



TECHNICAL DATA

STANDARD RESPONSE ORDINARY HAZARD DRY HSW SPRINKLERS (8.0K) (VK2503, VK2523, & VK2543)

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

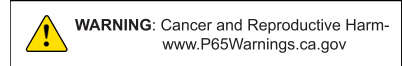
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1. DESCRIPTION

Viking Standard Response Ordinary Hazard 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 drop 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. The large orifice dry sidewall sprinkler allows greater flows at lower pressures than standard orifice sprinklers. The newly desinged deflector carries and expanded approval for installation from 4" to 12" below the ceiling.

Viking Standard Response Ordinary Hazard 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 cULus listed as corrosion resistant as indicated in the Approval Chart.

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.



2. LISTINGS AND APPROVALS

cULus cULus Listed: Category VNIV

NYC Approved: MEA 89-92-E, Volume 37

Refer to the Approval Chart on page 3 and Design Criteria on page 4 for cULus Listing requirements that must be followed.

3. TECHNICAL DATA

Specifications:

Available since 2005.

Minimum Operating Pressure: 7 PSI (0.5 bar)

Maximum Working Pressure: 175 PSI (12 bar).

Factory tested hydrostatically to 500 psi (34.5 bar)

Thread size: 1" NPT or 25 mm BSP

Nominal K-Factor: 8.0 U.S. (115.2 metric*) for lengths up to 48".

* 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 U.S. Patent numbers: 8,636,075 and 8,376,060 and 10,220,231

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 and Adapter: Brass UNS-C36000

Orifice: Copper UNS-C11000 or UNS-C21000

Tube: ERW Hydraulic Steel Tube

Inlet and Barrel End: QM Brass or Brass UNS-C31400 or Brass UNS-C31600

Support (Internal): Brass UNS-C36000 or Brass UNS-C31400 or Brass UNS-C31600

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 Ordinary Hazard 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 3, 5, 6, and 7). 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 mm to 1,156 mm) for the adjustable standard style, 3" to 47" (76 mm to 1,194 mm) for the plain barrel style, and 3-1/4" to 47-1/2" (83 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 64-1/4" (1,632 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: 155 °F (68 °C) = B, 175 °F (79 °C) = D, 200 °F (93 °C) = E, 286 °F (141 °C) = 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 VK2543 with 1" NPT Threads, Chrome finish, 155 °F (68 °C) temperature rating, a Model G-1 Escutcheon, and "A" length of 10" = Part No. 21481FBY10.

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. Wrench for recessed sprinklers: 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

C. Model G-1 Recessed Dry Escutcheon Cup: Base Part No.

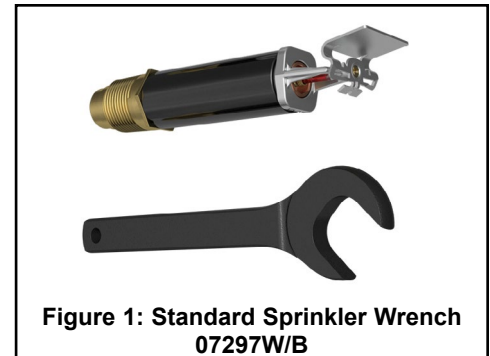


Figure 1: Standard Sprinkler Wrench
07297W/B

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 waterway. 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 Ordinary Hazard 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 Temp. Rating ¹	Maximum Ambient Ceiling Temperature ²	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

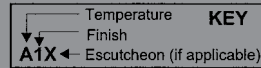
Sprinkler Finishes: Brass, Chrome, White Polyester, and ENT
Corrosion-Resistant Coating^{3,4}: White Polyester and ENT in all temperature ratings

Footnotes

- ¹ The sprinkler temperature rating is stamped on the deflector.
- ² Based on NFPA-13. Other limits may apply, depending on fire loading, sprinkler location, and other requirements of the Authority Having Jurisdiction. Refer to specific installation standards.
- ³ **The corrosion-resistant Polyester and ENT 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. 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.**
- ⁴ **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.**

