



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

Visit the Viking website for the latest edition of this technical data page www.vikinggroupinc.com

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" 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 environments and is listed and approved 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

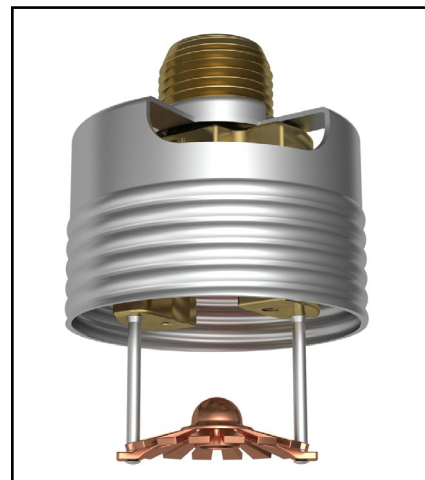


LPCB Approved: Ref. No. 096e/12



CE Certified: Standard EN 12259-1, EC-certificate of conformity 0832-CPD-2032

China Approval: Approved according to China GB Standard



WARNING: Cancer and Reproductive Harm
www.P65Warnings.ca.gov

Refer to the Approval Charts and Design Criteria listing and 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; Phosphor Bronze UNS-C51000 for Sprinkler VK463

Deflector Pins: Stainless Steel Alloy

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 PTFE 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: The sprinkler and cover plate must be ordered separately. Refer to Tables 1 and 2.



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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.

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:

13503AE = 200 °F (93 °C) Temperature Rated Sprinkler with a standard Brass finish.

SIN	Sprinkler Base Part Number ⁸	Size		1: Finishes		2: Temperature Ratings				
		NPT Inch	BSPT mm	Description	Suffix ¹	Sprinkler Temperature Classification	Nominal Rating	Bulb Color	Max. Ambient Ceiling Temperature ²	Suffix
VK462	13503	1/2	--	Brass	A	Ordinary	155 °F (68 °C)	Red	100 °F (38 °C)	B
VK462	21356 ^{7,9}	--	15	ENT ^{3,4}	JN	Intermediate	175 °F (79 °C)	Yellow	150 °F (65 °C)	D
VK463	13667	1/2	--			Intermediate	200 °F (93 °C)	Green	150 °F (65 °C)	E

Accessories

Sprinkler Wrenches and tools (see Figure 1):

- A. Heavy Duty Part Number: 14047W/B⁵ (available since 2006)
- B. Head Cabinet Wrench Part Number: 14031⁶ (available since 2006)
- C. Optional Concealed Cover Plate Installer Tool Part Number: 14412¹⁰ (available since 2007)
- D. Optional Large Concealed Cover Plate Installer Tool Part No. 14867¹⁰ (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. UL Listed as corrosion resistant.
4. 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.
5. Requires a ½" ratchet (not available from Viking).
6. Also optional for removal of the protective cap. Ideal for sprinkler cabinets.
7. Not available with ENT finish. See approval charts for more information.
8. See approval charts for more information.
9. Approved according to China GB Standard.
10. The installer tool is for push-on style cover plates only.



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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:

23190MC/W = 165 °F (74 °C) Temperature Rated, 2-3/4" (70 mm) diameter, Thread-On style Round Cover Plate with a Painted White finish.

1: Select a Cover Plate Base Part Number ³						2: Select a Finish	
Thread-On Style			Push-On Style			Description	Suffix ⁵
Base Part Number	Size Inch (mm)	Type	Base Part Number	Size Inch (mm)	Type		
23190	2-3/4 (70)	Round	23447	2-3/4 (70)	Round	Polished Chrome	F
23174	3-5/16 (84)	Round	23463	3-5/16 (84)	Round	Brushed Chrome	F-/B
23179	3-5/16 (84)	Square	23482	3-5/16 (84)	Square	Bright Brass	B
23193 ⁴	2-3/4 (70)	Stainless Steel Round	23455 ⁴	2-3/4 (70)	Stainless Steel Round	Antique Brass	B-/A
						Brushed Brass	B-/B
23183 ⁴	3-5/16 (84)	Stainless Steel Round	23473 ⁴	3-5/16 (84)	Stainless Steel Round	Brushed Copper	E-/B
						Painted White	M-/W
23174-/CR	3-5/16 (84)	Clean Room	23463-/CR	3-5/16 (84)	Clean Room	Painted Ivory	M-/I
23183CR ⁴	3-5/16 (84)	Stainless Steel Round Clean Room	23473CR ⁴	3-5/16 (84)	Stainless Steel Round Clean Room	Painted Black	M-/B

