



## TECHNICAL DATA

## MIRAGE® EC/QREC OH-ELO CONCEALED PENDENT SPRINKLER VK538 (K11.2)

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 Mirage® EC/QREC ELO Concealed Pendent Sprinkler VK538 is a thermosensitive solder link spray sprinkler designed for installation on concealed pipe systems where the appearance of a smooth ceiling is desired. With a K-factor of 11.2, the sprinkler produces flows required to meet Ordinary Hazard density requirements at lower pressures than 5.6K or 8.0K sprinklers. The fusible operating element and special deflector characteristics meet the challenges of quick response extended coverage standards. Sprinkler VK538 has cULus Listings as both standard and quick response.

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" and "thread-on" designs of the concealed cover plate assemblies allow 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 atmospheres and is cULus Listed as corrosion resistant as indicated in the Approval Charts. The ENT finish is only available for the sprinkler assembly, the cover plate is not plated.



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

### 2. LISTINGS AND APPROVALS



**cULus Listed:** Category VNIV

Refer to the Approval Chart and Design Criteria for cULus Listing requirements that must be followed.

### 3. TECHNICAL DATA

#### Specifications:

Available since 2011.

Minimum Operating Pressure: 7 psi (0.5 bar).

Maximum Working Pressure: 175 psi (12 bar).

Factory tested hydrostatically to 500 psi (34.5 bar).

Thread size: ¾" NPT

Nominal K-Factor: 11.2 U.S. (161.3 metric\*)

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

Patented

#### Material Standards:

Sprinkler Body: Brass UNS-C84400

Deflector: Bronze UNS-C51000

Deflector Pins: Stainless Steel

Fusible Element Assembly: Nickel Alloy and Eutectic Solder

Lever and Lever Bar: Stainless Steel

Seat: Bronze UNS-C31400 / UNS-C31600

Deflector Carrier: Brass UNS-C84400 or QM Brass

Retaining Bolt: Brass UNS-C36000

Screw: Brass UNS-C36000

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

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

#### Cover Assembly Materials:

Cover: Brass UNS-C26800 or Stainless Steel UNS-S30400

Base: Cold Rolled Steel UNS-G10060 / G10080, Finish: Copper Flash

Springs: Nickel Alloy

Solder: Non-eutectic

**Ordering Information:** Refer to Tables 1 and 2 (Also refer to the current Viking price list).

### 4. INSTALLATION

Refer to appropriate NFPA Installation Standards.



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### 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 fusible element assembly to disengage, releasing seat 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

The Viking Model VK538 Sprinkler 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**

#### 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 (refer to Table 2)

#### Example:

17115AE = 205 °F (96 °C) Temperature Rated Sprinkler with a standard Brass finish.

SIN	Sprinkler Base Part Number <sup>8</sup>	Size		1: Finishes		2: Temperature Ratings			
		NPT Inch	BSPT mm	Description	Suffix <sup>1</sup>	Sprinkler Temperature Classification	Nominal Rating	Max. Ambient Ceiling Temperature <sup>2</sup>	Suffix
VK538	17115	3/4	--	Brass	A	Ordinary	165 °F (74 °C)	100 °F (38 °C)	C
				ENT <sup>5,6</sup>	JN	Intermediate	205 °F (96 °C)	150 °F (65 °C)	E

#### Accessories

##### Sprinkler Wrenches and tools (see Figure 1):


- A. Heavy Duty Part Number: 15467W/B<sup>3</sup> (available since 2009)
- B. Head Cabinet Wrench Part Number: 15466<sup>3,4</sup> (available since 2009)
- C. Optional Concealed Cover Plate Installer Tool Part Number: 14867<sup>7</sup> (available since 2007)

##### Sprinkler Cabinet:

Holds up to 6 sprinklers: Part number 01731A (available since 1971).

#### Footnotes

1. Where a dash (-) is shown in the Finish suffix designation, insert the desired Temperature Rating suffix. See example above.
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. Requires a 1/2" ratchet (not available from Viking).
4. Also optional for removal of the protective cap. Ideal for sprinkler cabinets.
5. cULus Listed as corrosion resistant.
6. The corrosion resistant coatings have passed the standard corrosion test required by the approving agencies indicated in the Approval Chart. 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.
7. The installer tool is for push-on style cover plates only.

