

## Series DS-2 Dry-Type Sprinklers 11.2K\* Pendent Standard and Quick Response, Standard Coverage

### General Description

TYCO Series DS-2 Dry-Type Sprinklers, 11.2K Pendent, Standard (5 mm Bulb) and Quick Response (3 mm Bulb) and Standard Coverage, are decorative glass bulb automatic sprinklers typically used where:

- pendent sprinklers are required on dry pipe systems that are exposed to freezing temperatures; for example, sprinkler drops from unheated portions of buildings
- sprinklers and/or a portion of the connecting piping may be exposed to freezing temperatures; for example, sprinkler drops from wet systems into freezers

#### NOTICE

*Series DS-2 Dry-Type Sprinklers described herein must be installed and maintained in compliance with this document, as well as with the applicable standards of the National Fire Protection Association, in addition to the standards of any other Authorities Having Jurisdiction. Failure to do so may impair the performance of these devices.*

*Owners are responsible for maintaining their fire protection system and devices in proper operating condition. The installing contractor or sprinkler manufacturer should be contacted with any questions.*

#### IMPORTANT

*Always refer to Technical Data Sheet TFP700 for the "INSTALLER WARNING" that provides cautions with respect to handling and installation of sprinkler systems and components. Improper handling and installation can permanently damage a sprinkler system or its components and cause the sprinkler to fail to operate in a fire situation or cause it to operate prematurely.*

*Series DS-2 Dry-Type Sprinklers must only be installed in fittings that meet the requirements of the Design Criteria section.*

### Model/Sprinkler Identification Numbers (SINs)

TY5255 - Standard Response  
TY5235 - Quick Response

### Technical Data

#### Approvals

UL and C-UL Listed  
NYC Approved under MEA 173-02-E

Refer to Table A.

#### Maximum Working Pressure

175 psi (12,1 bar)

#### Inlet Thread Connections

1-inch NPT (Standard Order)  
ISO 7-R1

#### Discharge Coefficient

Refer to Table B.

#### Temperature Ratings

Refer to Table A.

#### Finishes

Sprinkler: Natural Brass, Chrome Plated, White Polyester

Escutcheon: White Coated or Chrome Plated, Brass Plated



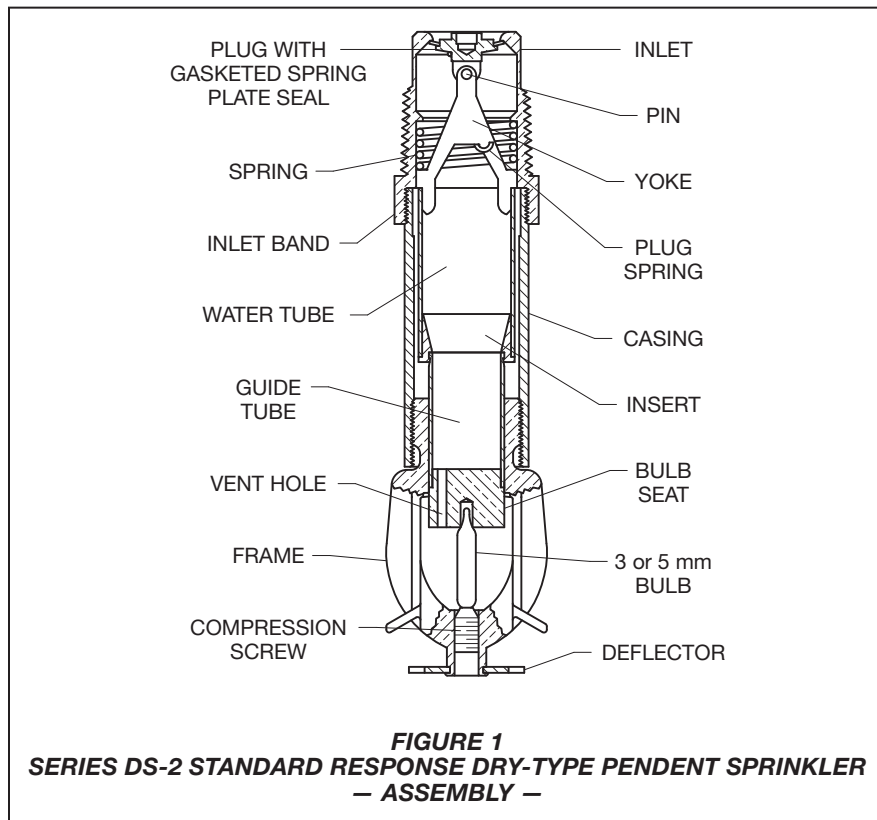
#### Physical Characteristics

Inlet . . . . .	Copper
Plug . . . . .	Copper
Yoke . . . . .	Stainless Steel
Casing . . . . .	Galvanized Carbon Steel
Insert . . . . .	Bronze
Bulb Seat . . . . .	Bronze
Bulb . . . . .	Glass
Compression Screw . . . . .	Bronze
Deflector . . . . .	Bronze
Frame . . . . .	Bronze
Guide Tube . . . . .	Stainless Steel
Water Tube . . . . .	Stainless Steel
Spring . . . . .	Stainless Steel
Gasketed Spring Plate Seal . . . . .	Beryllium Nickel w/Teflon*
Pin . . . . .	Stainless Steel
Button Spring . . . . .	Stainless Steel
Escutcheon . . . . .	Carbon Steel

\*Refer to Table B for info on discharge coefficients.

