



TECHNICAL DATA

STANDARD RESPONSE CONCEALED PENDENT SPRINKLER VK4921 (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

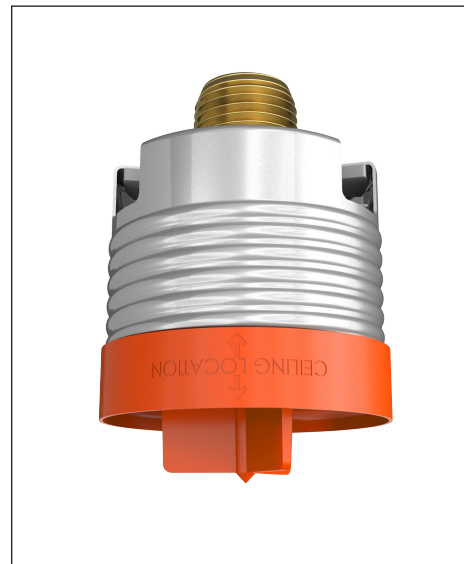
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1. DESCRIPTION

Viking Standard Response Concealed Pendent Sprinkler VK4921 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 consists of a permanently mounted and threaded adapter cup designed to be installed with a low-profile cover assembly that provides up to 1/2" (13 mm) of vertical adjustment. The two-piece design allows installation and testing of the sprinkler prior to installation of the cover plate. The threaded 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. During installation of the sprinkler and system testing, the newly designed protective cap guards the sprinkler frame from damage.

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 VKKW



FM Approved: Class 2015



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

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

3. TECHNICAL DATA

Specifications:

Minimum Operating Pressure: 7 psi (0.5 bar)
Maximum Working Pressure: FM - 175 psi (12 bar). UL - 250 psi (17.2 bar)
Factory tested hydrostatically to 500 psi (34.5 bar).
Thread size: 1/2" (15 mm) NPT or 15 mm BSPT
Nominal K-Factor: 5.6 U.S. (80.6 metric*)
Glass-bulb fluid temperature rated to -65 °F (-55 °C)

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

Material Standards:

Deflector: Phosphor Bronze UNS-C51000
Deflector Pins: Stainless Steel UNS-S43000
Pip Cap and Insert Assembly: Copper UNS-C11000, SS UNS-S30400 and SS UNS-S31600
Compression Screw: 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
Shipping Cap: HPDE

Cover Plate Materials:

Cover Plate Assembly: Copper UNS-C11000 and Brass UNS-C26800 or Stainless Steel UNS-S30400
Spring: Beryllium Nickel
Solder: Eutectic

Ordering Information: Refer to Tables 1 and 2.

4. INSTALLATION

Refer to appropriate NFPA Installation Standards and installation instructions in this document.



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5. OPERATION

During fire conditions, when the temperature around the sprinkler approaches its operating temperature, the cover plate detaches, releasing the deflector. Continued heating of the exposed sprinkler causes the heat-sensitive liquid in the glass bulb to expand, causing the glass to shatter, releasing the pip cap and sealing spring assembly. Water flowing through the sprinkler orifice strikes the deflector, forming a uniform spray pattern over a specific area of coverage determined by the water supply pressure at the sprinkler to extinguish or control the fire.

6. INSPECTIONS, TESTS AND MAINTENANCE

Refer to NFPA 25 for Inspection, Testing and Maintenance requirements.

7. AVAILABILITY

Viking Sprinkler Model VK4921 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: 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:

23114AE = 200 °F (93 °C) Temperature Rated Sprinkler with a standard Brass finish.

Sprinkler Base Part No.	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
23114	1/2	--	Brass	A	Ordinary	155 °F (68 °C)	Red	100 °F (38 °C)	B
23116	--	15	ENT ^{3,4}	JN	Intermediate	175 °F (79 °C)	Yellow	150 °F (65 °C)	D
					Intermediate	200 °F (93 °C)	Green	150 °F (65 °C)	E

Accessories

Sprinkler Wrenches⁵ and Tools (see Figure 1):

- A. Heavy Duty Wrench - part number: 22978MB
- B. Installation Wrench - part number 23143
- C. Protective cap removal tool - part number: 23142

Sprinkler Cabinet:

Part number 01731A.

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 1/2" ratchet which is not available from us.



