



TECHNICAL DATA

STANDARD RESPONSE DRY PENDENT ELO 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

1. DESCRIPTION

Viking Standard Response Dry Pendent Extra-Large Orifice (ELO) Sprinklers are thermosensitive spray sprinklers suitable for use in areas subject to freezing. These dry pendent ELO sprinklers are FM Approved for storage and non-storage applications. In certain FM cold storage installations, the dry ELO sprinklers can provide a design advantage with lower overall water demands. In these applications, the dry ELO must be installed on a wet pipe system, per FM data sheet 8-9. In non-storage applications, when used in dry or preaction systems, the sprinklers are designed to prevent water or condensation from entering the drop nipple before the sprinkler operates. Viking Standard Response Dry Pendent ELO Sprinklers are available in various finishes and temperature ratings to meet design requirements.

The optional dry sprinkler boot assembly is intended to slow the exchange of air between the inside and outside of the freezer (or any dry sprinkler installation) to help prevent humidity and temperature differential in the area around the sprinkler. Condensation can lead to ice build-up, which could inhibit sprinkler operation or cause premature operation.

If using the insulating boot assemblies included with your sprinklers (optional for installation), follow the installation instructions in this technical data page. Insulating boot assemblies, if used, shall be installed on smooth, flat, and clean surfaces. There are specific installation situations, as with corrugated ceiling panels, where alternative penetration sealing methods may be utilized. For additional information contact Viking Technical Services.



Thread Size	K-Factor
1-1/4" NPT (32 mm BSP)	11.2 (161.3 Metric)
SIN	Style
VK544	Plain Barrel
VK545	Adjustable Recessed
VK546	Adjustable Standard

2. LISTINGS AND APPROVALS



FM Approved: Classes 2013 and 2015

Refer to Approval Chart and Design Criteria on page 4 for FM Approval requirements that must be followed.

3. TECHNICAL DATA

Specifications:

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: 1-1/4" NPT or 32 mm BSP

Nominal K-Factor: 11.2 U.S. (161.3 metric**) for all listed and approved lengths.

* FM Approval, and NFPA 13 installs require a minimum of 7 psi (0.5 bar).

**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.

Material Standards:

Frame Casting: Brass UNS-C84400

Deflector: Brass

Fusible Link Assembly: Beryllium Nickel, coated with Polyurethane

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

Compression Screw: Brass UNS-C36000

Pip Cap: Brass UNS-C36000

Pip Cap Adapter: Brass UNS-C36000

Orifice: Brass UNS-C36000

Tube: ERW Hydraulic Steel Tube

Barrel End and Threads: QM Brass

Support (Internal): QM Brass

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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Dry Barrel Seals: (NOTE: 2 seals included with each VK544 and 1 with each VK545 or VK546):

Seal:

ASTM D1056 2A0/1 4015-EL EPDM-Butyl-PE Foam Rubber OR

ASTM D1056 2A1 Neoprene/EPDM/SBR OR

ASTM D1056 2C1 Neoprene/EPDM

Over Seal Ring and Under Seal Ring: Cold Rolled Steel

Finish: White Paint

#10 Screws: Stainless Steel

Escutcheon Materials:

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

Recessed Dry Escutcheons: Cold Rolled Steel UNS-G10080

Temperatures and Finishes:

Finish	Brass	Chrome	White Polyester
Suffix	A	F	M-/W
Temperature	165 °F (74 °C)	205 °F (96 °C)	280 °F (138 °C)
Suffix	C	E	G

Ordering Information: Refer to Table 1.

4. INSTALLATION

Refer to the applicable FM Loss Prevention data sheets.

Refer to appropriate NFPA Installation Standards.

5. OPERATION

During fire conditions, the heat-sensitive fusible element disengages, releasing the internal parts to open the waterway. Water flowing through the sprinkler orifice strikes the sprinkler deflector, forming a uniform spray pattern to suppress the fire.

6. INSPECTIONS, TESTS AND MAINTENANCE

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

7. AVAILABILITY

The Viking Standard Response Dry Pendent 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.

