



## TECHNICAL DATA

## FREEDOM® RESIDENTIAL CONCEALED HORIZONTAL SIDEWALL SPRINKLER VK480

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 Freedom® Residential Concealed Horizontal Sidewall Sprinkler VK480 is a small high-sensitivity solder link and lever residential sprinkler designed for installation on concealed pipe systems, where the appearance of a smooth wall is desired. The sprinkler orifice design, with a K-Factor of 4.0 (57.7 metric\*), allows the sprinkler's efficient use of available water supplies for the hydraulically designed fire-protection system. The operating element and special deflector characteristics meet the challenges of residential sprinkler standards. The special Electroless Nickel PTFE (ENT) coating has been investigated for installation in corrosive atmospheres and is listed/approved as corrosion resistant as indicated in the Approval Chart.

The sprinkler is hidden from view by a low profile, small diameter cover plate installed flush to the wall. The cover plate is available in several decorative finishes to meet design requirements. The two-piece design allows installation and testing of the sprinkler prior to installation of the cover plate. After the system has been tested and wall finish has been applied, the push-on design of the cover plate assembly allows easy installation of the cover plate with up to 1/4" (6.4 mm) adjustment. Sprinkler VK480 is provided with a pipe guide to properly locate the sprinkler and allow the 1/4" adjustment of the cover plate.



### 2. LISTINGS AND APPROVALS

 **UL Listed (C-UL-US-EU):** Category VKKW (VK480)

Refer to the Approval Chart and Design Criteria for C-UL-US-EU Listing requirements that must be followed.

### 3. TECHNICAL DATA

#### Specifications:

Available since 2010.

Minimum Operating Pressure: Refer to the Approval Chart.

Maximum Working Pressure: 175 psi (12 bar). Factory tested hydrostatically to 500 psi (34.5 bar).

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

Nominal K-Factor: 4.0 U.S. (57.7 metric\*)

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

Available Cover Plate Horizontal Adjustment: 1/4" (6 mm)

Overall Length (Sprinkler Body): 2" (50 mm)

Covered by the following US Patent Numbers: 7,712,218 and 8,960,319

#### Material Standards:

Sprinkler Body: QM Brass and Brass UNS-C84400

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

Seat: Brass UNS-C31400

Deflector Ring: Brass UNS-C23000

Deflector Pins: Stainless Steel UNS-S30200

Halo: Brass UNS-C31400 or Phosphor Bronze UNS-C51000

Flow Shaper: Phosphor Bronze UNS-C51000

Lever Bar Ring: Brass UNS-C31400 or Brass UNS-C84400

Compression Screw: 18-8 Stainless Steel

Fusible Link Assembly: Nickel Alloy and Eutectic Solder

Fusible Link Levers: Stainless Steel UNS-S31600

Guide Pin: Stainless Steel UNS-S43000

Shipping Cap: Polyethylene



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### Cover Assembly Materials:

Cover Plate Assembly: Copper UNS-C11000 and Brass UNS-C26800

Spring: Beryllium Nickel

Solder: Eutectic

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

Viking Freedom® Residential Concealed HSW Sprinkler VK480 and Cover Plate Assembly must be ordered separately:

**Sprinkler:** Base part No. 16116

Finish Suffixes: Brass = A, ENT = JN

Temperature Suffixes: 165 °F (74 °C) = C, 205 °F (96 °C) = E

For example, sprinkler VK480 with an ENT finish and a 165 °F (74 °C) temperature rating = Part No. 16116JNC

**Cover Plate Assembly:** Base Part No. 16207 (3-5/16" diameter)

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: White Polyester = M-W

Temperature Suffix: 135 °F (57 °C) = A

For example, cover 16207 with a White Painted finish and a 135 °F (57 °C) temperature rating = 16207MA/W.

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

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

### Sprinkler Wrenches\*\*:

A. Heavy Duty Wrench Part No. 16208W/R\*\* (available since 2010)

B. Head Cabinet Wrench Part Number 16267\*\*\* (available since 2010)

C. Optional Large Concealed Cover Plate Installer Tool Part No. 14867 (available since 2007)

\*\*Requires a ½" ratchet (not available from Viking).

\*\*\*Ideal for sprinkler cabinets.

**Sprinkler Cabinet:** Part No. 01731A, Capacity: five (5) 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 exposed sprinkler causes the fusible element to disengage, releasing the sealing assembly. Water flowing through the sprinkler orifice strikes the flow shaper, 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 Freedom® Residential Concealed Horizontal Sidewall Sprinkler VK480 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.