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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 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				
Base Part Number	Size Inch (mm)	Type	Base Part Number	Size Inch (mm)	Type	Description	Suffix ⁵
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	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	3-5/16 (84)	Stainless Steel Round	Brushed Copper	E-/B
						Painted White	M-/W
						Painted Ivory	M-/I
						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.



Heavy Duty Wrench



Installation Wrench



Cap Removal Tool

Figure 1: Sprinkler Wrenches and Cap Removal Tool



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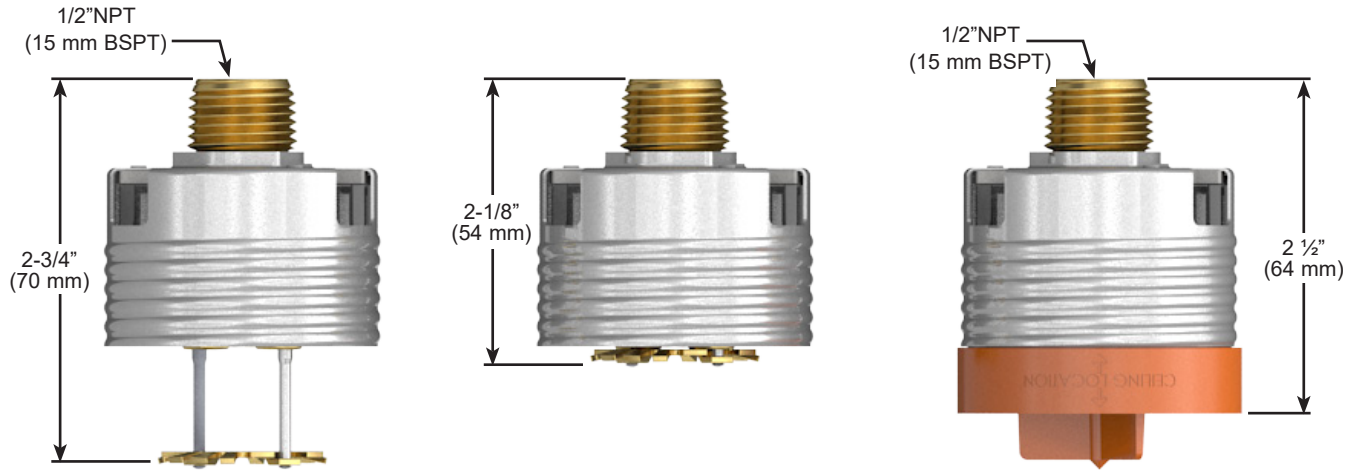


Figure 2: Sprinkler Dimensions



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

Figure 3: Identification of Custom Paint



Figure 4: Square Cover Assembly



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Approval Chart									
Concealed Pendent Sprinkler VK4921									
Sprinkler Temperature Rating Cover Plate Temperature Rating Cover Plate Finish KEY									
Sprinkler Base Part No. ¹	SIN	Thread Size		Nominal K-factor		Maximum Water Working Pressure		Listings and Approvals ³ (Refer also to Design Criteria)	
		NPT Inch	BSPT mm	U.S.	metric ²	cULus	FM	cULus ⁴	FM
23114A	VK4921	1/2"	--	5.6	80.6	250 psi (17.2 bar)	175 psi (12 bar)	AV1, BX1, AS2, BT2	AV1, BX1, AS2, BT2
23114JN ⁷	VK4921	1/2"	--	5.6	80.6	250 psi (17.2 bar)	175 psi (12 bar)	AV1, BX1, AS2, BT2	--
23116A	VK4921	--	15	5.6	80.6	250 psi (17.2 bar)	175 psi (12 bar)	AV1, BX1, AS2, BT2	AV1, BX1, AS2, BT2
23116JN ⁷	VK4921	--	15	5.6	80.6	250 psi (17.2 bar)	175 psi (12 bar)	AV1, BX1, AS2, BT2	--
Sprinkler Temperature Ratings				Cover Plate Assembly Temperature Ratings ⁵				Cover Plate Assembly Finishes	
A = 155 °F (68 °C) B = 175 °F (79 °C) and 200 °F (93 °C)				S - 135 °F (57 °C) cULus Listed or 139 °F (59 °C) FM Approved Stainless Steel cover 23193 and 23455, or 23183 and 23473 (large diameter) T - 165 °F (74 °C) Stainless Steel cover 23193 and 23455 or 23183 and 23473 (large diameter) V - 135 °F (57 °C) cULus Listed or 139 °F (59 °C) FM Approved cover 23190 and 23447, 23174 and 23463 (large diameter), or 23179 and 23482 (square cover plate) X - 165 °F (74 °C) cover 23190 and 23447, or 23174 and 23463 (large diameter)				1 - Polished Chrome, Brushed Chrome, Bright Brass, Antique Brass, Brushed Brass, Brushed Copper, Painted ⁶ White, Painted ⁶ Ivory, or Painted ⁶ Black 2 - Stainless Steel 3 - Polished Chrome, Painted White, Painted Ivory, or Painted Black	
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 listings and approvals available at the time of printing. Other approvals may be in process. Check with the manufacturer for any additional approvals. 4. Listed by Underwriter's Laboratories for use in the U.S. and Canada. 5. The 135 °F (57 °C) [139 °F (59 °C)] covers have an orange label. The 165 °F (74 °C) covers have a white label. 6. 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. 7. cULus Listed as corrosion resistant.									
NOTE: Custom colors are indicated on a label inside the cover assembly. Refer to Figure 3.									



