



## TECHNICAL DATA

## STANDARD RESPONSE DRY HORIZONTAL SIDEWALL 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

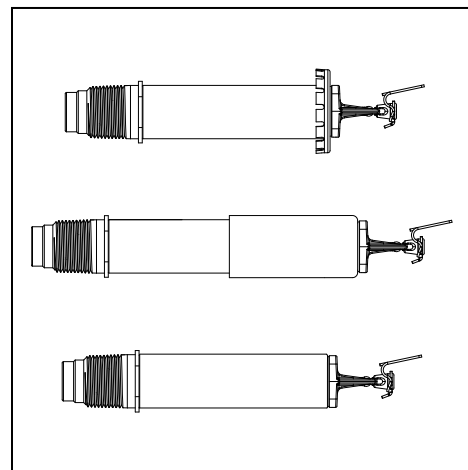
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### 1. DESCRIPTION

Viking Standard Response Dry Horizontal Sidewall Sprinklers are thermosensitive spray sprinklers suitable for use in areas subject to freezing. The sprinklers are designed for dry systems and preaction systems where it is necessary to prevent water or condensation from entering the supply nipple before sprinkler operation. They may also be installed in spaces subject to freezing and supplied from a wet system in an adjacent heated area.

Viking Standard Response Dry Horizontal Sidewall Sprinklers are available in various finishes and temperature ratings to meet design requirements. The special Polyester and Electroless Nickel PTFE (ENT) coatings have been investigated for installation in corrosive atmospheres and are listed/approved as corrosion resistant as indicated in the Approval Charts. (Note: FM Global has no approval classification for Polyester coatings as corrosion resistant.)

**NOTE: When installed in some corrosive environments, the Polyester finish may change color. This natural discoloration over time is not in itself an indication of corrosion and should not be treated as such. All sprinklers installed in corrosive environments should be replaced or tested as described in NFPA 25 on a more frequent basis.**



For Light Hazard Occupancies Only

### 2. LISTINGS AND APPROVALS

 **cULus Listed:** Category VNIV

 **FM Approved:** Class 2013 and 2015

**NYC Approved:** MEA 89-92-E, Volume 2

 **CCCF Approved:** Approved by the China Certification Center for Fire Products (CCCF)

Refer to Approval Chart 1 and Design Criteria for cULus Listing requirements, and refer to Approval Chart 2 and Design Criteria for FM Approval requirements that must be followed.

### 3. TECHNICAL DATA

#### Specifications:

Available since 1991.

Minimum Operating Pressure: 7 psi (0.5 bar)

Maximum Working Pressure: 175 psi (12 bar). Factory tested pneumatically to 100 psi (6.89 bar)

Thread size: 1" NPT or 25 mm BSP

Nominal K-Factor: 5.6 U.S. (80.6 metric\*) for all listed and approved lengths.

\* 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)

Covered by the following U.S. Patent numbers: 8,636,075 and 8,376,060

#### Material Standards:

Frame Casting: Brass UNS-C84400

Deflector: Phosphor Bronze UNS-C51000

Bulb: Glass, nominal 5 mm diameter

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

Compression Screw: Brass UNS-C36000

Pip Cap: Brass UNS-C31400 or UNS-C31600

Pip Cap Adapter: Brass UNS-C36000

Orifice: Copper UNS-C22000 or UNS-C11000

Tube: ERW Hydraulic Steel Tube

Inlet and Barrel Threads: QM Brass

Support (Internal): Stainless Steel UNS-S30400

Barrel: Steel Pipe UNS-G10260, Electrodeposited Epoxy Base finish

Sleeve (for Adjustable Standard style only): Brass UNS-C26000 or UNS-C26800



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### Escutcheon Materials:

Adjustable Standard Dry Escutcheons: Brass UNS-C26000 or UNS-C26800

Recessed Dry Escutcheons: Cold Rolled Steel UNS-G10080

ENT Coated Adjustable and Recessed Escutcheons: Stainless Steel UNS-S30400

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

Order Standard Response Dry Horizontal Sidewall Sprinklers by first adding the appropriate suffix for the sprinkler finish, the appropriate suffix for the temperature rating, and then the suffix for the length ("A" dimension) to sprinkler base part number. Order in a specific length noted as the "A" dimension (see Figures 2, 4, and 6). The "A" dimension is the distance from the face of the fitting (tee) to the desired finished surface of the wall in which it is to be installed.

These sprinklers are listed and approved in lengths from 1-1/2" to 45-1/2" (38.1 mm to 1,156 mm) for the adjustable standard style, 3" to 47" (76.2 mm to 1,194 mm) for the plain barrel style, and 3-1/4" to 47-1/2" (82.5 mm to 1,207 mm) for the adjustable recessed style.

Lengths exceeding the standard lengths are available, with no approvals, on a "made-to-order" basis: Recessed Dry Horizontal Sidewall up to 65-1/4" (1,664 mm). Adjustable Standard Dry Horizontal Sidewall up to 63-1/2" (1,613 mm). Plain Barrel Dry Horizontal Sidewall up to 65" (1,651 mm). Contact the manufacturer for more information.

Finish Suffix: Brass = A, Chrome = F, White Polyester = M-W, and ENT = JN

Temperature Suffix (°F/°C): 155°/68° = B, 175°/79° = D, 200°/93° = E, 286°/141° = G

Escutcheon Suffix = Y for the adjustable recessed sprinkler with the Model G-1 Escutcheon (no suffix needed for the Model E-1 Escutcheon).

For example, sprinkler VK162 with 1" NPT Threads, a Chrome finish, a 155 °F/68 °C temperature rating, a Model G-1 Escutcheon, and "A" length of 10" = Part No. 07856UFBY10.

### Available Finishes And Temperature Ratings:

Refer to Table 1.