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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 the Cover Assembly (Required)	Cover Plate Base Part Number <sup>3</sup>
Ordinary	165 °F (74 °C)	100 °F (38 °C)	135 °F (57 °C)	16207
Intermediate	205 °F (96 °C)	150 °F (65 °C) <sup>4</sup>	135 °F (57 °C)	16207

**Cover Plate Finish:** White Polyester


### Footnotes

- The sprinkler temperature rating is stamped on the inlet.
- 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.
- Part number shown is the base part number. For complete part number, refer to current Viking price list schedule.
- Cover plate is ONLY 135 °F (57 °C).

## Approval Chart

### Viking VK480, 4.0 K-Factor Residential Concealed HSW Sprinkler

For systems designed to NFPA 13D or NFPA 13R. For systems designed to NFPA 13, refer to the design criteria on page 4.  
 For Ceiling types refer to the most current Edition of NFPA 13, 13R or 13D.

Sprinkler Base Part Number <sup>1</sup>	SIN	NPT Thread Size		Nominal K-Factor		Maximum Water Working Pressure					
		Inches	mm	U.S.	metric <sup>2</sup>						
16116A	VK480	1/2	15	4.0	57.7	175 psi (12 bar)					
16116JN <sup>10</sup>	VK480	1/2	15	4.0	57.7	175 psi (12 bar)					
Max. Coverage Area <sup>6</sup> Width X Length Ft. X Ft. (m X m)	Max. Spacing Ft. (m)	Ordinary Temp Rating (165 °F/74 °C)		Intermediate Temp Rating (205 °F/96 °C)		Centerline of Sprinkler to Ceiling	Installation Type	Listings and Approvals <sup>3</sup>			Minimum Spacing Ft. (m)
		Flow <sup>6</sup> GPM (L/min)	Pressure <sup>6</sup> PSI (bar)	Flow <sup>6</sup> GPM (L/min)	Pressure <sup>6</sup> PSI (bar)			 <sup>4</sup>	NYC	NSF	
12 X 12 (3.7 X 3.7)	12 (3.7)	11 (41.7)	7.6 (0.52)	13 (49.3)	10.6 (0.73)	4-3/8 to 6-3/8 inches	Concealed with Cover Plate Assembly	See Footnote 8 and 9	See Footnote 5	-	8 (2.4)
14 X 14 (4.3 X 4.3)	14 (4.3)	13 (49.3)	10.6 (0.73)	13 (49.3)	10.6 (0.73)						
16 X 16 (4.9 X 4.9)	16 (4.9)	16 (60.6)	16 (1.10)	16 (60.6)	16 (1.10)						
16 X 18 (4.9 X 5.5)	16 (4.9)	17 (64.4)	18.1 (1.25)	18 (68.1)	20.3 (1.40)	6-3/8 to 12-3/8 inches					
12 X 12 (3.7 X 3.7)	12 (3.7)	12 (45.5)	9 (0.62)	13 (49.3)	10.6 (0.73)						
14 X 14 (4.3 X 4.3)	14 (4.3)	14 (53.0)	12.3 (0.84)	14 (53.0)	12.3 (0.84)						
16 X 16 (4.9 X 4.9)	16 (4.9)	16 (60.6)	16 (1.10)	16 (60.6)	16 (1.10)						
16 X 18 (4.9 X 5.5)	16 (4.9)	18 (68.1)	20.3 (1.40)	18 (68.1)	20.3 (1.40)						

### Footnotes

- For complete part number, also refer to current Viking price list schedule.
- 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.
- 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. Refer also to Design Criteria listed below.
- Sprinkler VK480 is Listed by Underwriter's Laboratories, Inc. for use in the U.S., Canada, and European Union.
- Meets New York City requirements, effective July 1, 2008.
- For areas of coverage smaller than shown, use the "Flow" and "Pressure" for the next larger area listed. Flows and pressures listed are per sprinkler. The distance from sprinklers to walls shall not exceed one-half the sprinkler spacing indicated for the minimum "Flow" and "Pressure" used.
- Other paint colors are available on request with the same listings as the standard finish colors. Listings and approvals apply for any paint manufacturer. Contact Viking for additional information. Custom colors are indicated on a label inside the cover assembly. Refer to Figure 1.
- Cover Temperature Rating is 135 °F (57 °C). Cover Part No. 16207<sup>1</sup>.
- Accepted Cover Plate Finishes are: White Polyester<sup>7</sup>.
- cULus Listed as corrosion resistant.