\*DuPont Registered Trademark

<b>Temperature Rating</b>	<b>Bulb Color Code</b>	<b>TY5255</b> Standard Response  <b>TY5235</b> Quick Response with Flush Escutcheon (Figure 2) with Extended Escutcheon (Figure 4) without Escutcheon (Figure 5)			<b>TY5255</b> Standard Response  <b>TY5235</b> Quick Response with Recessed Escutcheon (Figure 3)		
		<b>SPRINKLER FINISH</b>					
		<b>Natural Brass</b>	<b>Chromed Plate</b>	<b>White Polyester</b>	<b>Natural Brass</b>	<b>Chromed Plate</b>	<b>White Polyester</b>
135°F (57°C)	Orange	1, 2, 3			1, 2, 3		
155°F (68°C)	Red						
175°F (79°C)	Yellow						
200°F (93°C)	Green	N/A					
286°F (141°C)	Blue						
<b>Notes</b>							
1. Listed by Underwriters Laboratories, Inc. (maximum order length of 48 inches)							
2. Listed by Underwriters Laboratories for use in Canada (maximum order length of 48 inches)							
3. Approved by the City of New York under MEA 173-02-E							
<b>TABLE A</b> <b>SERIES DS-2 STANDARD RESPONSE DRY-TYPE PENDENT SPRINKLERS</b> <b>– LABORATORY LISTINGS AND APPROVALS –</b>							