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

### Sprinkler Wrenches:

A. Standard Wrench: Part No. 07297W/B (available since 1991)

B. Recessed Sprinkler Wrench: Part No. 07565W/B\*\* (available since 1991)

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

**Dry Sprinkler Protective Cover:** Part No. 15610

### Replacement Escutcheons:

A. Adjustable Standard Dry Escutcheon: Base Part No. 08086F

B. Model E-1 Recessed Dry Escutcheon Cup: Base Part No. 05459A

## 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 internal parts to open the water-way. 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

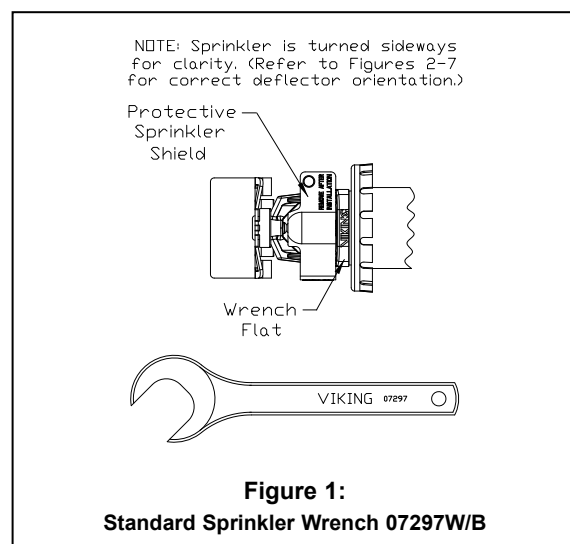
Refer to NFPA 25 for Inspection, Testing and Maintenance requirements.

## 7. AVAILABILITY

The Viking Standard Response Dry Horizontal Sidewall 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.





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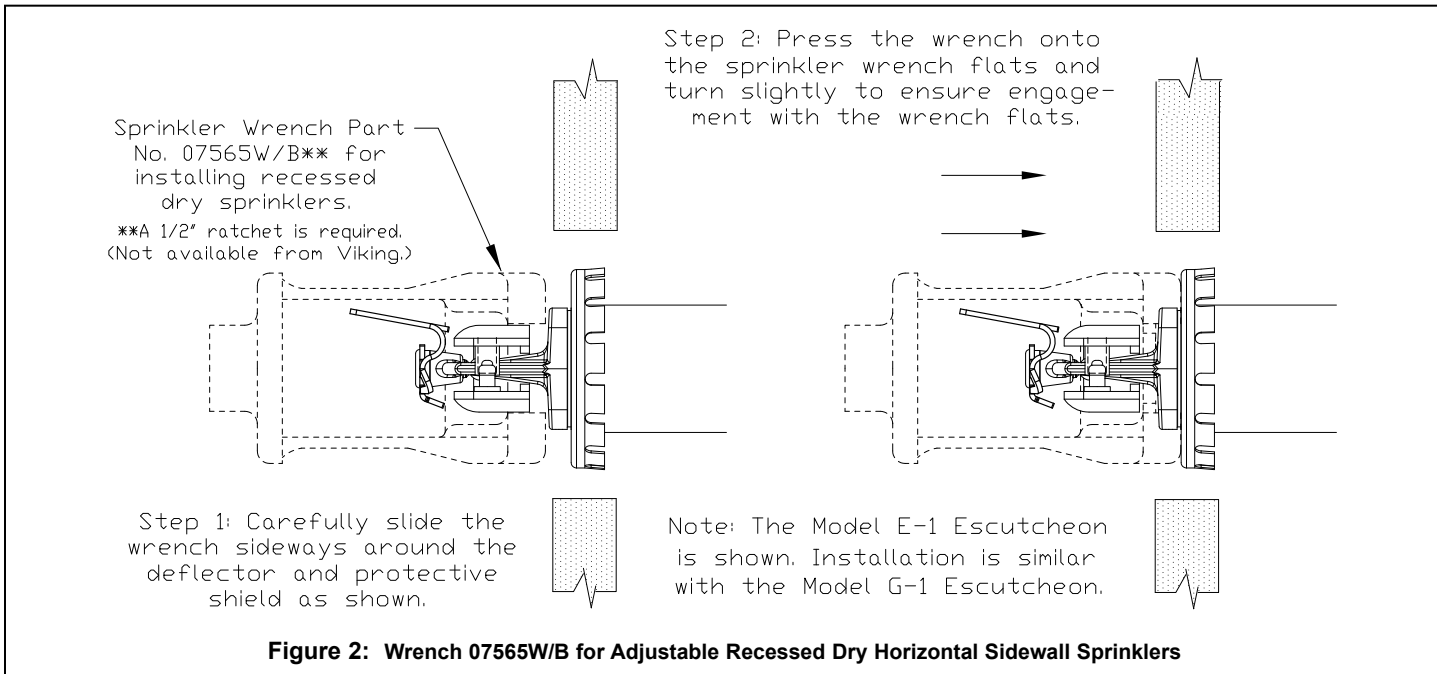
TABLE 1: AVAILABLE SPRINKLER TEMPERATURE RATINGS AND FINISHES

Sprinkler Temperature Classification	Sprinkler Nominal Temperature Rating <sup>1</sup>	Maximum Ambient Ceiling Temperature <sup>2</sup>	Bulb Color
Ordinary	155 °F (68 °C)	100 °F (38 °C)	Red
Intermediate	175 °F (79 °C)	150 °F (65 °C)	Yellow
Intermediate	200 °F (93 °C)	150 °F (65 °C)	Green
High	286 °F (141 °C)	225 °F (107 °C)	Blue

**Sprinkler Finishes:** Brass, Chrome, White Polyester, and ENT  
**Corrosion-Resistant Coating<sup>3,4</sup>:** White Polyester and ENT in all temperature ratings

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.
- <sup>3</sup> The corrosion-resistant Polyester and ENT coatings have passed the standard corrosion test required by the approving agencies indicated in the Approval Charts. These tests cannot and do not represent all possible corrosive environments. Note: These coatings are NOT corrosion proof. Prior to installation, verify through the end-user that the coatings are compatible with or suitable for the proposed environment. Polyester and ENT coatings are applied to the exposed exterior surfaces only. Note that the spring is exposed on sprinklers with Polyester and ENT coatings.
- <sup>4</sup> When installed in some corrosive environments, the Polyester finish may change color. This natural discoloration over time is not in itself an indication of corrosion and should not be treated as such. All sprinklers installed in corrosive environments should be replaced or tested as described in NFPA 25 on a more frequent basis.



