



## TECHNICAL DATA

### MIRAGE® STANDARD AND QR CONCEALED PENDENT SPRINKLER VK462 AND HP SPRINKLER VK463 (K5.6)

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

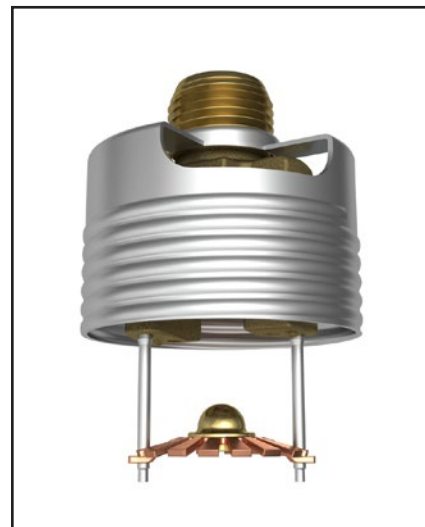
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

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## 1. DESCRIPTION

Viking Mirage® Standard and Quick Response Concealed Pendent Sprinkler VK462 and HP Sprinkler VK463 are thermosensitive glass-bulb spray sprinklers 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. The Electroless Nickel PTFE (ENT) coating has been investigated for installation in corrosive environments and is cULus Listed 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



**cULus Listed:** Category VNIV



**FM Approval:** Class 2015

**NYC Approved:** MEA 89-92-E, Volume 32



**VdS Approved:** Certificate G4080021



**LPCB Approved:** Certificate number 096e/12



**CE Certified:** Standard EN 12259-1, EC-certificate of conformity 0786-CPD-40249



**CCCF Approved:** Approved by the China Certification Center for Fire Products (CCCF)



**MED Certified:** Standard EN 12259-1, EC-certificate 0832-MED-1003

Refer to Approval Chart 1 Design Criteria for cULus Listing requirements, and refer to Approval Chart 2 and Design Criteria on page 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: Sprinkler VK463 is 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 deflector. Sprinkler VK462 is rated to a maximum 175 psi (12 bar) wwp.**

Factory tested hydrostatically to 500 psi (34.5 bar)

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

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

Glass-bulb fluid temperature rated to -65°F (-55°C)

Patents Pending

\*cULus Listing, FM Approval, and NFPA 13 installs require a minimum of 7 psi (0.5 bar). The minimum operating pressure for LPCB and CE Approvals ONLY is 5 psi (0.35 bar).

†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.

### Material Standards:

Sprinkler Body: Brass UNS-C84400

Deflector: Copper UNS-C19500 for Sprinkler VK462

Phosphor Bronze UNS-C51000 for Sprinkler VK463

Deflector Pins: Stainless Steel Alloy

Bulb: Glass, nominal 3 mm diameter



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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 or Stainless Steel UNS-S30400  
 Base: Brass UNS-C26000 or UNS-C26800  
 Springs: Nickel Alloy  
 Solder: Eutectic

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

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

**Sprinkler:** Base Part No. VK462 - 13503A for Brass finish and 13503JN for ENT finish. VK463 - HP Base Part No. 13667A

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

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

For example, sprinkler VK463 with a 155 °F (68 °C) temperature rating = 13667AB.

**Standard 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")

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) UL (139 °F (59 °C) FM and LPCB) = A, 165 °F (74 °C) = C

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

**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).

Temperature Suffix: 135 °F (57 °C) UL (139 °F (59 °C) FM and LPCB) = A, 165 °F (74 °C) = C

For example, cover 21876 with a 165 °F (74 °C) temperature rating = 21876C

**NOTE:** The cULus Listings for the square cover plate 15394 are for the 135 °F (57 °C) temperature rated cover plate only. Refer to the Approval Chart.

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

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

#### 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). \*\*\*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 Sprinklers VK462 and VK463 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.

