



## TECHNICAL DATA

## AUSTRALIAN WATERMARK FREEDOM® RESIDENTIAL SPRINKLERS

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 Sprinklers are small, thermosensitive, glass-bulb residential sprinklers available in several different styles, finishes and temperature ratings to meet varying design requirements. The Electroless Nickel PTFE (ENT) coating has been investigated for installation in corrosive environments and is Listed/Approved as indicated in the Approval Chart. The orifice design allows efficient use of available water supplies for the hydraulically designed fire-protection system. The glass bulb operating element and special deflector characteristics meet the challenges of residential sprinkler standards.

For Concealed style sprinklers, the unit is pre-assembled with a threaded adapter for installation with a low-profile cover assembly—available in push-on or thread-on styles—which allows installation and testing of the sprinkler prior to installation of the cover plate. Each sprinkler also includes a protective cap that prevents damage during installation and finishing and keeps errant overspray from coating internal parts. The two-piece design provides room for adjustment while also 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 C-UL-US-EU 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.

### 2. LISTINGS AND APPROVALS



UL Listed: Category VKKW



WaterMark certified. Certificate WMTS-486, WM-022899



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

Refer to the Approval Charts and Design Criteria for the appropriate sprinkler(s) for requirements that must be followed.

### 3. TECHNICAL DATA

#### Specifications:

Minimum Operating Pressure: 7 psi (0.5 bar)

Rated to: 175 PSI (12 bar) maximum water working pressure (WWP)

Factory tested hydrostatically to 500 psi (34.5 bar).

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

Nominal K-factors: Refer to Ordering Information

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

#### Material Standards:

Frame Casting: Brass

Deflector: Brass or Phosphor Bronze

Bulb: Glass, nominal 3 mm diameter

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

Pip Cap and Insert Assembly: Copper and Stainless Steel

Compression Screw: Brass or Stainless Steel

**For ENT coated sprinklers:** Belleville spring - Exposed, Screw and Pipcap - ENT plated.

**For Concealed Sprinklers** Pins: Stainless Steel; Button: Brass; Yoke: Phosphor Bronze, Cover Adapter: Cold Rolled Steel JIS G3141 and Carbon Steel UNS-G10100 (per JIS G3141), Shipping Cap: High Density Polyethylene

Vibration damper ring: Buna-N Rubber SAE AS-568-017

#### Cover Plate Materials:

Cover Plate Assembly: Copper and Brass

Spring: Beryllium Nickel

Solder: Eutectic

**Ordering Information: (Refer to Tables 1 - 3.)**

### 4. INSTALLATION

Refer to appropriate NFPA, FM Global, FPAA101D, and/or any other applicable installation standards.

### 5. OPERATION

During fire conditions, when the temperature around the sprinkler reaches its operating temperature, the heat-sensitive liquid in the glass bulb expands, causing the bulb to shatter, releasing the pip cap 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 Freedom® Residential Sprinklers 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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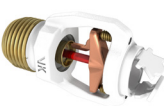

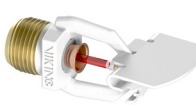

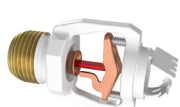
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**TABLE 1:**

### AVAILABLE SPRINKLER STYLES

	SIN	Style	K-factor		SIN	Style	K-factor
	VK467	Upright	4.9		VK480	Concealed Horizontal Sidewall	4.0
	VK470 VK468 VK466 VK472	Pendent Pendent Pendent Pendent	3.0 4.9 5.2 5.8		VK490	Concealed Horizontal Sidewall	5.8
	VK430	Pendent	4.3	 (cover plate not shown)	VK496	Concealed Pendent	3.0
	VK486	Horizontal Sidewall	4.0	 (cover plate not shown)	VK494	Concealed Pendent	4.9
	VK484	Horizontal Sidewall	4.2	 (cover plate not shown)	VK498	Concealed Pendent	5.8
	VK460	Horizontal Sidewall	5.8				



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**TABLE 2: ORDERING INFORMATION - SPRINKLERS**

Instructions: Using the sprinkler base part number,  
(1) add the suffix for the desired Finish  
(2) add the suffix for the desired Temperature Rating.  
(3) For Concealed Sprinklers, order a cover plate (refer to Table 3)

SIN	Style	Nominal K-factor		Sprinkler Base Part No.	Size  NPT Inch	1: Finishes		2: Temperature Ratings				
		U.S.	metric			Description	Suffix <sup>1</sup>	Nominal Rating	Bulb Color	Max. Ambient Ceiling Temperature <sup>3</sup>	Suffix	
Upright, Pendent, and Horizontal Sidewall (HSW) Sprinklers (includes recessed versions)												
VK467	Upright	4.9	71	23029	1/2	Brass	A	155 °F (68 °C)	Red	100 °F (38 °C)	B	
VK470	Pendent	3.0	43	23021	1/2	Chrome	F	175 °F (79 °C)	Yellow	150 °F (65 °C)	D	
VK430	Pendent	4.3	62	23022	1/2	White Polyester <sup>4,5</sup>	M-/W	Sprinkler Wrenches (see Figure 1)				
VK468	Pendent	4.9	71	23023	1/2	Black Polyester <sup>4,5</sup>	M-/B					
VK466	Pendent	5.2	75	23024	1/2	ENT <sup>4,5</sup>	JN	A) Standard Wrench		21475W/B		
VK472	Pendent	5.8	84	23025	1/2			B) Recessed Socket Wrench		13655M/B <sup>2</sup>		
VK486	HSW	4.0	58	23026	1/2			Sprinkler Cabinets				
VK484	HSW	4.2	60	23027	1/2			≤ 6 Sprinklers		01724A		
VK460	HSW	5.8	84	23028	1/2			6-12 Sprinklers		01725A		
Flush and Concealed												
VK480	HSW	4.0	58	23031	1/2	Brass	A	155 °F (68 °C)	Red	100 °F (38 °C)	B	
VK490	HSW	5.8	84	23032	1/2	ENT <sup>4,5</sup>	JN	200 °F (93 °C)	Green	150 °F (65 °C)	E	
VK496	Pendent	3.0	43	23717	1/2			Sprinkler Wrenches (see Figure 1)				
VK494	Pendent	4.9	71	23706	1/2			B) Recessed Socket Wrench		13655M/B <sup>2</sup>		
	VK498	Pendent	5.8	84	23726			1/2	C) Concealed installation wrench		24339 <sup>6</sup>	
								D) Protective cap removal tool		24340		
						Sprinkler Cabinet						
							Up to 5 Sprinklers		01731A			

**Example:** 23029MB/W = VK467 with White Polyester Finish and 155 °F (68 °C) Nominal temperature rating. This sprinkler is to be installed into an area with a maximum ambient temperature of 100 °F (38 °C) meaning if the area will experience temperatures above the maximum ambient rating, you shall use a higher temperature-rated sprinkler.

### Footnotes

- Where a dash (-) is shown in the Finish suffix designation, insert the desired Temperature Rating suffix. See example above.
- Requires a 1/2" ratchet which is not available from Viking.
- 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.
- UL Listed as corrosion resistant.
- 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.
- Requires a 3/8" ratchet which is not available from Viking.



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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.

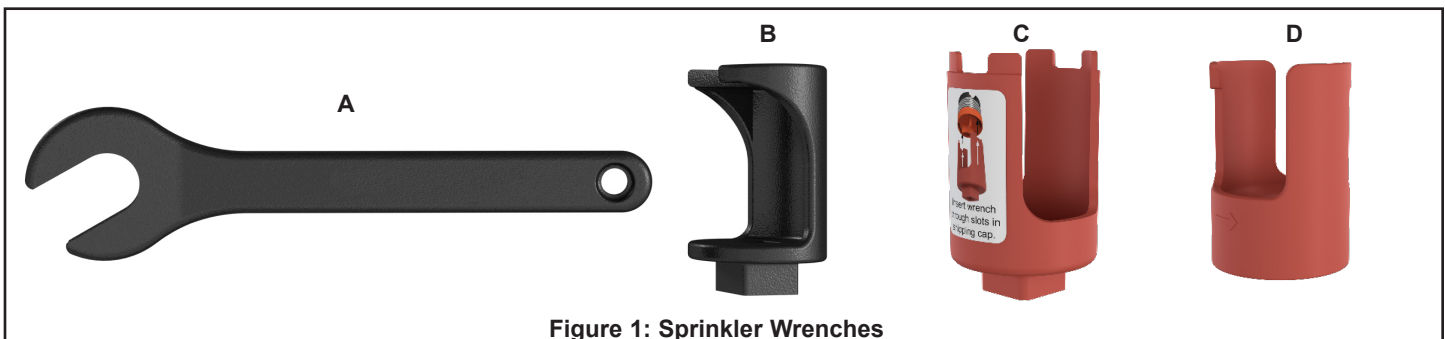
1: Select a Cover Plate Base Part Number <sup>3</sup>						2: Select a Finish			
Thread-On Style			Push-On Style						
Base Part Number <sup>1</sup>	Size Inch (mm)	Type	Base Part Number	Size Inch (mm)	Type	Description	Suffix <sup>5</sup>		
23190	2-3/4 (70)	Round	23447	2-3/4 (70)	Round	Polished Chrome	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 <sup>5</sup>	2-3/4 (70)	Stainless Steel Round	23455 <sup>5</sup>	2-3/4 (70)	Stainless Steel Round	Antique Brass	B-/A		
						Brushed Brass	B-/B		
23183 <sup>5</sup>	3-5/16 (84)	Stainless Steel Round	23473 <sup>5</sup>	3-5/16 (84)	Stainless Steel Round	Brushed Copper	E-/B		
						Painted White	M-/W		
			16207 <sup>6</sup>	3-5/16 (84)	Round	Painted Ivory	M-/I		
						Painted Black	M-/B		
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		155 °F (68 °C)		100 °F (38 °C)		A	
165 °F (74 °C)		Intermediate		200 °F (93 °C)		150 °F (65 °C)		C	

**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	155 °F (68 °C)	100 °F (38 °C)	<b>A</b>
165 °F (74 °C)	Intermediate	200 °F (93 °C)	150 °F (65 °C)	<b>C</b>

**Footnotes**

1. Part number shown is the base part number. For complete part number, refer to the current Viking price list schedule.
2. The sprinkler temperature rating is stamped on the deflector.
3. 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.
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.
6. For use with the VK480 and VK490 only.



**Figure 1: Sprinkler Wrenches**




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### Approval Chart - VK467 4.9 K-Factor Residential Upright Sprinkler

For systems designed to NFPA 13D or NFPA 13R. For systems designed to NFPA 13, refer to the design criteria.  
For Ceiling types refer to current editions of NFPA 13, 13R or 13D

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												
23029	VK467	1/2	15	4.9	70.6	175 psi (12 bar)	2-1/4	58												
Max. Coverage Area <sup>4</sup> Ft.X Ft. (m X m)	Ordinary Temp Rating (155 °F/68 °C)		Intermediate Temp Rating (175 °F/79 °C)		Deflector to Ceiling	Installation Type	Listings and Approvals <sup>3</sup>		Minimum Spacing Ft. (m)											
	Flow <sup>4</sup> GPM (L/min)	Pressure <sup>4</sup> PSI (bar)	Flow <sup>4</sup> GPM (L/min)	Pressure <sup>4</sup> PSI (bar)				NYC		NSF										
12 X 12 (3.7 X 3.7)	14 (53.0)	8.16 (0.56)	14 (53.0)	8.16 (0.56)	3 - 5 inches	Upright	See Foot- note 7 and 9.	See Foot- note 6.	See Foot- note 7.	9 (2.74)										
14 X 14 (4.3 X 4.3)	14 (53.0)	8.16 (0.56)	14 (53.0)	8.16 (0.56)																
16 X 16 (4.9 X 4.9)	16 (60.6)	10.66 (0.73)	16 (60.6)	10.66 (0.73)																
12 X 12 (3.7 X 3.7)	15 (56.8)	9.37 (0.65)	15 (56.8)	9.37 (0.65)	5 - 10 inches						Upright	See Foot- note 7 and 9.	See Foot- note 6.	See Foot- note 7.	9 (2.74)					
14 X 14 (4.3 X 4.3)	15 (56.8)	9.37 (0.65)	15 (56.8)	9.37 (0.65)																
16 X 16 (4.9 X 4.9)	18 (68.1)	13.49 (0.93)	18 (68.1)	13.49 (0.93)																
12 X 12 (3.7 X 3.7)	15 (56.8)	9.37 (0.65)	--	--	1 to 3 inch- es below 14 inch beams											Upright	See Foot- note 7 and 9.	See Foot- note 6.	See Foot- note 7.	9 (2.74)
14 X 14 (4.3 X 4.3)	15 (56.8)	9.37 (0.65)	--	--																
16 X 16 (4.9 X 4.9)	18 (68.1)	13.49 (0.93)	--	--																

#### Footnotes

- <sup>1</sup> Part number shown is the base part number. For complete part number, refer to Viking's current price 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 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.
- <sup>4</sup> 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.
- <sup>5</sup> Listed by Underwriter's Laboratories, Inc. for use in the U.S., Canada, and European Union.
- <sup>6</sup> Meets New York City requirements, effective July 1, 2008.
- <sup>7</sup> Approved Finishes are: Brass, Chrome, White Polyester, and Black Polyester<sup>8</sup>
- <sup>8</sup> Other paint colors are available on request with the same C-UL-US-EU listings as the standard finish colors.
- <sup>9</sup> C-UL-US-EU listed as corrosion resistant - Electroless Nickel PTFE (ENT)



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### DESIGN CRITERIA - VK467

(Also refer to the Approval Chart.)

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

When using Viking Residential Upright Sprinkler VK467 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.

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 for NFPA 13D and NFPA13R 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 of NFPA 13.
- Minimum distance between residential sprinklers: 9 ft. (2.74 m).

### BEAM CEILING GUIDELINES - VK467

C-UL-US-EU Listed for installation in residential occupancies with beam ceilings (with horizontal ceilings only).

Refer to the Approval Chart for sprinkler areas of coverage and hydraulic design.

**Sprinkler Location:** Locate sprinklers on the underside of the beams (not in the bays or pockets formed by the beams). Refer to Figure 2. The vertical distance from the sprinkler deflector to the bottom of the primary beam must be between 1" and 3" (25 to 76 mm). The horizontal distance from the centerline of the sprinkler to the primary beam cannot be more than 2" (51 mm) (Figure 2).

**Beam Position:** Directly attached to the underside of a combustible or non-combustible smooth ceiling of any height.

#### Beam Size and Shape (Cross section):

- Depth: Maximum 14" (356 mm) for primary beams. Secondary beam depth cannot be greater than the primary beam.
- Width: Unlimited.
- Beam Shape: Rectangular to circular.