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<b>Approval Chart 1 (UL)</b> Standard Response Dry Horizontal Sidewall Sprinklers Maximum 175 PSI (12 bar) WWP											
Sprinkler Base Part Number <sup>1</sup>	SIN	Style	Thread Size		Nominal K-Factor <sup>2</sup>		Order Length Increment		Listings and Approvals <sup>4</sup> (Refer also to Design Criteria below.)		
			NPT	BSP	U.S.	metric <sup>3</sup>	Inches	mm	cULus <sup>5</sup>	NYC <sup>6</sup>	(CC) <sup>7</sup>
07857U	VK156	Adjustable	1"	--	5.6	80.6	1/2"	12.7	A1, A5	A1	--
07860U		Standard	--	25 mm	5.6	80.6	1/2"	12.7	A1, A5	--	--
07856U	VK162	Adjustable	1"	--	5.6	80.6	1/4"	6.35	B2, B6	B2	--
07859U		Recessed	--	25 mm	5.6	80.6	1/4"	6.35	B2, B6	--	--
07858U	VK152	Plain Barrel	1"	--	5.6	80.6	1/2"	12.7	A3	A4	--
07861U			--	25 mm	5.6	80.6	1/2"	12.7	A3	--	--
20378U	VK152	Plain Barrel	1"	--	5.6	80.6	1/2"	12.7	--	--	C7
20375U			--	25 mm	5.6	80.6	1/2"	12.7	--	--	C7
<b>Approved Temperature Ratings</b> A - 155 °F (68 °C), 175 °F (79°C), 200 °F (93 °C), and 286 °F (141 °C) B - 155 °F (68 °C), 175 °F (79°C), and 200 °F (93 °C) C - 155 °F (68 °C)			<b>Approved Finishes and "A" Dimensions</b> 1 - Chrome, Brass, or White Polyester <sup>7</sup> sprinkler with a Chrome, Brass, or White Polyester Sleeve and Escutcheon with "A" dimensions 1-1/2" to 45-1/2" (38.1 mm to 1,156 mm) 2 - Chrome, Brass, or White Polyester <sup>7</sup> with "A" dimensions 3-1/4" to 47-1/2" (82.5 to 1,207 mm) 3 - Chrome, Brass, White Polyester <sup>7</sup> , or ENT <sup>7</sup> with "A" dimensions 3" to 47" (76.2 to 1,194 mm) 4 - Chrome or Brass with "A" dimensions 3" to 47" (76.2 to 1,194 mm) 5 - ENT <sup>7</sup> sprinkler with an ENT <sup>7</sup> Sleeve and Escutcheon with "A" dimensions 1-1/2" to 45-1/2" (38.1 mm to 1,156 mm) 6 - ENT <sup>7</sup> with "A" dimensions 3-1/4" to 47-1/2" (82.5 to 1,207 mm) 7 - Chrome with "A" dimensions 3" to 47" (76.2 to 1,194 mm)								
<b>Footnotes</b> <sup>1</sup> Part number shown is the base part number. For complete part number, refer to current Viking price list schedule. <sup>2</sup> K-Factor applies for standard lengths ("A" Dimensions indicated above). <sup>3</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>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 for use in the U.S. and Canada. <sup>6</sup> Accepted for use, City of New York Department of Buildings, MEA 89-92-E, Vol. 2. <sup>7</sup> cULus Listed as corrosion resistant.											

<b>DESIGN CRITERIA - UL</b> (Also refer to Approval Chart 1 above.)
<b>NOTE: When using CPVC fittings with Viking dry sprinklers, use only new Nibco Model 5012-S-BI tees. When selecting other CPVC fittings, contact Viking Technical Services.</b>
<b>cULus Listing Requirements:</b> Standard Dry Horizontal Sidewall Sprinklers are cULus Listed as indicated in Approval Chart 1 for installation in accordance with the latest edition of NFPA 13 for standard spray horizontal sidewall sprinklers. <ul style="list-style-type: none"> <li>• Limited to Light Hazard occupancies, where allowed by the installation standards being applied, with smooth ceilings only.</li> <li>• Protection areas and maximum spacing shall be in accordance with the tables provided in NFPA 13.</li> <li>• Minimum spacing allowed is 6 ft. (1.8 m).</li> <li>• Deflector must be positioned between 4" and 6" (102 mm and 152 mm) below the ceiling. Keep the top of the deflector oriented parallel with the ceiling.</li> <li>• Locate no less than 4" (102 mm) from end walls.</li> <li>• Maximum distance from end walls shall be no more than one-half of the allowable distance between sprinklers. The distance shall be measured perpendicular to the wall.</li> <li>• The sprinkler installation and obstruction rules contained in NFPA 13 for sidewall standard spray sprinklers must be followed.</li> </ul>
<b>IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. Also refer to page DRY1-3 for general care, installation, and maintenance information. Viking sprinklers are to be installed in accordance with the latest edition of Viking technical data, the appropriate standards of NFPA, LPCB, APSAD, VdS or other similar organizations, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable.</b>



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### Approval Chart 2 (FM)

Standard Response Dry Horizontal Sidewall Sprinklers  
 Maximum 175 PSI (12 bar) WWP

KEY	
—	Temperature
—	Finish
A1X ←	Escutcheon (if applicable)