	<b>TECHNICAL DATA</b>	<b>MIRAGE® EC/QREC OH-ELO CONCEALED PENDENT SPRINKLER VK538 (K11.2)</b>
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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.

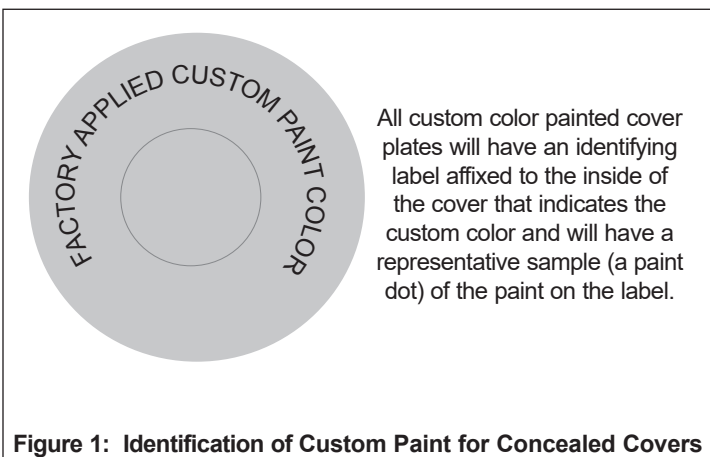
**Example:**  
 15765MC/W = 165 °F (74 °C) Temperature Rated 3-5/16" (84 mm) diameter, Thread-On style Round Cover Plate with a Painted White finish.

1: Select a Cover Plate Base Part Number <sup>3</sup>						2: Select a Finish <sup>5</sup>	
Thread-On Style			Push-On Style			Description	Suffix <sup>4</sup>
Base Part Number	Size Inch (mm)	Type	Base Part Number	Size Inch (mm)	Type		
15765	3-5/16 (84)	Round	23495	3-5/16 (84)	Round	Polished Chrome	F
21878 <sup>5</sup>	3-5/16 (84)	Stainless Steel Round	23504 <sup>5</sup>	3-5/16 (84)	Stainless Steel Round	Painted White	M-/W
						Painted Black	M-/B
						Painted Ivory	M-/I

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
135 °F (57 °C)	Ordinary	165 °F (74 °C)	100 °F (38 °C)	A
165 °F (74 °C)	Ordinary	165 °F (74 °C)	100 °F (38 °C)	C
165 °F (74 °C)	Intermediate	205°F (96 °C)	150 °F (65 °C)	C

**Footnotes**

1. The sprinkler temperature rating is stamped on the deflector.
2. 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.
3. Part number shown is the base part number. For complete part number, refer to current Viking price list schedule.
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.



**Figure 1: Identification of Custom Paint for Concealed Covers**



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Sprinkler Base Part Number <sup>1</sup>	SIN	NPT Thread Size		Nominal K-Factor		Maximum Water Working Pressure	Overall Length	
		Inches	mm	U.S.	metric <sup>2</sup>		Inches	mm
17115A	VK538	3/4	20	11.2	161.3	175 psi (12 bar)	2-5/8	66.6

### Approval Chart EC/QREC Ordinary Hazard ELO Sprinklers

KEY	
Temperature	Finish
A1X ←	Escutcheon (if applicable)