**Beam Types:** Combustible or non-combustible, solid surface, solid or hollow core.

#### Beam Spacing:

- A. For primary beams, the distance from the wall to the center of the nearest primary beam must be at least 3'-4" (1.0 m), and not more than one-half the listed sprinkler spacing. **Note:** Sprinklers may not be required to be located in the first beam nearest the wall. Center-to-center distance between primary beams is to be a maximum of 16 ft (4.9 m). Refer to Figure 4A.
- B. When beam pockets created by the primary beams exceed 20 ft (6.1 m) in length, secondary beams are required as follows (also refer to Figure 4B):
  1. Secondary beam depth must be equal to primary beam depth.
  2. Secondary beams must be placed so that the bays formed by the primary beams do not exceed 20 ft (6.1 m) in length.
- C. When primary beam spans do not exceed 20 ft (6.1 m), secondary beams (not required) may have any distance from wall to nearest secondary beam and any distance center to center between secondary beams.

#### Also:

When primary beam spans exceed 20ft (6.1m) an alternate protection scheme for the compartment would be to calculate all the sprinklers in the compartment. Refer to Figure 5.

- More stringent design requirement.
- Secondary beams or baffles would not be required for a compartment space design.
- The minimum required discharge from each sprinkler would utilize flow rates given in the Approval Chart for NFPA 13D and NFPA13R applications

**Lintels:** Must be present over doorways exiting the compartment. Lintel height must be at least 8" (203 mm), or at least the depth of the primary beams, whichever is greater.

**Beam and Soffit Arrangements:** If a soffit is installed, beams may be arranged within the soffit. The cross section of the soffit may be any size, provided it does not create an obstruction to water distribution per the obstruction rules of NFPA 13 for residential sprinklers. Where there is a soffit, beam spacing from the wall is to be measured from the face of the soffit rather than the wall. **NOTE:** The sprinkler area of coverage is to be measured from the wall.

#### Definitions:

- Primary beams: The main beams that run primarily in one direction.
- Secondary beams: The beams that run perpendicular to the main beams.

**IMPORTANT:** Always refer to Bulletin Form No. F\_091699 - Care and Handling of Sprinklers. Also refer to Form No.s F\_080190, F\_080814, and 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.





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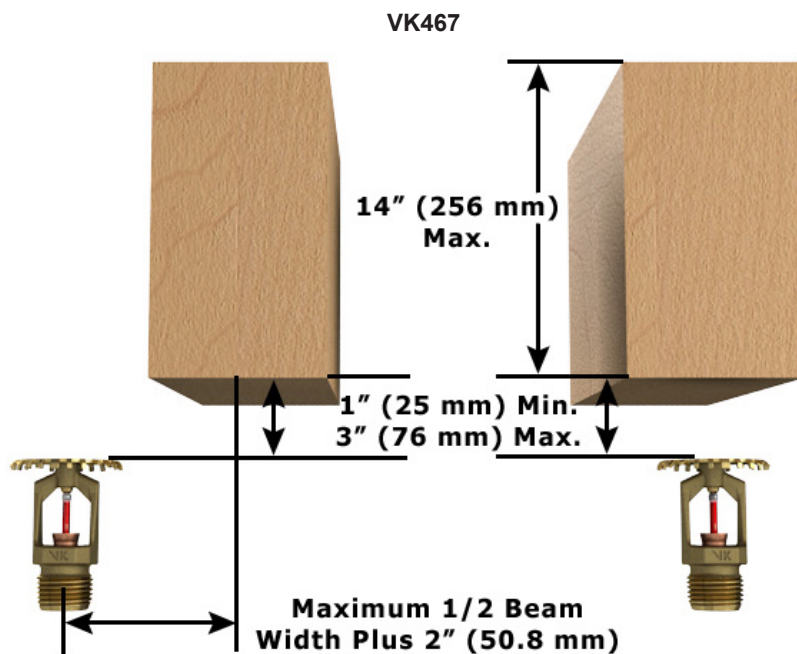


Figure 2: Sprinkler Positioning Under Primary Beams

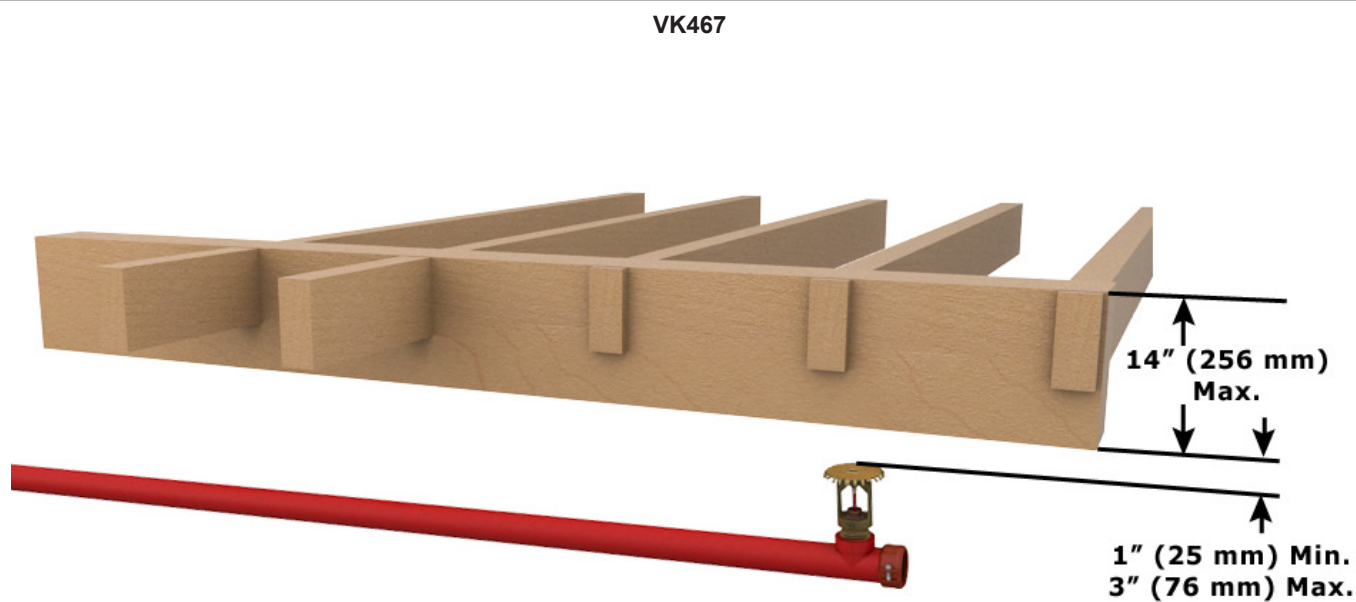


Figure 3: Sprinkler Positioning Under Primary Beams



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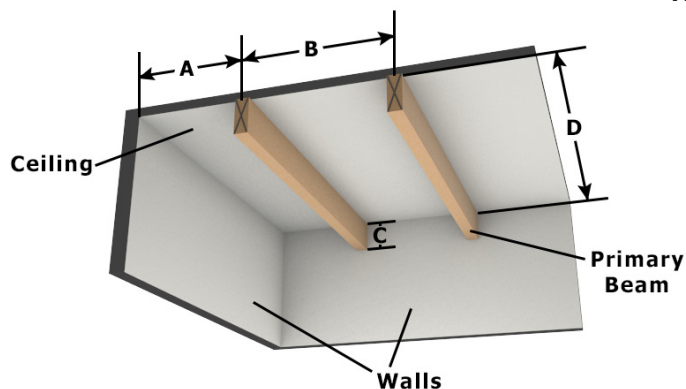
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VK467



All dimensions are measured to wall faces and to centerlines of beams.

A = Distance from wall to nearest primary beam:

Minimum: 3 ft 4 in (1.0 m).

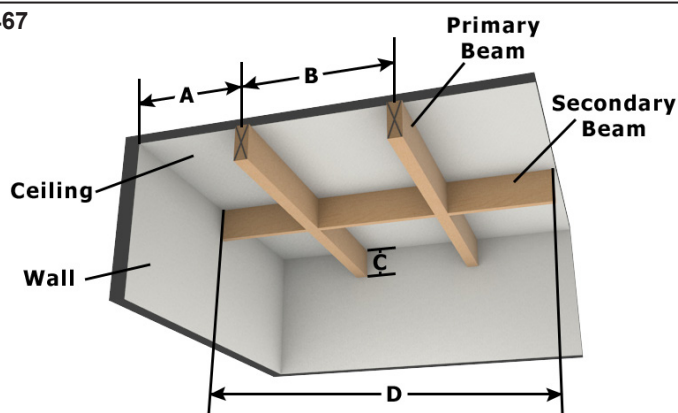
Maximum: No more than 1/2 listed sprinkler spacing.

B = Spacing between primary beams: 16 ft (4.9 m) maximum

C = Beam depth: 14" (356 mm) maximum

D = Beam span: 20 ft (6.1 m) maximum

**Figure 4A: Primary Beam Spans up to 20 ft (6.1 m)**



All dimensions are measured to wall faces and to centerlines of beams.

A = Distance from wall to nearest primary beam:

Minimum: 3 ft 4 in (1.0 m).

Maximum: No more than 1/2 listed sprinkler spacing.

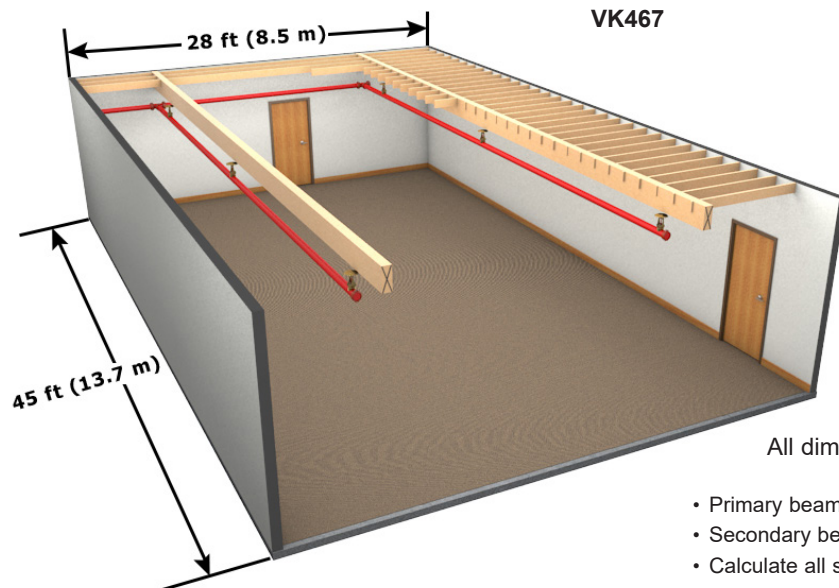
B = Spacing between primary beams: 16 ft (4.9 m) maximum

C = Beam depth: 14" (356 mm) maximum

D = 20 ft (6.1 m) maximum for secondary beams that are to be equal in depth for primary beams and that are required so that primary beam pockets do not exceed 20 ft (6.1 m).

**Figure 4B: Primary Beam Spans over 20 ft (6.1 m)**

VK467



### **EXAMPLE**

All dimensions are measured to wall faces and to centerlines of beams.

- Primary beam spans exceeding 20 ft (6.1 m)
- Secondary beams or baffles not required
- Calculate all sprinklers in compartment  
(Above example 6 sprinklers)

**Figure 5: Alternate Entire Compartment Protection Scheme Example**






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### Approval Chart - VK470 3.0 K-Factor Residential Pendent Sprinkler

For systems designed to NFPA 13D or NFPA 13R. For systems designed to NFPA 13, refer to the design criteria.  
For Ceiling types refer to the current editions of NFPA 13, 13R or 13D

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		
23021	VK470	1/2	15	3.0	43.2	175 psi (12 bar)	2-1/4	58		
Max. Coverage Area <sup>4</sup> Ft.X Ft. (m X m)	Ordinary Temp Rating (155 °F/68 °C)		Intermediate Temp Rating (175 °F/79 °C)		Deflector to Ceiling	Installation Type	Listings and Approvals <sup>3</sup>			Minimum Spacing Ft. (m)
	Flow <sup>4</sup> GPM (L/min)	Pressure <sup>4</sup> PSI (bar)	Flow <sup>4</sup> GPM (L/min)	Pressure <sup>4</sup> PSI (bar)			 <sup>5</sup>	NYC	NSF	
12 X 12 (3.7 X 3.7)	8 (30.3)	7.11 (0.49)	8 (30.3)	7.11 (0.49)	1-1/8 to 2 inch	Standard surface- mounted escutcheons, <b>or</b> recessed with the Micromatic® Model E-1, E-2, or E-3 Recessed Escutcheon	See Footnotes 6 and 9	See Foot- note 7	--	8 (2.4)
14 X 14 (4.3 X 4.3)	10 (37.9)	11.11 (0.77)	10 (37.9)	11.11 (0.77)						
15 X 15 (4.6 X 4.6)	12 (45.4)	16 (1.10)	12 (45.4)	16 (1.10)						
16 X 16 (4.9 X 4.9)	13 (49.2)	18.8 (1.29)	13 (49.2)	18.8 (1.29)						

#### Footnotes

- Part number shown is the base part number. For complete part number, refer to Viking's current price 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.
- 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.
- Listed by Underwriter's Laboratories, Inc. for use in the U.S., Canada, and European Union.
- Approved Finishes are: Brass, Chrome, White Polyester, and Black Polyester <sup>8</sup>.
- Meets New York City requirements, effective July 1, 2008.
- Other paint colors are available on request with the same C-UL-US-EU listings as the standard finish colors.
- Approved finish is Electroless Nickel PTFE (ENT). ENT is C-UL-US-EU Listed as corrosion resistant. ENT is available with standard surface-mounted escutcheons or the Micromatic Model E-1 Recessed Escutcheon.

### DESIGN CRITERIA - VK470

(Also refer to the Approval Chart.)

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

When using Viking Residential Pendent Sprinkler VK470 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.

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 for NFPA 13D and NFPA13R 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.
- Minimum distance between residential sprinklers: 8 ft. (2.4 m).

**IMPORTANT: Always refer to Bulletin Form No. F\_091699 - Care and Handling of Sprinklers. Also refer to Form No.s F\_080190, F\_080814, and 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.**



## TECHNICAL DATA

## AUSTRALIAN WATERMARK FREEDOM® RESIDENTIAL SPRINKLERS

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

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### Approval Chart - VK430

#### 4.3 K-Factor Residential Pendent Sprinkler

For systems designed to NFPA 13D or NFPA 13R. For systems designed to NFPA 13, refer to the design criteria.

