

## 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 (e.g., sprinkler drops from unheated portions of buildings)
- sprinklers and/or a portion of the connecting piping may be exposed to freezing temperatures (e.g., 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 (NFPA), in addition to the standards of any other authorities having jurisdiction. Failure to do so may impair the performance of these devices.

The owner is responsible for maintaining their fire protection system and devices in proper operating condition. Contact the installing contractor or product manufacturer with any questions.

#### IMPORTANT

Refer to Technical Data Sheet TFP2300 for warnings pertaining to regulatory and health information.

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.

### 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

ISO 7-R 1

#### Discharge Coefficient

Refer to Table C.

#### Temperature Ratings

Refer to Table A.

#### Finishes

Sprinkler: Refer to Table D.

Escutcheon: Refer to Table D.

#### 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



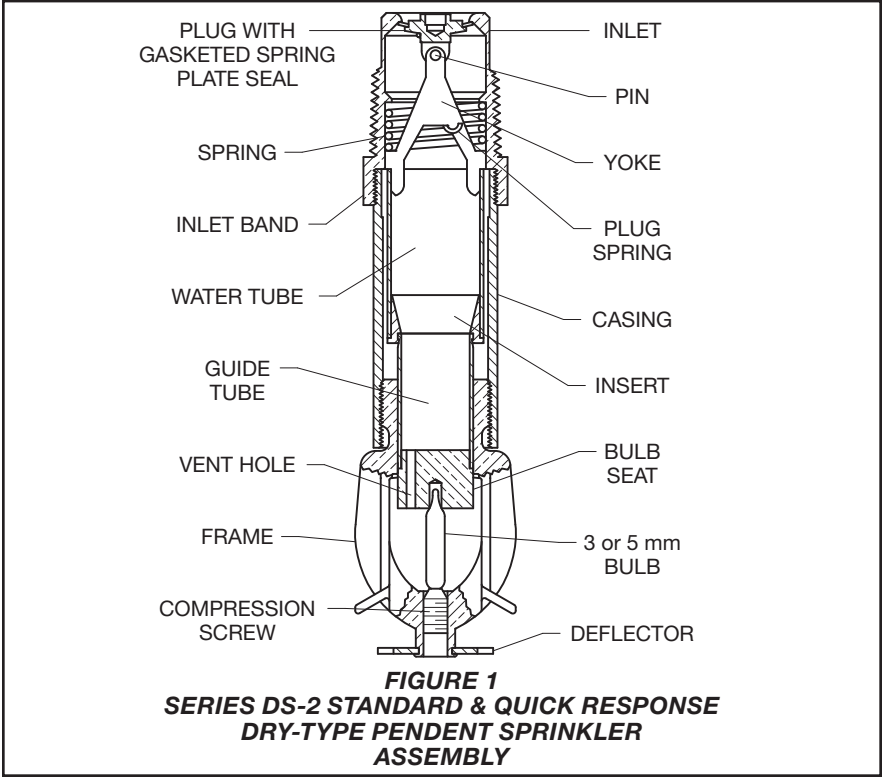
### Operation

When TYCO Series DS-2 Dry-Type Sprinklers, 11.2K Pendent, Standard (5 mm bulb) and Quick Response (3 mm bulb), and Standard Coverage are in service, water is prevented from entering the assembly by the Plug with Gasketed Spring Plate Seal (Ref. 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.

Temperature Rating	Bulb Color Code	TY5255 Standard Response		
		TY5235 Quick Response		
		with Flush Escutcheon (Figure 2)		
		with Recessed Escutcheon (Figure 3)		
		with Extended Escutcheon (Figure 4)		
		without Escutcheon (Figure 5)		
		SPRINKLER FINISH		
		Natural Brass	Chromed Plated	Signal White
135°F (57°C)	Orange	1, 2, 3		
155°F (68°C)	Red			
175°F (79°C)	Yellow			
200°F (93°C)	Green			
286°F (141°C)	Blue			
<b>Notes:</b> 1. Listed by Underwriters Laboratories, Inc. (UL), maximum order length of 48 inches 2. Listed by Underwriters Laboratories for use in Canada (C-UL), 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 &amp; QUICK RESPONSE, STANDARD COVERAGE</b> <b>DRY-TYPE PENDENT SPRINKLERS</b> <b>LABORATORY LISTINGS AND APPROVALS</b>				



# Design Criteria

TYCO Series DS-2 Dry-Type Sprinklers, 11.2K Pendent, Standard (5 mm bulb) and Quick Response (3 mm bulb), and Standard Coverage are intended for use in fire sprinkler systems designed in accordance with the standard coverage installation rules recognized by the applicable listing agency (e.g., 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 in. x 1 in. NPT Female Adapter (P/N 80145)
- 1 in. x 1 in. x 1 in. 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 branchline. Otherwise, use the configuration shown in Figure 9 to assure complete water drainage from above Series DS-2 Dry-Type Sprinklers and the branchline. Failure to do so may result in pipe freezing and water damage.

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 <sup>2</sup> , 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 (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:**

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

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

**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*
- *inufficient 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 tem-

peratures must be pitched for proper drainage.