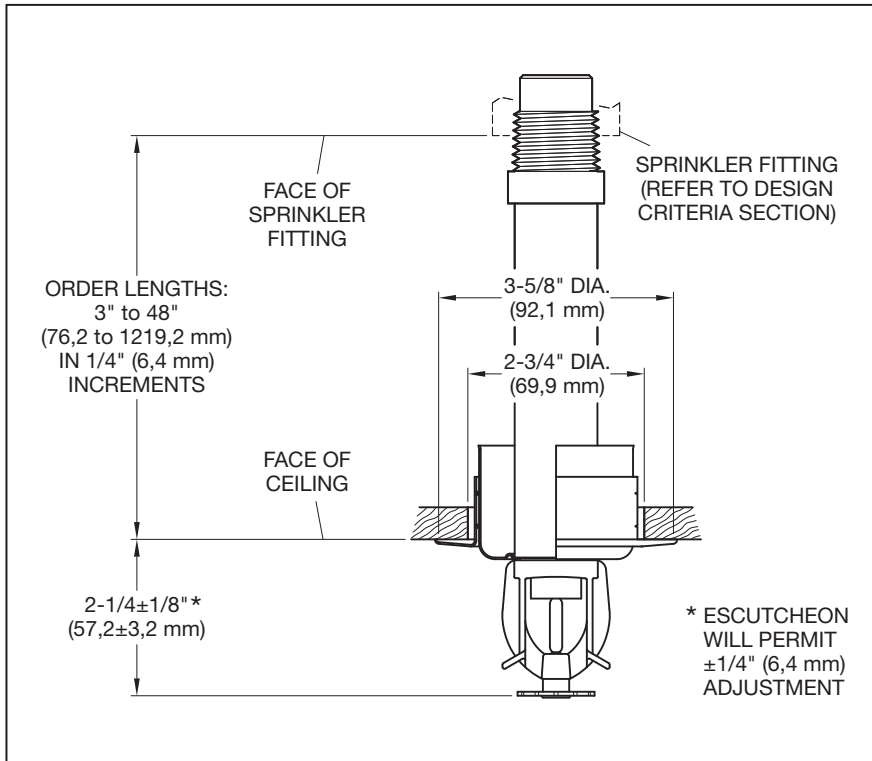


## Operation

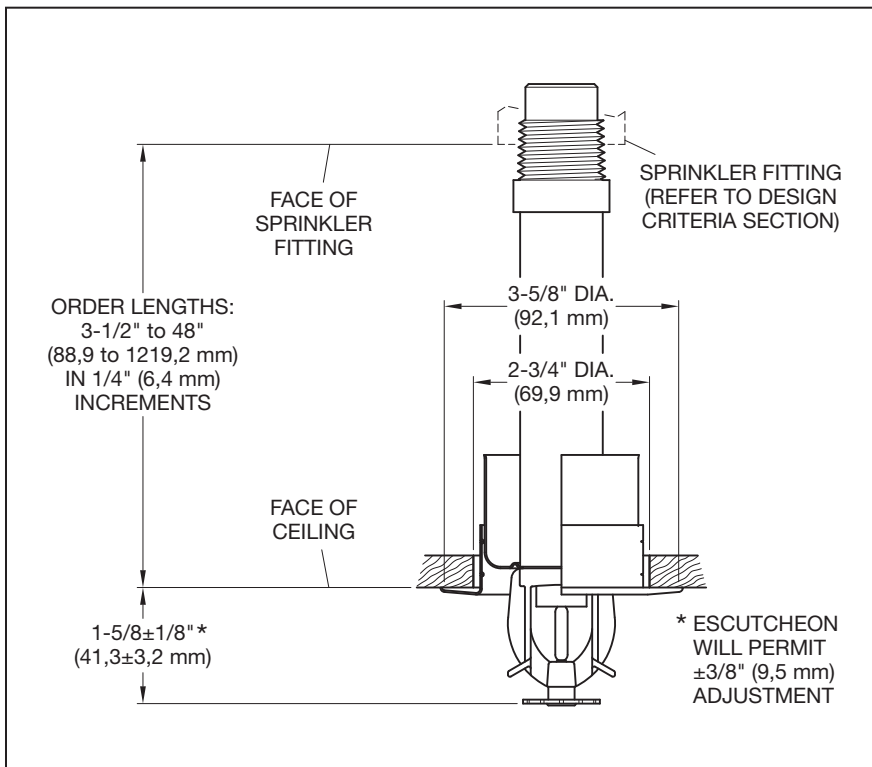
When TYCO Series DS-2 Dry-Type Sprinklers are in service, water is prevented from entering the assembly by the Plug with Gasketed Spring Plate Seal (Figure 1) in the Inlet of the Sprinkler.

The glass bulb contains a fluid that expands when exposed to heat. When the rated temperature is reached, the fluid expands sufficiently to shatter the glass bulb, and the Bulb Seat is released.

The compressed Spring is then able to expand and push the Water Tube as well as the Guide Tube outward. This action simultaneously pulls inward on the Yoke, withdrawing the Plug with Gasketed Spring Plate Seal from the Inlet, allowing the sprinkler to activate and flow water.



**FIGURE 2**  
**SERIES DS-2 DRY-TYPE PENDENT WITH FLUSH ESCUTCHEON**  
**STANDARD RESPONSE (TY5255) OR QUICK RESPONSE (TY5235)**



**FIGURE 3**  
**SERIES DS-2 DRY-TYPE PENDENT WITH RECESSED ESCUTCHEON**  
**STANDARD RESPONSE (TY5255) OR QUICK RESPONSE (TY5235)**