3: Temperature Rating Matrix^{1,2}

Cover Plate Nominal Rating (Required)	Temperature Classification	Sprinkler Nominal Rating	Sprinkler Maximum Ambient Ceiling Temperature ²	Suffix
UL: 135 °F (57 °C) FM: 139 °F (59 °C)	Ordinary	155 °F (68 °C)	100 °F (38 °C)	A
165 °F (74 °C)	Intermediate	175 °F (79 °C)	150 °F (65 °C)	C
165 °F (74 °C)	Intermediate	200 °F (93 °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. Stainless Steel versions are not available with any finishes or paint.
5. Where a dash (-) is shown in the Finish suffix designation, insert the desired Temperature Rating suffix. See example above.



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Approval Chart 1 (UL)												
Mirage® Concealed Pendent Sprinklers VK462 and VK463												
Sprinkler Base Part No. ¹	SIN	Thread Size		Nominal K-factor		Maximum Water Working Pressure	Listings and Approvals ⁴ (Refer also to Design Criteria)					
		NPT Inch	BSPT mm	U.S.	metric ²		cULus ⁵	NYC	VdS ⁷	LPCB	CE	China Approval
Standard Response Applications												
13503A	VK462	1/2"	--	5.6	80.6	175 psi (12 bar)	--	--	AY1, CZ1	AY1, BZ1	AY1, CZ1 ⁸	--
21356A ¹²	VK462	--	15	5.6	80.6	175 psi (12 bar)	--	--	--	--	--	AY1, CZ1
Quick Response Applications												
13503A	VK462	1/2"	15	5.6	80.6	175 psi (12 bar)	AV1, BX1, AS2, BT2	AV1, BX1 ⁶	--	--	--	--
13503JN ¹¹	VK462	1/2"	15	5.6	80.6	175 psi (12 bar)	AV1, BX1, AS2, BT2	AV1, BX1 ⁶	--	--	--	--
21356A ¹²	VK462	--	15	5.6	80.6	175 psi (12 bar)	AY1, CZ1	--	--	--	--	--
13667A	VK463	1/2"	15	5.6	80.6	250 psi (17.2 bar) ³	AV1, BX1	AV1, BX1 ⁶	--	--	--	--
13667JN ¹¹	VK463	1/2"	15	5.6	80.6	250 psi (17.2 bar) ³	AV1, BX1	AV1, BX1 ⁶	--	--	--	--
Approved Sprinkler Temperature Rating Codes		Approved Cover Plate Temperature Rating Codes					Approved Cover Plate Finish Codes					
A = 155 °F (68 °C) B = 175 °F (79 °C) C = 200 °F (93 °C)		S - 135 °F (57 °C) cover 23193, 23445 or 23183, 23473 (large diameter) T - 165 °F (74 °C) cover 23193, 23445 or 23183, 23473 (large diameter) V - 135 °F (57 °C) cover 23190, 23447, 23174, 23463 (large diameter), or 23179, 23482 (square cover plate) X - 165 °F (74 °C) cover 23190, 23447, or 23174, 23463 (large diameter) Y - 135 °F (57 °C) cover 23190, 23447 <i>LPCB Approved as 139 °F (59 °C)</i> Z - 165 °F (74 °C) cover 23190, 23447					1 - Polished Chrome, Brushed Chrome, Bright Brass, Antique Brass, Brushed Brass, Brushed Copper, Painted White, Painted Ivory, or Painted Black 2 - Stainless Steel					
Footnotes												
<ol style="list-style-type: none"> 1. Part number shown is the base part number. For complete part number, refer to current Viking price list schedule. 2. 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. 3. The Water Working Pressure rating is stamped on the deflector. 4. 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. 5. Listed by Underwriter's Laboratories for use in the U.S. and Canada. 6. Accepted for use, City of New York Department of Buildings, MEA Number 89-92-E, Vol. 32. 7. 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. 8. CE Certified, Standard EN 12259-1, EC-certificate of conformity 0832-CPD-2032. 9. The 135/139 °F cover has an orange label. The 165 °F (74 °C) cover has a white label. 10. 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. 11. cULus Listed as corrosion resistant. 12. Approved according to China GB Standard. 												
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 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.

