi (0.5 bar)

**Maximum Working Pressure: Sprinklers VK405 and VK454 are rated for use with water working pressures ranging from the minimum 7 psi (0.5 bar) up to 250 psi (17.2 bar) for high-pressure systems. High-pressure (HP) sprinklers can be identified by locating "250" stamped on the sprinkler body. Sprinkler VK404 is rated to a maximum 175 psi (12 bar) wwp.**

Factory tested pneumatically to 95 psi (6.55 bar)

Spring: U.S.A. Patent No. 4,570,720

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

Nominal K-Factor: 5.6 U.S. (80.6 metric†)

†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.

Available Cover Plate Vertical Adjustment: 1/2" (12.7 mm) +/- 1/4" (6.4 mm)

##### Material Standards:

Sprinkler Body: Brass UNS-C84400

Body Cap: Brass UNS-C26000

Deflector: Copper UNS-C19500

Deflector Pins: Stainless Steel UNS-S30300

Button: UNS-C23000 H55-H80

Screw: Brass UNS-C36000

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

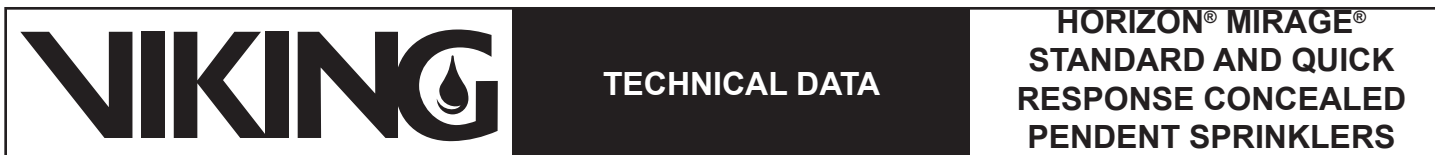
Fusible Link Assembly††: Nickel Alloy and Eutectic Solder

††The fusible link of the Quick Response Concealed Sprinkler is marked with a purple stripe or dot for identification purposes only.

Fusible Link Levers: Stainless Steel UNS-S31600

Lever Bar: Copper Alloy UNS-C72500

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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#### Cover Assembly Materials:

Cover Plate Assembly: Brass UNS-C26000 or UNS-C26800

Spring: Nickel Alloy

Solder: Eutectic

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

Viking Horizon® Mirage® Standard and Quick Response Concealed Pendent Sprinklers and Cover Plate Assemblies must be ordered separately:

**Sprinklers:** Base Part No. 09782A, 09783A, or 12292

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

Temperature Suffix (°F/°C): 165°/74° = C, 220°/104° = F

For example, sprinkler VK404 with a 165 °F/74 °C temperature rating = 09783AC.

#### Cover Plate Assembly:

Base Part No. 11225 with a 2-3/4" (69.8 mm) diameter, 135 °F/57 °C rated

Base Part No. 09804 with a 2-3/4" (69.8 mm) diameter, 165 °F/74 °C rated

Base Part No. 11697 with a 3-5/16" (84.1 mm) diameter, 135 °F/57 °C or 165 °F/74 °C rated

Specify finish and temperature rating of the cover plate assembly by first adding the appropriate suffix for the finish and then the appropriate suffix for the cover temperature rating to the base part number:

Finish Suffix for Covers 09804 and 11697: 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-/SW1004, Painted Ivory = M-/SW1634, Painted Black = M-/SW1007

Finish Suffix for Cover 11225: Polished Chrome = F

Temperature Suffix (°F/°C): 135°/57° = A, 165°/74° = C

For example, cover 09804 with a Polished Chrome finish and a 165 °F/74 °C temperature rating = 09804FC.

#### 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 Part Number 08336W/B (available since 1983), or

B. Light Duty Part Number 10366W/B\*\* (available since 1998)

\*Requires a 1/2" ratchet (not available from Viking).

\*\*Ideal for sprinkler cabinets.

**Sprinkler Cabinet:** Part No. 01731A, Capacity: six (6) sprinklers (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 sprinkler causes the heat-sensitive fusible link to disengage, releasing the deflector and sealing assembly. Water flowing through the sprinkler orifice strikes the 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 concealed sprinklers are 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.