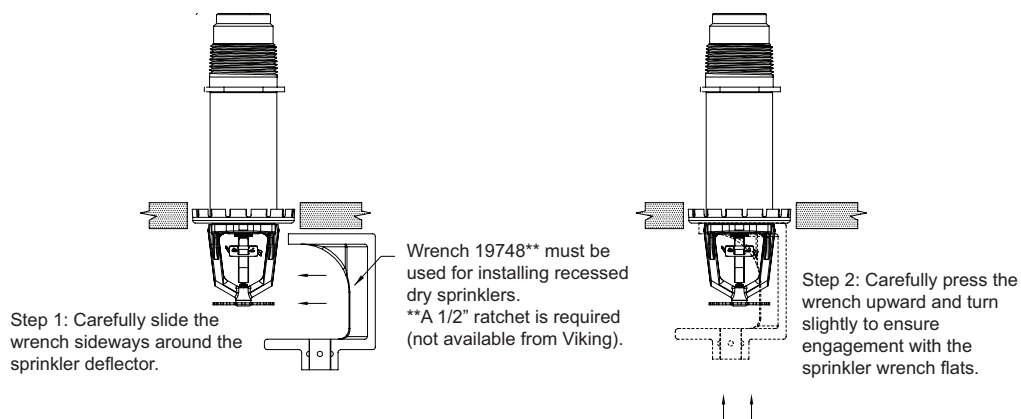


Figure 1: Wrench 19748W/B for Adjustable Recessed Dry Pendent Sprinklers



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TABLE 1: ORDERING INFORMATION

Instructions: Using the sprinkler base part number,

(1) add the suffix for the desired Finish

(2) add the suffix for the desired Temperature Rating.

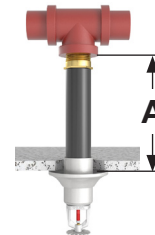
(3) Add the "A" Dimension

Model	Sprinkler Base Part No.	Size		1: Finishes		2: Temperature Ratings			
		NPT Inch	BSP mm	Description	Suffix ¹	Nominal Rating ⁴	Frame Paint Color	Max. Ambient Ceiling Temperature ²	Suffix
VK544	19830	1-1/4	--	Brass ³	A	165 °F (74 °C)	None	100 °F (38 °C)	C
	19831	--	32	Chrome	F	205 °F (96 °C)	White	150 °F (65 °C)	E
VK545	19835	1-1/4	--	White Polyester	M-W	280 °F (138 °C)	Blue	225 °F (107 °C)	G
	19836	--	32						
VK546	19840	1-1/4	--						
	19841	--	32						

3. Available "A" Lengths Inches (mm)

12 (305)
18 (457)
24 (610)
30 (762)
36 (914)
42 (1067)
48 (1219)

The "A" Dimension is the distance as measured from the face of the fitting in which the sprinkler will be installed to the face of the finished ceiling in the protected area. See Figures 2, 3, and 4



Example: 19835FC12 is a VK545 with a Chrome finish and a 165 temperature rating with "A" dimension of 12 inches. 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.

Accessories

Sprinkler Wrench⁵:

Socket Wrench (for Recessed sprinklers): Part No. 19748W/B - requires a 1/2" ratchet (not available from Viking)

Replacement Escutcheons:

A. Adjustable Standard Dry Escutcheon: Base Part No. 19730.

B. Recessed Dry Escutcheon Cup: Base Part No. 19728.

Dry Barrel Seals: (NOTE: 2 seals are included with each VK544 and 1 with each VK545 or VK546)

Part No. 22089M/B

Footnotes

- Where a dash (-) is shown in the Finish suffix designation, insert the desired Temperature Rating suffix.
- 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.
- The VK544 is the only sprinkler available with a brass finish.
- The VK545 is not available with a 280 °F (138 °C) temperature rating.
- For Standard Adjustable and Plain Barrel sprinklers, use a pipe wrench applied on the inlet housing.