	<h2 style="margin: 0;">TECHNICAL DATA</h2>	<h3 style="margin: 0;">FREEDOM® RESIDENTIAL CONCEALED HORIZONTAL SIDEWALL SPRINKLER VK480</h3>
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**DESIGN CRITERIA**  
(Also refer to the Approval Chart above.)

**UL Listing Requirements (C-UL-US-EU):**


When using Viking Residential Concealed Horizontal Sidewall Sprinkler VK480 for systems designed to NFPA 13D or NFPA 13R, apply the listed areas of coverage and minimum water supply requirements shown in the Approval Chart above.

For systems designed to NFPA 13: The number of design sprinklers is to be the four contiguous most hydraulically demanding sprinklers. The minimum required discharge from each of the four sprinklers is to be the greater of the following:

- The flow rates given in the Approval Chart above for NFPA 13D and NFPA 13R applications for each listed area of coverage, **or**
- Calculated based on a minimum discharge of 0.1 gpm/sq. ft. over the “design area” in accordance with sections 8.5.2.1 or 8.6.2.1.2 of NFPA 13.
- **THE TOP OF THE SPRINKLER BODY AND THE TOP OF THE INSTALLATION WRENCH ARE MARKED “TOP”.** Orient the top of the sprinkler element parallel with the ceiling as shown in Figure 3.
- Minimum distance between residential sprinklers: 8 ft. (2.4 m).

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

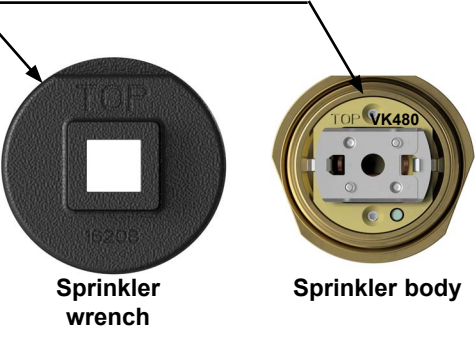
**IMPORTANT: Always refer to Bulletin Form No. F\_091699 - Care and Handling of Sprinklers. Also refer to Form No. F\_080190 and Form No. F\_080415 for general care, installation, and maintenance information. Viking sprinklers are to be installed in accordance with the latest edition of Viking technical data, the appropriate standards of NFPA and any other similar Authorities Having Jurisdiction, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable. Final approval and acceptance of all residential sprinkler installations must be obtained from the Authorities Having Jurisdiction.**



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.

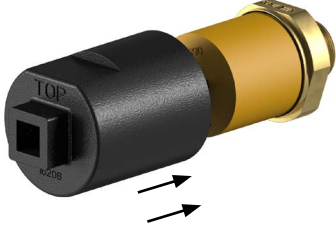
**Figure 1: Identification of Custom Paint for Concealed Covers**

The internal design of the sprinkler wrench is shaped to fit over the sprinkler and protective cap to ensure that the top of the wrench will be oriented in the same direction as the top of the sprinkler deflector.



**Sprinkler wrench**      **Sprinkler body**

Orient the sprinkler and wrench as shown then slide the wrench over the sprinkler body and the protective cap.



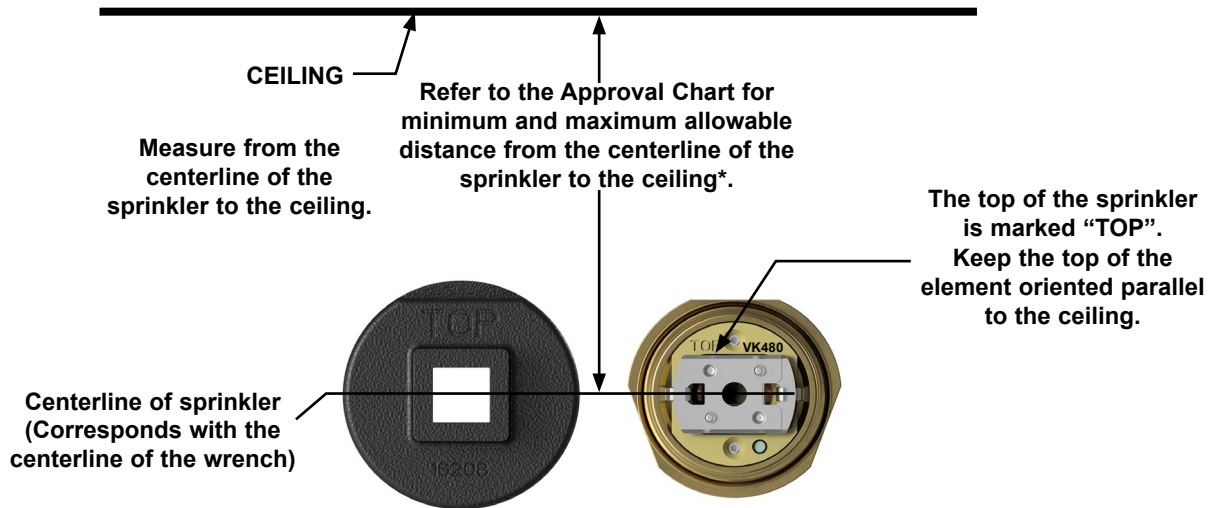
**Figure 2: Sprinkler VK480 Installation and Correct Use of Wrench**



