



## TECHNICAL DATA

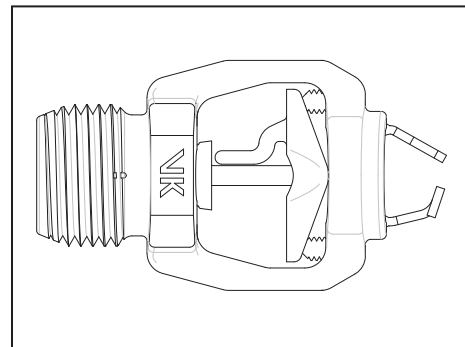
### FREEDOM® RESIDENTIAL HORIZONTAL SIDEWALL SPRINKLER VK453 (K4.0)

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

#### 1. DESCRIPTION

Viking Freedom® Residential Horizontal Sidewall Sprinkler VK453 is a small, thermo-sensitive, glass-bulb residential sprinkler available in several different finishes and temperature ratings to meet varying design requirements. The orifice design, with a K-Factor of 4.0 (57.7 metric†), allows efficient use of available water supplies for the hydraulically designed fire-protection system. The fast response type glass bulb and special deflector combine speed of operation and area of coverage to meet residential sprinkler standards while being aesthetically pleasing.



#### 2. LISTINGS AND APPROVALS

**cULus Listed:** Category VKKW

**NYC Approved:** MEA 89-92-E, Volume 35

**NSF Certified:** NSF/ANSI Standard 61, Drinking Water System Components

Refer to the Approval Chart on pages 143x and Design Criteria on page 143y for cULus Listing requirements that must be followed.

#### 3. TECHNICAL DATA

##### Specifications:

Available since 2005.

Minimum Operating Pressure: Refer to the Approval Chart.

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

Testing: U.S.A. Patent No. 4,831,870

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

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

†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.

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

Overall Length: 2-7/16" (62 mm)

##### Material Standards:

Frame Casting: Brass UNS-C84400

Deflector: Phosphor Bronze UNS-C51000

Bulb: Glass, nominal 3 mm diameter

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

Pip Cap and Insert Assembly: Copper UNS-C11000 and Stainless Steel UNS-S30400

Compression Screws: 18-8 Stainless Steel

Yoke: Phosphor Bronze UNS-C51000

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

**Sprinkler:** Base Part No. 13389

Order Sprinkler VK453 by first adding the appropriate suffix for the sprinkler finish and then the appropriate suffix for the temperature rating to the sprinkler base part number.

Finish Suffix: Brass = A, Chrome-Enloy® = F, and White Polyester = M-/W

Temperature Suffix (°F/°C): 155°/68° = B, 175°/79° = D

For example, sprinkler VK453 with a Brass finish and a 155 °F/68 °C temperature rating = Part No. 13389AB.

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

**Accessories:** (Also refer to the "Sprinkler Accessories" section of the Viking data book.)

##### Sprinkler Wrenches:

A. Standard Wrench: Part No. 10896W/B (available since 2000)

B. Wrench for recessed sprinklers: Part No. 13655W/B\* (available since 2006)

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

Viking Technical Data may be found on  
The Viking Corporation's Web site at  
<http://www.vikinggroupinc.com>.  
The Web site may include a more recent  
edition of this Technical Data Page.

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**Sprinkler Cabinets:**

- A. Six-head capacity: Part No. 01724A (available since 1971)
- B. Twelve-head capacity: Part No. 01725A (available since 1971)

**4. INSTALLATION**

Refer to appropriate NFPA Installation Standards.

**5. OPERATION**

During fire conditions, the heat-sensitive liquid in the glass bulb expands, causing the glass to shatter, releasing the yoke, pip cap, and sealing spring assembly. Water flowing through the sprinkler orifice strikes the sprinkler deflector, forming a uniform spray pattern to extinguish or control the fire.

**6. INSPECTIONS, TESTS AND MAINTENANCE**

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

**7. AVAILABILITY**

The Viking Model VK453 Sprinkler is available through a network of domestic and international distributors. See The Viking Corporation web site for the closest distributor or contact The Viking Corporation.

**8. GUARANTEE**

For details of warranty, refer to Viking's current list price schedule or contact Viking directly.