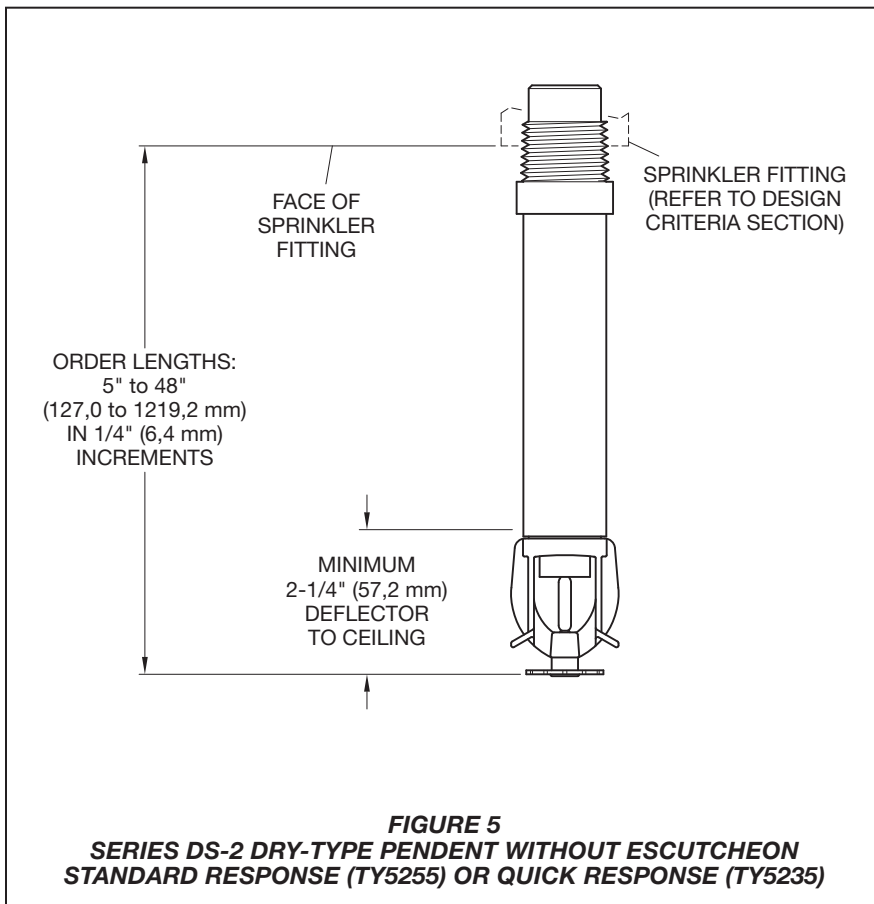
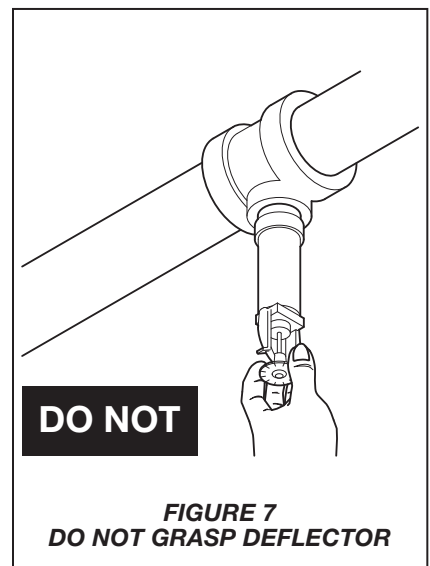
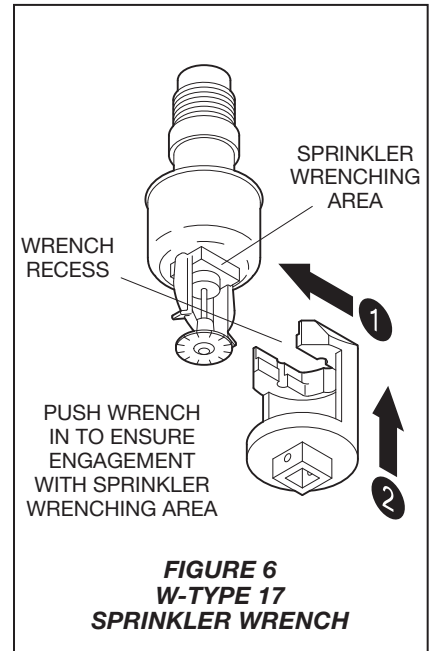
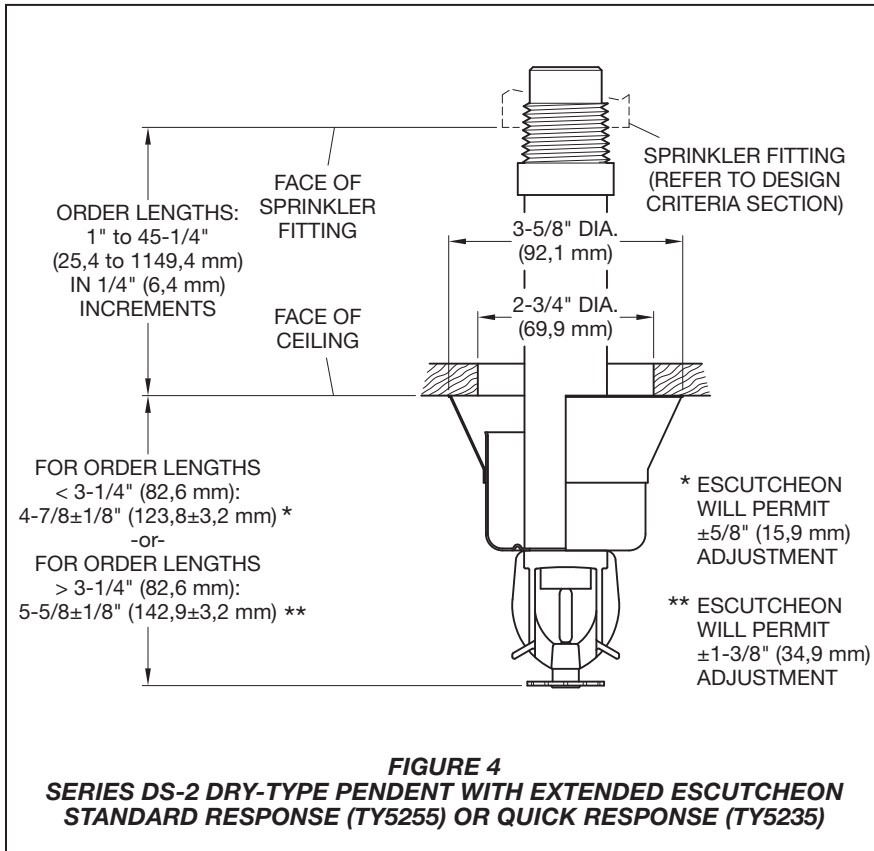
<b>K-Factor LENGTH, Inches (mm)</b>	<b>K-Factor, GPM/psi<sup>1/2</sup> (LPM/bar<sup>1/2</sup>)</b>
2-1/2 to 6-1/4 (63 mm to 159 mm)	11.2 (161,3)
6-1/2 to 10-1/2 (165 mm to 267 mm)	11.1 (159,8)
10-3/4 to 14-3/4 (273 mm to 375 mm)	11.0 (158,4)
15 to 18-3/4 (381 mm to 476 mm)	10.9 (157,0)
19 to 23 (483 mm to 584 mm)	10.8 (155,5)
23-1/4 to 26-3/4 (591 mm to 679 mm)	10.7 (154,1)
27-1/4 to 31-1/4 (692 mm to 794 mm)	10.6 (152,6)
31-1/2 to 35-1/4 (800 mm to 895 mm)	10.5 (151,2)
35-1/2 to 39-1/2 (902 mm to 1003 mm)	10.4 (149,8)
39-3/4 to 43-1/2 (1010 mm to 1105 mm)	10.3 (148,3)
43-3/4 to 48 (1111 mm to 1219 mm)	10.2 (146,9)