Sprinkler Base Part Number <sup>1</sup>	SIN	Style	Thread Size		Nominal K-Factor <sup>2</sup>		Order Length Increment		FM Approvals <sup>4</sup> (Refer also to Design Criteria below.)
			NPT	BSP	U.S.	metric <sup>3</sup>	Inches	mm	
07857U	VK156	Adjustable	1"	--	5.6	80.6	1/2"	12.7	A1
07860U		Standard	--	25 mm	5.6	80.6	1/2"	12.7	A1
07856U	VK162	Adjustable	1"	--	5.6	80.6	1/4"	6.35	B2
07859U		Recessed	--	25 mm	5.6	80.6	1/4"	6.35	B2
07858U	VK152	Plain	1"	--	5.6	80.6	1/2"	12.7	A3
07861U		Barrel	--	25 mm	5.6	80.6	1/2"	12.7	A3

#### Approved Temperature Ratings

A - 155 °F (68 °C), 175 °F (79°C), 200 °F (93 °C), and 286 °F (141 °C)  
 B - 155 °F (68 °C), 175 °F (79°C), and 200 °F (93 °C)

#### Approved Finishes and "A" Dimensions

- 1 - Brass, Bright Brass, Chrome, White Polyester, or ENT<sup>5</sup> with "A" dimensions 1-1/2" to 45-1/2" (38.1 mm to 1,156 mm)
- 2 - Brass, Bright Brass, Chrome, White Polyester, or ENT<sup>5</sup> with "A" dimensions 3-1/4" to 47-1/2" (82.5 mm to 1,207 mm)
- 3 - Brass, Bright Brass, Chrome, White Polyester, or ENT<sup>5</sup> with "A" dimensions 3" to 47" (76.2 mm to 1,194 mm)

#### Footnotes

- <sup>1</sup> Part number shown is the base part number. For complete part number, refer to current Viking price list schedule.
- <sup>2</sup> K-Factor applies for standard lengths ("A" Dimensions indicated above).
- <sup>3</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>4</sup> This chart shows the FM Approvals available at the time of printing. Other approvals may be in process. Check with the manufacturer for any additional approvals.
- <sup>5</sup> FM approved as corrosion resistant.

### DESIGN CRITERIA - FM

(Also refer to Approval Chart 2 above.)

**NOTE: When using CPVC fittings with Viking dry sprinklers, use only new Nibco Model 5012-S-BI tees. When selecting other CPVC fittings, contact Viking Technical Services.**

#### FM Approval Requirements:

Dry horizontal sidewall sprinklers VK152, VK156, and VK162 are FM Approved as dry standard response **Non-Storage** sidewall sprinklers as indicated in the FM Approval Guide. For specific application and installation requirements, reference the latest applicable FM Loss Prevention Data Sheets (including Data Sheet 2-0). FM Global Loss Prevention Data Sheets contain guidelines relating to, but not limited to: minimum water supply requirements, hydraulic design, ceiling slope and obstructions, minimum and maximum allowable spacing, and deflector distance below the ceiling.

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

**IMPORTANT: Always refer to Bulletin Form No. F\_091699 - Care and Handling of Sprinklers. Also refer to page DRY1-3 for general care, installation, and maintenance information. Viking sprinklers are to be installed in accordance with the latest edition of Viking technical data, the appropriate standards of NFPA, FM Global, LPCB, APSAD, VdS or other similar organizations, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable.**



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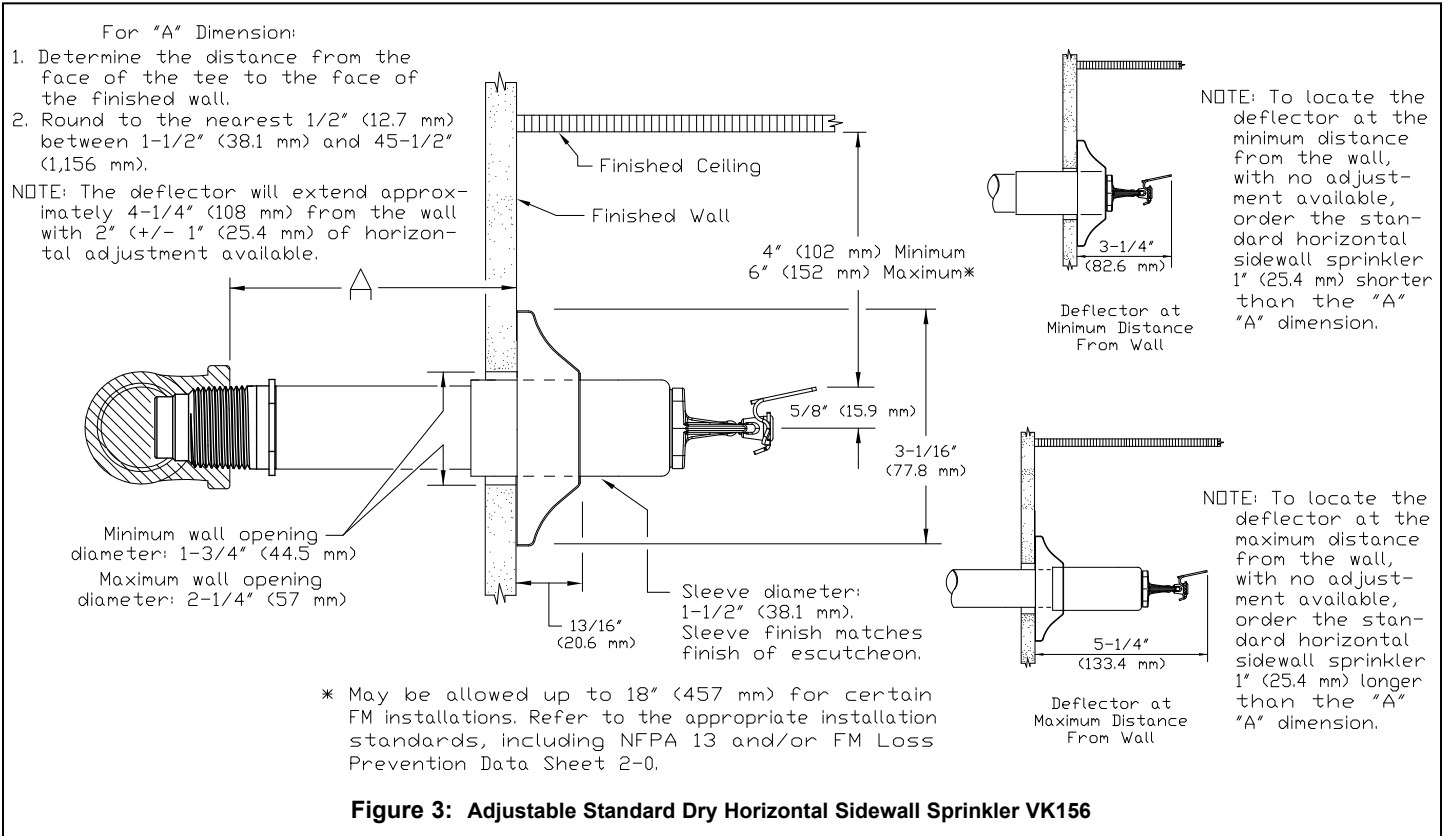