For Ceiling types refer to current Editions of NFPA 13, 13R or 13D

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		
23022	VK430	1/2	15	4.3	62	175 psi (12 bar)	2-1/4		58	
Max. Cover- age Area <sup>4</sup> Ft.X Ft. (m X m)	Ordinary Temp Rating (155 °F/68 °C)		Intermediate Temp Rat- ing (175 °F/79 °C)		Deflector to Ceiling	Installation Type	Listings and Approv- als <sup>3</sup>			Minimum Spacing Ft. (m)
	Flow <sup>4</sup> GPM (L/min)	Pressure <sup>4</sup> PSI (bar)	Flow <sup>4</sup> GPM (L/min)	Pressure <sup>4</sup> PSI (bar)			 US <sup>5</sup> EU	NYC <sup>7</sup>	NSF <sup>8</sup>	
12 X 12 (3.7 X 3.7)	12 (45.4)	7.8 (0.54)	12 (45.4)	7.8 (0.54)	1-1/8 to 2 inch	Standard sur- face-mounted escutcheons or recessed with the Micromatic® Model E-1, E-2, or E-3 Recessed Escutcheon	See Foot- note 6 and 10	See Foot- note 6	See Foot- note 6	8 (2.4)
14 X 14 (4.3 X 4.3)	13 (49.2)	9.1 (0.63)	13 (49.2)	9.1 (0.63)						
16 X 16 (4.9 X 4.9)	13 (49.2)	9.1 (0.63)	13 (49.2)	9.1 (0.63)						
18 X 18 (5.5 X 5.5)	17 (64.4)	15.6 (1.08)	17 (64.4)	15.6 (1.08)						
20 X 20 (6.1 X 6.1)	21 (79.5)	23.9 (1.64)	21 (79.5)	23.9 (1.64)						

#### Footnotes

- Part number shown is the base part number. For complete part number, refer to Viking's current price 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.
- 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.
- Listed by Underwriter's Laboratories, Inc. for use in the U.S., Canada, and European Union.
- Approved Finishes are: Brass, Chrome, White Polyester, and Black Polyester<sup>9</sup>.
- Accepted for use, City of New York Department of Buildings, MEA Number 89-92-E, Vol. 24.
- UL Classified to: NSF/ANSI Standard 61, Drinking Water System Components (MH48034).
- Other paint colors are available on request with the same C-UL-US-EU listings as the standard finish colors.
- Approved finish is Electroless Nickel PTFE (ENT). ENT is C-UL-US-EU Listed as corrosion resistant. ENT is available with standard surface-mounted escutcheons or the Micromatic Model E-1 Recessed Escutcheon.

### DESIGN CRITERIA - VK430

(Also refer to the Approval Chart.)

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

When using Viking Residential Pendent Sprinkler VK430 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 on page 3.

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 on data page 3 for NFPA 13D and NFPA13R 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.
- Minimum distance between residential sprinklers: 8 ft. (2.4 m).

**IMPORTANT:** Always refer to Bulletin Form No. F\_091699 - Care and Handling of Sprinklers. Also refer to Form No. F\_080190, F\_080814, and 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.



## TECHNICAL DATA

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### Approval Chart - VK468 4.9 K-Factor Residential Pendent Sprinkler

For systems designed to NFPA 13D or NFPA 13R. For systems designed to NFPA 13, refer to the design criteria.  
 For Ceiling types refer to current editions of NFPA 13, 13R or 13D

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			
23023	VK468	1/2	15	4.9	70.6	175 psi (12 bar)	2-1/4	58			
Max. Coverage Area <sup>4</sup> Ft.X Ft. (m X m)	Ordinary Temp Rating (155 °F/68 °C)		Intermediate Temp Rating (175 °F/79 °C)		Deflector to Ceiling	Installation Type	Listings and Approvals <sup>3</sup>				Minimum Spacing Ft. (m)
	Flow <sup>4</sup> GPM (L/min)	Pressure <sup>4</sup> PSI (bar)	Flow <sup>4</sup> GPM (L/min)	Pressure <sup>4</sup> PSI (bar)			C-UL- US- EU <sup>5</sup>	VdS	NYC <sup>6</sup>	NSF <sup>8</sup>	
12 X 12 (3.7 X 3.7)	13 (49.2)	7.0 (0.48)	13 (49.2)	7.0 (0.48)	1-1/8 to 2 inch	Standard sur- face-mounted escutcheons, or recessed with the Micromatic® Model E-1, E-2, or E-3 Recessed Escutcheon	See Foot- notes 7 and 10.	See Foot- notes 7 and 10.	See Foot- note 7.	See Foot- note 7.	8 (2.4)
14 X 14 (4.3 X 4.3)	13 (49.2)	7.0 (0.48)	13 (49.2)	7.0 (0.48)							
16 X 16 (4.9 X 4.9)	13 (49.2)	7.0 (0.48)	13 (49.2)	7.0 (0.48)							
18 X 18 (5.5 X 5.5)	17 (64.4)	12.0 (0.83)	17 (64.4)	12.0 (0.83)							
20 X 20 (6.1 X 6.1)	20 (75.7)	16.7 (1.15)	20 (75.7)	16.7 (1.15)							

#### Footnotes

- Part number shown is the base part number. For complete part number, refer to Viking's current price 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.
- 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.
- Listed by Underwriter's Laboratories, Inc. for use in the U.S., Canada, and European Union.
- Accepted for use, City of New York Department of Buildings, MEA Number 89-92-E, Vol. 35.
- Approved Finishes are: Brass, Chrome, White Polyester, and Black Polyester<sup>9</sup>
- UL Classified to: NSF/ANSI Standard 61, Drinking Water System Components (MH48034).
- Other paint colors are available on request with the same C-UL-US-EU listings as the standard finish colors.
- Approved finish is Electroless Nickel PTFE (ENT). ENT is C-UL-US-EU Listed as corrosion resistant. ENT is available with standard surface-mounted escutcheons or the Micromatic Model E-1 Recessed Escutcheon.

### DESIGN CRITERIA - VK468

(Also refer to the Approval Chart.)

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

When using Viking Residential Pendent Sprinkler VK468 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.

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 for NFPA 13D and NFPA13R 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.
- Minimum distance between residential sprinklers: 8 ft. (2.4 m).

**IMPORTANT:** Always refer to Bulletin Form No. F\_091699 - Care and Handling of Sprinklers. Also refer to Form No. F\_080614, F\_080415 and F\_080190 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, VdS, 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.



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### Approval Chart - VK466

#### 5.2 K-Factor Residential Pendent Sprinkler

For systems designed to NFPA 13D or NFPA 13R. For systems designed to NFPA 13, refer to the design criteria.

For Ceiling types refer to NFPA 13, 13R or 13D 2013 Editions

Sprinkler Base Part Number <sup>1</sup>	SIN	NPT Thread Size		Nominal K-Factor		Maximum Water Work- ing Pressure	Overall Length			
		Inches	mm	U.S.	metric <sup>2</sup>		Inches		mm	
23024	VK466	1/2	15	5.2	74.9	175 psi (12 bar)	2-1/4		58	
Max. Coverage Area <sup>6</sup> Ft.X Ft. (m X m)	Ordinary Temp Rating (155 °F/68 °C)		Intermediate Temp Rat- ing (175 °F/79 °C)		Deflector 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 <sup>7</sup>	
12 X 12 (3.7 X 3.7)	14 (53.0)	7.2 (0.50)	14 (53.0)	7.2 (0.50)	1-1/8 to 2 inch	Standard surface-mounted escutcheons, or recessed with the Micromatic® Model E-1, E-2, or E-3 Recessed Escutcheon	See Foot- notes 8 and 10	See Foot- note 5	See Foot- note 8	8 (2.4)
14 X 14 (4.3 X 4.3)	14 (53.0)	7.2 (0.50)	14 (53.0)	7.2 (0.50)						
16 X 16 (4.9 X 4.9)	14 (53.0)	7.2 (0.50)	14 (53.0)	7.2 (0.50)						
18 X 18 (5.5 X 5.5)	17 (64.4)	10.7 (0.74)	17 (64.4)	10.7 (0.74)						
20 X 20 (6.1 X 6.1)	20 (75.7)	14.8 (1.02)	20 (75.7)	14.8 (1.02)						

#### Footnotes

- Part number shown is the base part number. For complete part number, refer to Viking's current price 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 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.
- UL Classified to: NSF/ANSI Standard 61, Drinking Water System Components (MH48034).
- Approved Finishes are: Brass, Chrome, White Polyester, and Black Polyester<sup>9</sup>.
- Other paint colors are available on request with the same C-UL-US-EU listings as the standard finish colors.
- Approved finish is Electroless Nickel PTFE (ENT). ENT is C-UL-US-EU Listed as corrosion resistant. ENT is available with standard surface-mounted escutcheons or the Micromatic Model E-1 Recessed Escutcheon.

### DESIGN CRITERIA - VK466

(Also refer to the Approval Chart.)

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

When using Viking Residential Sprinkler VK466 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.

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 for NFPA 13D and NFPA13R 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.
- Minimum distance between residential sprinklers: 8 ft. (2.4 m).

**IMPORTANT:** Always refer to Bulletin Form No. F\_091699 - Care and Handling of Sprinklers. Also refer to Form No. F\_080190, F\_080814, and 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.



## TECHNICAL DATA

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### Approval Chart - VK472 5.8 K-Factor Residential Pendent Sprinkler

For systems designed to NFPA 13D or NFPA 13R. For systems designed to NFPA 13, refer to the design criteria. For Ceiling types refer to current editions of NFPA 13, 13R or 13D

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		
23025	VK472	1/2	15	5.8	83.6	175 psi (12 bar)		2-1/4	58		
Max. Coverage Area <sup>6</sup> Ft.X Ft. (m X m)	Ordinary Temp Rating (155 °F/68 °C)		Intermediate Temp Rating (175 °F/79 °C)		Deflector 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)			C-UL- US- EU <sup>4</sup>	VdS	NYC	NSF <sup>10</sup>	
16 X 16 (4.9 X 4.9)	16 (60.6)	7.6 (0.52)	--	--	1-1/8 to 2 inch	Standard surface-mounted escutcheons or recessed with the Micromatic® Model E-1, E-2, or E-3 Recessed Escutcheon	See Foot- notes 8 and 9.	See Foot- notes 8 and 9.	See Foot- note 5	See Foot- note 8	8 (2.4)
18 X 18 (5.5 X 5.5)	17 (64.4)	8.6 (0.59)	17 (64.4)	8.6 (0.59)							
20 X 20 (6.1 X 6.1)	21 (79.5)	13.1 (0.90)	--	--							

#### Footnotes

- Part number shown is the base part number. For complete part number, refer to Viking's current price 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 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.
- Other paint colors are available on request with the same C-UL-US-EU listings as the standard finish colors.
- Approved Finishes are: Brass, Chrome, White Polyester, and Black Polyester <sup>7</sup>.
- Approved finish is Electroless Nickel PTFE (ENT). ENT is C-UL-US-EU Listed as corrosion resistant. ENT is available with standard surface-mounted escutcheons or the Micromatic Model E-1 Recessed Escutcheon.
- UL Classified to : NSF/ANSI Standard 61, Drinking Water System Components (MH48034)

### DESIGN CRITERIA - VK472

(Also refer to the Approval Chart.)

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

When using Viking Residential Pendent Sprinkler VK472 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.

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 for NFPA 13D and NFPA13R 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.
- Minimum distance between residential sprinklers: 8 ft. (2.4 m).

**IMPORTANT: Always refer to Bulletin Form No. F\_091699 - Care and Handling of Sprinklers. Also refer to Form No. F\_080614, F\_080415 and F\_080190 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, VdS, 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.**



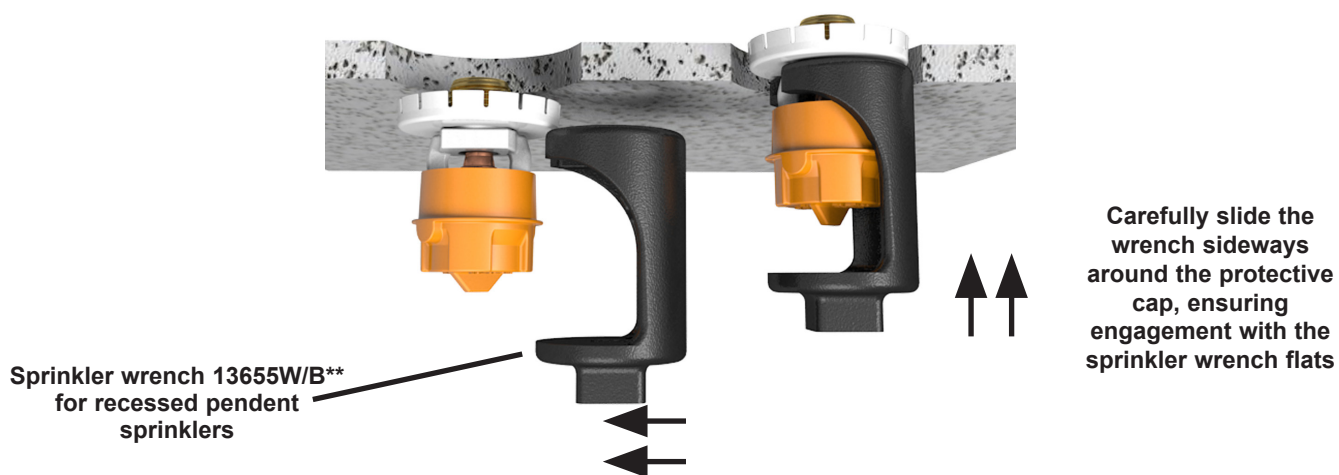


## TECHNICAL DATA

## AUSTRALIAN WATERMARK FREEDOM® RESIDENTIAL SPRINKLERS

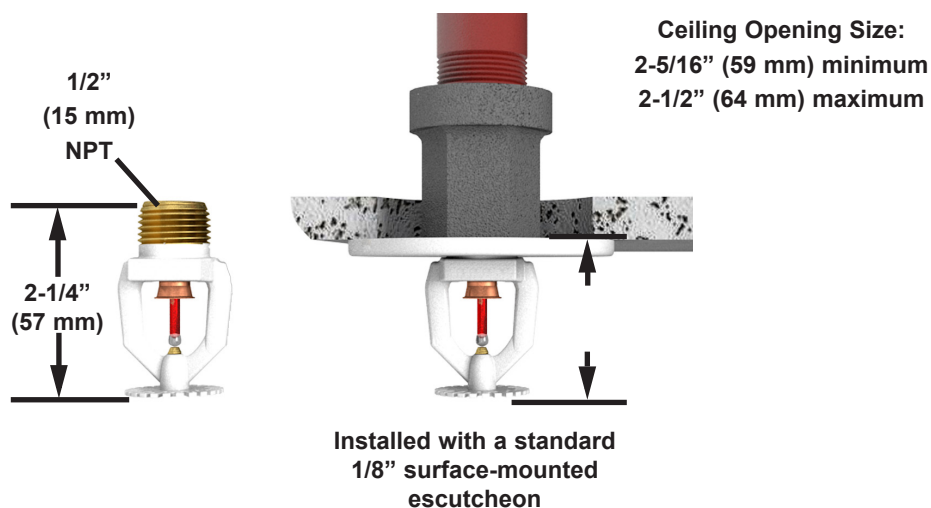
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VK470, VK430, VK468, VK466, and VK472



**Figure 6: Installing Recessed Pendent Sprinklers**  
 \*\* A 1/2" ratchet is required (not available from Viking)

VK470, VK430, VK468, VK466, and VK472



**Figure 7: Pendent Sprinkler Dimensions with a Standard Escutcheon**



## TECHNICAL DATA

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VK470, VK430, VK468, VK466, and VK472

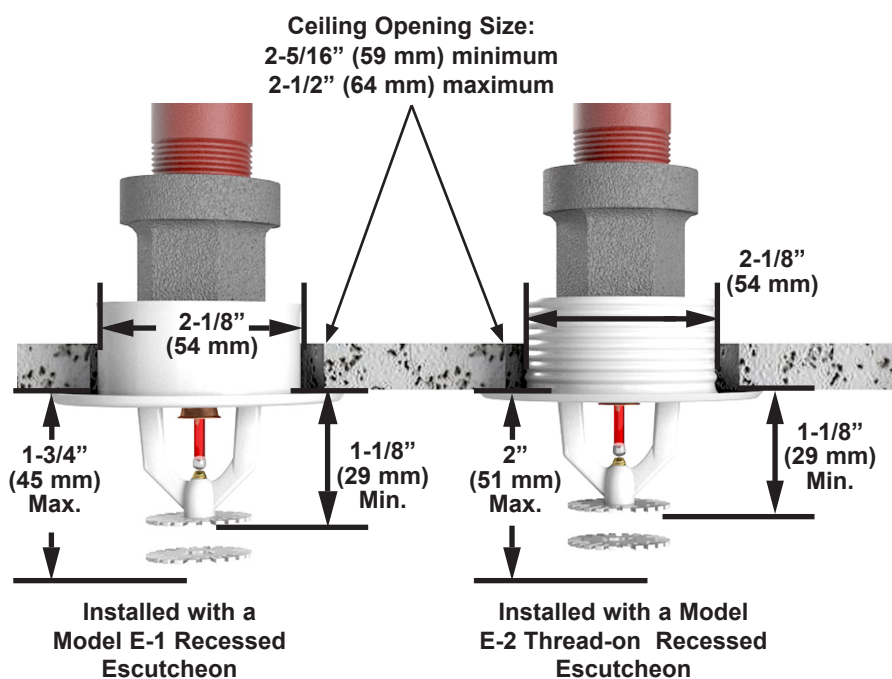


Figure 8: Pendant Sprinkler Dimensions with the Model E-1 and E-2 Recessed Escutcheons



# TECHNICAL DATA

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### Approval Chart - VK486

#### 4.0 K-Factor Residential Horizontal Sidewall Sprinkler

For systems designed to NFPA 13D or NFPA 13R. For systems designed to NFPA 13, refer to the design criteria.