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Approval Chart FM

Standard Response ELO Dry Pendent Sprinklers
 Maximum 175 PSI (12 bar) WWP

Sprinkler Base Part No. ¹	SIN	Style	Thread Size		Nominal K-Factor ²		Order Length Increment		FM Approvals ⁴ (Refer also to Design Criteria below.)
			NPT	BSP	U.S.	Metric ³	Inches	mm	
19830	VK544	Plain Barrel	1-1/4"	--	11.2	--	6"	--	A1
19831			--	32 mm	--	161.3	--	153	A1
19835	VK545	Adjustable Recessed	1-1/4"	--	11.2	--	6"	--	B2
19836			--	32 mm	--	161.3	--	153	B2
19840	VK546	Adjustable Standard	1-1/4"	--	11.2	--	6"	--	A3
19841			--	32 mm	--	161.3	--	153	A3

Approved Finishes and "A" Dimensions

Approved Temperature Ratings	Approved Finishes and "A" Dimensions
A - 165 °F (74 °C), 205 °F (96°C) and 280 °F (138 °C) B - 165 °F (74 °C) and 205 °F (96°C)	1 - Brass, Chrome, and White Polyester, with "A" dimensions 12" to 48" (305 to 1,22 m) 2 - Chrome and White Polyester, with "A" dimensions 12" to 48" (305 to 1,22 m) 3 - Chrome, and White Polyester with a Chrome or White Polyester Sleeve and Escutcheon with "A" dimensions 12" to 48" (305 to 1,22 m)

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 FM Approvals available at the time of printing. Other approvals may be in process. Check with the manufacturer for any additional approvals.

DESIGN CRITERIA - FM

(Also refer to Approval Chart above.)

FM Approval Requirements:

ELO Dry Pendent Sprinklers in the Approval Chart above are FM Approved as standard response, standard spray storage sprinklers as indicated in the FM Approval Guide. For specific application and installation requirements, reference the latest applicable FM Loss Prevention Data Sheets (including 2-0) and Technical Advisory Bulletins. FM Global Loss Prevention Data Sheets and Technical Advisory Bulletins 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 Bulletin Form 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.



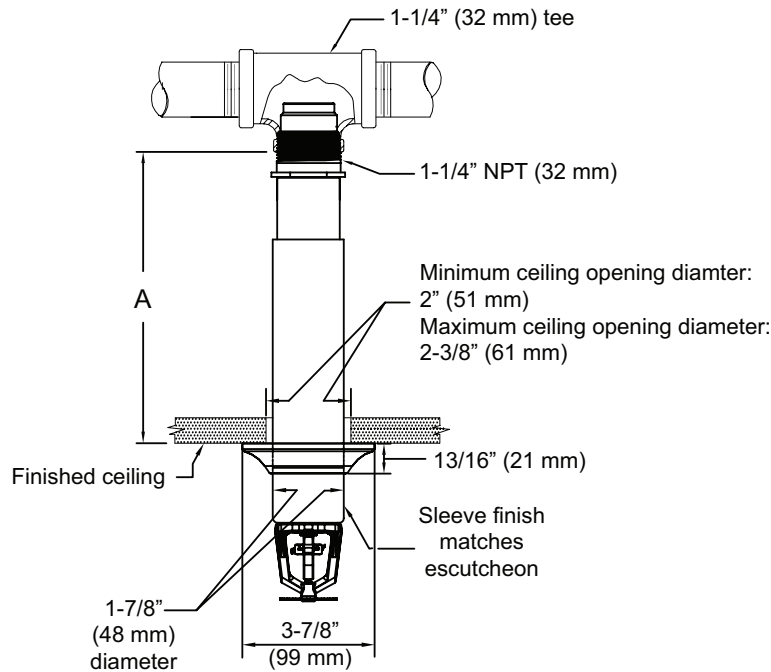
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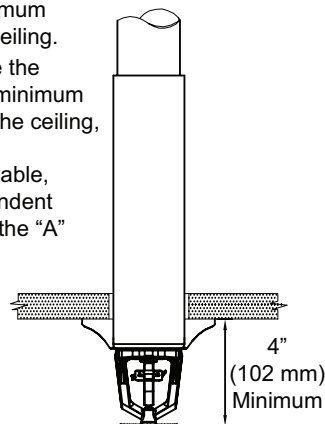
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For "A" Dimension:

1. Determine the distance from the face of the tee to the finished ceiling.
2. Round to the nearest 6" (153 mm) increment between 12" and 48" (305 mm and 1,22 m).
3. Per "A" dimension, the deflector will be located approximately 4" (102 mm) below the ceiling.