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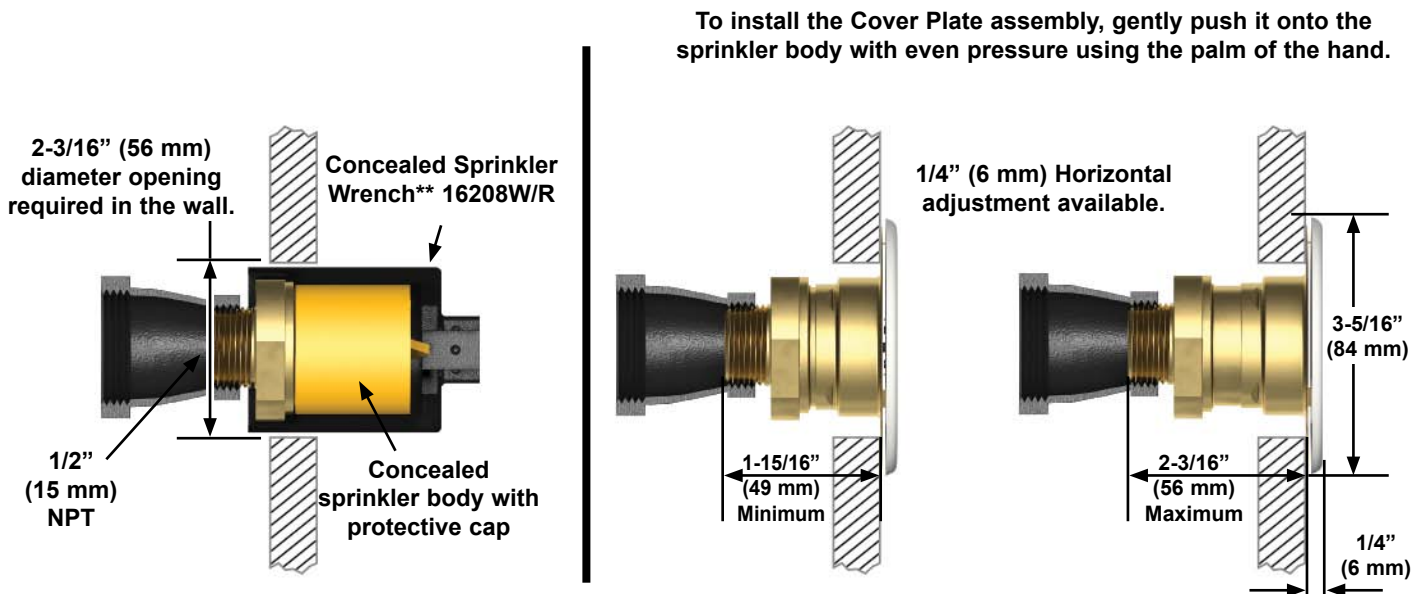
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**Figure 3: Sprinkler VK480 Correct Deflector Orientation**

\*Distance from the ceiling affects water supply requirements. Refer to the Approval Chart.



**Figure 4: Sprinkler VK480 Dimensions and Cover Installation**

\*\* A 1/2" ratchet is required (not available from Viking).