Figure 3: Adjustable Standard Dry Horizontal Sidewall Sprinkler VK156

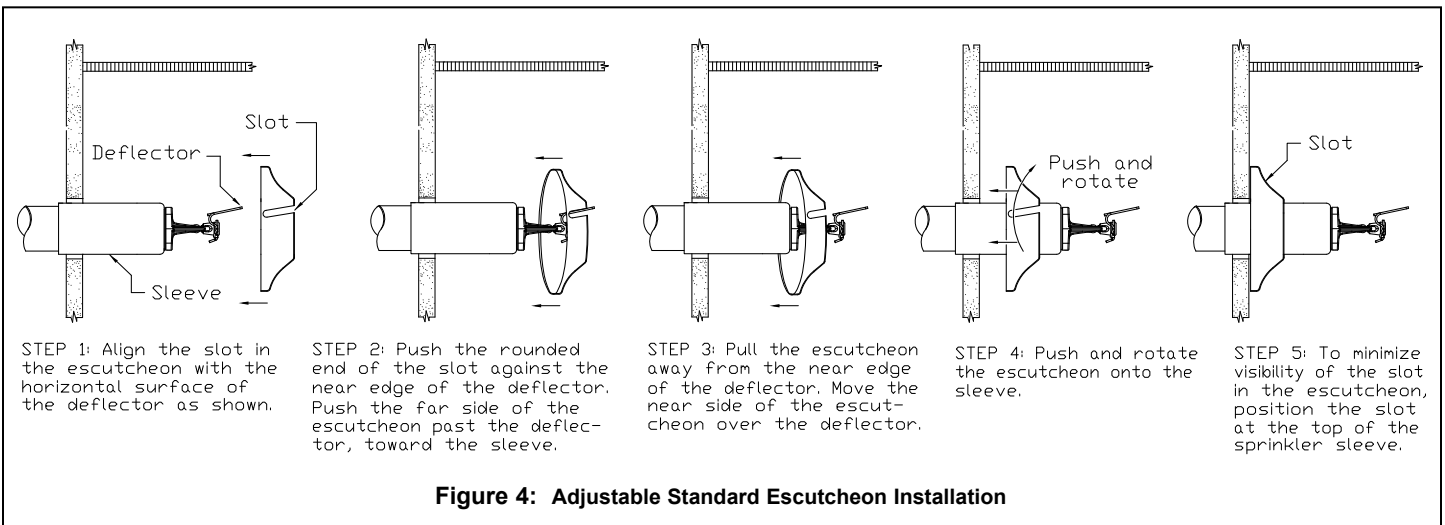


Figure 4: Adjustable Standard Escutcheon Installation



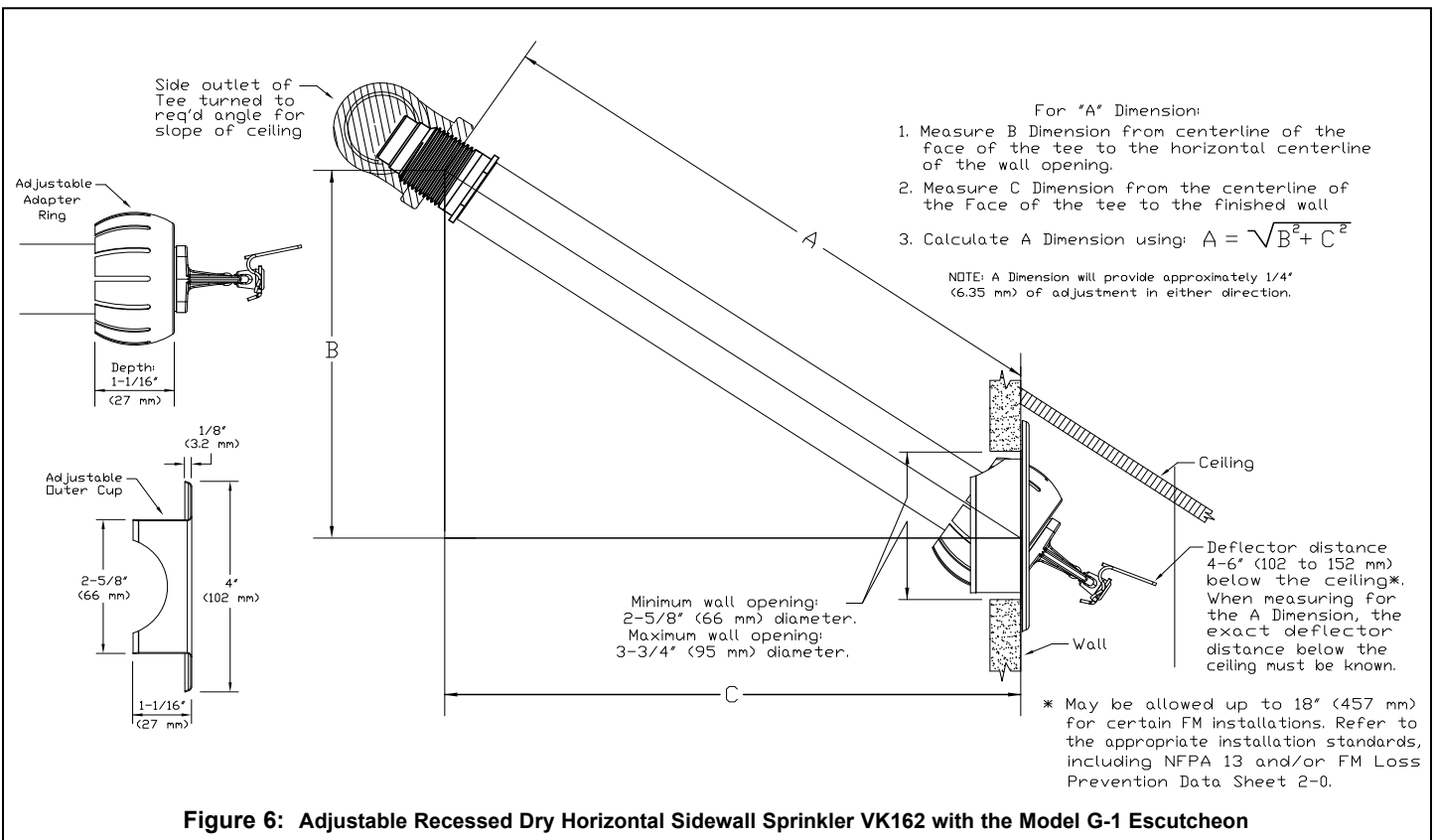