**TABLE 1: AVAILABLE SPRINKLER TEMPERATURE RATINGS AND FINISHES**

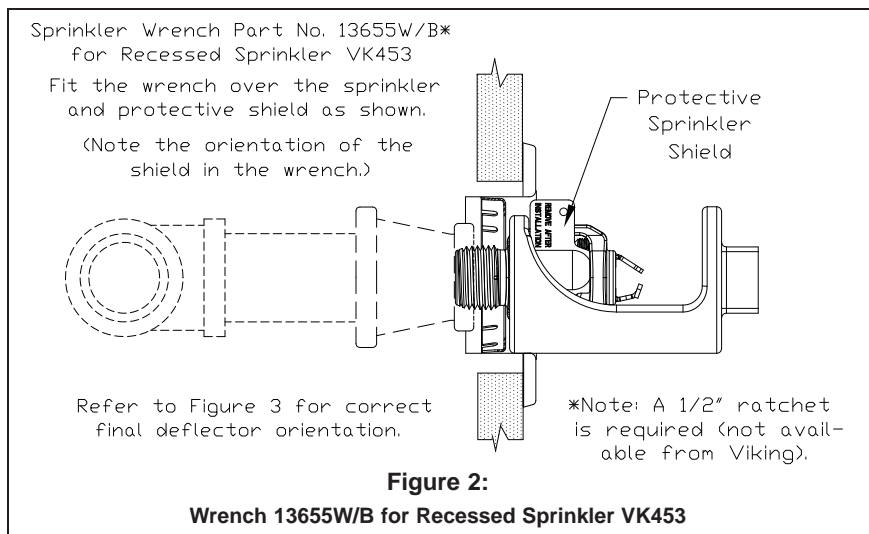
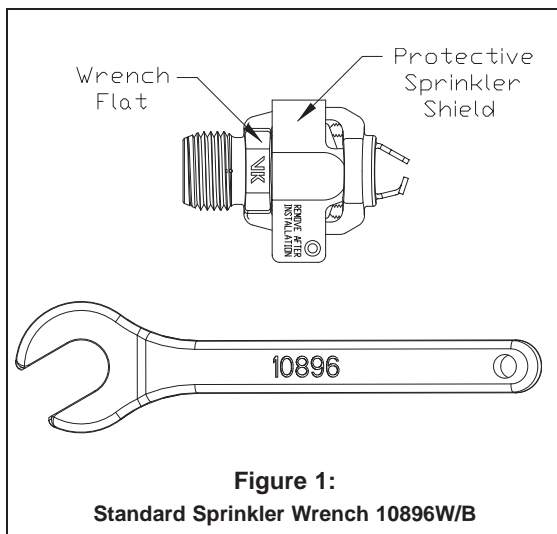
Sprinkler Temperature Classification	Sprinkler Nominal Temperature Rating <sup>1</sup>	Maximum Ambient Ceiling Temperature <sup>2</sup>	Bulb Color
Ordinary	155 °F (68 °C)	100 °F (38 °C)	Red
Intermediate	175 °F (79 °C)	150 °F (65 °C)	Yellow

**Sprinkler Finishes:** Brass, Chrome-Enloy® (patents pending), and White Polyester

**Footnotes**

<sup>1</sup> The sprinkler temperature rating is stamped on the deflector.

<sup>2</sup> Based on NFPA-13. Other limits may apply, depending on fire loading, sprinkler location, and other requirements of the Authority Having Jurisdiction. Refer to specific installation standards.



	<h2 style="margin: 0;">TECHNICAL DATA</h2>	<h3 style="margin: 0;">FREEDOM® RESIDENTIAL HORIZONTAL SIDEWALL SPRINKLER VK453 (K4.0)</h3>
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Sprinkler Base Part Number <sup>1</sup>	NPT Thread Size		Nominal K-Factor		Maximum Water Working Pressure	Overall Length	
	Inches	mm	U.S.	metric <sup>2</sup>		Inches	mm
13389	1/2	15	4.0	57.7	175 psi (12 Bar)	2-7/16	62