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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> | Large Cover Plate Base Part Number <sup>3</sup> | Square Cover Plate Base Part Number <sup>3</sup> | Bulb Color |
|--------------------------------------|---|--|---|---|---|--|------------|
| Ordinary                             | 155 °F (68° C)                                    | 100 °F (38 °C)                                   | 135 °F (57 °C) cULus                            | 13504 or 21876 <sup>5</sup>               | 13642 or 21875 <sup>5</sup>                     | 15394  | Red        |
|                                      |   |  | 139 °F (59 °C) FM and LPCB                      |   |   |  |            |
| Intermediate                         | 175 °F (79° C)                                    | 150 °F (65° C)                                   | 165 °F (74 °C)                                  | 13504 or 21876 <sup>5</sup>               | 13642 or 21875 <sup>5</sup>                     | 15394  | Yellow     |
| Intermediate                         | 200 °F (93° C)                                    | 150 °F (65° C)                                   | 165 °F (74 °C)                                  | 13504 or 21876 <sup>5</sup>               | 13642 or 21875 <sup>5</sup>                     | 15394  | Green      |

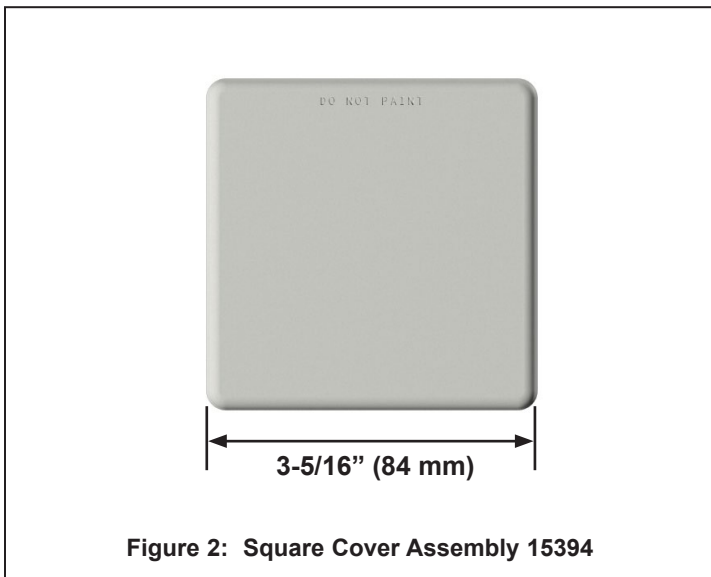
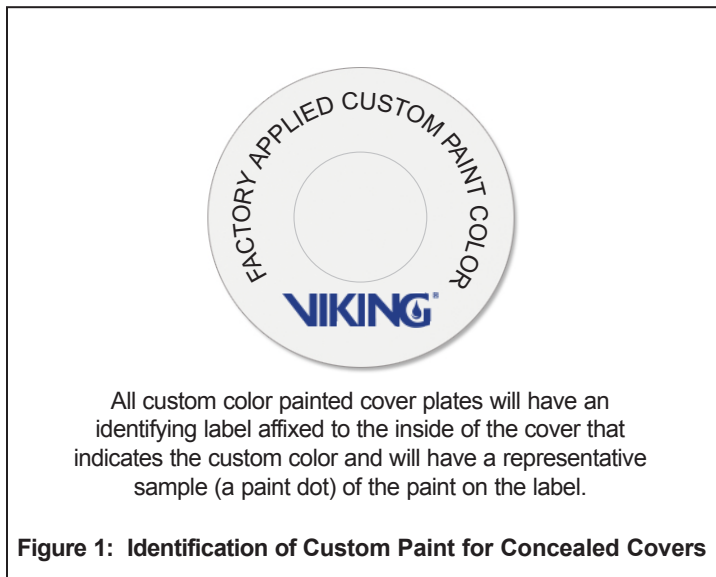
**Cover Plate Finishes<sup>5</sup>:** Polished Chrome, Brushed Chrome, Bright Brass, Antique Brass, Brushed Brass, Brushed Copper, Painted White, Painted Ivory, or Painted Black


**Sprinkler Finishes:** Brass and ENT

**Corrosion Resistant Coatings<sup>4</sup>:** ENT


**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.
- <sup>3</sup> Part number shown is the base part number. For complete part number, refer to current Viking price list schedule.
- <sup>4</sup> 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, but the Belleville spring is exposed.
- <sup>5</sup> Stainless Steel versions are not available with any finishes or paint.