Deflector at minimum distance below ceiling.
 NOTE: To locate the deflector at the minimum distance below the ceiling, with no upward adjustment available, order the dry pendent sprinkler as per the "A" dimension.



Deflector at maximum distance below ceiling.
 NOTE: To locate the deflector at the maximum distance below the ceiling, with no downward adjustment available, order the dry pendent sprinkler 6" (153 mm) longer than the "A" dimension.

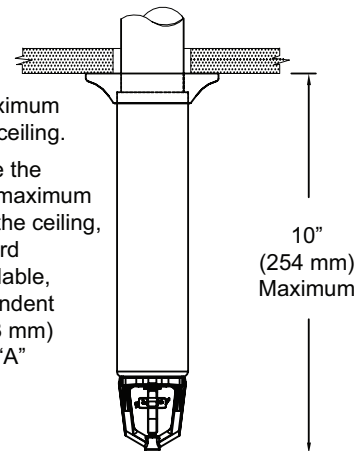


Figure 2: Adjustable Standard Dry Pendent Sprinkler



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For "A" Dimension:

1. Determine the distance from the face of the tee to the finished ceiling.
2. For adjustable recessed the "A" dimension must be a minimum of 12" (305 mm) up to 48" (1,22 m) in 6" (153 mm) increments.

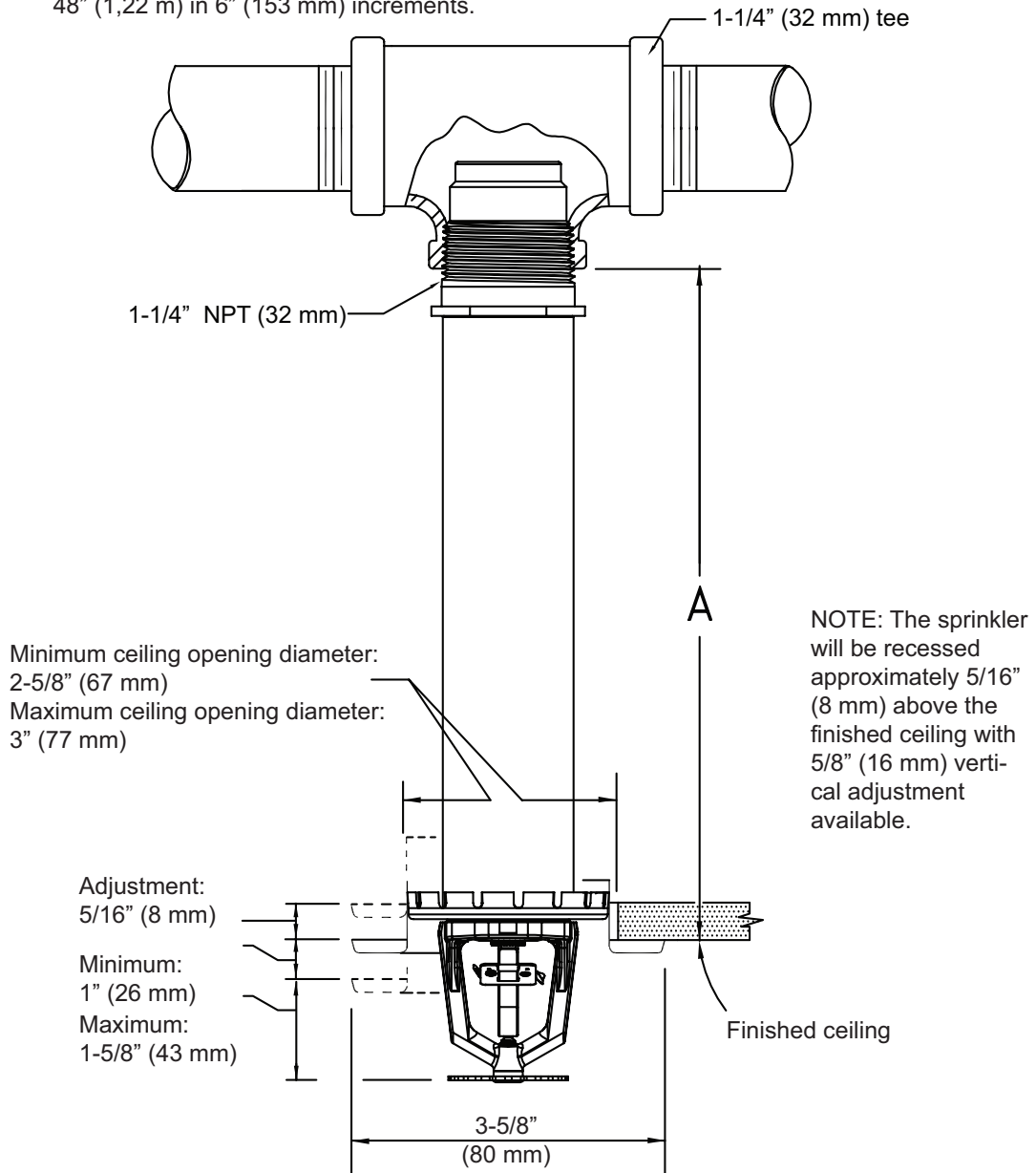


Figure 3: Adjustable Recessed Dry Pendent Sprinkler



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For "A" Dimension:

1. Determine the distance from the face of the tee to the base of the sprinkler.
2. Round up to the next higher 6" (153 mm) increment between 12" and 48" (305 mm and 1,22 m)