Max. Sprinkler Spacing (L x W <sup>6</sup> )	Maximum Area per Sprinkler	Minimum Water Supply Requirements <sup>6</sup>		Listings <sup>3</sup>	
		Ordinary Hazard Group I	Ordinary Hazard Group II	(Refer also to UL Design Criteria.)	
		Flow / Pressure	Flow / Pressure	cULus <sup>4</sup>	NYC
<b>Standard Response</b>					
20 ft. x 20 ft. (6.1 m x 6.1 m)	400 ft <sup>2</sup> (37.2 m <sup>2</sup> )	60 gpm @ 28.7 psi (227.1 L/min @ 1.98 Bar)	80 gpm @ 51.0 psi (302.8 L/min @ 3.52 Bar)	AY1, AV2	See Footnote 5.
<b>Quick Response</b>					
14 ft. x 14 ft. (4.3 m x 4.3 m)	196 ft <sup>2</sup> (18.2 m <sup>2</sup> )	30 gpm @ 7.2 psi (113.6 L/min @ .50 Bar)	39 gpm @ 12.1 psi (147.7 L/min @ .84 Bar)	AZ1, BY1, AW2, BV2	See Footnote 5.
16 ft. x 16 ft. (4.9 m x 4.9 m)	256 ft <sup>2</sup> (23.8 m <sup>2</sup> )	38 gpm @ 11.5 psi (143.9 L/min @ .79 Bar)	51 gpm @ 20.7 psi (193.1 L/min @ 1.43 Bar)	AZ1, BY1, AW2, BV2	See Footnote 5.
18 ft. x 18 ft. (5.5 m x 5.5 m)	324 ft <sup>2</sup> (30.1 m <sup>2</sup> )	49 gpm @ 19.1 psi (185.5 L/min @ 1.32 Bar)	65 gpm @ 33.7 psi (246.1 L/min @ 2.32 Bar)	AZ1, BY1, AW2, BV2	See Footnote 5.
20 ft. x 20 ft. (6.1 m x 6.1 m)	400 ft <sup>2</sup> (37.2 m <sup>2</sup> )	60 gpm @ 28.7 psi (227.1 L/min @ 1.98 Bar)	80 gpm @ 51.0 psi (302.8 L/min @ 3.52 Bar)	AX1, BY1, AU2, BV2	See Footnote 5.
<b>Approved Temperature Ratings</b>		<b>Cover Assembly Temperature Ratings<sup>1</sup></b>		<b>Cover Plate Finishes<sup>7</sup></b>	
A - 165 °F (74 °C) B - 205 °F (96 °C)		U = 135 °F (57 °C) cover 21878, 23504 V = 165 °F (74 °C) cover 21878, 23504 W = 135 °F (57 °C) or 165 °F (74 °C) cover 21878, 23504 X - 135 °F (57 °C) cover 15765, 23495 Y - 165 °F (74 °C) cover 15765, 23495 Z - 135 °F (57 °C) or 165 °F (74 °C) cover 15765, 23495		1 - Polished Chrome, Painted White, Painted Ivory, or Painted Black 2 - Stainless Steel	

#### 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> This chart shows listings and approvals available at time of printing. Check with the manufacturer for any additional approvals.

<sup>4</sup> cULus Listed for use in the U.S. and Canada.

<sup>5</sup> Meets New York City requirements, effective July 1, 2008.

<sup>6</sup> To determine "Minimum Water Supply Requirement" for areas of coverage where length and width of actual sprinkler spacing are not equal, select the "Maximum Sprinkler Spacing" from the chart that is equal to or greater than the larger of the actual spacing (length or width) dimensions used. Example: When using 10'-6" x 13'-0" sprinkler spacing, provide the "Minimum Water Supply Requirement" listed in the chart for 14'-0" x 14'-0" spacing. For areas of coverage smaller than shown, use the "Minimum Water Supply Requirement" in the appropriate hazard group for the next larger area listed. The distance from sprinklers to walls shall not exceed one-half the "Maximum Sprinkler Spacing" listed for the "Minimum Water Supply Requirement" used.

<sup>7</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 1.



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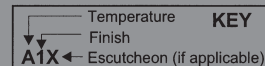
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Sprinkler Base Part Number <sup>1</sup>	SIN	NPT Thread Size		Nominal K-Factor		Maximum Water Working Pressure	Overall Length	
		Inches	mm	U.S.	metric <sup>2</sup>		Inches	mm
17115JN <sup>7</sup>	VK538	3/4	20	11.2	161.3	175 psi (12 bar)	2-5/8	66.6