For Ceiling types refer to current Editions of NFPA 13, 13R or 13D

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			
23026	VK486	1/2	15	4.0	57.7	175 psi (12 bar)		2-7/16		62		
Max. Coverage Area <sup>3</sup> Width X Length Ft. X Ft. (m X m)	Max. Spac- ing Ft. (m)	Ordinary Temp Rating (155 °F/68 °C)		Intermediate Temp Rating (175 °F/79 °C)		Top of Deflec- tor to Ceiling	Installation Type	Listings and Approvals <sup>4</sup>				Min. Spac- ing Ft. (m)
		Flow <sup>3</sup> GPM (L/min)	Pressure <sup>3</sup> PSI (bar)	Flow <sup>3</sup> GPM (L/min)	Pressure <sup>3</sup> PSI (bar)			C-UL-US-EU <sup>5</sup>	VdS	NYC	NSF <sup>9</sup>	
12 X 12 (3.7 X 3.7)	12 (3.7)	11 (41.7)	7.6 (0.52)	11 (41.7)	7.6 (0.52)	4 to 6 inches	Standard surface- mounted escutch- eons or recessed with the Micromatic® Model E-1, E-2, E-3, or G-1 Recessed Escutcheon	See Foot- note 6 and 10.	See Foot- note 6.	See Foot- note 7.	See Foot- note 6.	8 (2.4)
14 X 14 (4.3 X 4.3)	14 (4.3)	12 (45.5)	9 (0.62)	12 (45.5)	9 (0.62)							
16 X 16 (4.9 X 4.9)	16 (4.9)	13 (49.3)	10.6 (0.73)	13 (49.3)	10.6 (0.73)							
16 X 18 (4.9 X 5.5)	16 (4.9)	16 (60.6)	16 (1.10)	16 (60.6)	16 (1.10)							
16 X 20 (4.9 X 6.1)	16 (4.9)	22 (83.3)	30.3 (2.09)	22 (83.3)	30.3 (2.09)							
16 X 22 (4.9 X 6.7)	16 (4.9)	24 (90.8)	36 (2.48)	24 (90.8)	36 (2.48)							
18 X 18 (5.5 X 5.5)	18 (5.5)	18 (68.1)	20.3 (1.40)	19 (71.9)	22.6 (1.60)							
18 X 20 (5.5 X 6.1)	18 (5.5)	22 (83.3)	30.3 (2.09)	22 (83.3)	30.3 (2.09)							
20 X 20 (6.1 X 6.1)	20 (6.1)	22 (83.3)	30.3 (2.09)	22 (83.3)	30.3 (2.09)	6 to 12 inches						
12 X 12 (3.7 X 3.7)	12 (3.7)	12 (45.5)	9 (0.62)	12 (45.5)	9 (0.62)							
14 X 14 (4.3 X 4.3)	14 (4.3)	12 (45.5)	9 (0.62)	13 (49.3)	10.6 (0.73)							
16 X 16 (4.9 X 4.9)	16 (4.9)	14 (53.0)	12.3 (0.84)	14 (53.0)	12.3 (0.84)							
16 X 18 (4.9 X 5.5)	16 (4.9)	16 (60.6)	16 (1.10)	16 (60.6)	16 (1.10)							
16 X 20 (4.9 X 6.1)	16 (4.9)	23 (87.1)	33.1 (2.28)	23 (87.1)	33.1 (2.28)							
16 X 22 (4.9 X 6.7)	16 (4.9)	26 (98.4)	42.3 (2.91)	26 (98.4)	42.3 (2.91)							
18 X 18 (5.5 X 5.5)	18 (5.5)	18 (68.1)	20.3 (1.40)	19 (71.9)	22.6 (1.60)							
18 X 20 (5.5 X 6.1)	18 (5.5)	23 (87.1)	33.1 (2.28)	23 (87.1)	33.1 (2.28)							
20 X 20 (6.1 X 6.1)	20 (6.1)	24 (90.8)	36 (2.48)	24 (90.8)	36 (2.48)							

#### Footnotes

- Part number shown is the base part number. For complete part number, refer to Viking's current price 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.
- 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.
- 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 by Underwriter's Laboratories, Inc. for use in the U.S., Canada, and European Union.
- Approved Finishes are: Brass, Chrome, White Polyester, and Black Polyester <sup>8</sup>
- Meets New York City requirements, effective July 1, 2008.
- Other paint colors are available on request with the same C-UL-US-EU listings as the standard finish colors.
- UL Classified to : NSF/ANSI Standard 61, Drinking Water System Components (MH48034)
- Approved finish is Electroless Nickel PTFE (ENT). ENT is C-UL-US-EU Listed as corrosion resistant. ENT is available with standard surface-mounted escutcheons or the Micromatic Model E-1 Recessed Escutcheon.



## TECHNICAL DATA

## AUSTRALIAN WATERMARK FREEDOM® RESIDENTIAL SPRINKLERS

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

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Visit the Viking website for the latest edition of this technical data page [www.vikinggroupinc.com](http://www.vikinggroupinc.com)

### DESIGN CRITERIA - VK486

(Also refer to the Approval Chart.)

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

When using Viking Residential Horizontal Sidewall Sprinkler VK486 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.

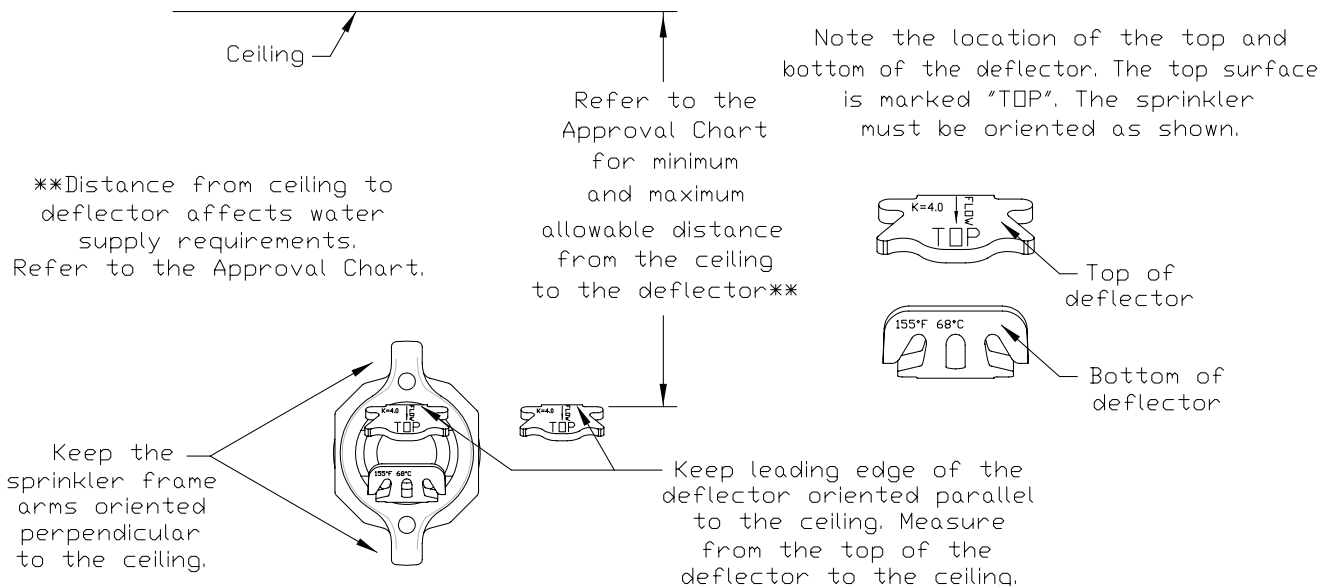
For systems designed to NFPA 13: The number of design sprinklers is to be the four contiguous most hydraulically demanding sprinklers. The minimum required discharge from each of the four sprinklers is to be the greater of the following:

- The flow rates given in the Approval Chart 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.
- Minimum distance between residential sprinklers: 8 ft. (2.4 m).
- The VK486 horizontal sidewall sprinkler deflector shall be located a minimum of 1-1/4" (31.8 mm) and a maximum of 6" (152 mm) from the wall on which it is installed.

**DEFLECTOR POSITION:** Install sprinkler VK486 with the leading edge of the deflector oriented parallel to the ceiling and the sprinkler frame arms oriented perpendicular to the ceiling (see Figure 10). **THE TOP SURFACE OF THE DEFLECTOR IS MARKED "TOP"**. The sprinkler must be oriented as shown in Figure 9 below.

**IMPORTANT:** Always refer to Bulletin Form No. F\_091699 - Care and Handling of Sprinklers. Also refer to Form No. F\_080190, F\_080814, and 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.

#### VK486



**Figure 9:**

**Correct Orientation of the Deflector**



# TECHNICAL DATA

## AUSTRALIAN WATERMARK FREEDOM® RESIDENTIAL SPRINKLERS

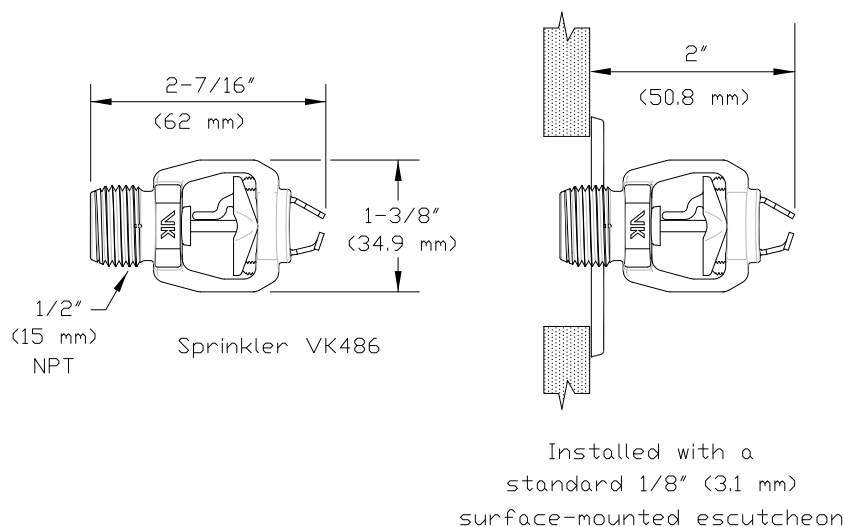
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### VK486

Wall Opening Size:  
2-5/16" (58.7 mm) minimum  
2-1/2" (63.5 mm) maximum

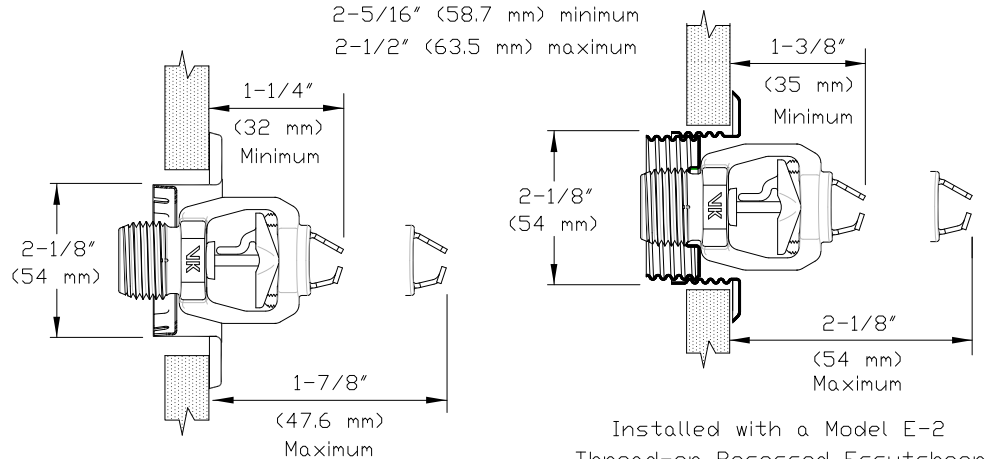


**Figure 10:**

**Sprinkler VK486 Dimensions with a Standard Escutcheon**

### VK486

Wall Opening Size:  
2-5/16" (58.7 mm) minimum  
2-1/2" (63.5 mm) maximum



**Figure 11:**

**Sprinkler VK486 Dimensions with the Model E-1 and E-2 Recessed Escutcheons**





# TECHNICAL DATA

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## Approval Chart - VK484

### 4.2 K-Factor Residential Horizontal Sidewall Sprinkler

For systems designed to NFPA 13D or NFPA 13R. For systems designed to NFPA 13, refer to the design criteria.