**Notes**

K-Factor Length is determined as follows:

- **Flush:** Order Length from Figure 2 plus 1/2 inch (12,7 mm)
- **Recessed:** Order Length from Figure 3 plus 1/4 inch (6,3 mm).
- **Extended:** Order Length from Figure 4 plus 3-1/4 inch (82,6 mm)
- **Without Escutcheon:** Order Length from Figure 5 minus 2-1/4 inches (57,2 mm)

**TABLE B**  
**— DISCHARGE COEFFICIENTS —**



Ambient Temperature Exposed to Discharge End of Sprinkler	Temperatures for Heated Area <sup>1</sup>		
	40°F (4°C)	50°F (10°C)	60°F (16°C)
	Minimum Exposed Barrel Length, Inches (mm) <sup>2</sup>		
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 (200)	1 (25)	0
0°F (-18°C)	12 (305)	3 (75)	0
-10°F (-23°C)	14 (355)	4 (100)	1 (25)
-20°F (-29°C)	14 (355)	6 (150)	3 (75)
-30°F (-34°C)	16 (405)	8 (200)	4 (100)
-40°F (-40°C)	18 (455)	8 (200)	4 (100)
-50°F (-46°C)	20 (510)	10 (255)	6 (150)
-60°F (-51°C)	20 (510)	10 (255)	6 (150)

**Notes**

- For protected area temperatures that occur between values listed above, use the next cooler temperature.
- These lengths are inclusive of wind velocities up to 30 mph (18,6 kph).

**TABLE C**  
**EXPOSED SPRINKLER BARRELS IN WET PIPE SYSTEMS**  
**– MINIMUM RECOMMENDED LENGTHS –**

## Design Criteria

TYCO Series DS-2 Dry-Type Sprinklers are intended for use in fire sprinkler systems designed in accordance with the standard coverage installation rules recognized by the applicable Listing agency; for example, UL Listing is based on NFPA 13 requirements.

### Sprinkler Fittings

Install 1-inch NPT Series DS-2 Dry-Type Sprinklers in the 1-inch NPT outlet or run of the following fittings:

- malleable or ductile iron threaded tee fittings that meet the dimensional requirements of ANSI B16.3 (Class 150)
- cast iron threaded tee fittings that meet the dimensional requirements of ANSI B16.4 (Class 125).

Do not install Series DS-2 Dry-Type Sprinklers into elbow fittings. The Inlet of the sprinkler can contact the interior of the elbow.

The unused outlet of the threaded tee is plugged as shown in Figure 9.

You can also install Series DS-2 Dry-Type Sprinklers in the 1-inch NPT outlet of a GRINNELL Figure 730 Mechanical Tee. However, the use of the Figure 730 Tee for this arrangement is limited to wet pipe systems.

The configuration shown in Figure 8 is only applicable for wet pipe systems where the sprinkler fitting and water-filled pipe above the sprinkler fitting are not subject to freezing and where the length of the Dry-Type Sprinkler has the minimum exposure length depicted in Figure 10. Refer to the Exposure Length section.

For wet pipe system installations of 1-inch NPT Series DS-2 Dry-Type Sprinklers connected to CPVC piping, use only the following TYCO CPVC fittings:

- 1" x 1" NPT Female Adapter (P/N 80145)
- 1" x 1" x 1" NPT Sprinkler Head Adapter Tee (P/N 80249).

For dry pipe system installations, use only the side outlet of maximum 2-1/2-inch reducing tee when locating Series DS-2 Dry-Type Sprinklers directly below the branch line. Otherwise, use the configuration shown in Figure 9 to assure complete water drainage from above Series DS-2 Dry-Type Sprinklers and the branch line. Failure to do so may result in pipe freezing and water damage.