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DESIGN CRITERIA - UL

(Also refer to Approval Chart)

cULus Listing Requirements:

Concealed Pendent Sprinkler VK4921 is cULus Listed as standard 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.

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.

DESIGN CRITERIA - FM

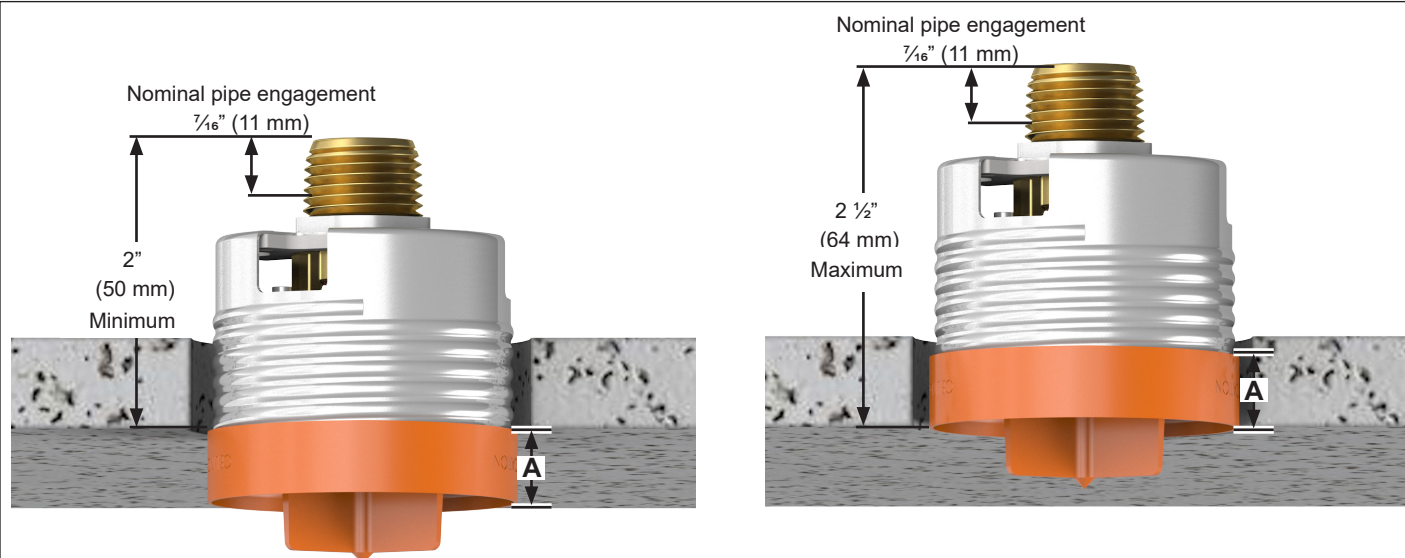
(Also refer to Approval Chart)

FM Approval Requirements:

Viking Concealed Pendent Sprinkler VK4921 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, LPCB, APSAD, VdS or other similar organizations, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable.



Install the sprinkler so the finished surface of the ceiling lines up within the marked $\frac{1}{2}$ " (13 mm) range on the protective cap (A).