Approval Chart

**Standard Response Ordinary Hazard Dry
Horizontal Sidewall Sprinklers (8.0K)
Maximum 175 PSI (12 bar) WWP**



Sprinkler Base Part Number ¹	SIN	Style	Thread Size		Nominal K-Factor ²	Order Length Increment		Listings and Approvals ⁴ (Refer also to Design Criteria on page 102w.)						
			NPT	BSP		Inches	mm	cULus ⁵	FM	NYC ⁶	VdS	LPCB	UL	ULC
21487U	VK2523	Adjustable	1"	--	8.0 U.S. (115.2 metric ³)	1/2"	12.7	A1, A5	--	A1	--	--	--	--
21488U	VK2523	Standard	--	25 mm		1/2"	12.7	A1, A5	--	A1	--	--	--	--
21481U	VK2543	Adjustable	1"	--		1/4"	6.35	B2, B6	--	B2	--	--	--	--
21482U	VK2543	Recessed	--	25 mm		1/4"	6.35	B2, B6	--	B2	--	--	--	--
21493U	VK2503	Plain	1"	--		1/2"	12.7	A3	--	A4	--	--	--	--
21494U	VK2503	Barrel	--	25 mm		1/2"	12.7	A3	--	A4	--	--	--	--

Approved Finishes and "A" Dimensions

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)

- 1 - Chrome or White Polyester⁷ sprinkler with a Chrome 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 or White Polyester⁷ with "A" dimensions 3-1/4" to 47-1/2" (82.5 mm to 1,207 mm)
- 3 - Chrome, Brass, White Polyester⁷, or ENT⁷ with "A" dimensions 3" to 47" (76.2 mm to 1,194 mm)
- 4 - Chrome or Brass with "A" dimensions 3" to 47" (76.2 mm to 1,194 mm)
- 5 - ENT⁷ sprinkler with an ENT⁷ Sleeve and Escutcheon with "A" dimensions 1-1/2" to 45-1/2" (38.1 mm to 1,156 mm)
- 6 - ENT⁷ with "A" dimensions 3-1/4" to 47-1/2" (82.5 mm to 1,207 mm)

Footnotes

- ¹ Part number shown is the base part number. For complete part number, refer to current Viking price list schedule.
- ² K-Factor applies for standard lengths ("A" Dimensions indicated above).
- ³ 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.
- ⁴ 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.
- ⁵ Listed by Underwriter's Laboratories for use in the U.S. and Canada.
- ⁶ Accepted for use, City of New York Department of Buildings, MEA Number 89-92-E, Vol. 37.
- ⁷ cULus Listed as corrosion resistant.

	<h2 style="margin: 0;">TECHNICAL DATA</h2>	<p>STANDARD RESPONSE ORDINARY HAZARD DRY HSW SPRINKLERS (8.0K) (VK2503, VK2523, & VK2543)</p>
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DESIGN CRITERIA
 (Also refer to the Approval Chart on page 3.)

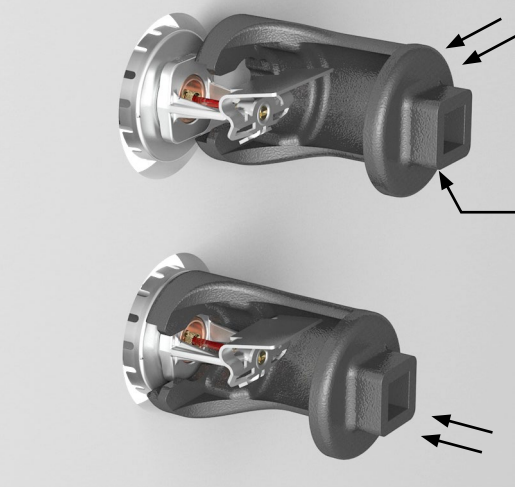
NOTE: When using CPVC fittings with Viking dry sprinklers, use only new Nibco Model 5012-S-BI tees. When selecting other CPVC fittings, contact Viking Technical Services.

cULus Listing Requirements:

Standard Dry Horizontal Sidewall Sprinklers are cULus Listed as indicated in the Approval Chart for installation in accordance with the latest edition of NFPA 13 for sidewall standard spray sprinklers.