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| Approval Chart 1 (UL)  |       |  |    |                  |                     |                                 |   |                       |                  |          |  |     |          |
|--|-------|--|----|------------------|---------------------|---------------------------------|---|-----------------------|------------------|----------|---|-----|----------|
| Mirage® Concealed Pendent Sprinklers VK462 and VK463   |       |  |    |                  |                     |                                 |   |                       |                  |          |   |     |          |
| Sprinkler Base Part No. <sup>1</sup>   | SIN   | Thread Size  |    | Nominal K-Factor |                     | Maximum Water Working Pressure  | Listings and Approvals <sup>4</sup> (Refer also to Design Criteria)   |                       |                  |          |   |     |          |
|  |       | Inch   | mm | U.S.             | metric <sup>2</sup> |                                 | cULus <sup>5</sup>  | NYC                   | VdS <sup>7</sup> | LPCB     | CE  | 12  | CCC      |
| <b>Standard Response Applications</b>  |       |  |    |                  |                     |                                 |   |                       |                  |          |   |     |          |
| 13503A   | VK462 | 1/2"   | -- | 5.6              | 80.6                | 175 psi (12 bar)                | --  | --                    | AY1, CZ1         | AY1, BZ1 | AY1, CZ1 <sup>8</sup>   | AY3 | --       |
| 19785A   | VK462 | 1/2"   | -- | 5.6              | 80.6                | 175 psi (12 bar)                | --  | --                    | --               | --       | --  | --  | AY2, CZ2 |
| 21356A   | VK462 | --   | 15 | 5.6              | 80.6                | 175 psi (12 bar)                | --  | --                    | --               | --       | --  | --  | AY2, CZ2 |
| <b>Quick Response Applications</b>   |       |  |    |                  |                     |                                 |   |                       |                  |          |   |     |          |
| 13503A   | VK462 | 1/2"   | 15 | 5.6              | 80.6                | 175 psi (12 bar)                | AV1, BX1, AS3, BT3  | AV1, BX1 <sup>6</sup> | --               | --       | --  | AY3 | --       |
| 13503JN <sup>11</sup>  | VK462 | 1/2"   | 15 | 5.6              | 80.6                | 175 psi (12 bar)                | AV1, BX1, AS3, BT3  | AV1, BX1 <sup>6</sup> | --               | --       | --  | --  | --       |
| 13667A   | VK463 | 1/2"   | 15 | 5.6              | 80.6                | 250 psi (17.2 bar) <sup>3</sup> | AV1, BX1  | AV1, BX1 <sup>6</sup> | --               | --       | --  | --  | --       |
| <b>Sprinkler Temperature Ratings</b>   |       | <b>Cover Plate Assembly Temperature Ratings<sup>1,9</sup></b>  |    |                  |                     |                                 | <b>Cover Plate Assembly Finishes<sup>10</sup></b>   |                       |                  |          |   |     |          |
| A - 155 °F (68 °C)<br>B - 175 °F (79 °C) and 200 °F (93 °C)<br>C - 200 °F (93 °C)  |       | S - 135 °F (57 °C) cover 21876 or 21875 (large diameter)<br>T - 165 °F (74 °C) cover 21876 or 21875 (large diameter)<br>V - 135 °F (57 °C) cULus Listed cover 13504, 13642 (large diameter), or 15394 (square cover plate)<br>X - 165 °F (74 °C) cover 13504, or 13642 (large diameter)<br>Y - 135 °F (57 °C) cover 13504 <i>LPCB Approved as 139 °F (59 °C)</i><br>Z - 165 °F (74 °C) cover 13504 |    |                  |                     |                                 | 1 - Polished Chrome, Brushed Chrome, Bright Brass, Antique Brass, Brushed Brass, Brushed Copper, Painted White, Painted Ivory, or Painted Black<br>2 - Brass<br>3 - Stainless Steel |                       |                  |          |   |     |          |
| <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.<br><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.<br><sup>3</sup> The Water Working Pressure rating is stamped on the deflector.<br><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.<br><sup>5</sup> Listed by Underwriter's Laboratories for use in the U.S. and Canada.<br><sup>6</sup> Accepted for use, City of New York Department of Buildings, MEA Number 89-92-E, Vol. 32.<br><sup>7</sup> VdS Approved, standards VdS 2344:2005-12, VdS 2100-25:2008-01, and EN 12259-1:1999 + A1:2001 + A2:2004 + A3:2006, Certificate G4080021.<br><sup>8</sup> CE Certified, Standard EN 12259-1, EC-certificate of conformity 0786-CPD-40249.<br><sup>9</sup> The 135/139 °F cover has an orange label. The 165 °F (74 °C) cover has a white label.<br><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.<br><sup>11</sup> cULus Listed as corrosion resistant.<br><sup>12</sup> MED Certified, Standard 12259-1, EC-certificate 0832-MED-1003.<br><b>NOTE:</b> Custom colors are indicated on a label inside the cover assembly. Refer to Figure 1. |       |  |    |                  |                     |                                 |   |                       |                  |          |   |     |          |