Figure 5: Sprinkler Installation Dimensions



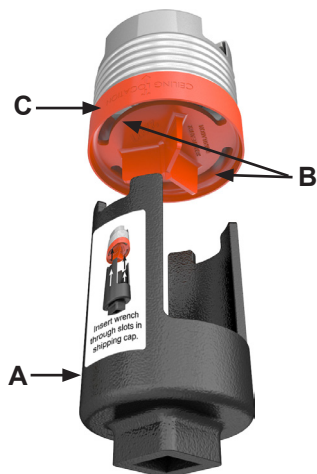
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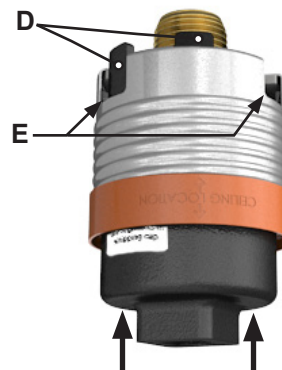


USE ONLY the designated sprinkler wrenches shown in this document. Permanent damage to the sprinkler assembly can occur if the proper wrench is not used. Other sprinkler wrenches available from Viking may fit into the sprinkler adapter cup; however, only the wrenches shown here are designed to properly install this sprinkler.



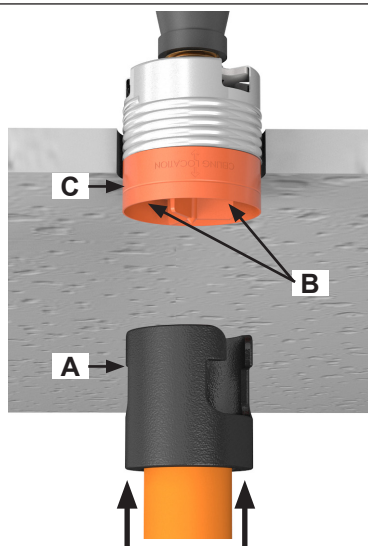
Step 1:
 Insert the wrench (A) into the slots (B) on the protective cap (C).

Scan for
 Installation Video

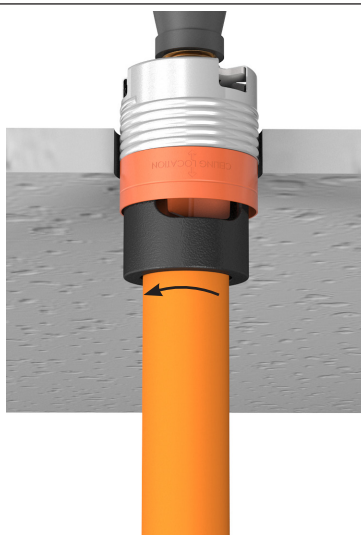


Step 2:
 Rotate the wrench slightly in either direction until the tines on the wrench (D) line up with the vent openings (E) on the adapter cup and lock into place. **NOTE:** A leak tight seal must be achieved. Turn the sprinkler clockwise 1 to 1-½ turns past finger-tight.

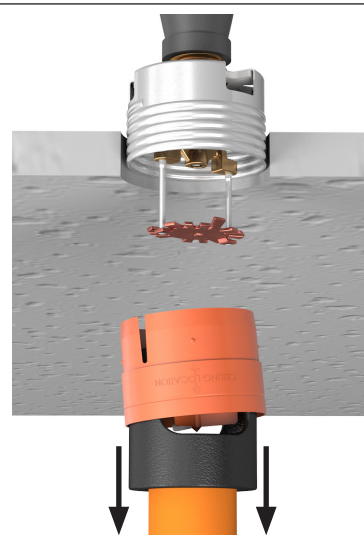
Figure 6: Using the Sprinkler Wrenches



Step 1:
 Attach a piece of plastic pipe as shown and tighten the thumb screw; then, insert the tool (A) into the slots (B) in the protective cap (C).



Step 2:
 Rotate the tool slightly to lock into place.



Step 2:
 Gently, pull downward to remove the protective cap. The deflector will slide downwards on the pins.

Figure 7: Using the Cap Removal Tool



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Install the cover plate by inserting the adapter into the adapter cup and (depending on style) pushing or threading into place. Snug the cover plate in place by rotating clockwise. Ensure the cover plate is flush with the ceiling as shown to allow airflow through the sprinkler assembly.

Figure 8: Installing The Cover Plate