- Designed for use in Light and Ordinary Hazard occupancies with smooth, flat ceilings only.
- Protection areas and maximum spacing shall be in accordance with the tables provided in NFPA 13.
- Minimum spacing allowed is 6 ft. (1.8 m).
- Deflector must be positioned between 4" and 12" (102 mm and 305 mm) below the ceiling. Keep the leading edge of the deflector and the centerline axis of the sprinkler frame oriented parallel with the ceiling.
- Locate no less than 4" (102 mm) from end walls.
- 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.
- The sprinkler installation and obstruction rules contained in NFPA 13 for sidewall standard spray sprinklers must be followed.

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, FM Global, LPCB, APSAD, VdS or other similar organizations, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable.



Step 1:
Carefully slide the wrench sideways around the deflector and protective shield as shown.

Sprinkler Wrench
(Part No. 07565W/B)** for installing recessed dry sprinklers.

Step 2:
Press the wrench onto the sprinkler wrench flats and turn slightly to ensure engagement with the wrench flats.

Figure 2: Wrench 07565W/B for Adjustable Recessed Dry Horizontal Sidewall Sprinklers

** NOTE: A 1/2" ratchet is required and not available from Viking.

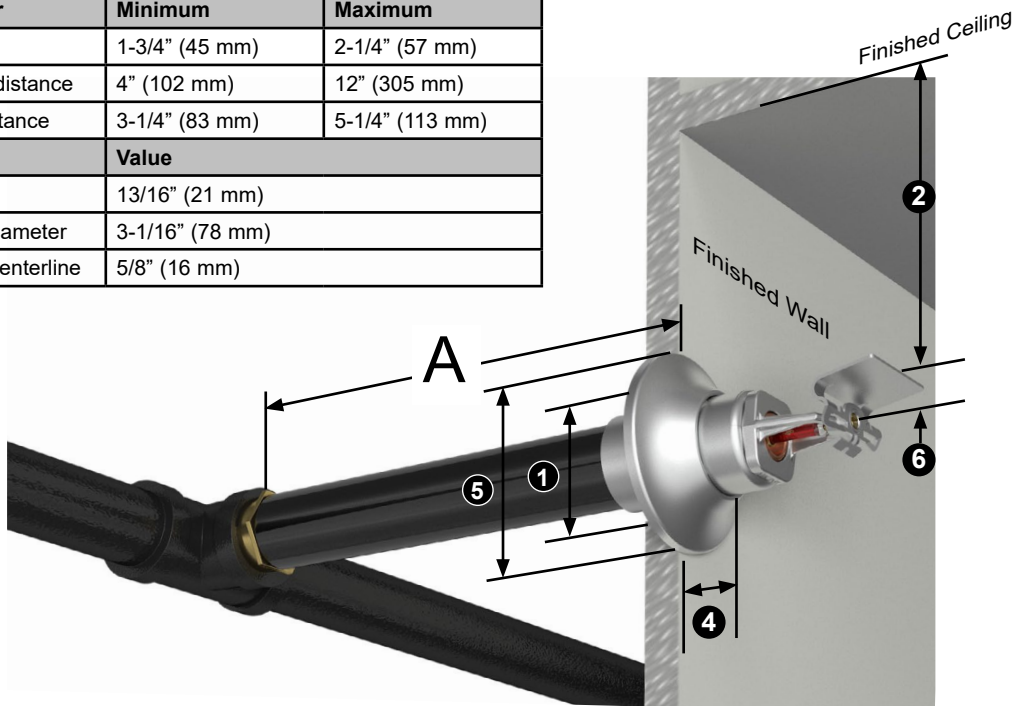


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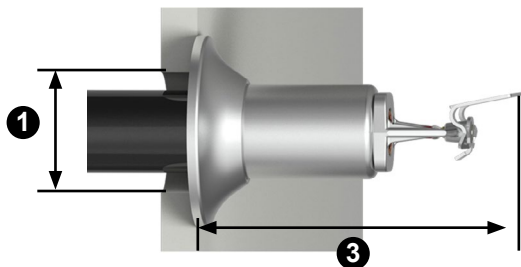
Ref	Variable Parameter	Minimum	Maximum
1	Wall opening	1-3/4" (45 mm)	2-1/4" (57 mm)
2	Deflector to ceiling distance	4" (102 mm)	12" (305 mm)
3	Deflector to wall distance	3-1/4" (83 mm)	5-1/4" (113 mm)
Ref	Fixed Parameter	Value	
4	Escutcheon depth	13/16" (21 mm)	
5	Escutcheon outer diameter	3-1/16" (78 mm)	
6	Top of deflector to centerline	5/8" (16 mm)	