For Ceiling types refer to NFPA 13, 13R or 13D current editions

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		
23027	VK484	1/2	15	4.2	60	175 psi (12 bar)	3	76		
Max. Coverage Area <sup>4</sup> Width X Length Ft. X Ft. (m X m)	Max. Spacing Ft. (m)	Ordinary Temp Rating (155 °F/68 °C)		Intermediate Temp Rating (175 °F/79 °C)		Top of Deflector to Ceiling	Installation Type	Listings and Approvals <sup>3</sup>		Minimum Spacing Ft. (m)
		Flow <sup>4</sup> GPM (L/min)	Pressure <sup>4</sup> PSI (bar)	Flow <sup>4</sup> GPM (L/min)	Pressure <sup>4</sup> PSI (bar)			cULus <sup>5</sup>	NYC	
12 X 12 (3.7 X 3.7)	12 (3.7)	13 (49.2)	9.6 (0.66)	13 (49.2)	9.6 (0.66)	4 to 6 inches	Standard surface-mounted escutcheons or recessed with the Micromatic® Model E-1, E-2, E-3, or G-1 Recessed Escutcheon	See Footnotes 7 and 9.	See Footnote 6	8 (2.4)
14 X 14 (4.3 X 4.3)	14 (4.3)	14 (53.0)	11.1 (0.77)	15 (56.8)	12.8 (0.88)					
16 X 16 (4.9 X 4.9)	16 (4.9)	16 (60.6)	14.5 (1.00)	17 (64.4)	16.4 (1.13)					
16 X 18 (4.9 X 5.5)	16 (4.9)	19 (71.9)	20.5 (1.41)	19 (71.9)	20.5 (1.41)					
16 X 20 (4.9 X 6.1)	16 (4.9)	22 (83.3)	27.4 (1.89)	22 (83.3)	27.4 (1.89)	6 to 12 inches				
12 X 12 (3.7 X 3.7)	12 (3.7)	14 (53.0)	11.1 (0.77)	14 (53.0)	11.1 (0.77)					
14 X 14 (4.3 X 4.3)	14 (4.3)	16 (60.6)	14.5 (1.00)	16 (60.6)	14.5 (1.00)					
16 X 16 (4.9 X 4.9)	16 (4.9)	18 (68.1)	18.4 (1.27)	18 (68.1)	18.4 (1.27)					
16 X 18 (4.9 X 5.5)	16 (4.9)	20 (75.7)	22.7 (1.56)	20 (75.7)	22.7 (1.56)					
16 X 20 (4.9 X 6.1)	16 (4.9)	25 (94.6)	35.4 (2.44)	25 (94.6)	35.4 (2.44)					

### Footnotes

1. Part number shown is the base part number. For complete part number, refer to Viking's current price 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. Refer also to Design Criteria.
4. 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.
5. Listed by Underwriter's Laboratories, Inc. for use in the U.S. and Canada.
6. Meets New York City requirements, effective July 1, 2008.
7. Approved Finishes are: Brass, Chrome, White Polyester, and Black Polyester<sup>8</sup>
8. Other paint colors are available on request with the same cULus listings as the standard finish colors.
9. Approved finish is Electroless Nickel PTFE (ENT). ENT is cULus Listed as corrosion resistant. ENT is available with standard surface-mounted escutcheons or the Micromatic Model E-1 Recessed Escutcheon.



## TECHNICAL DATA

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### DESIGN CRITERIA - VK484

(Also refer to the Approval Chart.)

#### cULus Listing Requirements:

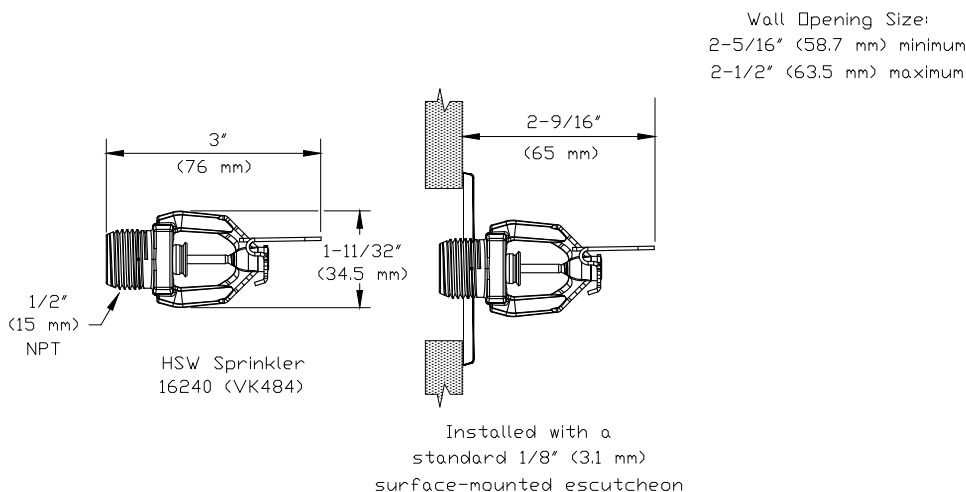
When using Viking Residential Sprinkler VK484 for systems designed to NFPA 13D or NFPA 13R, apply the listed areas of coverage and minimum water supply requirements shown in the Approval Chart.

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 for NFPA 13D and NFPA13R 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.
- Minimum distance between residential sprinklers: 8 ft. (2.4 m).
- The VK484 horizontal sidewall sprinkler deflector shall be located a minimum of 1-3/4" (44.5 mm) and a maximum of 6" (152 mm) from the wall on which it is installed.

**DEFLECTOR POSITION:** Install Viking Residential Horizontal Sidewall Sprinkler VK484 with the leading edge of the deflector oriented parallel with the ceiling and the sprinkler frame arms oriented perpendicular to the ceiling. Refer to the Approval Chart for the required distance between the top of the deflector and the ceiling.

**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 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.



**Figure 12:**  
**Sprinkler VK484 Dimensions with a Standard Escutcheon**



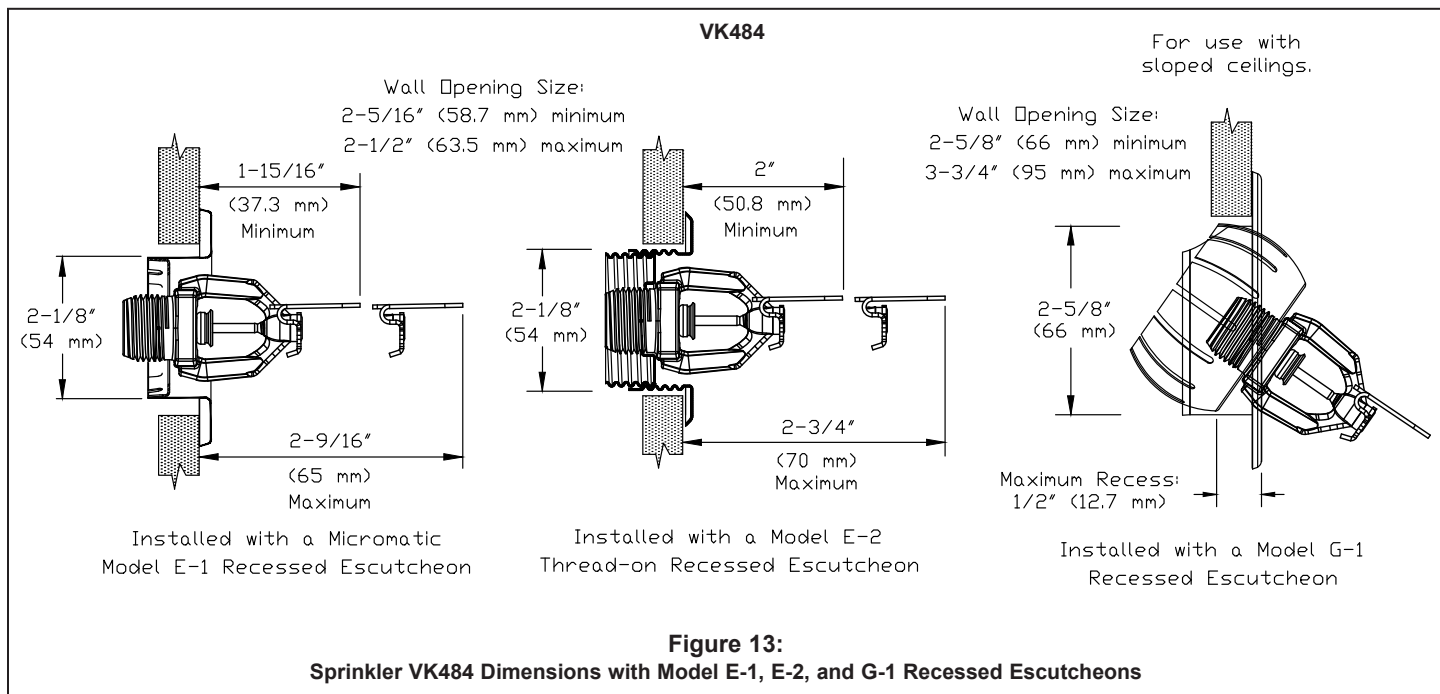
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### Approval Chart - VK460 5.8 K-Factor Residential Horizontal Sidewall Sprinkler

For systems designed to NFPA 13D or NFPA 13R. For systems designed to NFPA 13, refer to the design criteria.

For Ceiling types refer to current editions of NFPA 13, 13R or 13D.

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			
23028	VK460	1/2	15	5.8	83.6	175 psi (12 bar)		2-1/2		63.5		
Max. Coverage Area <sup>3</sup> Width X Length Ft. X Ft. (m X m)	Max. Spacing Ft. (m)	Ordinary Temp Rating (155 °F/68 °C)		Intermediate Temp Rating (175 °F/79 °C)		Top of Deflector to Ceiling	Installation Type	Listings and Approvals <sup>4</sup>				Minimum Spacing Ft. (m)
		Flow <sup>3</sup> GPM (L/min)	Pressure <sup>3</sup> PSI (bar)	Flow <sup>3</sup> GPM (L/min)	Pressure <sup>3</sup> PSI (bar)			C-UL- US-EU <sup>5</sup>	VdS	NYC	NSF <sup>8</sup>	
12 X 12 (3.7 X 3.7)	12 (3.7)	16 (60.6)	7.6 (0.52)	16 (60.6)	7.6 (0.52)	4 to 6 inches	Standard surface-mounted escutcheons <b>or</b> recessed with the Micromatic® Model E-1, E-2, or E-3 Recessed Escutcheon, or G-1 Adjustable Escutcheon	See Footnote 7 and 10	See Footnote 7	See Footnote 6	See Footnote 7	8 (2.4)
14 X 14 (4.3 X 4.3)	14 (4.3)	16 (60.6)	7.6 (0.52)	16 (60.6)	7.6 (0.52)							
16 X 16 (4.9 X 4.9)	16 (4.9)	20 (75.7)	11.9 (0.82)	21 (79.5)	13.1 (0.90)							
16 X 18 (4.9 X 5.5)	16 (4.9)	22 (83.3)	14.4 (0.99)	22 (83.3)	14.4 (0.99)							
16 X 20 (4.9 X 6.1)	16 (4.9)	26 (98.4)	20.1 (1.39)	26 (98.4)	20.1 (1.39)							
16 X 22 (4.9 X 6.7)	16 (4.9)	31 (117.3)	28.6 (1.97)	--	--							
18 X 18 (5.5 X 5.5)	18 (5.5)	23 (87.1)	15.7 (1.1)	23 (87.1)	15.7 (1.1)							
18 X 20 (5.5 X 6.1)	18 (5.5)	29 (109.8)	25.0 (1.7)	29 (109.8)	25.0 (1.7)							
20 X 20 (6.1 X 6.1)	20 (6.1)	30 (113.6)	26.8 (1.8)	30 (113.6)	26.8 (1.8)							
16 X 24 (4.9 X 7.3)	16 (4.9)	38 (143.8)	42.9 (2.96)	--	--							
14 X 26 (4.3 X 7.9)	14 (4.3)	42 (159)	52.4 (3.62)	--	--	6 to 12 inches	Standard surface-mounted escutcheons only	See Footnote 7 and 10	See Footnote 7	See Footnote 6	See Footnote 7	
12 X 12 (3.7 X 3.7)	12 (3.7)	16 (60.6)	7.6 (0.52)	16 (60.6)	7.6 (0.52)							
14 X 14 (4.3 X 4.3)	14 (4.3)	18 (68.1)	9.7 (0.67)	18 (68.1)	9.7 (0.67)							
16 X 16 (4.9 X 4.9)	16 (4.9)	24 (90.8)	17.1 (1.2)	24 (90.8)	17.1 (1.2)							
16 X 18 (4.9 X 5.5)	16 (4.9)	27 (102.2)	21.7 (1.49)	27 (102.2)	21.7 (1.49)							
16 X 20 (4.9 X 6.1)	16 (4.9)	32 (121.1)	30.4 (2.1)	32 (121.1)	30.4 (2.1)							
16 X 22 (4.9 X 6.7)	16 (4.9)	37 (140.1)	40.7 (2.81)	--	--							
18 X 18 (5.5 X 5.5)	18 (5.5)	29 (109.8)	25.0 (1.7)	29 (109.8)	25.0 (1.7)							
18 X 20 (5.5 X 6.1)	18 (5.5)	35 (132.5)	36.4 (2.51)	35 (132.5)	36.4 (2.51)							
20 X 20 (6.1 X 6.1)	20 (6.1)	36 (136.3)	38.5 (2.66)	36 (136.3)	38.5 (2.66)							
16 X 24 (4.9 X 7.3)	16 (4.9)	42 (159)	52.4 (3.62)	--	--							
14 X 26 (4.3 X 7.9)	14 (4.3)	46 (174.1)	62.9 (4.34)	--	--							

#### Footnotes

- Part number shown is the base part number. For complete part number, refer to Viking's current price 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.
- 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.
- 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 by Underwriter's Laboratories, Inc. for use in the U.S., Canada, and European Union.
- Meets New York City requirements, effective July 1, 2008.
- Approved Finishes are: Brass, Chrome, White Polyester, and Black Polyester <sup>9</sup>
- UL Classified to : NSF/ANSI Standard 61, Drinking Water System Components (MH48034)
- Other paint colors are available on request with the same C-UL-US-EU listings as the standard finish colors.
- Approved finish is Electroless Nickel PTFE (ENT). ENT is C-UL-US-EU Listed as corrosion resistant. ENT is available with standard surface-mounted escutcheons or the Micromatic Model E-1 Recessed Escutcheon.



## TECHNICAL DATA

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### DESIGN CRITERIA - VK460

(Also refer to the Approval Chart.)

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

When using Viking Residential Sprinkler VK460 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.

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 for NFPA 13D and NFPA13R 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.
- Minimum distance between residential sprinklers: 8 ft. (2.4 m).
- The VK460 horizontal sidewall sprinkler deflector shall be located a minimum of 1-3/8" (35 mm) and a maximum of 6" (152 mm) from the wall on which it is installed.

**DEFLECTOR POSITION:** Install sprinkler VK460 with the leading edge of the deflector oriented parallel to the ceiling and the sprinkler frame arms oriented perpendicular to the ceiling (see Figure 14). **THE TOP SURFACE OF THE DEFLECTOR IS MARKED “TOP”.** The sprinkler must be oriented as shown in Figure 14.

**IMPORTANT:** Always refer to Bulletin Form No. F\_091699 - Care and Handling of Sprinklers. Also refer to Forms F\_080415, F\_080814, and F\_080190 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, VdS, 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.