### NOTICE

*Do not install Series DS-2 Dry-Type Sprinkler into any other type fitting without first consulting the Technical Services Department. Failure to use the appropriate fitting may result in one of the following:*

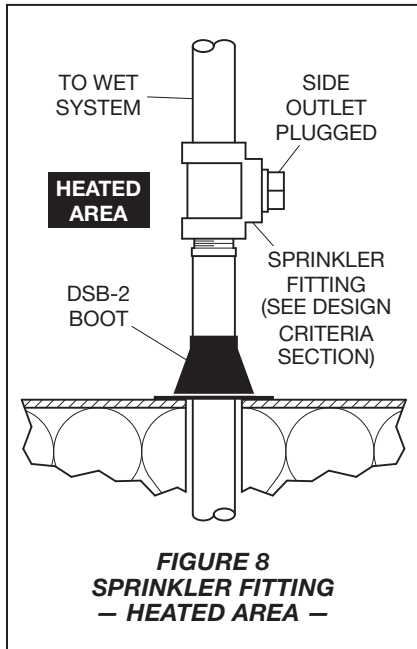
- Failure of the sprinkler to operate properly due to formation of ice over the Inlet Plug or binding of the Inlet Plug.*
- Insufficient engagement of the Inlet pipe-threads with consequent leakage.*

### Drainage

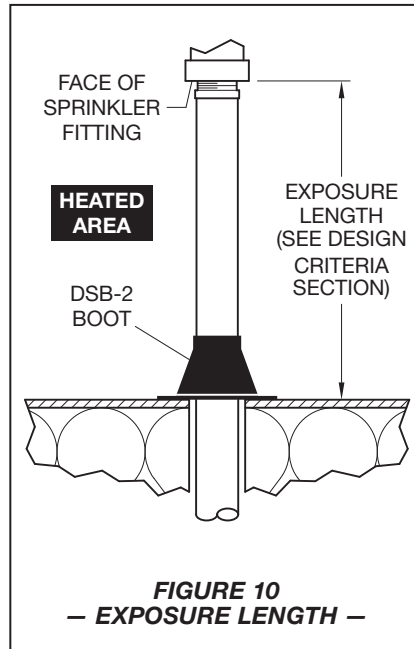
In accordance with the minimum requirements of the National Fire Protection Association for dry pipe sprinkler systems, branch, cross, and feed-main piping connected to Dry Sprinklers and subject to freezing temperatures must be pitched for proper drainage.

### Exposure Length

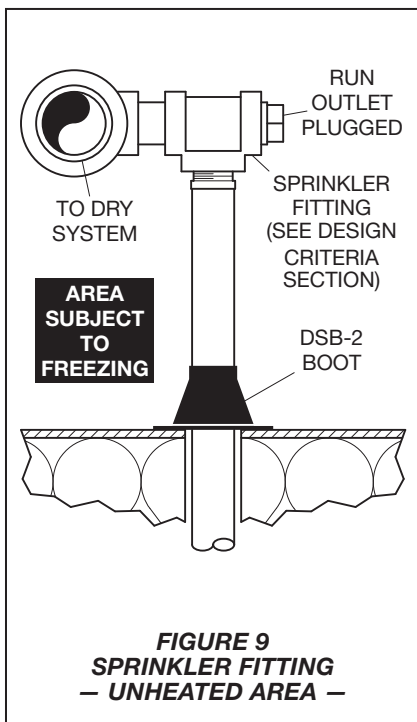
When using Dry Sprinklers in wet pipe sprinkler systems to protect areas subject to freezing temperatures, use Table C to determine a sprinkler's appropriate exposed barrel length to prevent water from freezing in the connecting pipes due to conduction. The exposed barrel length measurement must be taken from the face of the sprinkler fitting to the surface of the structure or insulation that is exposed to the heated area. Refer to Figure 10 for an example.



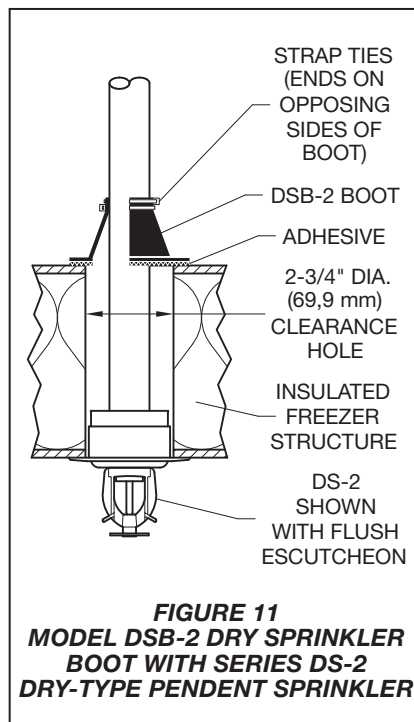
**FIGURE 8**  
**SPRINKLER FITTING**  
**— HEATED AREA —**



**FIGURE 10**  
**— EXPOSURE LENGTH —**



**FIGURE 9**  
**SPRINKLER FITTING**  
**— UNHEATED AREA —**



**FIGURE 11**  
**MODEL DSB-2 DRY SPRINKLER**  
**BOOT WITH SERIES DS-2**  
**DRY-TYPE PENDENT SPRINKLER**

For protected area temperatures between those given above, the minimum recommended length from the face of the fitting to the outside of the protected area may be determined by interpolating between the indicated values.