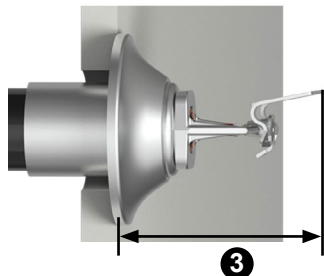
Determining the "A" Dimension: Adjustable Standard HSW Sprinkler

1. Determine the distance from the face of the tee to the finished face of the wall.
2. Round to the nearest 1/2" (13mm) between 1-1/2" (38 MM) and 45-1/2" (1,156 mm).

NOTE: The deflector will extend approximately 4-1/4" (108 mm) from the wall with 2" (+/- 1" (25 mm) horizontal adjustment available.



To locate the deflector at the **maximum** distance from the wall, with no adjustment available, order the standard dry horizontal sidewall sprinkler 1" (25 mm) **longer** than the "A" Dimension.



To locate the deflector at the **minimum** distance from the wall, with no adjustment available, order the standard dry horizontal sidewall sprinkler 1" (25 mm) **shorter** than the "A" Dimension.

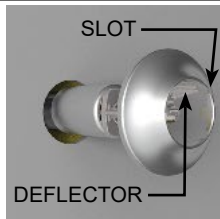
Figure 3: Adjustable Standard Ordinary Hazard Dry HSW Sprinkler



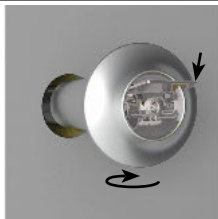
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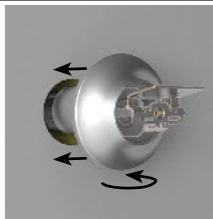
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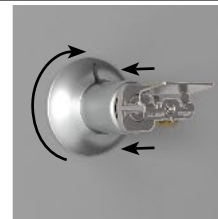
Step 1: Align the slot in the escutcheon with the horizontal surface of the deflector as shown.



Step 2: Push the rounded end of the slot against the near edge of the deflector. Slightly rotate the escutcheon horizontally and push the far side of the escutcheon past the deflector, toward the sleeve.



Step 3: Re-align the escutcheon with the sprinkler barrel and continue pushing it toward the sleeve.



Step 4: Push and rotate the escutcheon onto the sleeve and, if desired, orient the slot toward the top to minimize visibility.

Figure 4: Adjustable Standard Escutcheon Installation

Determining the "A" Dimension: Adjustable Recessed HSW Sprinkler with Model E-1 Escutcheon

- 1. Determine the distance from the face of the tee to the finished face of the wall.**
- 2. Round to the nearest 1/4" (16 mm) between 3-1/4" (83 mm) and 47-1/2" (1,207 mm).**

NOTE: The sprinkler will be recessed approximately 5/16" (8 mm) with 5/8" (16 mm) horizontal adjustment available.

Ref	Variable Parameter	Minimum	Maximum
1	Wall opening	2-1/8" (54 mm)	2-1/2" (64 mm)
2	Deflector to ceiling distance	4" (102 mm)	12" (305 mm)
3	Deflector to wall distance	1-7/8" (48 mm)	2-1/2" (64 mm)
Ref	Fixed Parameter	Value	
4	Escutcheon depth (Model E-1)	1-1/16" (27 mm)	
5	Escutcheon outer diameter	3-1/16" (78 mm)	
6	Top of deflector to centerline	5/8" (16 mm)	