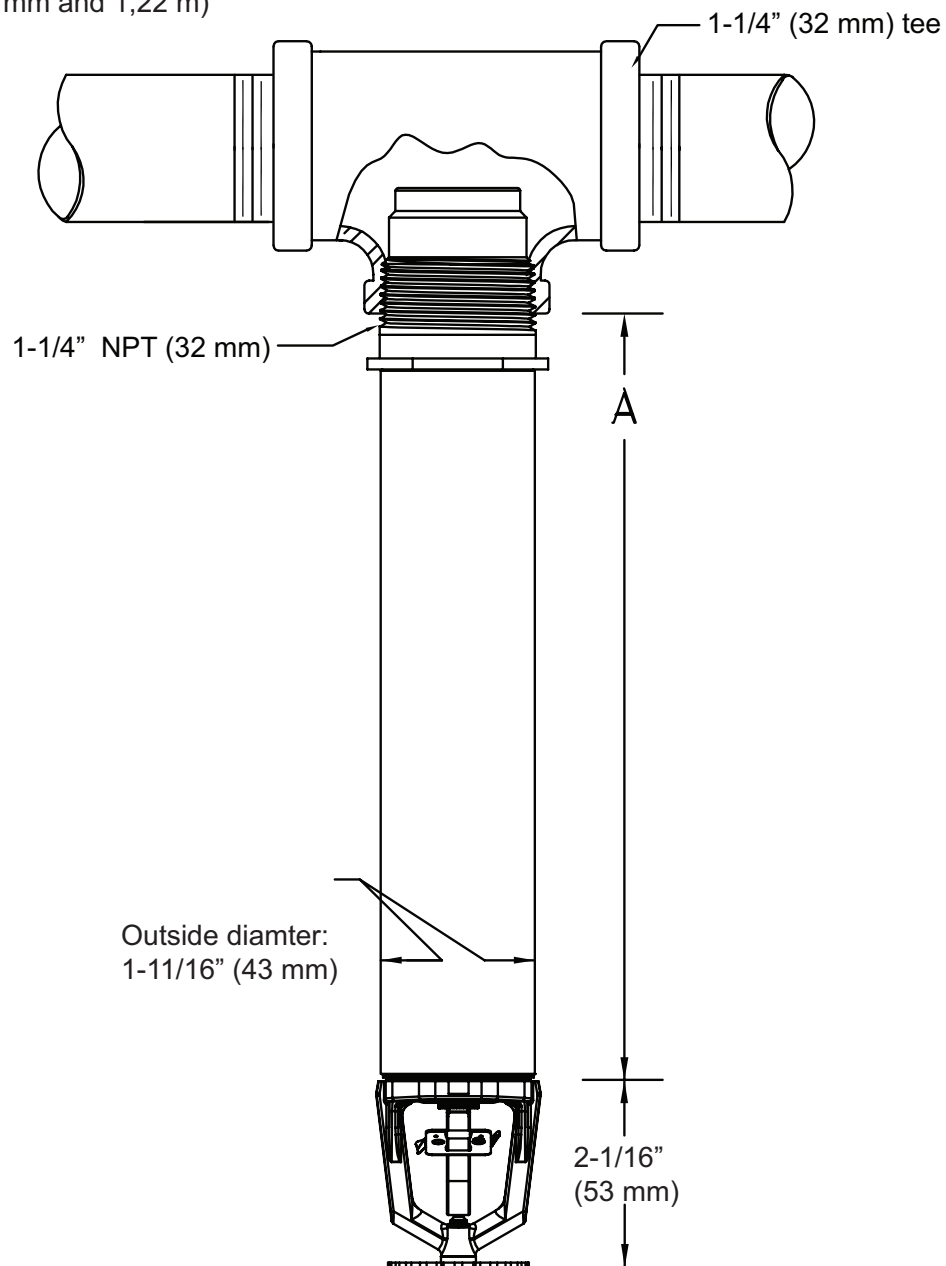


Figure 4: Plain Barrel Dry Pendent Sprinkler



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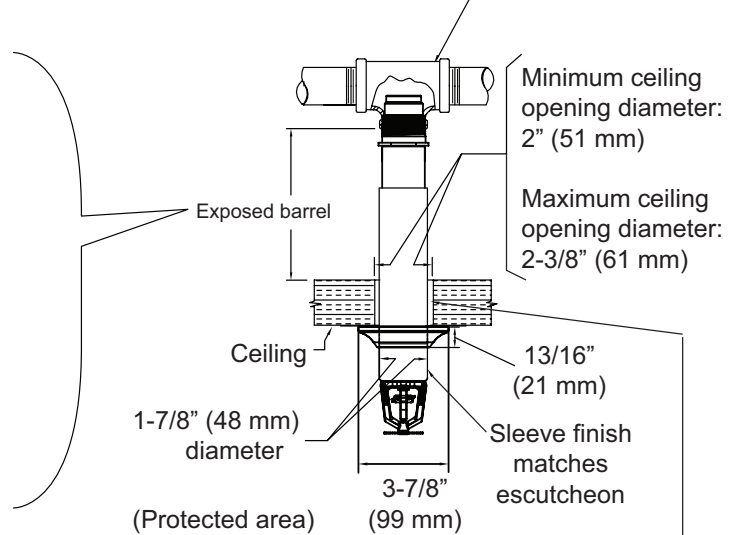
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Ambient Temperature of Protected Area* at the Discharge End of the Sprinkler	Exposed Barrel Ambient Temperature		
	40°F(4°C)	50°F(10°C)	60°F(16°C)
	Exposed Minimum Barrel Length** Face of Tee to Top of Ceiling In. (mm)		
40 °F(4 °C)	0	0	0
30 °F(-4 °C)	0	0	0
20 °F(-7 °C)	4 (102)	0	0
10 °F(-12 °C)	8 (203)	1 (26)	0
0 °F(-18 °C)	12 (305)	3 (76)	0
-10 °F(-23 °C)	14 (356)	4 (102)	1 (26)
-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)

Install 1-1/4" NPT (32 mm BSP) threaded end of dry pendent sprinkler into the 1-1/4" NPT (32 mm BSP) 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)

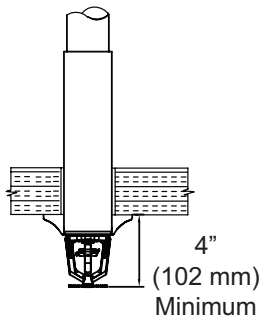


Seal the clearance space around the sprinkler to avoid leakage of air into the protected area and consequent formation of condensate around the frame, which could inhibit operation or cause premature operation. Refer to Figure 6 below.