	<b>TECHNICAL DATA</b>	<b>HORIZON® MIRAGE® STANDARD AND QUICK RESPONSE CONCEALED PENDENT SPRINKLERS</b>
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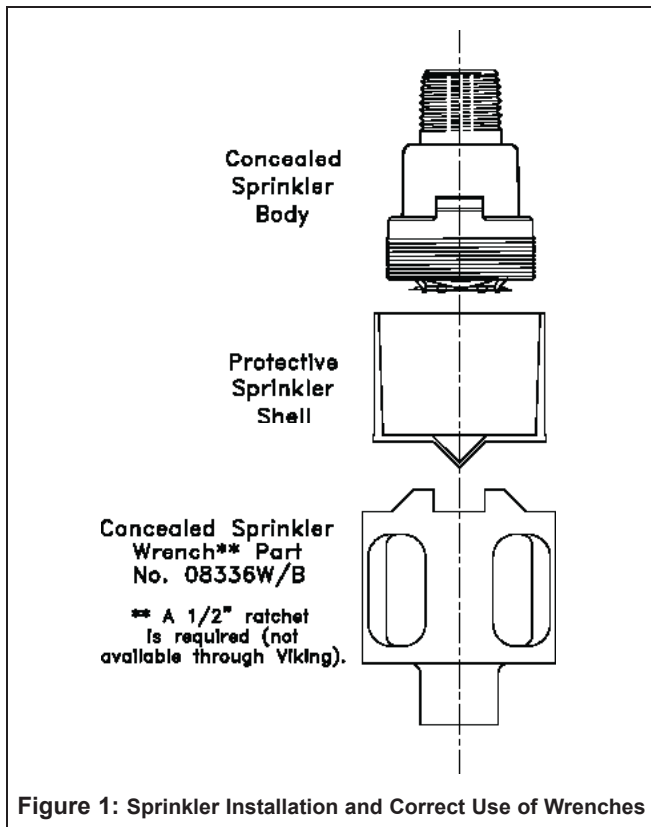
**TABLE 1: AVAILABLE SPRINKLER TEMPERATURE RATINGS AND FINISHES**

Sprinkler Temperature Classification	Sprinkler Nominal Temperature Rating <sup>1</sup>	Maximum Ambient Ceiling Temperature <sup>2</sup>	Temperature Rating of Cover Assembly (Required)	Cover Plate Base Part Number <sup>3</sup>
Ordinary	165 °F (74 °C)	100 °F (38 °C)	135 °F (57 °C)	11225 or 11697
			165 °F (74 °C)	09804 or 11697
Intermediate	220 °F (104 °C)	150 °F (65 °C)	135 °F (57 °C)	11697
			165 °F (74 °C)	09804 or 11697

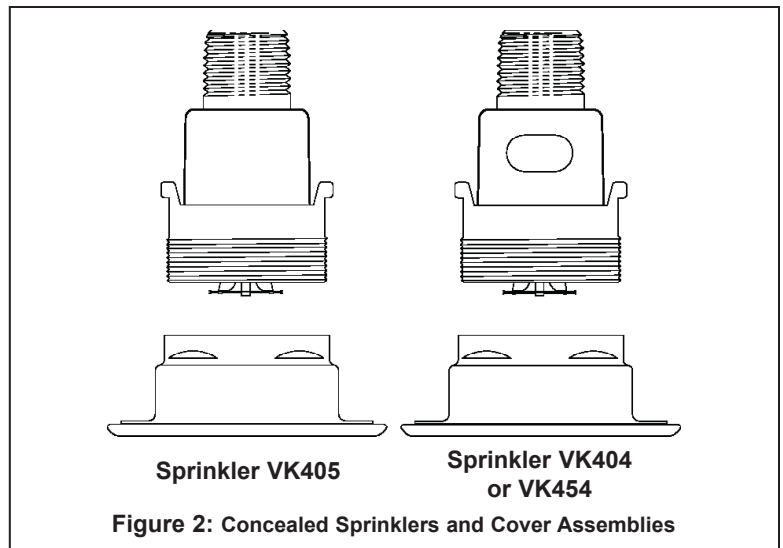
**Cover Plate Finishes:** For Covers 09804 and 11697: Polished Chrome, Brushed Chrome, Bright Brass, Antique Brass, Brushed Brass, Brushed Copper, Painted White, Painted Ivory, and Painted Black. For Cover 11225: Polished Chrome

**Footnotes**

- <sup>1</sup> The sprinkler temperature rating is stamped on the sprinkler body.
- <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.
- <sup>3</sup> Base part number is shown. For complete part number, refer to Viking's current price list schedule.



**Figure 1: Sprinkler Installation and Correct Use of Wrenches**

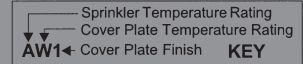




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**Approval Chart**

Horizon® Mirage® Standard and Quick Response  
 Concealed Pendent Sprinklers



Sprinkler Base Part Number <sup>1</sup>	SIN	NPT Thread Size		Nominal K-Factor		Maximum Water Working Pressure	Overall Length (Sprinkler Body)		Listings and Approvals <sup>4,5</sup> (Refer also to Design Criteria on page 20e.)		
		Inch	mm	U.S.	metric <sup>2</sup>		Inches	mm	cULus <sup>6</sup>	FM	NYC
<b>Standard Response Applications</b>											
09782A	VK405	1/2"	15	5.6	80.6	250 psi (17.2 bar) <sup>3</sup>	2-11/32"	59.5	AW2, AY1, BY1	--	AW2, AY1, BY1 <sup>7</sup>
09783A	VK404	1/2"	15	5.6	80.6	175 psi (12 bar)	2-11/32"	59.5	--	AX1, AY1, AZ1	AX1, AY1, AZ1 <sup>8</sup>
<b>Quick Response Applications</b>											
09783A	VK404	1/2"	15	5.6	80.6	175 psi (12 bar)	2-11/32"	59.5	AW2, AX1, AY1, BX1, BY1	--	AW2, AX1, AY1, BX1, BY1 <sup>7</sup>
12292	VK454	1/2"	15	5.6	80.6	250 psi (17.2 bar) <sup>3</sup>	2-11/32"	59.5	AW2, AX1, AY1, BX1, BY1	--	AW2, AX1, AY1, BX1, BY1 <sup>7</sup>
<b>Sprinkler Temperature Ratings</b> A - 165 °F (74 °C) B - 220 °F (104 °C)		<b>Cover Plate Assembly Temp. Ratings<sup>9</sup></b> W - 135 °F (57 °C) cover 11225 X - 135 °F (57 °C) cover 11697 (large diameter) Y - 165 °F (74 °C) cover 09804 Z - 165 °F (74 °C) cover 11697 (large diameter)						<b>Finishes of the Cover Plate Assembly<sup>10</sup></b> 1 - Polished Chrome, Brushed Chrome, Bright Brass, Antique Brass, Brushed Brass, Brushed Copper, Painted White, Painted Ivory, or Painted Black 2 - Polished Chrome			