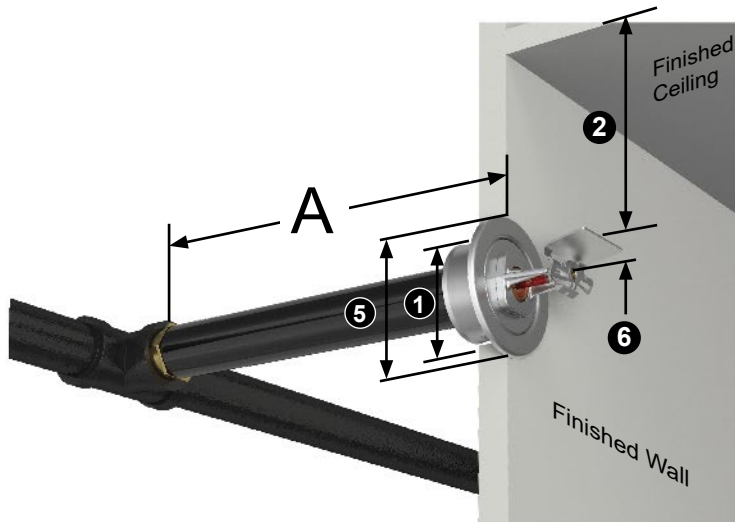
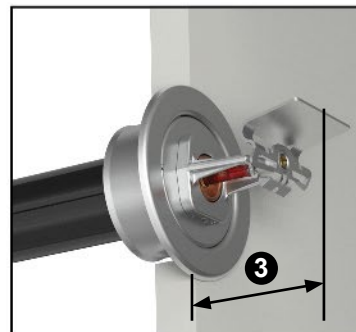
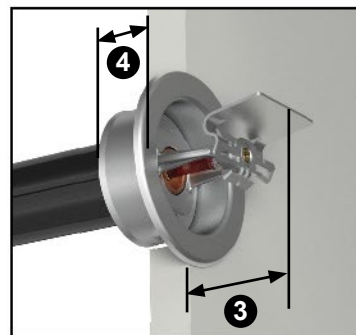


Figure 5: Adjustable Recessed Ordinary Hazard Dry HSW Sprinkler with the Model E-1 Escutcheon



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Determining the "A" Dimension - Plain Barrel Dry HSW Sprinkler

1. Determine the distance from the face of the tee to the base of the sprinkler.
2. Round to the next higher 1/2" (13 mm) increment, between 3" (76 mm) and 47" (1,194 mm).

Ref	Variable Parameter	Minimum	Maximum
1	Deflector to ceiling distance	4" (102 mm)	12" (305 mm)
2	Deflector to finished wall distance	Do not recess wrench boss	6" (152 mm)
Ref	Fixed Parameter	Value	
3	Sprinkler base to deflector distance	2-1/4" (57 mm)	
4	Top of deflector to centerline	5/8" (16 mm)	
5	Pipe outside diameter (Same as 1" (13 mm) Schedule 40 pipe)	1-5/16" (33 mm)	