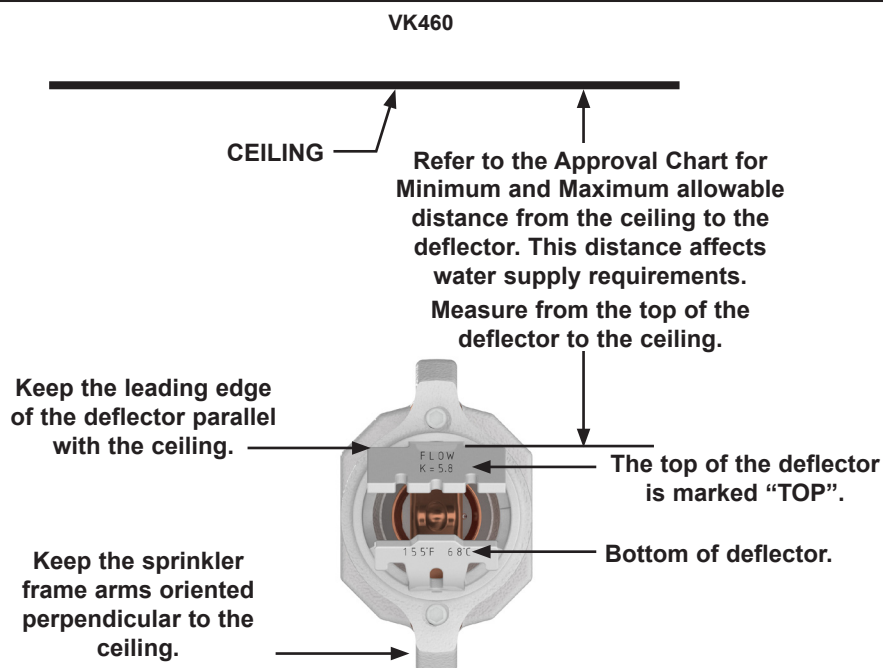


Figure 14: Correct Deflector Orientation





## TECHNICAL DATA

## AUSTRALIAN WATERMARK FREEDOM® RESIDENTIAL SPRINKLERS

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VK460

Wall Opening Size (A): Minimum 2-5/16" (59 mm) Maximum 2-1/2" (64 mm)

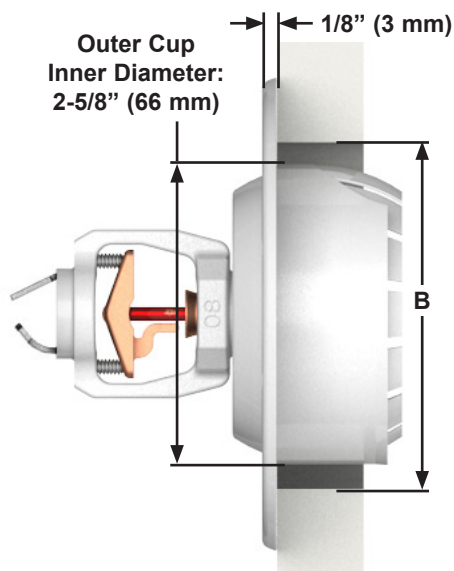
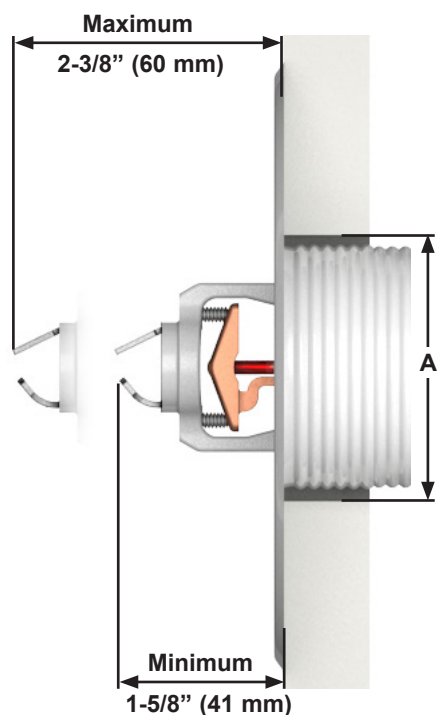
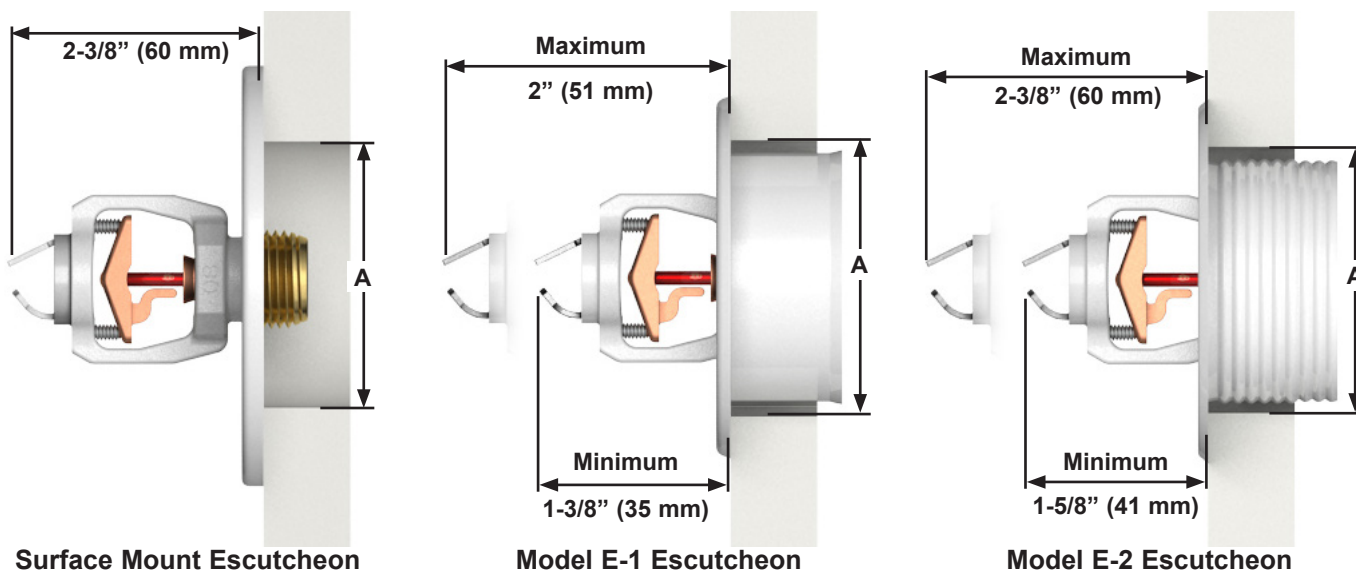


Figure 15: Installation Dimensions with Escutcheons




## TECHNICAL DATA

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### Approval Chart - 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.  
 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>							
23031		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)										
12 X 12 (3.7 X 3.7)	12 (3.7)	12 (45.5)	9 (0.62)	13 (49.3)	10.6 (0.73)	6-3/8 to 12- 3/8 inches									
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 26.
- Cover Temperature Rating is 135 °F (57 °C). Cover Part No. 16207<sup>7</sup>.
- Accepted Cover Plate Finishes are: White Polyester<sup>7</sup>.
- cULus Listed as corrosion resistant.

### DESIGN CRITERIA - VK480

(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.

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 19.
- 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.**



# TECHNICAL DATA

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### Approval Chart - VK490

#### 5.8 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 below.

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>									
23032		VK490	1/2	15	5.8	83.6	175 psi (12 bar)								
Max. Coverage Area <sup>6</sup> Width X Length Ft. X Ft. (m X m)	Max. Spacing Ft. (m)	All Temperatures		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)			 <sup>4</sup>	NYC	NSF							
12 X 12 (3.7 X 3.7)	12 (3.7)	16 (60.6)	7.6 (0.52)	4-3/8 to 6-3/8 inches	Concealed with Cover Plate Assembly	See Footnotes 7 and 8	See Footnote 5	-	8 (2.4)						
14 X 14 (4.3 X 4.3)	14 (4.3)	17 (64.4)	8.6 (0.59)												
16 X 16 (4.9 X 4.9)	16 (4.9)	18 (68.1)	9.6 (0.66)												
16 X 18 (4.9 X 5.5)	16 (4.9)	21 (79.5)	13.1 (0.90)												
16 X 20 (4.9 X 6.1)	16 (4.9)	23 (87.1)	15.7 (1.08)												
16 X 22 (4.9 X 6.7)	16 (4.9)	31 (117.3)	28.6 (1.97)												
18 X 20 (5.5 X 6.1)	18 (5.5)	28 (106.0)	23.3 (1.61)												
12 X 12 (3.7 X 3.7)	12 (3.7)	17 (64.4)	8.6 (0.59)	6-3/8 to 12-3/8 inches											
14 X 14 (4.3 X 4.3)	14 (4.3)	17 (64.4)	8.6 (0.59)												
16 X 16 (4.9 X 4.9)	16 (4.9)	19 (71.9)	10.7 (0.74)												
16 X 18 (4.9 X 5.5)	16 (4.9)	21 (79.5)	13.1 (0.90)												
16 X 20 (4.9 X 6.1)	16 (4.9)	26 (98.4)	20.1 (1.39)												
16 X 22 (4.9 X 6.7)	16 (4.9)	31 (117.3)	28.6 (1.97)												
18 X 20 (5.5 X 6.1)	18 (5.5)	28 (106.0)	23.3 (1.61)												

#### 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 VK490 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.
- Cover Temperature Ratings are 135 °F (57 °C) and 165 °F (74 °C). Cover Part No. 16207<sup>1</sup>.
- Accepted Cover Plate Finishes are: White Polyester and Chrome. 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 26.



## TECHNICAL DATA

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### DESIGN CRITERIA - VK490

(Also refer to the Approval Chart.)

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

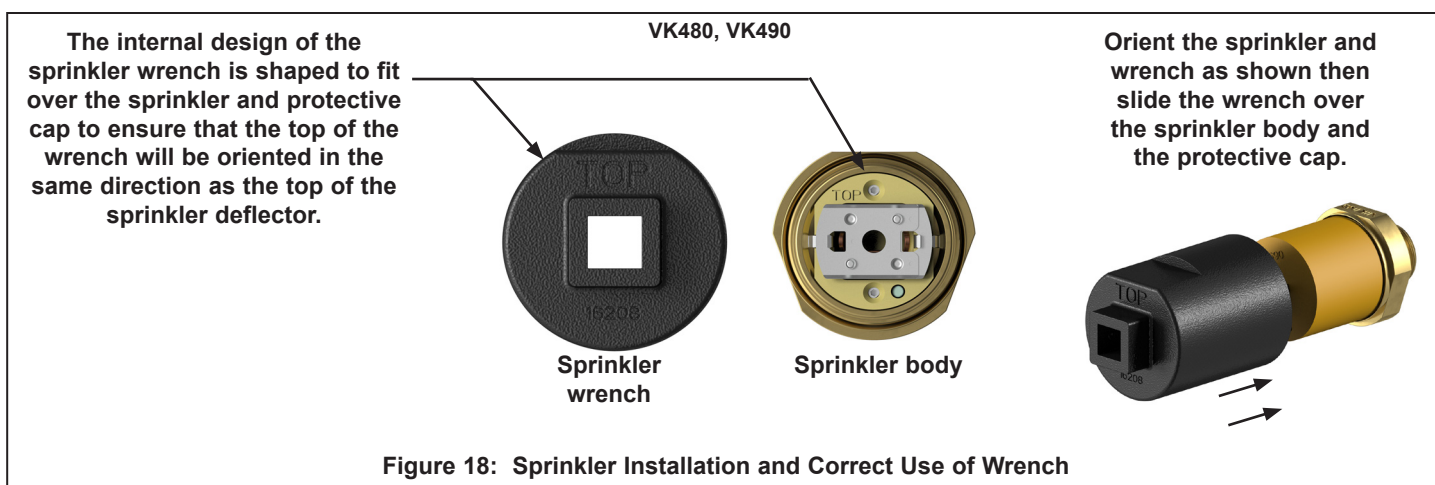
When using Viking Residential Concealed Horizontal Sidewall Sprinkler VK490 for systems designed to NFPA 13D or NFPA 13R, apply the listed areas of coverage and minimum water supply requirements shown in the Approval Chart on page 3.

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 19.
- 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 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.





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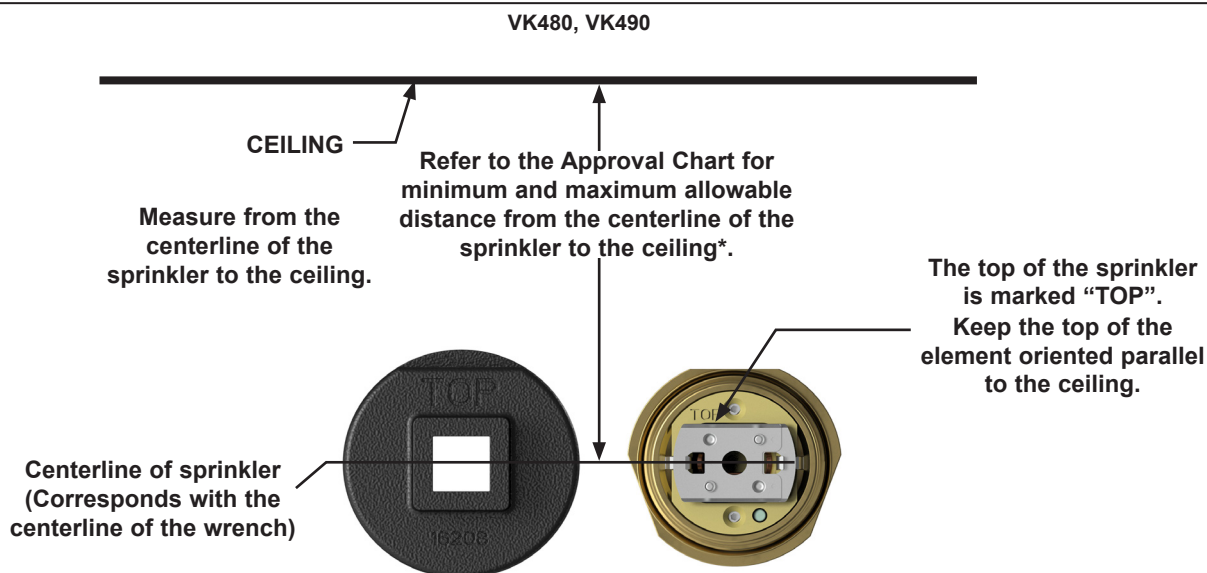