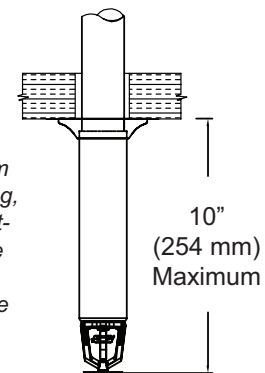
If humidity and temperature differential causes condensation on the exposed dry sprinkler, consider wrapping the exposed barrel with insulation, foam insulating tape, or equivalent.

Deflector at minimum distance below ceiling.

NOTE: To locate the deflector at the minimum distance below the ceiling, with no upward adjustment available, order the dry pendent as per the "A" dimension.



NOTE: To locate the deflector at the maximum distance below the ceiling, with no downward adjustment available, order the dry pendent sprinkler 6" (153 mm) longer than the "A" dimension.



Deflector at maximum distance below ceiling.

*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 2 - 4 for the "A" dimension.

NOTE: Exposed minimum barrel lengths are inclusive up to 30 mph wind velocities.

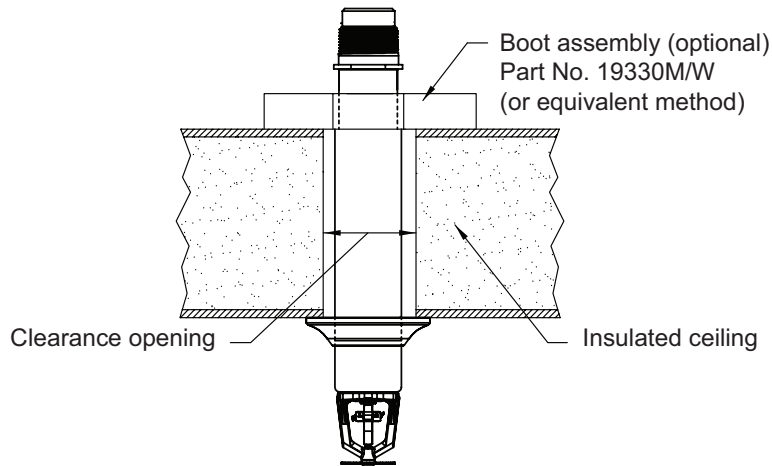
Figure 5: Dry Pendent Sprinkler Required Minimum Barrel Length Based on Ambient Temperature in the Protected Area (Adjustable Standard Dry Pendent Sprinkler is shown)



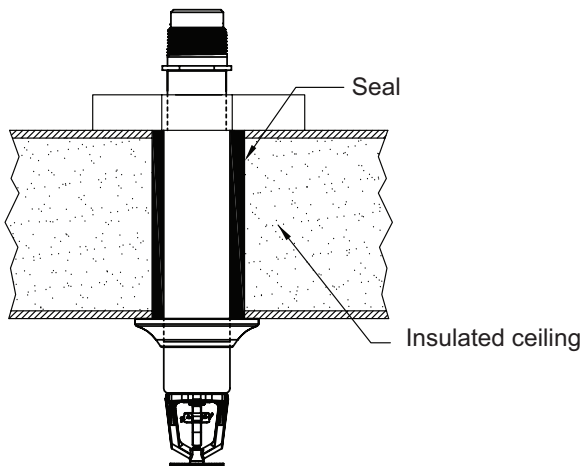
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Dry Sprinkler Seal on the Exterior of the ceiling



Dry Sprinkler Seal Within the ceiling

Figure 6: Dry Sprinkler Seal (Adjustable Standard Dry Pendent Sprinkler is Shown)