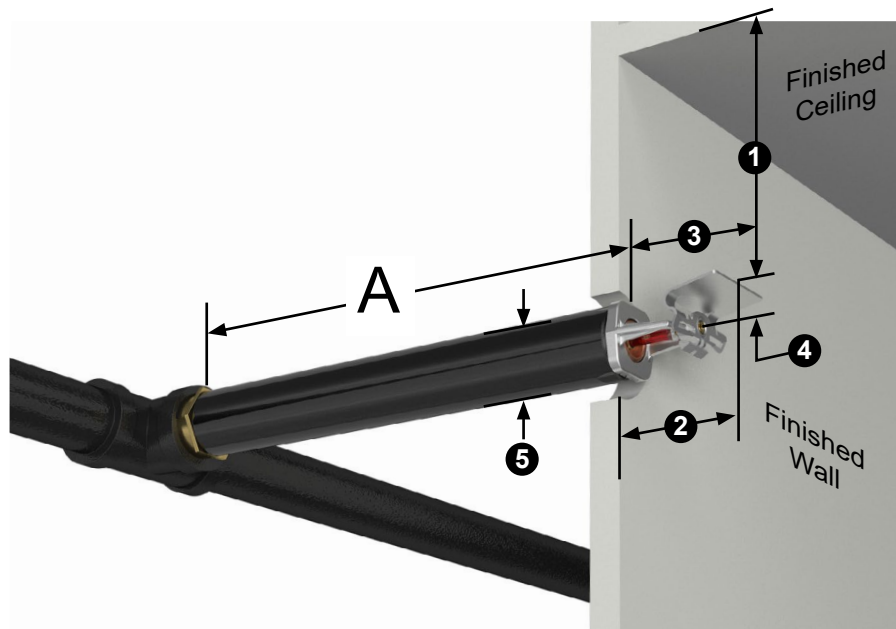


Figure 6: Plain Barrel Dry Horizontal Sidewall Sprinkler VK2503



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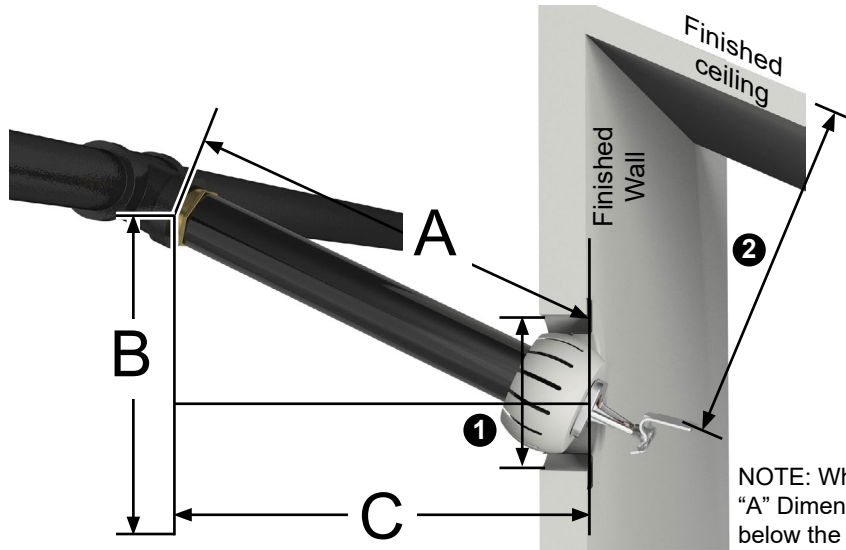
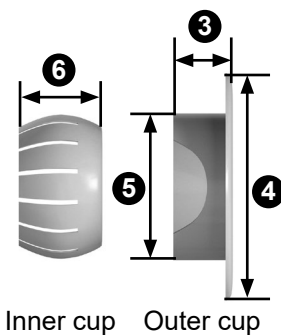
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Determining the “A” Dimension - Adjustable Recessed Dry HSW Sprinkler VK2543 with Model G-1 Escutcheon

1. Measure the “B” Dimension from the centerline of the face of the tee to the horizontal centerline of the wall opening.
2. Measure the “C” Dimension from the centerline of the face of the tee to the finished wall.
3. Calculate the “A” Dimension using this formula: $A = \sqrt{B^2 + C^2}$

NOTE: The “A” Dimension will provide approximately 1/4” (6 mm) of adjustment in either direction.

Ref	Variable Parameter	Minimum	Maximum
1	Wall opening	2-5/8” (66 mm)	3-3/4” (95 mm)
2	Deflector to ceiling distance	4” (102 mm)	12” (305 mm)
Ref	Fixed Parameter	Value	
3	Escutcheon depth (Model G-1 outer cup)	1-1/16” (27 mm)	
4	Escutcheon outer diameter (outer cup)	4” (102 mm)	
5	Escutcheon inner diameter (outer cup)	2-5/8” (66 mm)	
6	Escutcheon depth (inner cup)	1-1/16” (27 mm)	



NOTE: When measuring for the “A” Dimension, the exact deflector distance below the ceiling must be known.

Figure 7: Adjustable Recessed Dry Horizontal Sidewall Sprinkler VK2543 with the Model G-1 Escutcheon



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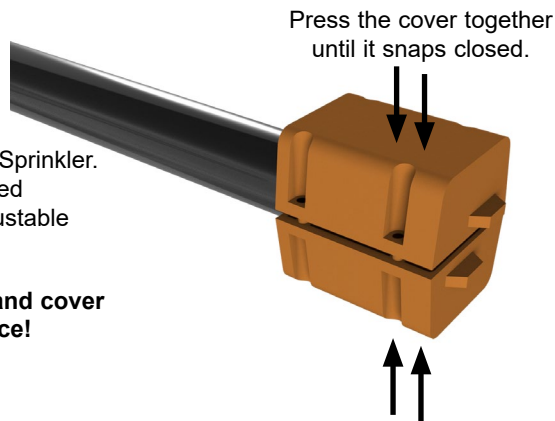
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Shown with a Plain Barrel Dry HSW Sprinkler.
The protective cover may also be used
with the Adjustable Recessed or Adjustable
Standard style Dry HSW Sprinkler.