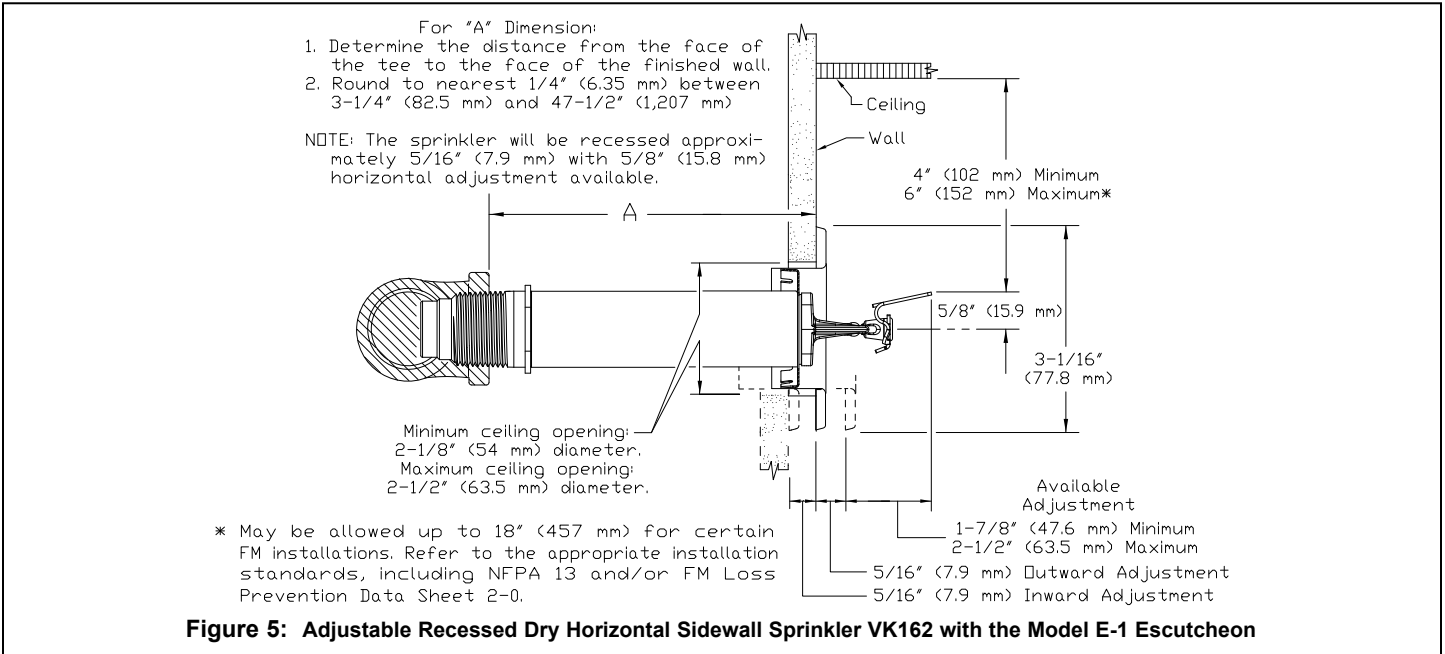
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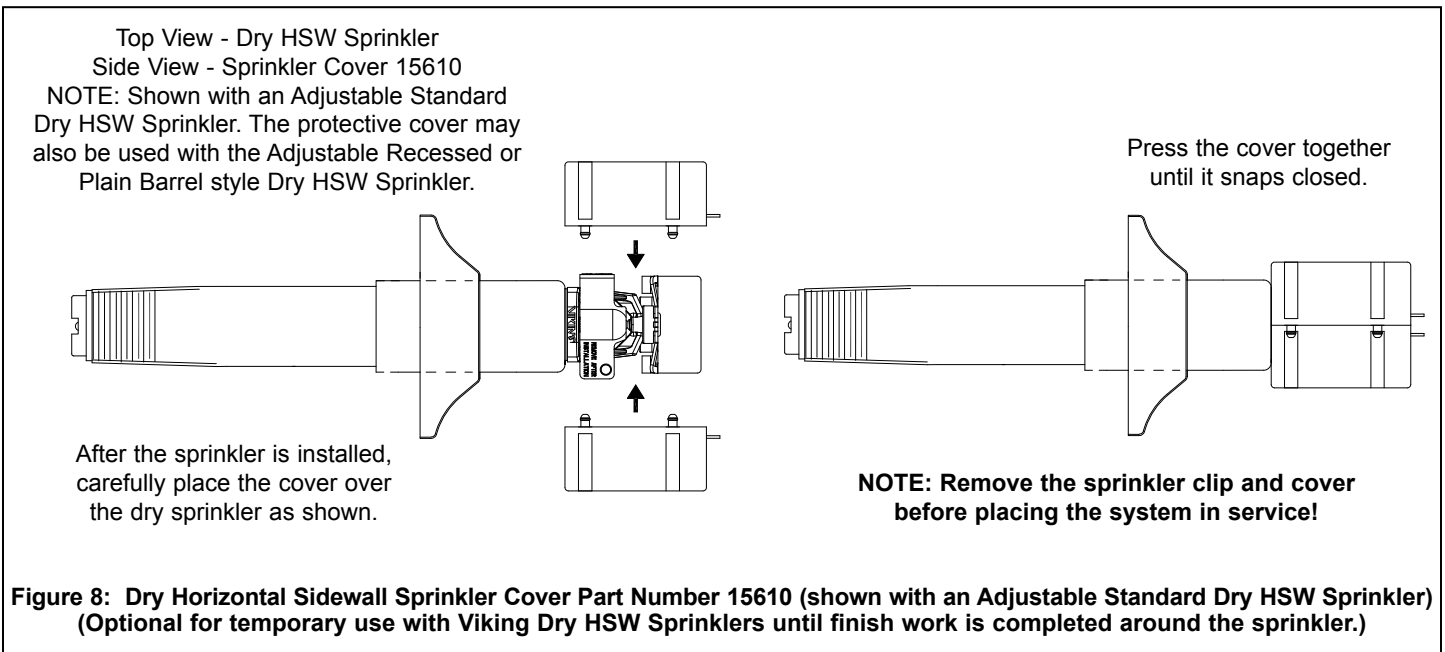
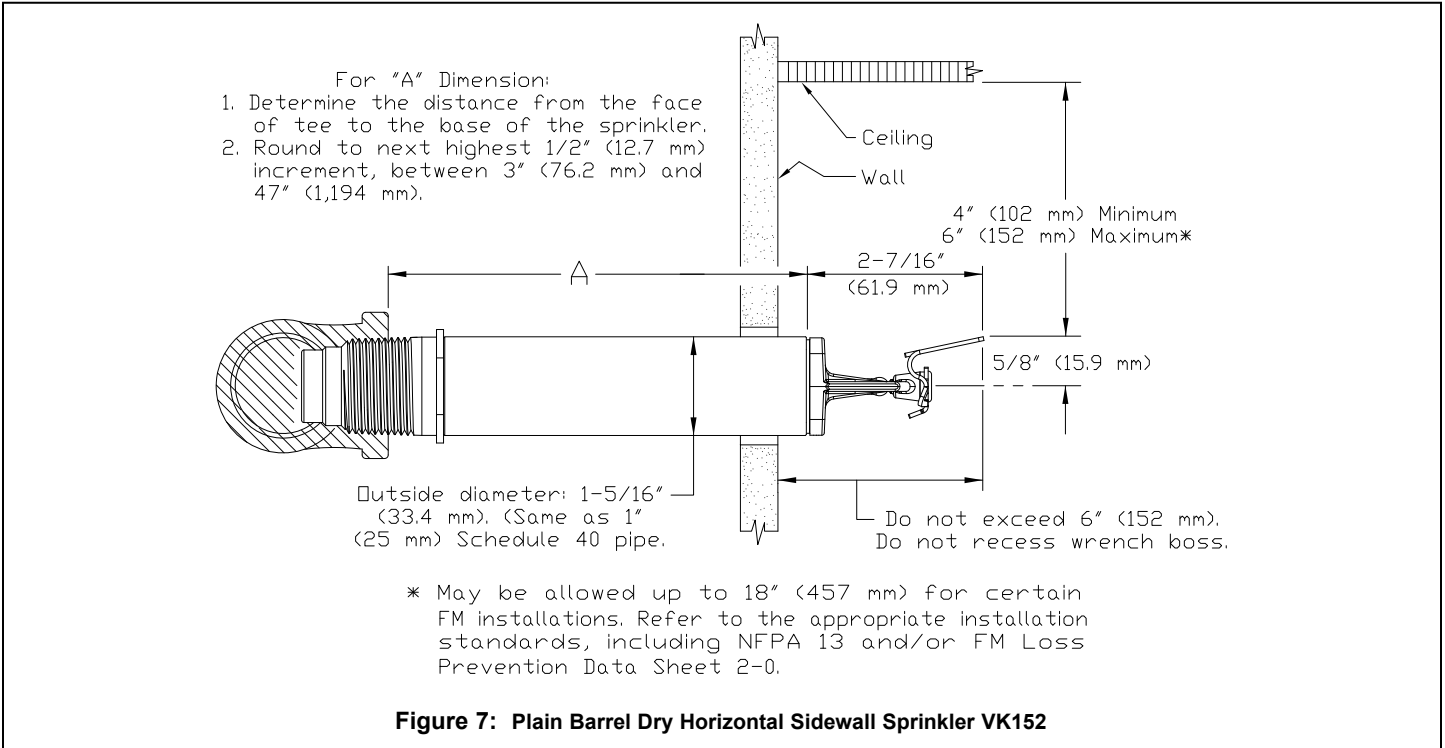