### Approval Chart EC/QREC Ordinary Hazard ELO Sprinklers



Max. Sprinkler Spacing (L x W <sup>5</sup> )	Maximum Area per Sprinkler	Minimum Water Supply Requirements <sup>5</sup>		Listings <sup>3</sup>
		Ordinary Hazard Group I	Ordinary Hazard Group II	(Refer also to UL Design Criteria.)
		Flow / Pressure	Flow / Pressure	cULus <sup>4</sup>
<b>Standard Response</b>				
20 ft. x 20 ft. (6.1 m x 6.1 m)	400 ft <sup>2</sup> (37.2 m <sup>2</sup> )	60 gpm @ 28.7 psi (227.1 L/min @ 1.98 Bar)	80 gpm @ 51.0 psi (302.8 L/min @ 3.52 Bar)	AY1, AV2
<b>Quick Response</b>				
14 ft. x 14 ft. (4.3 m x 4.3 m)	196 ft <sup>2</sup> (18.2 m <sup>2</sup> )	30 gpm @ 7.2 psi (113.6 L/min @ .50 Bar)	39 gpm @ 12.1 psi (147.7 L/min @ .84 Bar)	AZ1, BY1, AW2, BV2
16 ft. x 16 ft. (4.9 m x 4.9 m)	256 ft <sup>2</sup> (23.8 m <sup>2</sup> )	38 gpm @ 11.5 psi (143.9 L/min @ .79 Bar)	51 gpm @ 20.7 psi (193.1 L/min @ 1.43 Bar)	AZ1, BY1, AW2, BV2
18 ft. x 18 ft. (5.5 m x 5.5 m)	324 ft <sup>2</sup> (30.1 m <sup>2</sup> )	49 gpm @ 19.1 psi (185.5 L/min @ 1.32 Bar)	65 gpm @ 33.7 psi (246.1 L/min @ 2.32 Bar)	AZ1, BY1, AW2, BV2
20 ft. x 20 ft. (6.1 m x 6.1 m)	400 ft <sup>2</sup> (37.2 m <sup>2</sup> )	60 gpm @ 28.7 psi (227.1 L/min @ 1.98 Bar)	80 gpm @ 51.0 psi (302.8 L/min @ 3.52 Bar)	AX1, BY1, AU2, BV2

#### Approved Temperature Ratings

- A - 165 °F (74 °C)
- B - 205 °F (96 °C)

#### Cover Assembly Temperature Ratings<sup>1</sup>

- U = 135 °F (57 °C) cover 21878, 23504
- V = 165 °F (74 °C) cover 21878, 23504
- W = 135 °F (57 °C) or 165 °F (74 °C) cover 21878, 23504
- X - 135 °F (57 °C) cover 15765, 23495
- Y - 165 °F (74 °C) cover 15765, 23495
- Z - 135 °F (57 °C) or 165 °F (74 °C) cover 15765, 23495

#### Cover Plate Finishes<sup>6</sup>

- 1 - Polished Chrome, Painted White, Painted Ivory, or Painted Black
- 2 - Stainless Steel

#### 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> This chart shows listings and approvals available at time of printing. Check with the manufacturer for any additional approvals.
- <sup>4</sup> cULus Listed for use in the U.S. and Canada.
- <sup>5</sup> To determine "Minimum Water Supply Requirement" for areas of coverage where length and width of actual sprinkler spacing are not equal, select the "Maximum Sprinkler Spacing" from the chart that is equal to or greater than the larger of the actual spacing (length or width) dimensions used. Example: When using 10'-6" x 13'-0" sprinkler spacing, provide the "Minimum Water Supply Requirement" listed in the chart for 14'-0" x 14'-0" spacing. For areas of coverage smaller than shown, use the "Minimum Water Supply Requirement" in the appropriate hazard group for the next larger area listed. The distance from sprinklers to walls shall not exceed one-half the "Maximum Sprinkler Spacing" listed for the "Minimum Water Supply Requirement" used.
- <sup>6</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.
- <sup>7</sup> cULus Listed as corrosion resistant

**NOTE:** 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 the UL Approval Chart.)

#### **cULus Listing Requirements:**

EC/QREC OH-ELO Pendent Sprinkler VK538 is cULus Listed as indicated in the Approval Chart for installation in accordance with the latest edition of NFPA 13 for extended coverage pendent spray sprinklers as indicated below:

- The minimum water supplies and maximum areas of coverage shown in Approval Chart 1 are designed to provide the following design densities: 0.15 gpm/ft<sup>2</sup> (6.1 mm/min) for Ordinary-Hazard Group I densities; 0.2 gpm/ft.<sup>2</sup> (8.1 mm/min) for Ordinary-Hazard Group II densities.
- Minimum spacing allowed is 8 ft. (2.4 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 rules contained in NFPA 13 for extended coverage pendent spray sprinklers must be followed.
- Limited to use with smooth, flat, horizontal ceilings only.