Figure 19: Sprinkler Correct Deflector Orientation

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

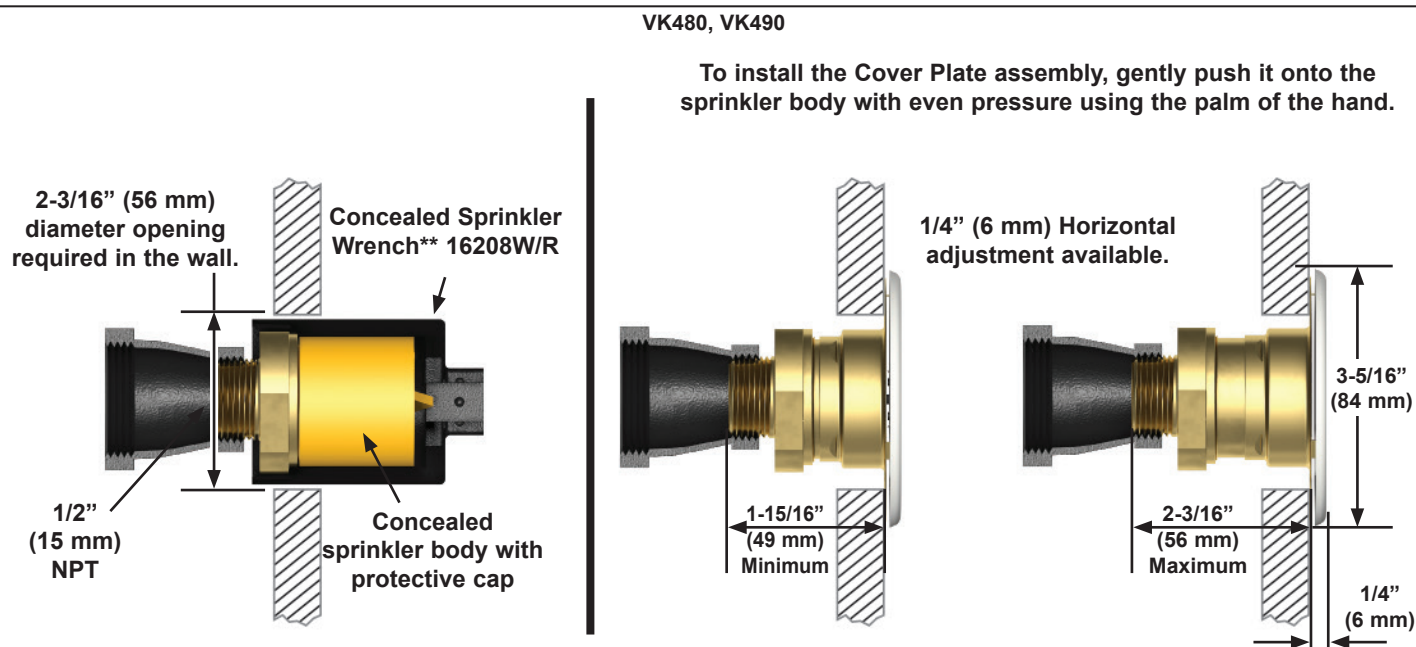


Figure 20: Sprinkler Dimensions and Cover Installation

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





## TECHNICAL DATA

## AUSTRALIAN WATERMARK FREEDOM® RESIDENTIAL SPRINKLERS

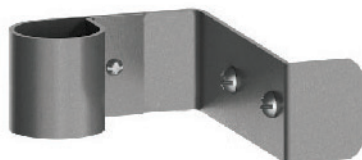
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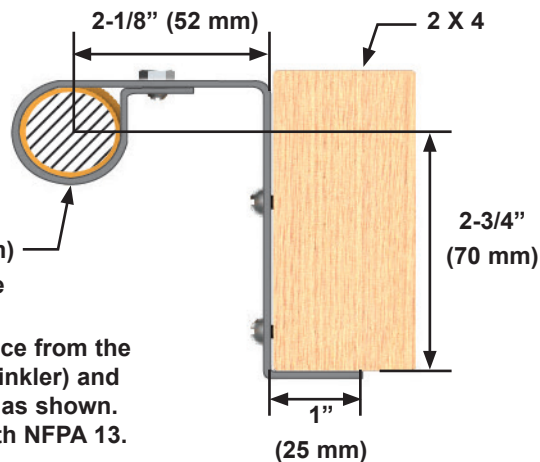
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VK480, VK490

3/4" (20 mm) Pipe Guide  
(Hardware included)



3/4" (20 mm)  
Pipe Guide



**NOTE:** To ensure that the sprinkler is located the correct distance from the face of the finished wall, use the pipe guide (included with sprinkler) and attached it to the 3/4" CPVC pipe and the 2 X 4 inside the wall as shown. All piping, hangers/bracing must be installed in accordance with NFPA 13.

Figure 21: Sprinkler VK480 Pipe Guide

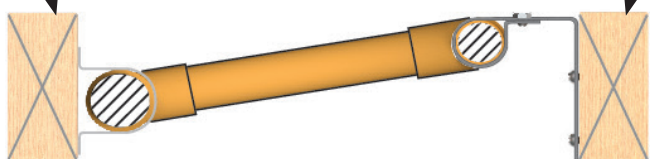
VK480, VK490

6" (152 mm) Max. from centerline of  
sprinkler to centerline of pipe guide  
for proper cover plate installation.

2 X 4

(Plan View)

2 X 4



2 X 4

Residential  
Concealed  
HSW Sprinkler

3/4" (20 mm)  
Pipe Guide

3/4" (20 mm)  
CPVC Piping

2 X 4

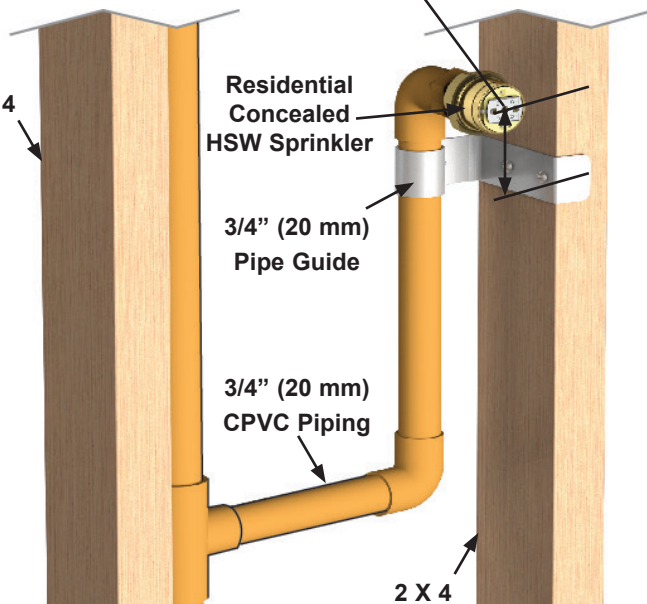


Figure 22: Sprinkler Pipe Guide Installation Instructions



## TECHNICAL DATA

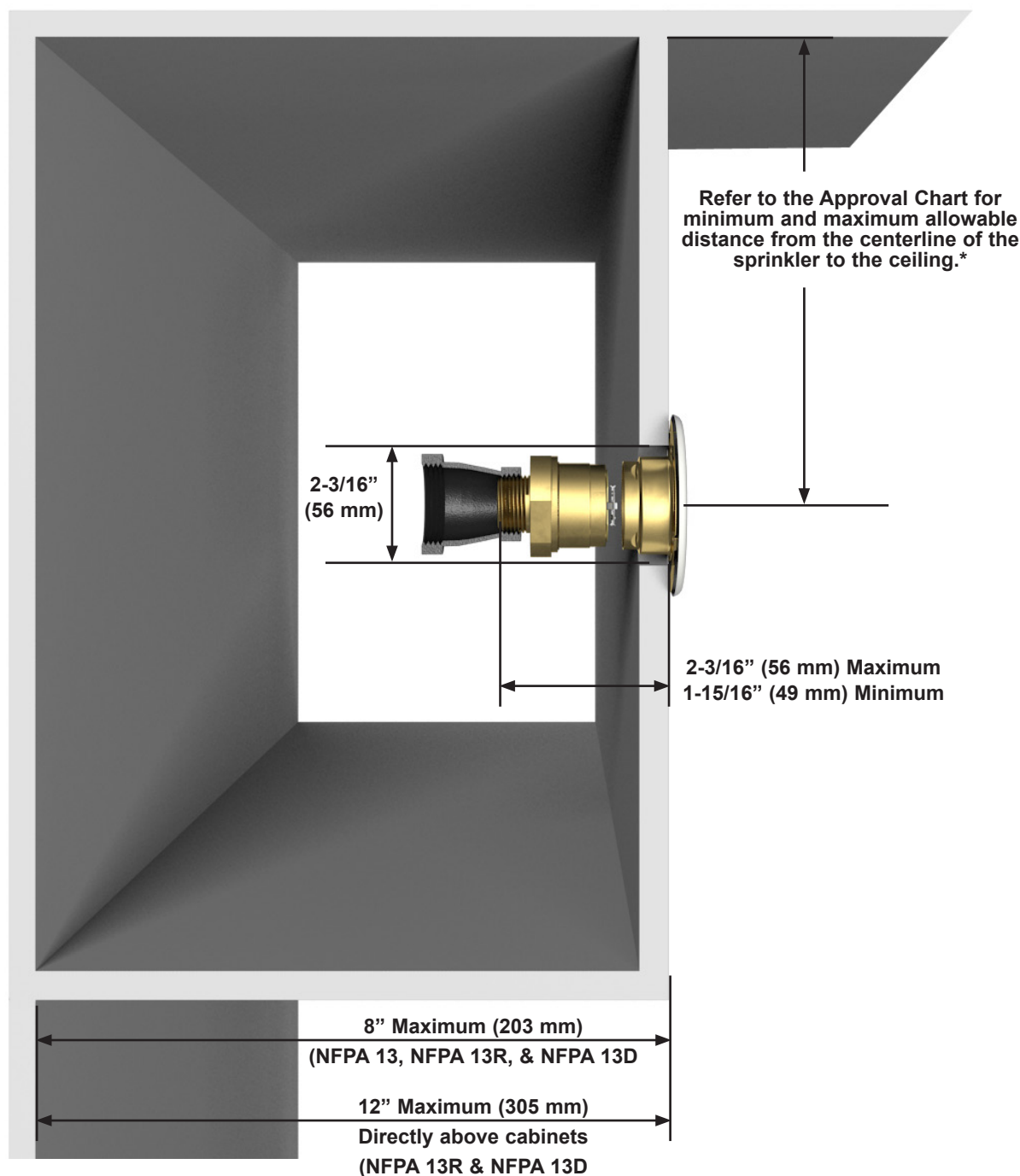
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VK480, VK490



**Figure 23: Sprinkler Installation - Soffit**

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



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### APPROVAL CHART - VK496

3.0 K-Factor Residential Concealed Pendent Sprinkler

For systems designed to NFPA 13D or NFPA 13R. For systems designed to NFPA 13, refer to the design criteria. For Ceiling types refer to current editions of NFPA 13, 13R or 13D

Sprinkler Base Part Number <sup>1</sup>	SIN	Thread Size		Nominal K-Factor		Maximum Water Working Pressure
		Inches	mm	U.S.	metric <sup>2</sup>	
23717	VK496	1/2	15	3.0	43.2	175 psi (12 bar)

Maximum Coverage Area <sup>5</sup> W X L Ft. X Ft. (m X m)	All Temperatures		Deflector to Ceiling	Installation Type	Listings and Approvals <sup>3</sup>	Minimum Spacing Ft. (m)
	Flow gpm (Lpm)	Pressure PSI (bar)			cULusEU <sup>4</sup>	
12 X 12 (3.7 X 3.7)	8 (30.3)	7.1 (0.49)	Refer to Figure 2	Concealed with Cover Plate Assembly. See Footnotes 6 & 7.	See Footnotes 3, 4, and 8	8 (2.4)
14 X 14 (4.3 X 4.3)	12 (45.4)	16 (1.1)				
16 X 16 (4.9 X 4.9)	15 (56.8)	25 (1.72)				

#### Footnotes

- Part number shown is the base part number. For complete part number, refer to current our price 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 by Underwriter's Laboratories, Inc. for use in the U.S., Canada, and European Union.
- 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 3.
- Accepted Cover Plate Finishes are: Polished Chrome, Brushed Chrome, Bright Brass, Antique Brass, Brushed Brass, Brushed Copper, Painted White, Painted Ivory, or Painted Black <sup>6</sup>.
- C-UL-US-EU Listed as corrosion resistant - Electroless Nickel PTFE (ENT)

### DESIGN CRITERIA

(Also refer to the Approval Chart above.)

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

When using Viking Residential Concealed Pendent Sprinkler VK496 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.

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 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.
- 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\_080415 - Best Practices for Residential Sprinkler Handling and Installation. 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 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.**



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### APPROVAL CHART - VK494

#### 4.9 K-Factor Residential Concealed Pendent Sprinkler

For systems designed to NFPA 13D or NFPA 13R. For systems designed to NFPA 13, refer to the design criteria. For Ceiling types refer to current editions of NFPA 13, 13R or 13D

Sprinkler Base Part Number <sup>1</sup>	SIN	Thread Size			Nominal K-factor		Maximum Water Working Pressure	
		NPT	BSPT		U.S.	metric <sup>2</sup>		
23706	VK494	1/2"	15 mm		4.9	70.6	175 psi (12 bar)	
Max. Coverage Area <sup>6</sup> W X L Ft. X Ft. (m X m)	Flow GPM (LPM)		Pressure PSI (bar)	Deflector to Ceiling	Installation Type	Listings and Approvals <sup>3,5</sup>		Minimum Spacing Ft. (m)
	155 °F (68 °C), 200 °F (93 °C) Temperature Rated Sprinklers		cULusEU <sup>4</sup>					
12 X 12 (3.7 X 3.7)	13 (49.2)		7.0 (0.48)	Refer to Figure 2	Concealed with Cover Plate As- sembly. See Footnote 7.	See Footnotes 8, & 9		8 (2.4)
14 X 14 (4.3 X 4.3)	13 (49.2)		7.0 (0.48)					
16 X 16 (4.9 X 4.9)	13 (49.2)		7.0 (0.48)					
18 X 18 (5.5 X 5.5)	17 (64.4)		12.0 (0.83)					
20 X 20 (6.1 X 6.1)	20 (75.7)		16.7 (1.15)					

### Footnotes

1. Part number shown is the base part number. For complete part number, refer to the current Viking price 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. Refer also to Design Criteria.
4. Listed by Underwriter's Laboratories, Inc. for use in the U.S., Canada, and European Union.
5. Meets New York City requirements, effective July 1, 2008.
6. 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.
7. Other paint colors are available on request with the same listings as the standard finish colors. Stainless Steel cover plates are not available with any finishes or paint. 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 3.
8. Accepted Cover Plate Finishes are: Polished Chrome, Brushed Chrome, Bright Brass, Antique Brass, Brushed Brass, Brushed Copper, Painted White, Painted Ivory, or Painted Black.
9. C-UL-US-EU Listed as corrosion resistant - Electroless Nickel PTFE (ENT)

### DESIGN CRITERIA

(Also refer to the Approval Chart.)

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

When using Viking Residential Concealed Pendent Sprinkler VK494 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.