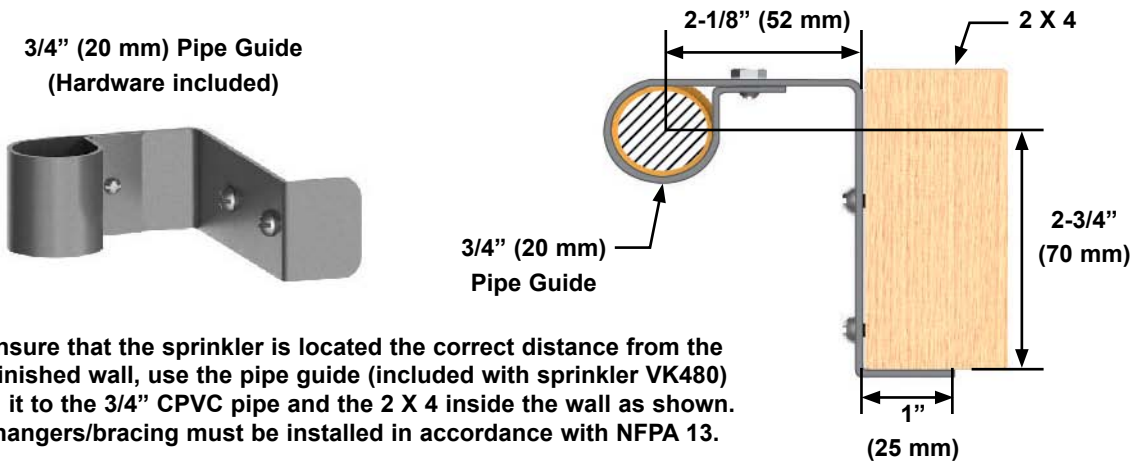




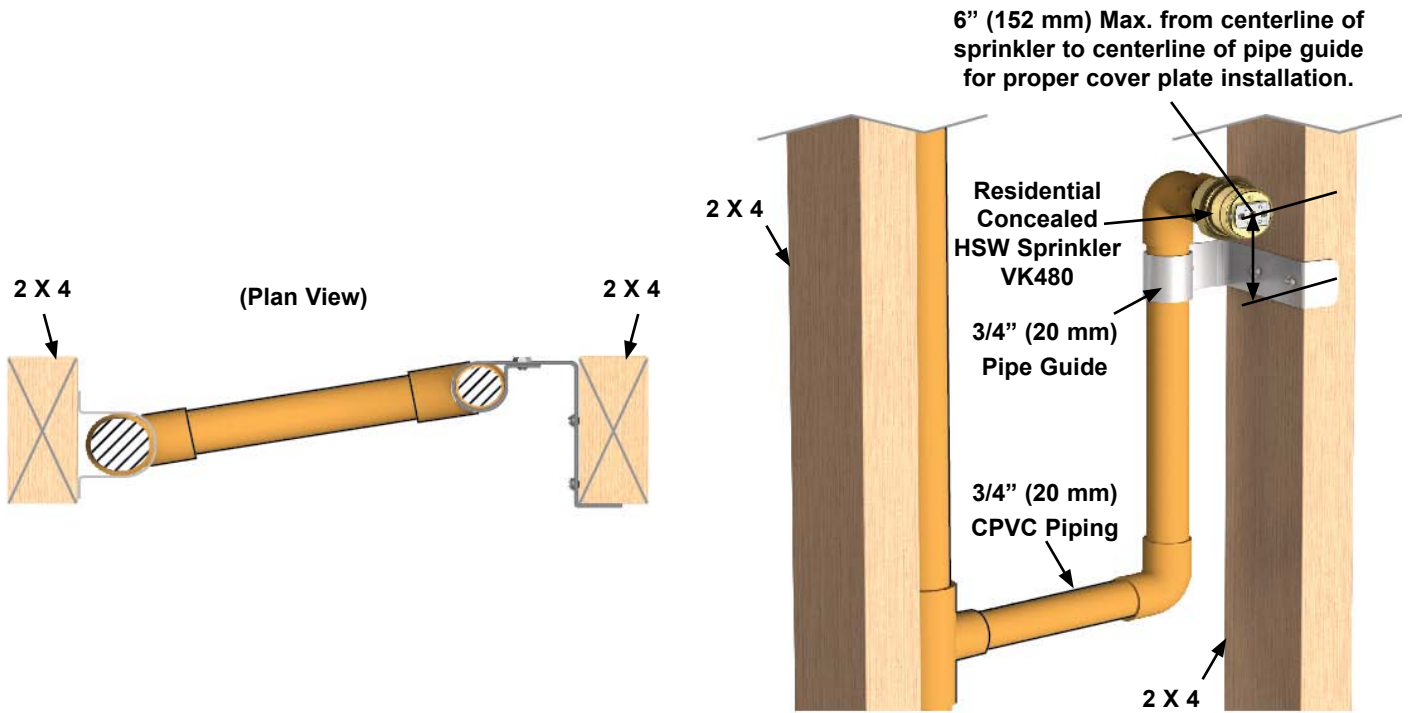
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**Figure 5: Sprinkler VK480 Pipe Guide**