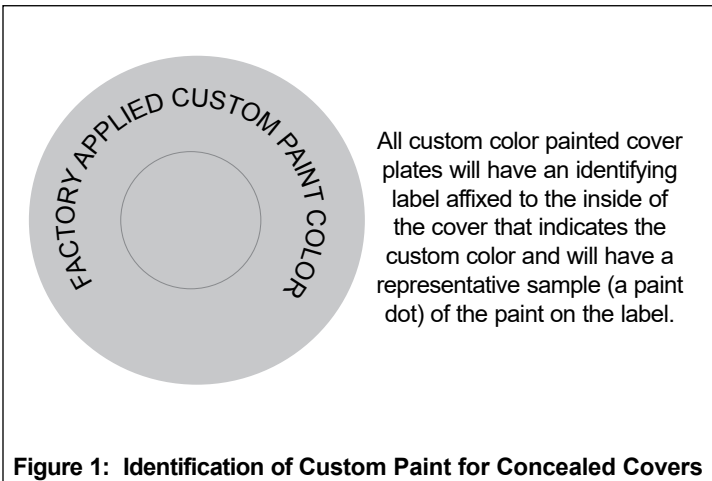
Due to the design the sprinkler type 'Domed-CCP' shall not be installed in false ceilings in which during a fire the pressure above the false ceiling may be assumed to be higher than the pressure below the false ceiling.

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)							Sprinkler Temperature Rating Cover Plate Temperature Rating AW1 ← Cover Plate Finish KEY
Mirage® Standard Response Concealed Pendent Sprinkler VK462							
Sprinkler Base Part No. ¹	SIN	Thread Size		Nominal K-Factor		Maximum Water Working Pressure	FM Approvals ³ (Refer also to Design Criteria below.)
		NPT Inch	BSPT mm	U.S.	metric ²		
13503A	VK462	1/2"	15	5.6	80.6	175 psi (12 bar)	AW1, BX1, AY2, BZ2
21356A ⁶	VK462	--	15	5.6	80.6	175 psi (12 bar)	AU1, CV1
Approved Sprinkler Temperature Rating Codes		Approved Cover Plate Temperature Rating Codes				Approved Cover Plate Finish Codes	
A - 155 °F (68 °C) B - 175 °F (79 °C) and 200 °F (93 °C) C - 200 °F (93 °C)		U - 139 °F (59 °C) cover 23190, 23447 V - 165 °F (74 °C) cover 23190, 23447 W - 139 °F (59 °C) cover 23190, 23447, or 23174, 23463 (large diameter), or 23179, 23482 (square cover plate) X - 165 °F (74 °C) cover 23190, 23447, 23174, 23463 (large diameter), or 23179, 23482 (square cover plate) Y - 139 °F (59 °C) cover, 23183, 23473 or 23193, 23455 Z - 165 °F (74 °C) cover 23183, 23473 or 23193, 23455				1 - Polished Chrome, Brushed Chrome, Bright Brass, Antique Brass, Brushed Brass, Brushed Copper, Painted White, Painted Ivory, or Painted Black 2 - Stainless Steel	
Footnotes							
1. Part number shown is the base part number. For complete part number, refer to current Viking price list schedule. 2. 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. 3. 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. 4. The 139 °F (59 °C) cover has an orange label. The 165 °F (74 °C) cover has a white label. 5. 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. 6. Approved according to China GB Standard. 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.)

FM Approval Requirements:

Viking Concealed Pendent Sprinkler VK462 is FM Approved as a standard response **Non-Storage** 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.

NOTE: The FM installation guidelines may differ from cULus and/or NFPA criteria.

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.