### Clearance Space

In accordance with Section 8.4.9.2 of the 2010 edition of NFPA 13, when connecting an area subject to freezing and an area containing a wet pipe sprinkler system, the clearance space around the sprinkler barrel of Dry-Type

Sprinklers must be sealed. Due to temperature differences between two areas, the potential for the formation of condensation in the sprinkler and subsequent ice build-up is increased. If this condensation is not controlled, ice build-up can occur that might damage the dry-type sprinkler and/or prevent proper operation in a fire situation.

Use of the Model DSB-2 Dry Sprinkler Boot, described in technical data sheet TFP591 and shown in Figure 11, can provide the recommended seal.

## Installation

Series DS-2 Dry-Type Sprinklers must be installed in accordance with the following instructions.

### NOTICE

*Series DS-2 Dry-Type Sprinklers must only be installed in fittings that meet the requirements of the Design Criteria section. Refer to the Design Criteria section for other important requirements regarding piping design and sealing of the clearance space around the Sprinkler Casing. With reference to Figure 7, do not grasp the sprinkler by the deflector. Failure to follow this instruction may impair performance of the device.*

Do not install any bulb-type sprinkler if the bulb is cracked or there is a loss of liquid from the bulb. With the sprinkler held horizontally, a small air bubble should be present. The diameter of the air bubble is approximately 1/16 inch (1,6 mm) for the 135°F (57°C) rating to 1/8 inch (3,2 mm) for the 360°F (182°C) rating.

Obtain a leak-tight 1-inch NPT sprinkler joint by applying a minimum-to-maximum torque of 20 to 30 ft. lbs. (26,8 to 40,2 Nm). Higher levels of torque may distort the sprinkler Inlet with consequent leakage or impairment of the sprinkler.

Do not attempt to compensate for insufficient adjustment in an Escutcheon Plate by under or over-tightening the Sprinkler. Re-adjust the position of the sprinkler fitting to suit.

1. Install pendent sprinklers only in the pendent position. The deflector of a pendent sprinkler must be parallel to the ceiling.
2. With a non-hardening pipe-thread sealant such as Teflon<sup>®</sup> applied to the Inlet threads, hand-tighten the sprinkler into the sprinkler fitting. **Do not grasp the sprinkler by the deflector (Figure 7).**
3. Wrench-tighten the sprinkler using either:

- a pipe wrench on the Inlet Band or the Casing (Figure 1).
- the W-Type 17 Sprinkler Wrench on the Wrench Flat (Figure 2).

Apply the Wrench Recess of the W-Type 17 Sprinkler Wrench to the Wrench Flat.

**Note:** If sprinkler removal becomes necessary, remove the sprinkler using the same wrenching method noted above. Sprinkler removal is easier when a non-hardening sealant was used and torque guidelines were followed. After removal, inspect the sprinkler for damage.

4. After installing the ceiling and applying a ceiling finish, slide on the outer piece of the Escutcheon until it comes in contact with the ceiling. Do not lift the ceiling panel out of its normal position.

When using the Deep Escutcheon, hold the outer piece in contact with the mounting surface (ceiling or wall). Then rotate the inner piece approximately 1/4 turn with respect to the outer piece, to hold the Deep Escutcheon firmly together.

## Care and Maintenance

TYCO Series DS-2 Dry-Type Sprinklers must be maintained and serviced in accordance with the following instructions.

### NOTICE

*Before closing a fire protection system main control valve for maintenance work on the fire protection system that it controls, obtain permission to shut down the affected fire protection systems from the proper authorities and notify all personnel who may be affected by this action.*

Absence of the outer piece of an escutcheon, which is used to cover a clearance hole, may delay the time to sprinkler operation in a fire situation.

A Vent Hole is provided in the Bulb Seat (Figure 1) to indicate if the Dry Sprinkler is remaining dry. Evidence of leakage from the Vent Hole indicates potential leakage past the Inlet seal and the need to remove the sprinkler to determine the cause of leakage; for example, an improper installation or an ice plug. Close the fire protection system control valve and drain the system before removing the sprinkler.

Exercise care to avoid damage before, during, and after installation. Never paint, plate, coat, or otherwise alter automatic sprinklers after they leave the factory.

Never repaint factory-painted Cover Plates. When necessary, replace cover plates with factory-painted units. Non-factory applied paint can adversely delay or prevent sprinkler operation in the event of a fire.

Replace sprinklers that:

- were damaged by dropping, striking, wrench twisting, wrench slippage, or the like.
- were modified or over-heated.
- have cracked bulbs or have lost liquid from the bulbs. Refer to the Installation Section in this data sheet.
- are leaking or exhibiting visible signs of corrosion.

Responsibility lies with owners for the inspection, testing, and maintenance of their fire protection system and devices in compliance with this document, as well as with the applicable standards of the National Fire Protection Association (for example, NFPA 25), in addition to the standards of any other Authorities Having Jurisdiction. The installing contractor or sprinkler manufacturer should be contacted relative to any questions.