<h3 style="margin: 0;">Approval Chart</h3> <p style="margin: 0;">Residential Horizontal Sidewall Sprinkler VK453                  For systems designed to NFPA 13D or NFPA 13R.                  For systems designed to NFPA 13, refer to the design criteria on page 143y.</p>	<table border="1" style="border-collapse: collapse;"> <tr> <td style="padding: 2px;">Temperature</td> <td rowspan="3" style="font-weight: bold; padding: 2px;">KEY</td> </tr> <tr> <td style="padding: 2px;">Finish</td> </tr> <tr> <td style="padding: 2px;">A1X ← Escutcheon (if applicable)</td> </tr> </table>	Temperature	KEY	Finish	A1X ← Escutcheon (if applicable)
Temperature	KEY				
Finish					
A1X ← Escutcheon (if applicable)					

**Installed below smooth, flat, horizontal ceilings, including ceilings with slopes up to and including 2/12 (9.5°).  
 With the deflector located between 4" and 6" (102 mm and 152 mm) below the ceiling.**

Maximum Areas of Coverage <sup>3</sup> (Width x Length)	Minimum Water Supply Requirements <sup>3</sup>	Listings and Approvals <sup>4</sup> (Refer also to Design Criteria on page 143y.)		
		cULus <sup>5,6</sup>	NYC <sup>7</sup>	NSF <sup>9</sup>
12' x 12' (3.7 m x 3.7 m)	11 gpm @ 7.6 psi (41.7 L/min @ 0.52 Bar)	A1X	A1X	A1X
14' x 14' (4.3 m x 4.3 m)	12 gpm @ 9 psi (45.5 L/min @ 0.62 Bar)	A1X	A1X	A1X
16' x 16' (4.9 m x 4.9 m)	16 gpm @ 16 psi (60.6 L/min @ 1.1 Bar)	A1X	A1X	A1X
16' x 18' (4.9 m x 5.5 m)	16 gpm @ 16 psi (60.6 L/min @ 1.1 Bar)	A1X	A1X	A1X
16' x 20' (4.9 m x 6.1 m)	23 gpm @ 33.1 psi (87.1 L/min @ 2.28 Bar)	A1X	A1X	A1X
18' x 18' (5.5 m x 5.5 m)	19 gpm @ 22.6 psi (71.9 L/min @ 1.56 Bar)	A1X	A1X	A1X
18' x 20' (5.5 m x 6.1 m)	24 gpm @ 36 psi (90.8 L/min @ 2.48 Bar)	A1X	A1X	A1X
20' x 20' (6.1 m x 6.1 m)	25 gpm @ 39 psi (94.6 L/min @ 2.69 Bar)	A1X	See Footnote 8.	A1X

**Installed below smooth, flat, horizontal ceilings, including ceilings with slopes up to and including 2/12 (9.5°).  
 With the deflector located between 6" and 12" (152 mm and 305 mm) below the ceiling.**

12' x 12' (3.7 m x 3.7 m)	12 gpm @ 9 psi (45.5 L/min @ 0.62 Bar)	A1X	A1X	A1X
14' x 14' (4.3 m x 4.3 m)	13 gpm @ 10.6 psi (49.3 L/min @ 0.73 Bar)	A1X	A1X	A1X
16' x 16' (4.9 m x 4.9 m)	16 gpm @ 16 psi (60.6 L/min @ 1.1 Bar)	A1X	A1X	A1X
16' x 18' (4.9 m x 5.5 m)	17 gpm @ 18.1 psi (64.4 L/min @ 1.25 Bar)	B1X	B1X	B1X
16' x 18' (4.9 m x 5.5 m)	18 gpm @ 20.3 psi (68.1 L/min @ 1.4 Bar)	C1X	C1X	C1X
16' x 20' (4.9 m x 6.1 m)	24 gpm @ 36 psi (90.8 L/min @ 2.48 Bar)	A1X	A1X	A1X
18' x 18' (5.5 m x 5.5 m)	19 gpm @ 22.6 psi (71.9 L/min @ 1.6 Bar)	A1X	A1X	A1X
18' x 20' (5.5 m x 6.1 m)	24 gpm @ 36 psi (90.8 L/min @ 2.48 Bar)	A1X	A1X	A1X