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### DESIGN CRITERIA - UL

(Also refer to Approval Chart 1)

#### cULus Listing Requirements:

Mirage® Concealed Pendent Sprinklers VK462 and VK463 are cULus Listed as quick response 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 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.**

#### VdS Approval Requirements:

- a) The sprinkler can be installed in a concrete ceiling (massive ceiling) or in a false ceiling made of light materials.
- b) This sprinkler is deflector fixed type and can be only activated by heat. The housing is not tight.
- c) Follow installation guidelines of current standards, CEA4001VdS and EN12845. These sprinklers can only be installed in LH and OH occupancies, except in OH4.

**NOTES:** Due to the design the sprinkler type 'Domed-CCP' shall not be installed in false ceilings in which the false ceiling space is protected by a water extinguishing system.


Due to the design the sprinkler type 'Domed-CCP' shall not be installed in false ceilings in which during a fire the pressure above the false ceiling may be assumed to be higher than the pressure below the false ceiling.

The criterion for the dropping of the cover relevant for this approval is heat.


Steps of installation:

1. Prepare the sprinkler key.
2. Remove the plastic cover.
3. Hold the sprinkler with the wrench and fasten it.
4. Replace the plastic cover and do not remove until the cover is installed.

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

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| Approval Chart 2 (FM)  |       |   |    |                  |                     |  |  |
|--|-------|---|----|------------------|---------------------|--|---|
| Mirage® Standard Response Concealed Pendent Sprinkler VK462  |       |   |    |                  |                     |  |   |
| Sprinkler Base Part No. <sup>1</sup>   | SIN   | NPT Thread Size   |    | Nominal K-Factor |                     | Maximum Water Working Pressure   | FM Approvals <sup>3</sup><br>(Refer also to Design Criteria below.)                 |
|  |       | Inch  | mm | U.S.             | metric <sup>2</sup> |  |   |
| 13503A   | VK462 | 1/2"  | 15 | 5.6              | 80.6                | 175 psi (12 bar)   | AW1, BX1, AY2, BZ2  |
| <b>Sprinkler Temperature Ratings</b><br>A - 155 °F (68 °C)<br>B - 175 °F (79 °C) and 200 °F (93 °C)  |       | <b>Cover Plate Assembly Temperature Ratings<sup>1,4</sup></b><br>Y - 139 °F (59 °C) cover 21875 or 21876<br>Z - 165 °F (74 °C) cover 21875 or 21876<br>W - 139 °F (59 °C) cover 13504, 13642 (large diameter), or 15394 (square cover plate)<br>X - 165 °F (74 °C) cover 13504, 13642 (large diameter), or 15394 (square cover plate) |    |                  |                     | <b>Cover Plate Assembly Finishes<sup>5</sup></b><br>1 - Polished Chrome, Brushed Chrome, Bright Brass, Antique Brass, Brushed Brass, Brushed Copper, Painted White, Painted Ivory, or Painted Black<br>2 - Stainless Steel |   |
| <b>Footnotes</b><br><sup>1</sup> Part number shown is the base part number. For complete part number, refer to current Viking price list schedule.<br><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.<br><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.<br><sup>4</sup> The 139 °F (59 °C) cover has an orange label. The 165 °F (74 °C) cover has a white label.<br><sup>5</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.<br><b>NOTE:</b> 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.)  |
| <b>FM Approval Requirements:</b><br>Viking Concealed Pendent Sprinkler VK462 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.<br><b>NOTE: The FM installation guidelines may differ from cULus and/or NFPA criteria.</b> |
| <b>IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. 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, FM Global, LPCB, APSAD, VdS or other similar organizations, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable.</b>  |