**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 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> The Water Working Pressure rating is stamped on the sprinkler body.
  - <sup>4</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>5</sup> Listings and approvals are for hazard occupancies up to and including Ordinary Hazard, Group II.
  - <sup>6</sup> Listed by Underwriter's Laboratories for use in the U.S. and Canada.
  - <sup>7</sup> Accepted for use, City of New York Department of Buildings, MEA Number 89-92-E, Vol. 28.
  - <sup>8</sup> Accepted for use, City of New York Department of Buildings, MEA Number 89-92-E, Vol. 27.
  - <sup>9</sup> The 135 °F cover has an orange label. The 165 °F cover has a white label.
  - <sup>10</sup> Painted finish consists 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 3.



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**DESIGN CRITERIA**

(Also refer to the Approval Chart on page 20d.)

**cULus Listing Requirements:**

Horizon® Mirage® Standard and Quick Response Concealed Pendent Sprinklers are cULus Listed 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. Maximum spacing allowed is 15 ft. (4.6 m).
- 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.
- The sprinkler installation and obstruction rules contained in NFPA 13 for standard coverage pendent spray sprinklers must be followed.

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

**FM Approval Requirements:** Horizon® Mirage® Concealed Pendent Sprinkler VK404 is FM Approved as a standard response standard spray sprinkler as indicated in the Approval Chart for hazard occupancies up to and including Ordinary Hazard, Group II. For installation in accordance with the latest applicable FM Loss Prevention Data Sheets and Technical Advisory Bulletins. FM Global Loss Prevention Data Sheets and Technical Advisory Bulletins 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.**

**NOTE:** Covers 09804 or 11697 must be used for all Factory Mutual Approved installations. Previous Model B-1 Cover Plate Assembly Part Number 08310 may still be used for cULus installations. The correct Horizon® Mirage® Sprinkler can be verified by checking the fusible link for the following identification scheme:

- A. Standard Response: No stripe or dot.
- B. Quick Response: Purple stripe or dot.
- C. EC or QREC: Yellow stripe or dot.

**IMPORTANT: Always refer to Bulletin Form No. F\_091699 - Care and Handling of Sprinklers. Also refer to page SR1-2 or QR1-2 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, APSAD, VdS or other similar organizations, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable.**

Note: Upon sprinkler activation, the deflector descends to approximately 13/16" (20.6 mm) below the sprinkler body.

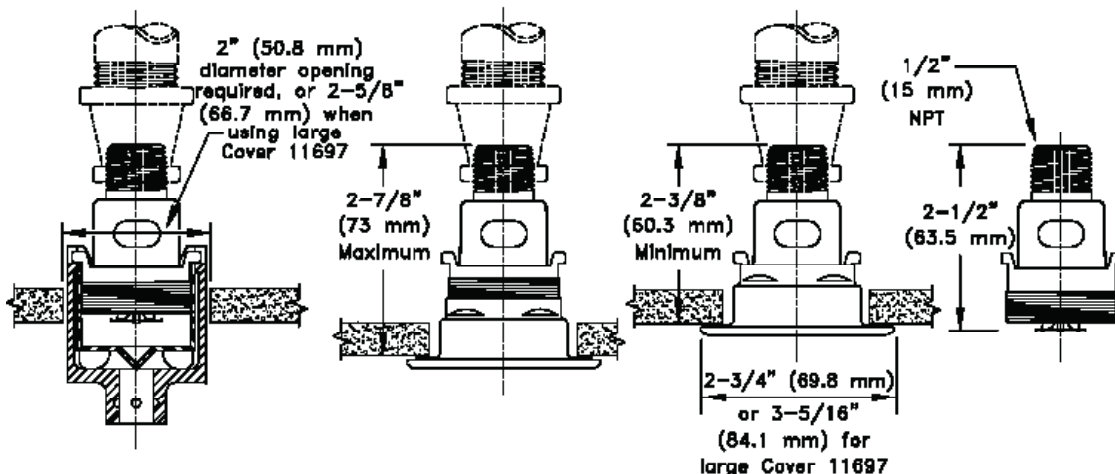


Figure 4: Sprinkler Dimensions and Cover Installation

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