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

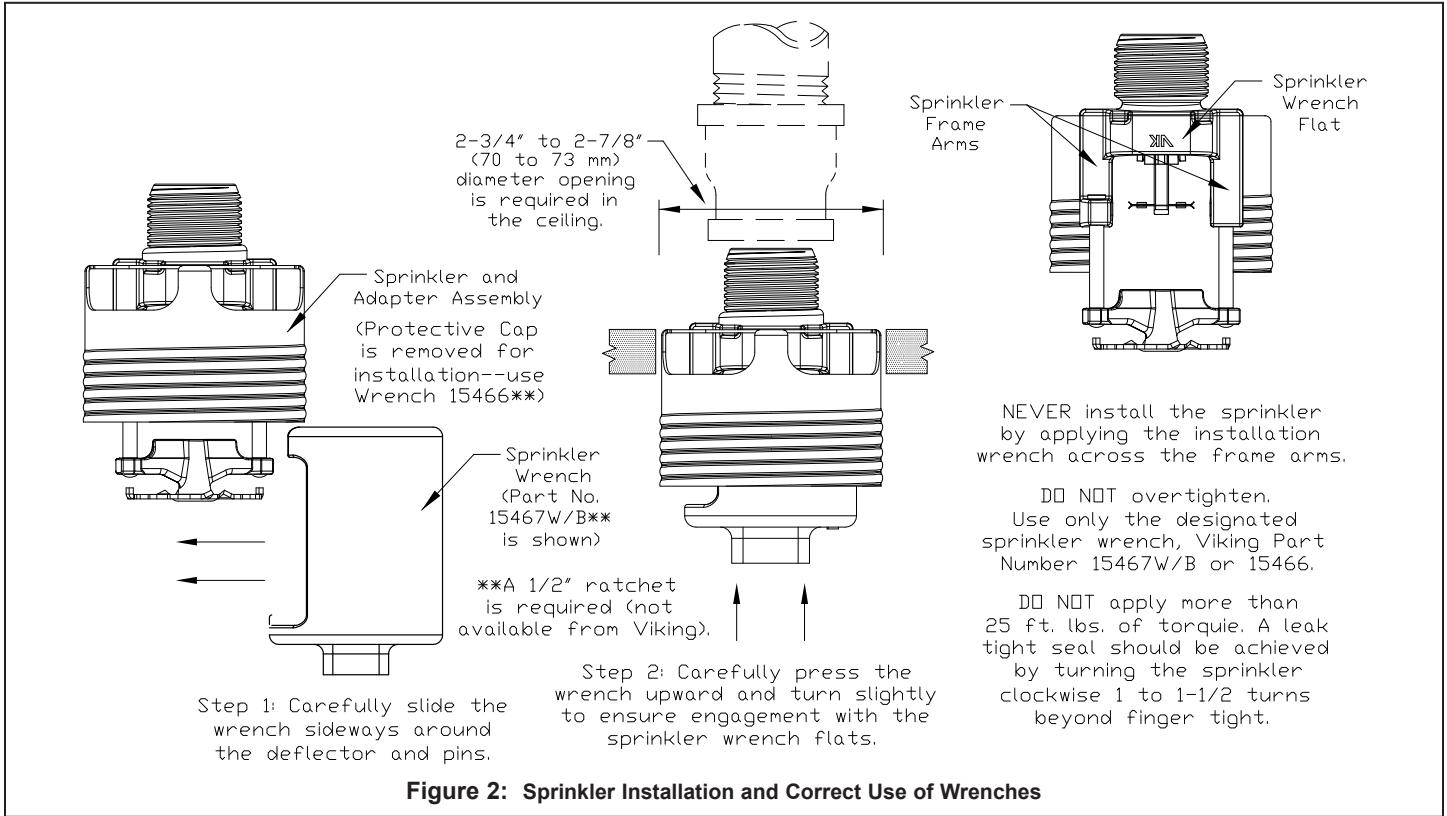
**IMPORTANT: Always refer to Bulletin Form No. F\_091699 - Care and Handling of Sprinklers. Also refer to pages EC1-3 for general care, installation, and maintenance information. Viking sprinklers are to be installed in accordance with the latest edition of Viking technical data, the appropriate standards of NFPA, LPCB, APSAD, VdS or other similar organizations, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable.**