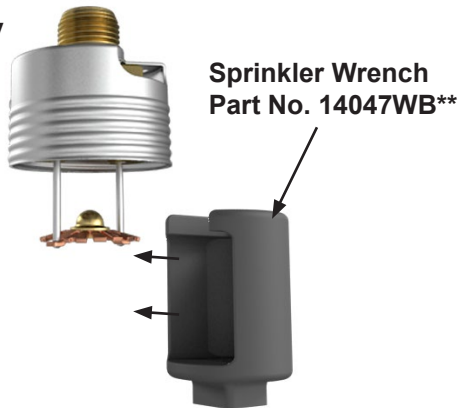
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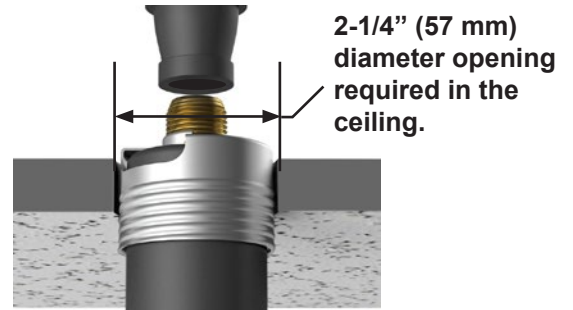
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**Sprinkler and Adapter Assembly**

- Protective cap removed
- Use wrench 14047WB\*\*

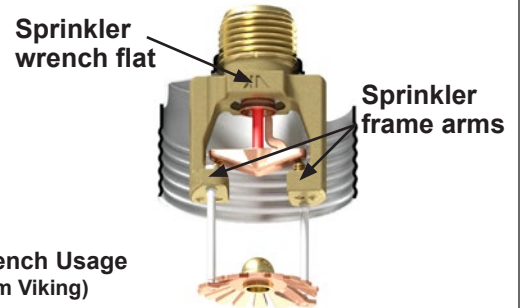


**Step 1:**  
Carefully slide the wrench sideways around the deflector and pins

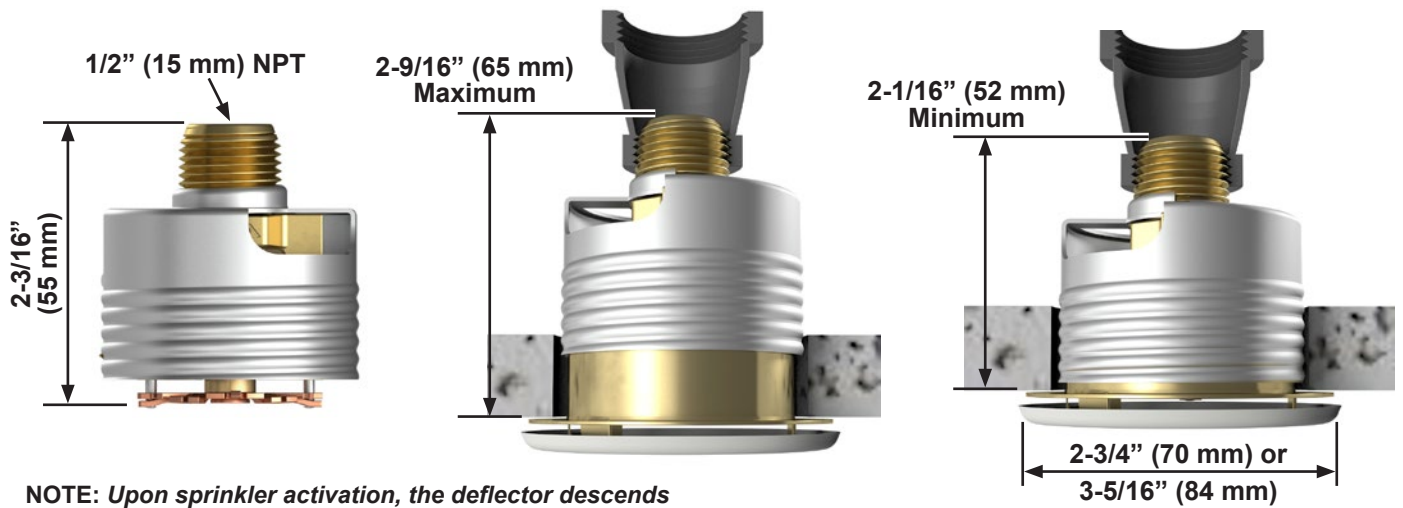


**Step 2:**  
Carefully press the wrench upward and turn slightly to ensure engagement with the sprinkler wrench flats.

**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 14047WB\*\* or 14031\*\*. A leak tight seal should be achieved by turning the sprinkler clockwise 1 to 1-1/2 turns beyond finger tight.



**Figure 3: Sprinkler Installation and Proper Wrench Usage**  
 \*\* A 1/2" ratchet is required (Not available from Viking)



**NOTE:** Upon sprinkler activation, the deflector descends to approximately 13/16" (21 mm) below the sprinkler body.

**Figure 4: Sprinkler Dimensions and Cover Installation**