**Exposure Length**

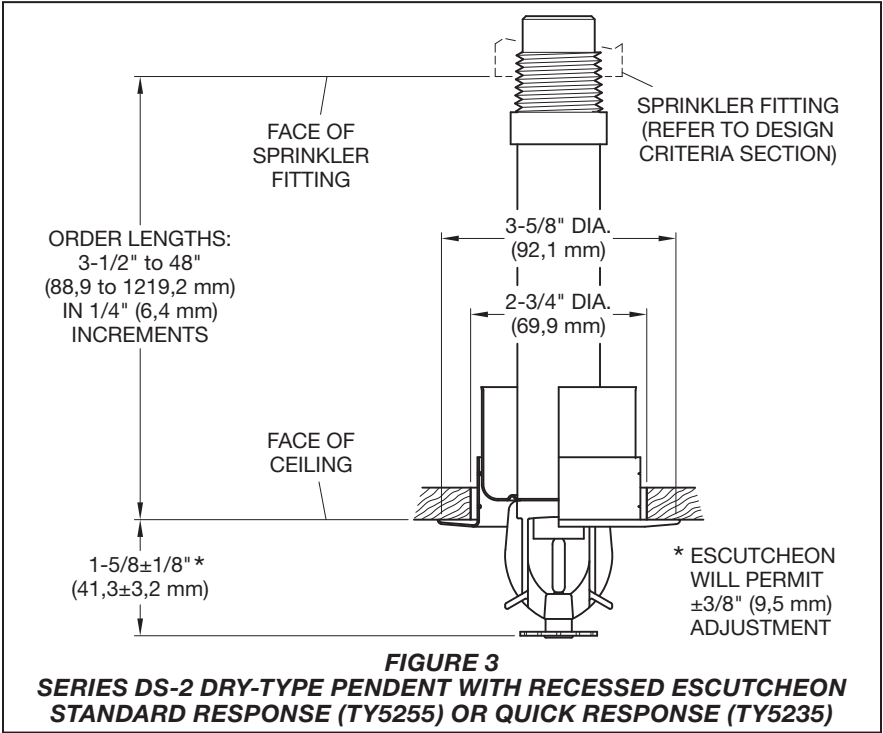
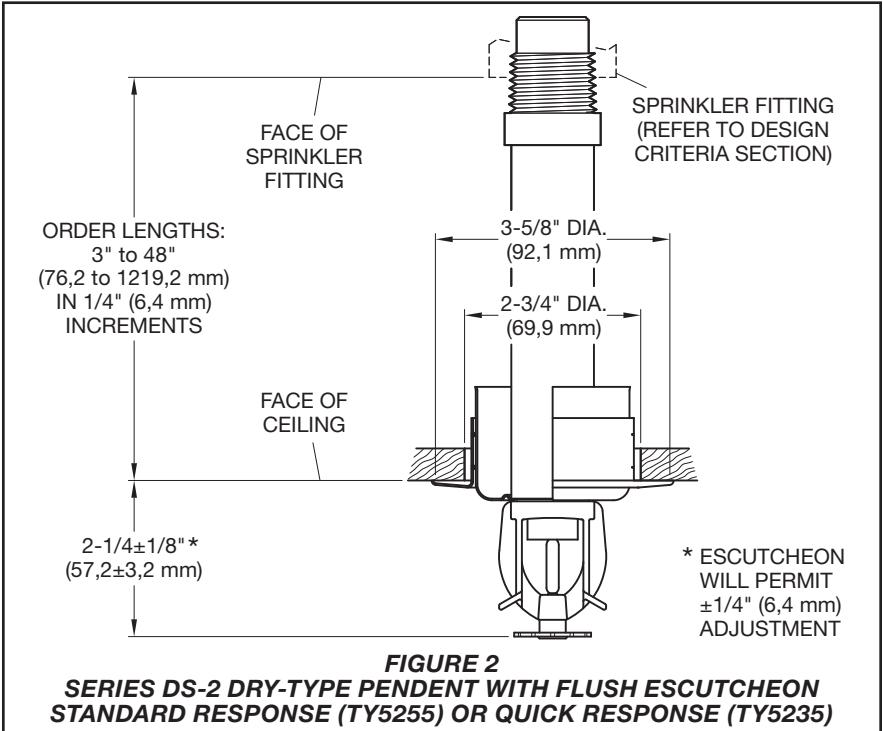
When using dry sprinklers in wet pipe sprinkler systems to protect areas subject to freezing temperatures, use Table B to determine a sprinkler's appropriate exposed barrel length to prevent water from freezing in the connecting pipes due to conduction. The exposed barrel length measurement must be taken 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.

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.



K-factor Length, Inches (mm)	K-factor, GPM/psi <sup>1/2</sup> (LPM/bar <sup>1/2</sup> )
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 in. (12,7 mm)
- **Recessed:** Order Length from Figure 3 plus 1/4 in. (6,3 mm)
- **Extended:** Order Length from Figure 4 plus 3-1/4 in. (82,6 mm)
- **Without Escutcheon:** Order Length from Figure 5 minus 2-1/4 in. (57,2 mm)

**TABLE C**  
**DISCHARGE COEFFICIENTS**