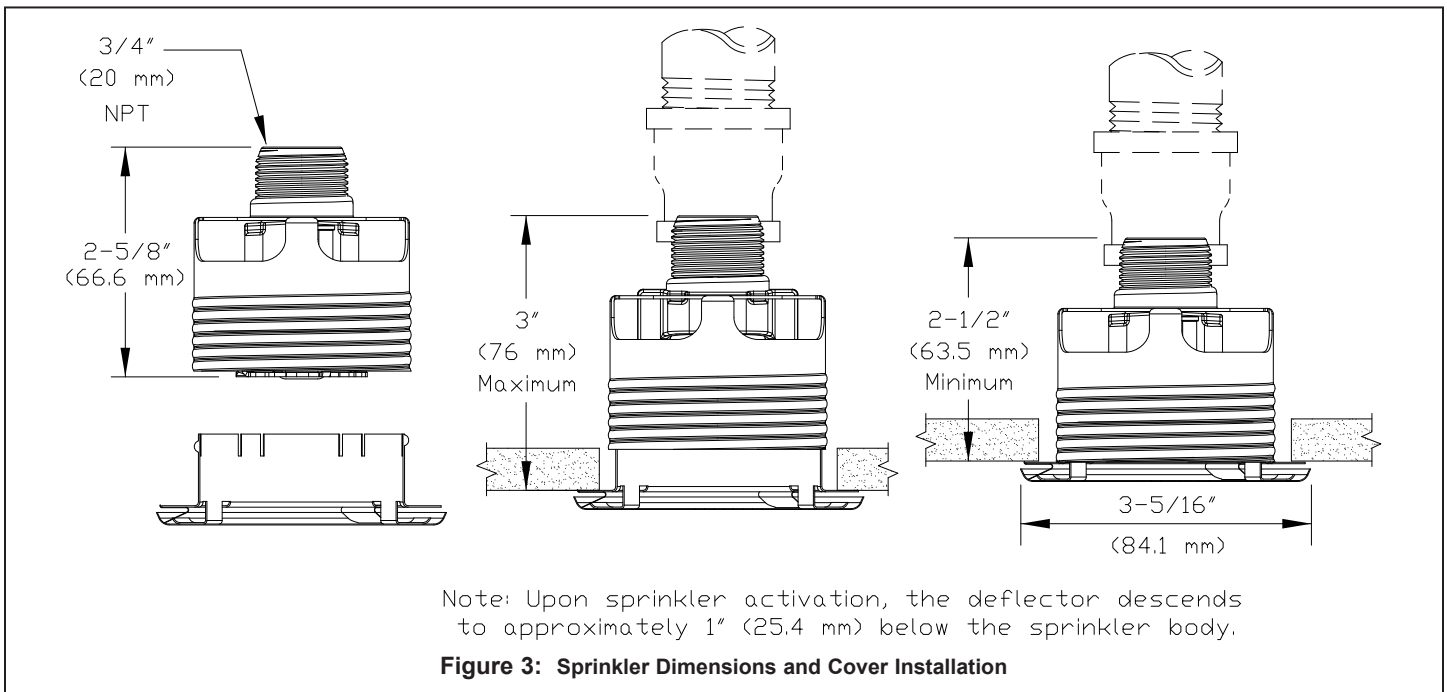
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**Figure 2: Sprinkler Installation and Correct Use of Wrenches**



**Figure 3: Sprinkler Dimensions and Cover Installation**