<p><b>Approved Temperature Ratings</b>                  A - 155 °F (68 °C) and 175 °F (79 °C)                  B - 155 °F (68 °C)                  C - 175 °F (79 °C)</p>	<p><b>Approved Finishes</b>                  1 - Brass, Chrome-Enloy®, White, and Black<sup>10</sup></p>	<p><b>Approved Escutcheons</b>                  X - Standard surface-mounted escutcheons or the Viking Microfast® Model F-1 Adjustable Escutcheon or recessed with the Viking Micromatic® Model E-1 or E-2 Recessed Escutcheon, or G-1 Adjustable Escutcheon.</p>
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**Footnotes**

- <sup>1</sup> Base part number shown. For complete part number, refer to Viking's current price list.
- <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> For areas of coverage smaller than shown, use the "Minimum Water Supply Requirement" 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 Water Supply Requirement" used.
- <sup>4</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.
- <sup>5</sup> Listed by Underwriter's Laboratories, Inc. for use in the U.S. and Canada.
- <sup>6</sup> Listing is for residential occupancies with smooth, flat, horizontal ceilings, including ceilings with slopes up to and including 2/12 (9.5°).
- <sup>7</sup> Accepted for use, City of New York Department of Buildings, MEA Number 89-92-E, Vol. 35.
- <sup>8</sup> Meets New York City requirements, effective July 1, 2008.
- <sup>9</sup> Tested and Certified by NSF (National Sanitation Foundation) to NSF/ANSI Standard 61, Drinking Water System Components.
- <sup>10</sup> Other paint colors are available on request with the same cULus Listings as the standard finish colors.

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**DESIGN CRITERIA**  
 (Also refer to the Approval Chart on page 143x.)

**cULus Listing Requirements:**

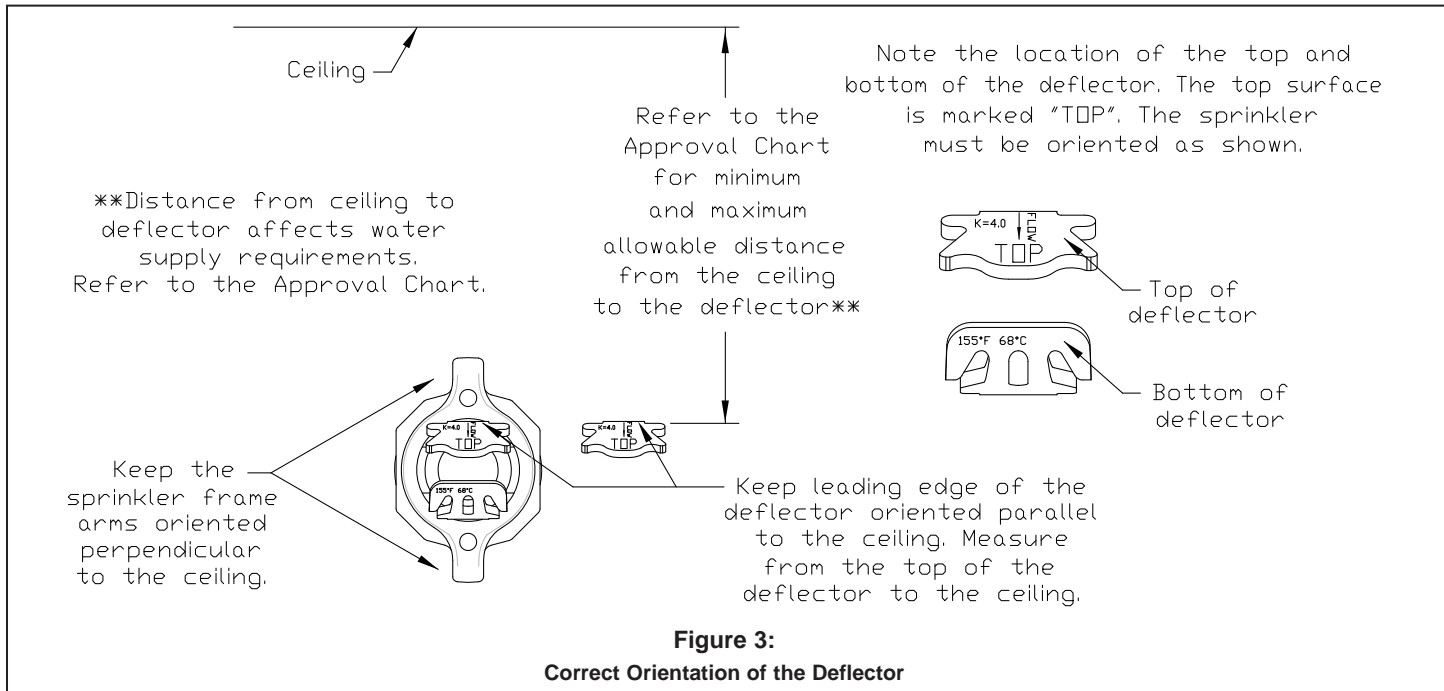
When using Viking Residential Horizontal Sidewall Sprinkler VK453 for systems designed to NFPA 13D or NFPA 13R, apply the listed areas of coverage and minimum water supply requirements shown in the Approval Chart on page 143x.