**NOTE: Remove the sprinkler clip and cover
before placing the system in service!**

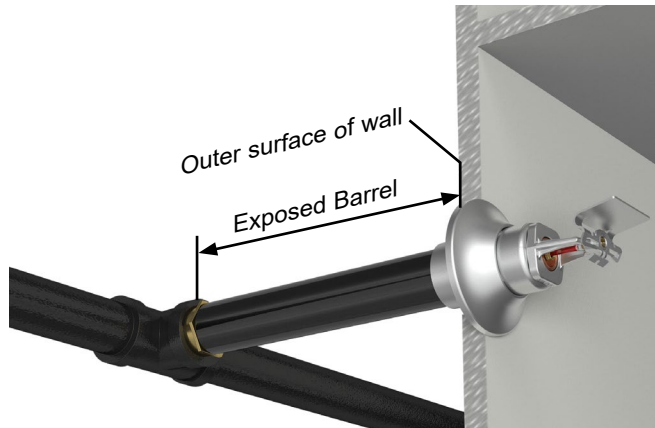


**Figure 8: Dry Horizontal Sidewall Sprinkler Cover Part Number 15610 (shown with a Plain Barrel Dry HSW Sprinkler)
(Optional for temporary use with Viking Dry HSW Sprinklers until finish work is completed around the sprinkler.)**

Ambient Temperature of the 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		
	Inches (mm)	Inches (mm)	Inches (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)	0
0 °F (-18 °C)	12 (305)	3 (76)	0
-10 °F (-23 °C)	14 (356)	4 (102)	1 (25)
-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)

* 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, 6, and 7 for the "A" Dimension. Exposed minimum barrel lengths are inclusive up to 30 mph wind velocities.



Seal the clearance space around the sprinkler 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.

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 the threaded end of the sprinkler into a 1" 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.

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

	TECHNICAL DATA	STANDARD RESPONSE ORDINARY HAZARD DRY HSW SPRINKLERS (8.0K) (VK2503, VK2523, & VK2543)
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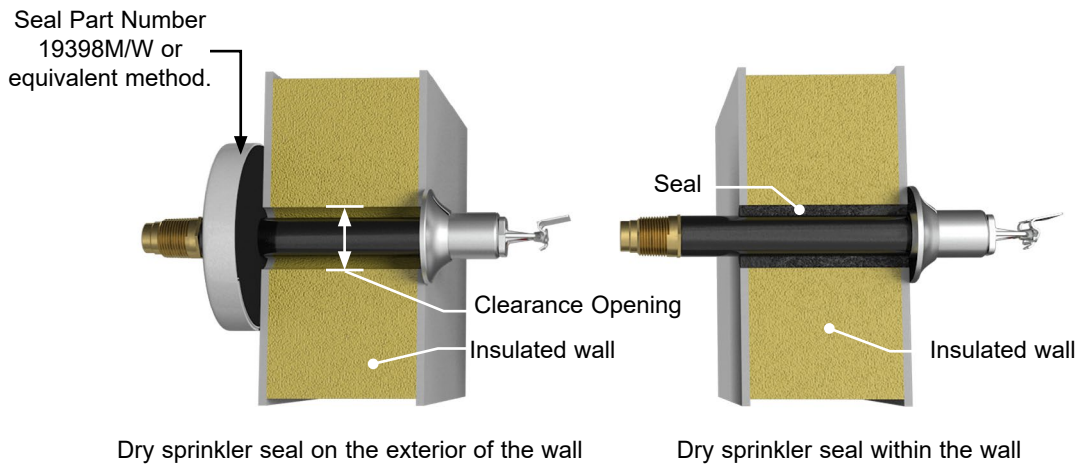


Figure 10: Dry Sprinkler Seal (Adjustable Standard Dry HSW Sprinkler is Shown)