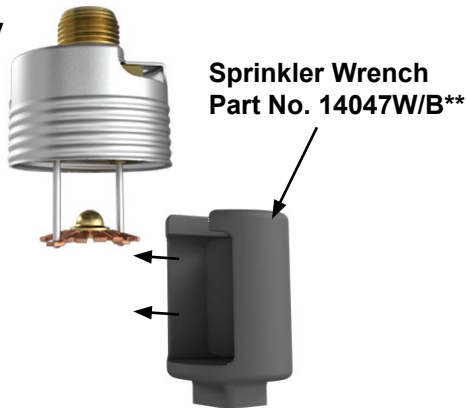
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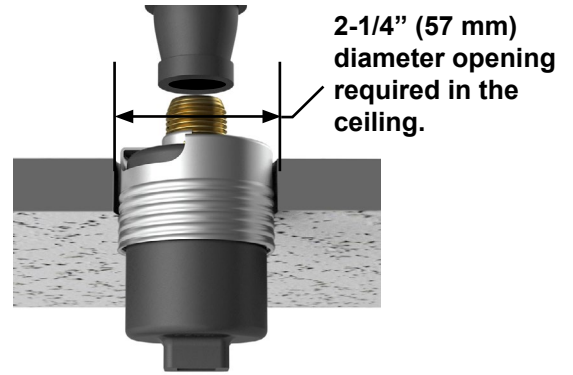
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Sprinkler and Adapter Assembly

- Protective cap removed
- Use wrench 14047W/B**



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

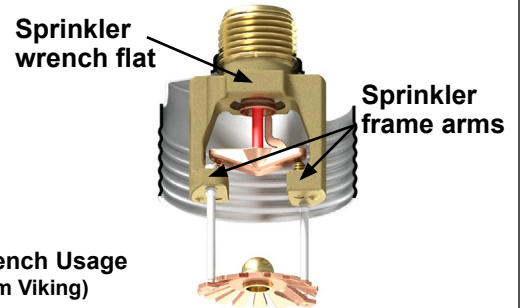
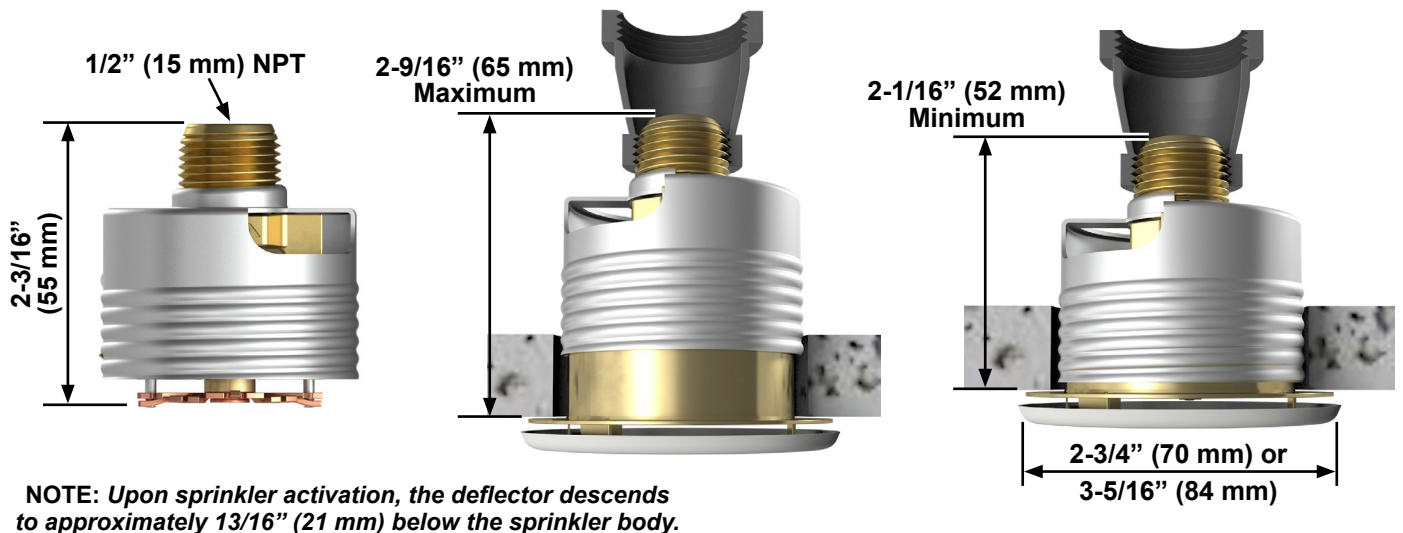


Figure 3: Sprinkler Installation and Proper Wrench Usage
 ** A 1/2" ratchet is required (Not available from Viking)



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

Figure 4: Sprinkler Dimensions and Cover Installation