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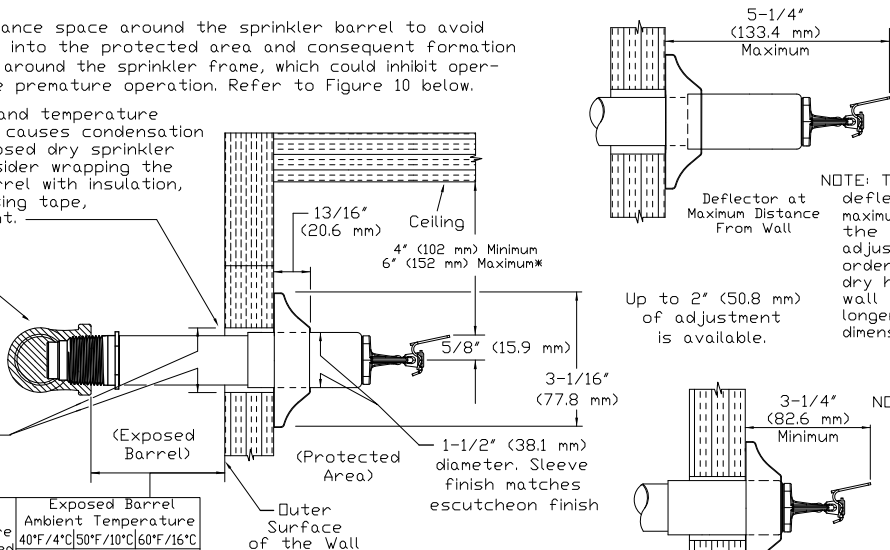
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Seal the clearance space around the sprinkler barrel to avoid leakage of air into the protected area and consequent formation of condensate around the sprinkler frame, which could inhibit operation or cause premature operation. Refer to Figure 10 below.