Automatic sprinkler systems are recommended to be inspected, tested, and maintained by a qualified Inspection Service in accordance with local requirements and/or national codes.

## Limited Warranty

Products manufactured by Tyco Fire Suppression and Building Products (TFSBP) are warranted solely to the original Buyer against defects in material and workmanship when paid for and properly installed and maintained under normal use and service. This warranty will expire twelve (12) months from installation or eighteen (18) months from delivery, whichever occurs first. No warranty is given for products or components manufactured by companies not affiliated by ownership with TFSBP or for products and components which have been subject to misuse, improper installation, corrosion, or which have not been installed, maintained, modified or repaired in accordance with applicable Standards of the National Fire Protection Association, and/or the standards of any other Authorities Having Jurisdiction. Materials found by TFSBP to be defective shall be either repaired or replaced, at TFSBP's sole option. TFSBP neither assumes, nor authorizes any person to assume for it, any other obligation in connection with the sale of products or parts of products. TFSBP shall not be responsible for sprinkler system design errors or inaccurate or incomplete information supplied by Buyer or Buyer's representatives.

In no event shall TFSBP be liable, in contract, tort, strict liability or under any other legal theory, for incidental, indirect, special or consequential damages, including but not limited to labor charges, regardless of whether TFSBP was informed about the possibility of such damages, and in no event shall TFSBP's liability exceed an amount equal to the sales price.

The foregoing warranty is made in lieu of any and all other warranties, express or implied, including warranties of merchantability and fitness for a particular purpose.

This limited warranty sets forth the exclusive remedy for claims based on failure of or defect in products, materials or components, whether the claim is made in contract, tort, strict liability or any other legal theory.

This warranty will apply to the full extent permitted by law. The invalidity, in whole or part, of any portion of this warranty will not affect the remainder.

P/N\* 61 - XXX - X - XXX

		MODEL/SIN			ORDER LENGTH (2)		
10	Standard Response Pendent with Flush Escutcheon	TY5255 (Figure 2)	1	NATURAL BRASS	WHITE	055	5.50"
11	Standard Response Pendent with Recessed Escutcheon	TY5255 (Figure 3)	4	WHITE POLYESTER	WHITE	082	8.25"
12	Standard Response Pendent with Extended Escutcheon	TY5255 (Figure 4)	9	CHROME PLATED	CHROME	180	18.00"
13	Standard Response Pendent without Flush Escutcheon	TY5255 (Figure 5)	0	CHROME PLATED	WHITE	187	18.75"
			5	NATURAL BRASS	BRASS PLATED	372	37.25"
						480	48.00"
30	Quick Response Pendent with Flush Escutcheon	TY5235 (Figure 2)					
31	Quick Response Pendent with Recessed Escutcheon	TY5235 (Figure 3)					
32	Quick Response Pendent with Extended Escutcheon	TY5235 (Figure 4)					
35	Quick Response Pendent without Flush Escutcheon	TY5235 (Figure 5)					

TEMPERATURE RATING (3)	
0	135°F (57°C)
1	155°F (68°C)
2	175°F (79°C)
3	200°F (93°C)
4	286°F (141°C)

**Notes**

\* Use Prefix "I" for ISO 7-R1 Connection; for example, I-61-101-1-180.

- Escutcheon Finish applies to sprinklers with escutcheons.
- Dry-Type Sprinklers are furnished based upon "Order Length" as measured per Figures 2 through 5, as applicable, and for each individual sprinkler where it is to be installed. After the measurement is taken, round it to the nearest 1/4 inch increment.
- 286°F (141°C) temperature rating applies to non-recessed sprinkler assemblies.

**TABLE D**  
**SERIES DS-2 STANDARD AND QUICK RESPONSE, STANDARD COVERAGE, DRY-TYPE SPRINKLERS**  
**— PART NUMBER SELECTION —**

## Ordering Procedure

Contact your local distributor for availability. When placing an order, indicate the full product name, including description and Part Number (P/N).

### Dry Sprinklers

When ordering 11.2 K-Factor Series DS-2 Dry-Type Sprinklers, specify the following information:

- Model/SIN  
Standard Response (TY5255) or Quick Response (TY5235), Standard Coverage, Dry-Type Pendent Sprinkler

- Order Length  
Dry-Type Sprinklers are furnished based upon Order Length as measured from the face of the wall to the face of the sprinkler fitting (Figure 2 through 5). After the measurement is taken, round it to the nearest 1/4 inch increment.
- Inlet Connections  
1-inch NPT or ISO 7-R1
- Temperature Rating
- Sprinkler Finish
- Escutcheon Type
- Part Number from Table D

### Sprinkler Wrench

Specify W-Type 17 Sprinkler Wrench, P/N 56-010-4-118.

### Sprinkler Boot

Specify Model DSB-2 Dry Sprinkler Boot, P/N 63-000-0-002. This Part Number includes one Boot, two Strap Ties, and 1/3 oz. of Adhesive (quantity of adhesive is sufficient for installing one Boot).