**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 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 9.5.2.1 or 10.2.4.1.2 of the current edition of NFPA 13.
- 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\_080415 - Best Practices for Residential Sprinkler Handling and Installation. 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 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.**



## TECHNICAL DATA

## AUSTRALIAN WATERMARK FREEDOM® RESIDENTIAL SPRINKLERS

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

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### APPROVAL CHART - VK498

5.8 K-Factor Residential Concealed Pendent Sprinkler

For systems designed to NFPA 13D or NFPA 13R. For systems designed to NFPA 13, refer to the design criteria. For Ceiling types refer to current editions 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>	
23726	VK498	1/2	15	5.8	83.6	175 psi (12 bar)
Max. Coverage Area <sup>6</sup> Ft. X Ft. (m X m)	All Temperature Ratings		Deflector to Ceiling	Installation Type	Listings and Approvals <sup>3,5</sup>	Minimum Spacing Ft. (m)
	Flow GPM (LPM)	Pressure PSI (bar)			cULusEU <sup>4</sup>	
12 X 12 (3.7 X 3.7)	16 (60.6)	7.6 (0.52)	Refer to Figure 4	Concealed with Cover Plate Assembly. See Footnote 7.	See Footnotes 8 and 9	8 (2.4)
14 X 14 (4.3 X 4.3)	16 (60.6)	7.6 (0.52)				
16 X 16 (4.9 X 4.9)	16 (60.6)	7.6 (0.52)				
18 X 18 (5.5 X 5.5)	17 (64.4)	8.6 (0.59)				
20 X 20 (6.1 X 6.1)	20 (75.7)	11.9 (0.82)				

### Footnotes

- Part number shown is the base part number. For complete part number, refer to current Viking price 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 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.
- Accepted Cover Plate Finishes are: Polished Chrome, Brushed Chrome, Bright Brass, Antique Brass, Brushed Brass, Brushed Copper, Painted White, Painted Ivory, or Painted Black <sup>9</sup>.
- C-UL-US-EU Listed as corrosion resistant - Electroless Nickel PTFE (ENT)

### DESIGN CRITERIA

(Also refer to the Approval Chart above.)

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

When using Viking Residential Concealed Pendent Sprinkler VK498 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.

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 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.
- 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\_080415 - Best Practices for Residential Sprinkler Handling and Installation. 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 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.



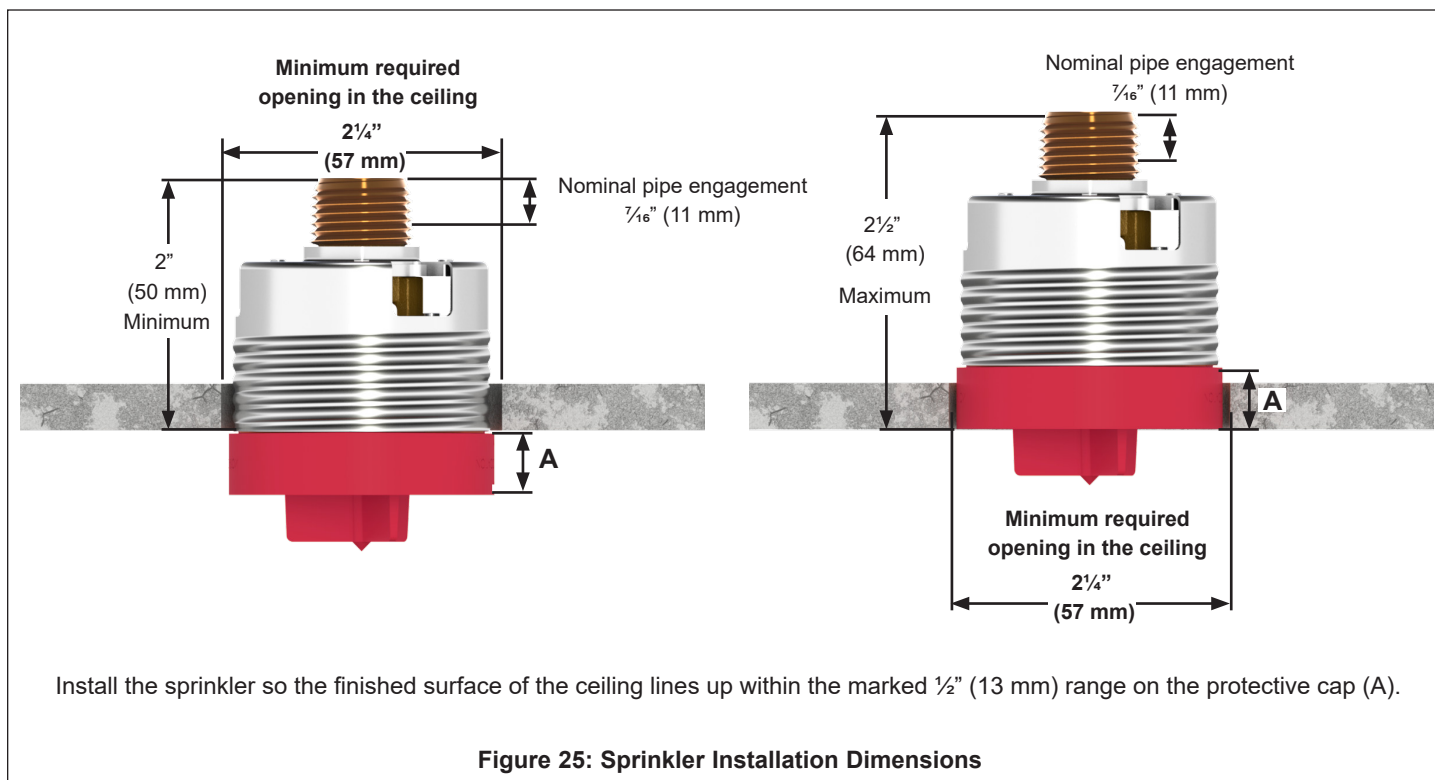
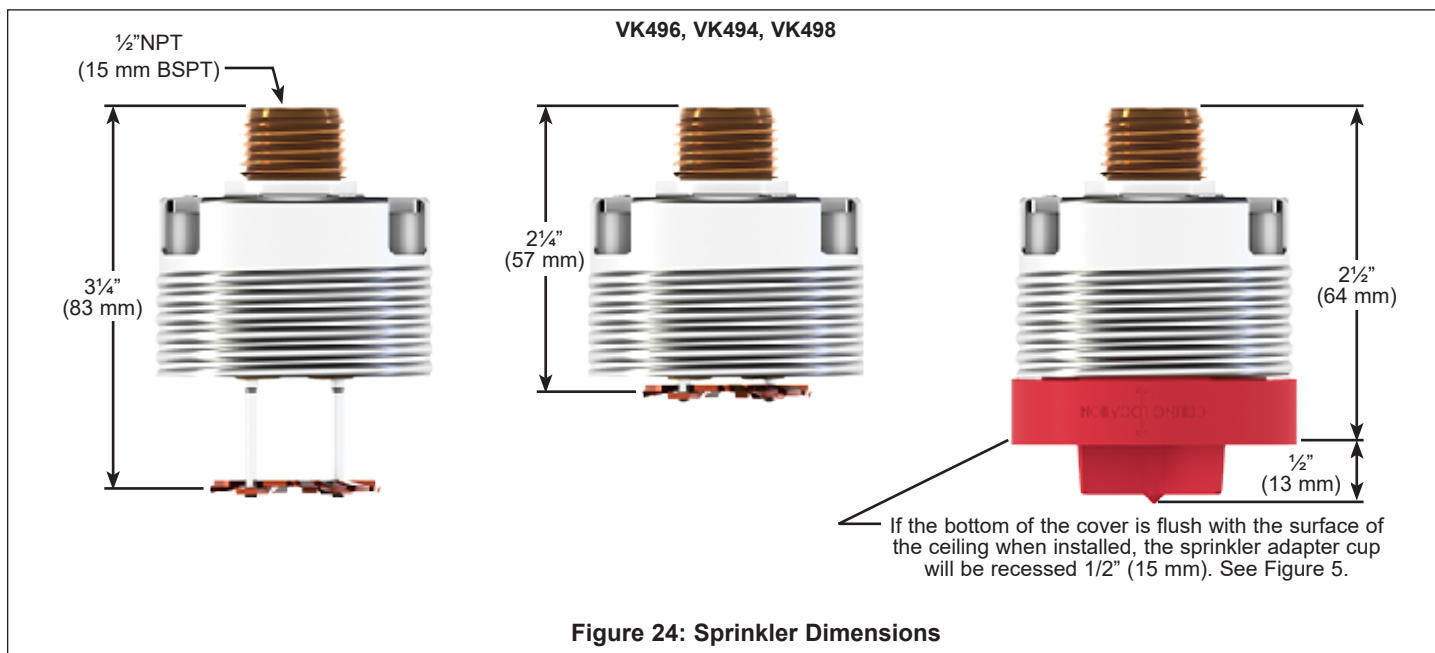
## TECHNICAL DATA

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





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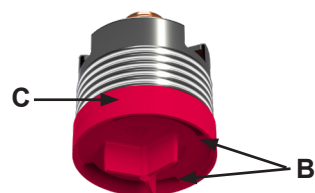
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VK496, VK494, VK498



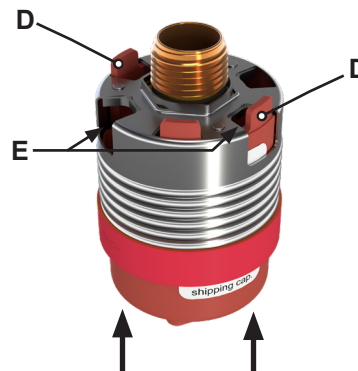
**USE ONLY** the designated sprinkler wrenches shown in this document. Permanent damage to the sprinkler assembly can occur if the proper wrench is not used. Other sprinkler wrenches available from Viking may fit into the sprinkler adapter cup; however, only the wrenches shown here are designed to properly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



NOTE: 3/8" ratchet required (not available from Viking).

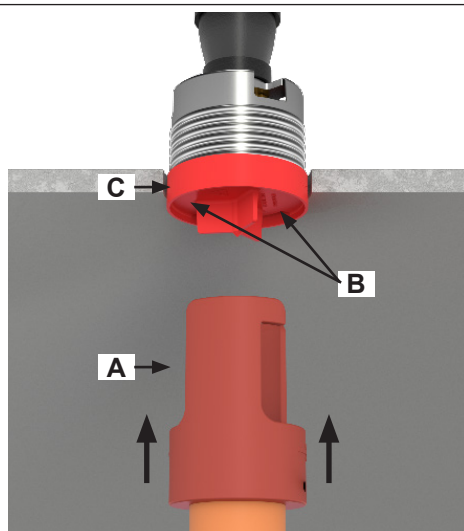


**Step 1:**  
Insert the wrench (A) into the slots (B) on the protective cap (C).

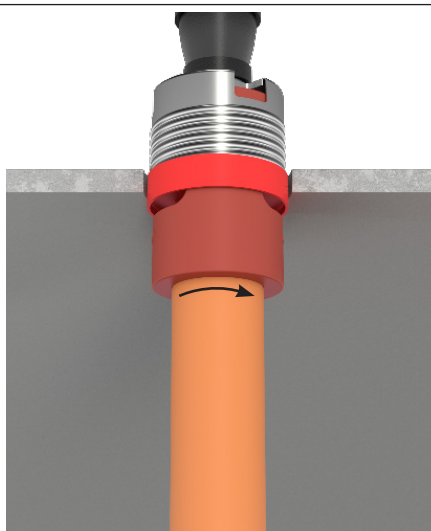


**Step 2:**  
Rotate the wrench slightly in either direction until the lines on the wrench (D) line up with the vent openings (E) on the adapter cup and lock into place. NOTE: A leak tight seal must be achieved. Turn the sprinkler clockwise 1 to 1½ turns past finger-tight.

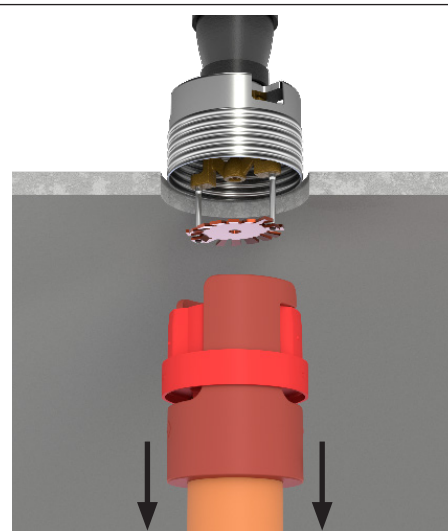
**Figure 26: Using the Sprinkler Wrench**



**Step 1:**  
Attach a piece of plastic pipe as shown and tighten the thumb screw (not shown); 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 27: Using the Cap Removal Tool**



## TECHNICAL DATA

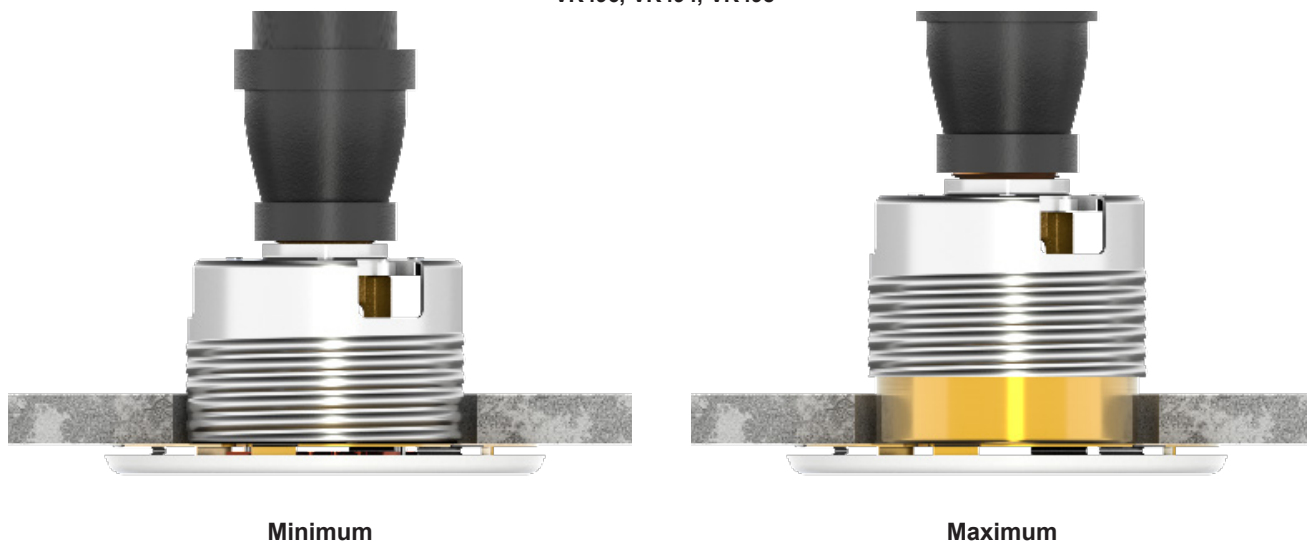
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VK496, VK494, VK498



Install the cover plate by inserting the adapter into the adapter cup and pushing or threading into place (depending on style). 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 28: Installing the Cover Plate