If humidity and temperature differential causes condensation on the exposed dry sprinkler barrel, consider wrapping the exposed barrel with insulation, foam insulating tape, or equivalent.

Install 1 inch NPT threaded end of dry sidewall sprinkler into the 1 inch NPT outlet of a malleable iron tee fitting per ANSI B 16.3 (Class 150) or cast iron threaded tee fitting per ANSI 16.4 (Class 125) only.

Minimum wall opening diameter: 1-3/4" (44.5 mm)  
Maximum wall opening diameter: 2-1/4" (57 mm).



NOTE: To locate the deflector at the maximum distance from the wall, with no adjustment available, order the standard dry horizontal sidewall sprinkler 1" longer than the "A" dimension.

Up to 2" (50.8 mm) of adjustment is available.

NOTE: To locate the deflector at the minimum distance from the wall, with no adjustment available, order the standard dry horizontal sidewall sprinkler 1" shorter than the "A" dimension.

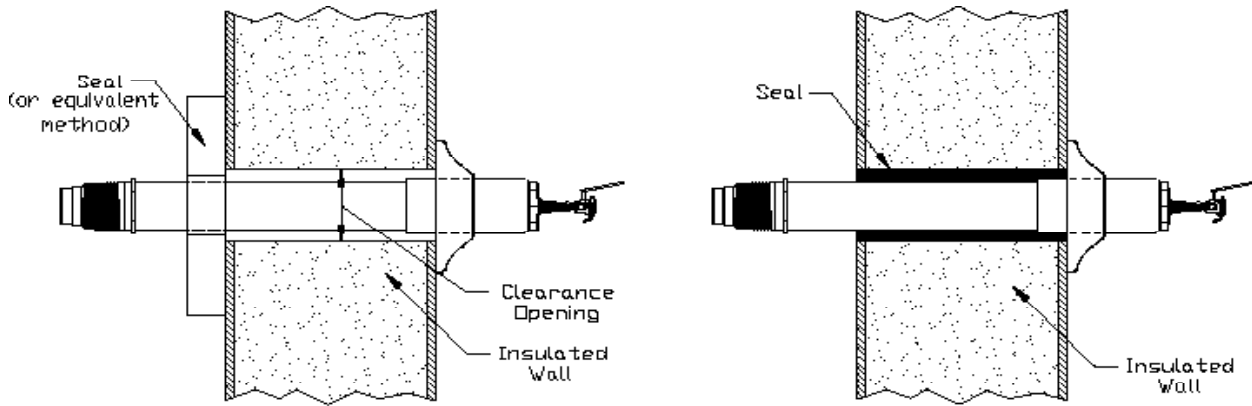
Ambient Temperature of Protected Area** at the Discharge End of the Sprinkler	Exposed Barrel Ambient Temperature		
	40°F/4°C	50°F/10°C	60°F/16°C
	Exposed Minimum Barrel Length*** Face of the Tee to the Outer Surface of the Wall		
	In. (mm)	In. (mm)	In. (mm)
40°F (4°C)	0	0	0
30°F (-1°C)	0	0	0
20°F (-7°C)	4 (100)	0	0
10°F (-12°C)	8 (203)	1 (25.4)	0
0°F (-18°C)	12 (305)	3 (76)	0
-10°F (-23°C)	14 (356)	4 (102)	1 (25.4)
-20°F (-29°C)	14 (356)	6 (152)	3 (76)
-30°F (-34°C)	16 (406)	8 (203)	4 (102)
-40°F (-40°C)	18 (457)	8 (203)	4 (102)
-50°F (-46°C)	20 (508)	10 (254)	6 (152)
-60°F (-51°C)	20 (508)	10 (254)	6 (152)

\*May be allowed up to 18" (457 mm) for certain FM installations. Refer to the appropriate installation standards, including NFPA 13 and/or FM Loss Prevention Data Sheet 2-0.

\*\*The protected area refers to the area below the ceiling. The ambient temperature is the temperature at the discharge end of the sprinkler. For protected area temperatures that occur between the values listed, use the next cooler temperature.

\*\*\*The minimum required barrel length is not the same as the "A" dimension. Refer to Figures 3, 5, and 7 for the "A" dimension. Exposed minimum barrel lengths are inclusive up to 30 mph wind velocities.

Figure 9: Dry Horizontal Sidwall Sprinkler Required Minimum Barrel Length Based on Ambient Temperature in the Protected Area (Adjustable Standard Dry HSW Sprinkler is Shown)



Dry Sprinkler Seal on the Exterior of the Wall

Dry Sprinkler Seal Within the Wall

Figure 10: Dry Sprinkler Seal (Adjustable Standard Dry HSW Sprinkler is Shown)