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 143x 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 VK453 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 VK453 with the leading edge of the deflector oriented parallel to the ceiling and the sprinkler frame arms oriented perpendicular to the ceiling (see Figure 4). **THE TOP SURFACE OF THE DEFLECTOR IS MARKED “TOP”.** The sprinkler must be oriented as shown in Figure 3 below.

**IMPORTANT: Always refer to Bulletin Form No. F\_091699 - Care and Handling of Sprinklers. Also refer to pages RES1-17 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.**



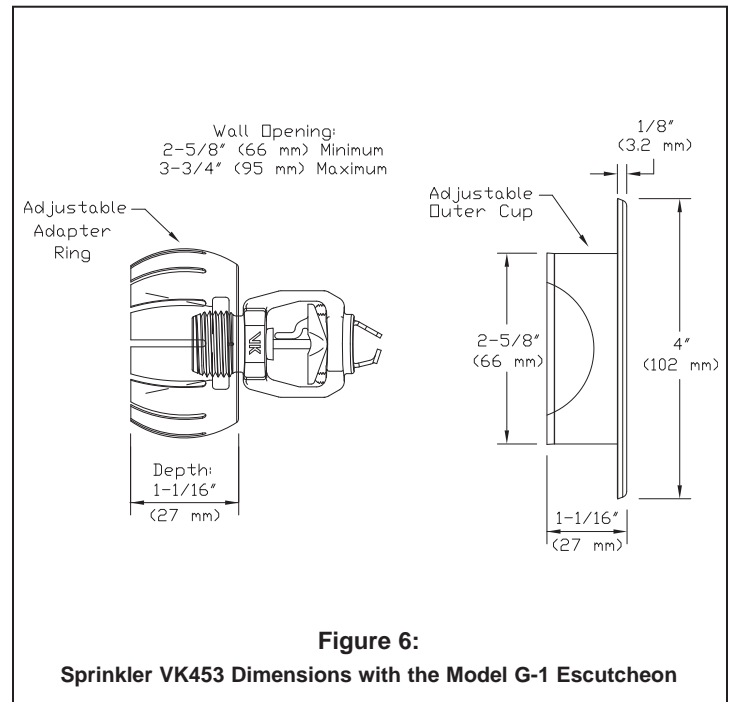
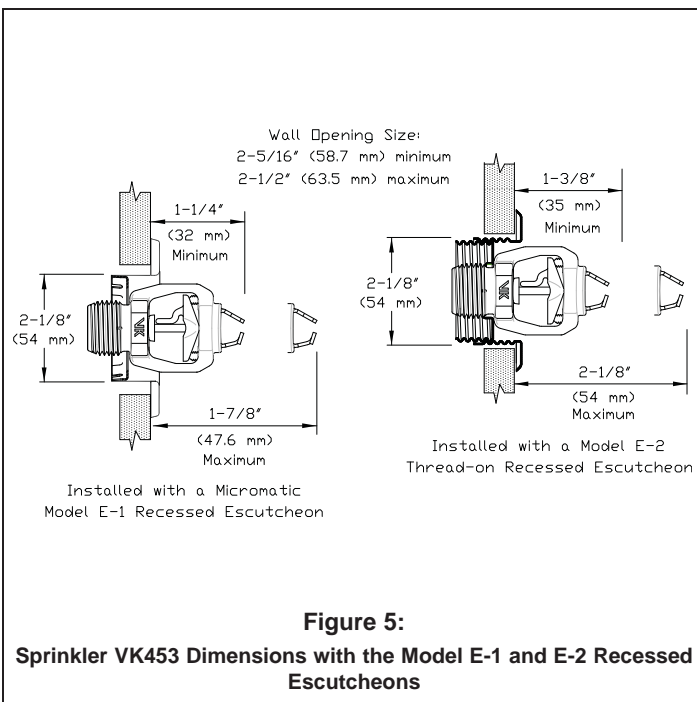
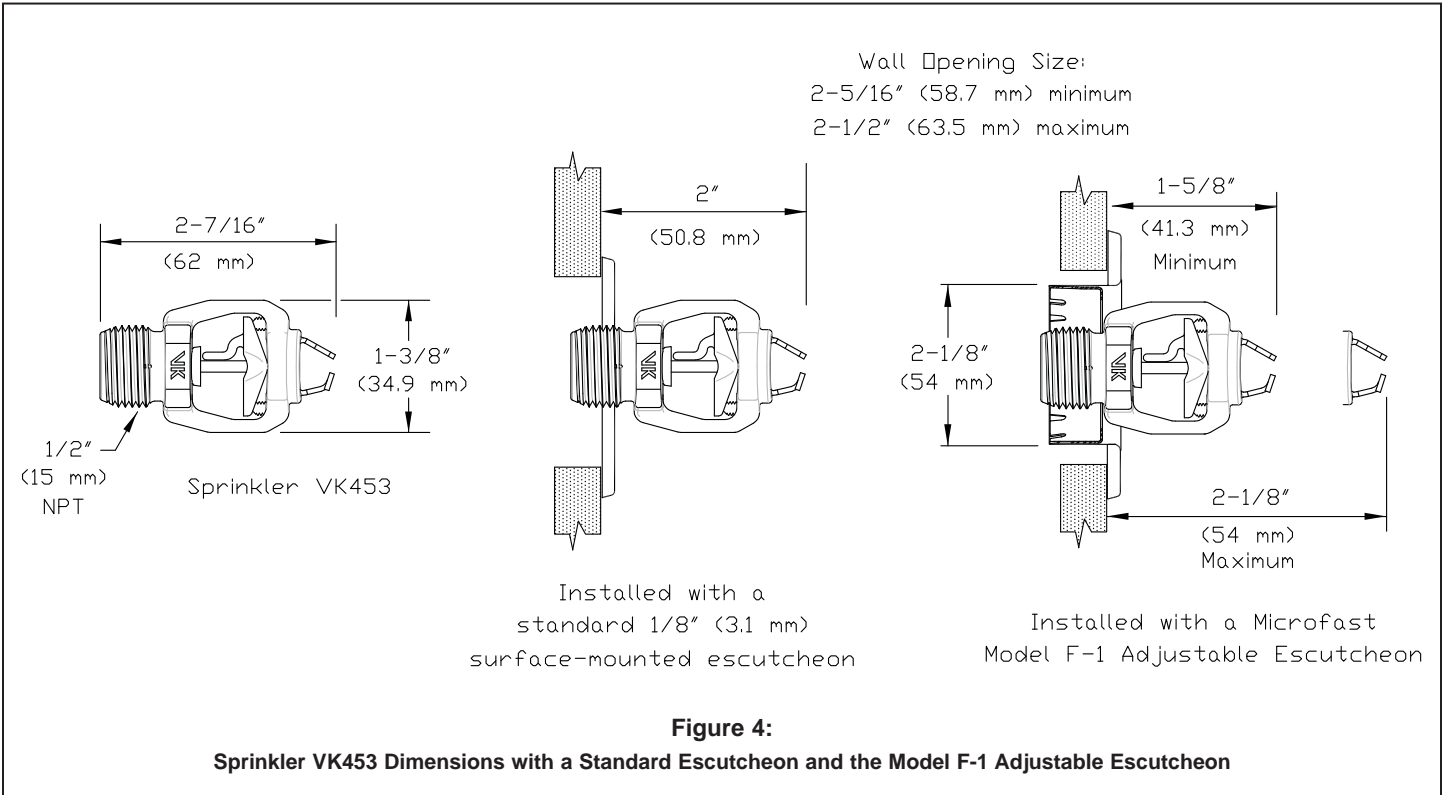


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SPRINKLER VK453 (K4.0)**

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