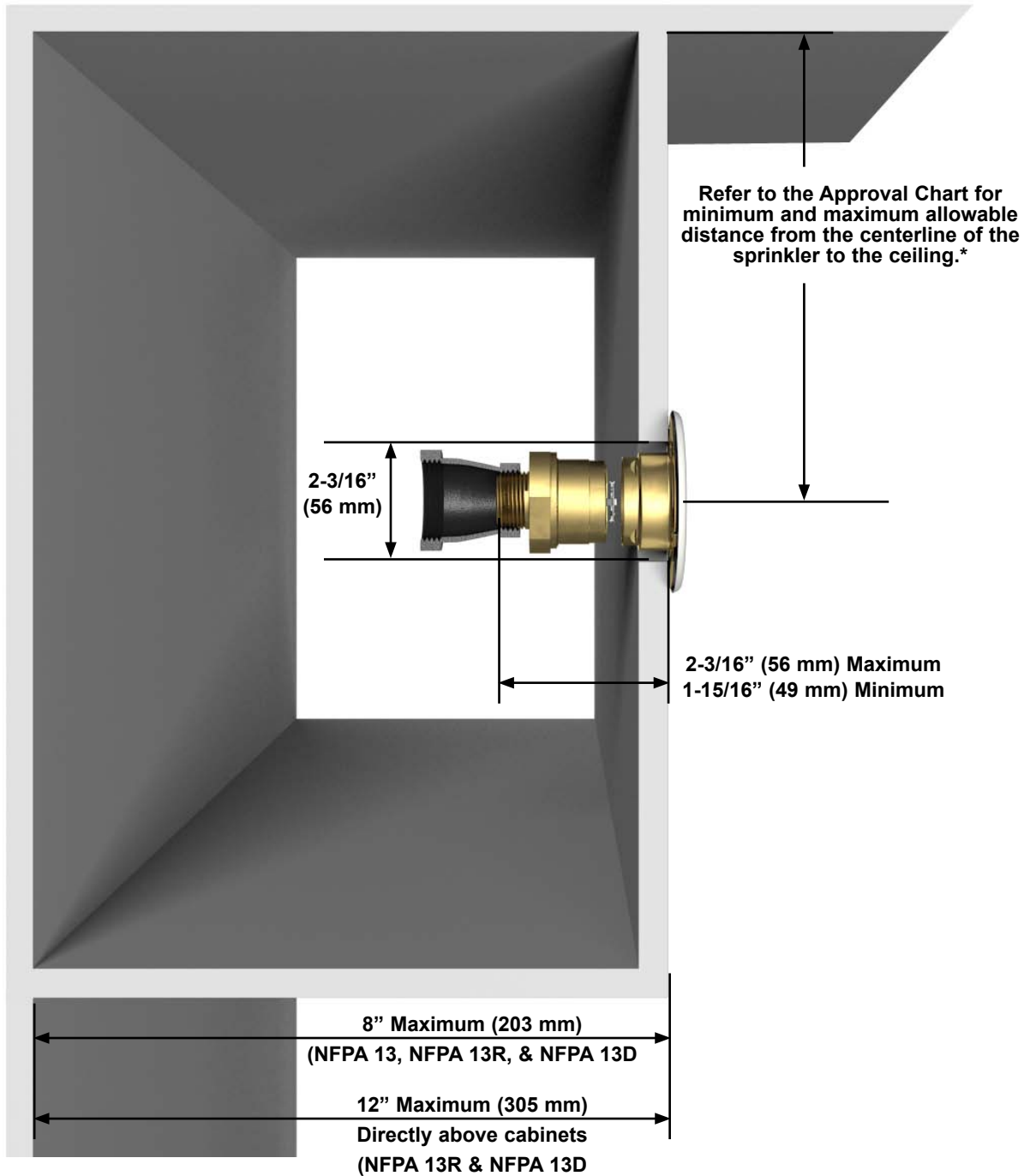
**Figure 6: Sprinkler VK480 Pipe Guide Installation Instructions**



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**Figure 7: Sprinkler VK480 Installation - Soffit**

\*Distance from the ceiling affects water supply requirements. Refer to the Approval Chart