

Series DS-1 Dry-Type Sprinklers 5.6K Horizontal Sidewall Standard and Quick Response, Extended Coverage

General Description

TYCO Series DS-1 Dry-Type Sprinklers, 5.6 K-factor Horizontal Sidewall, Standard (5 mm Bulb) and Quick Response (3 mm Bulb) and Extended Coverage, are decorative glass bulb automatic sprinklers typically used where the sprinklers and/or a portion of the connecting piping may be exposed to freezing temperatures; for example, horizontal piping extensions through a wall to protect an unheated area of a building. Series DS-1 Dry-Type Sprinklers are designed for extended coverage use in light hazard occupancies.

NOTICE

Series DS-1 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. Series DS-1 Dry-Type Sprinklers must only be installed in fittings that meet the requirements of the Design Criteria section.

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.

Sprinkler Identification Numbers (SINs)

TY3338 – 3 mm Bulb Type
TY3358 – 5 mm Bulb Type

Technical Data

Approvals

UL and C-UL Listed
NYC Approved under MEA 352-01-E

Refer to Table A.

Maximum Working Pressure

175 psi (12,1 bar)

Inlet Thread Connections

1 inch NPT or
ISO 7-R 1

Discharge Coefficient

$K=5.6 \text{ gpm/psi}^{1/2}$
(80,6 lpm/bar^{1/2})

Temperature Ratings

Refer to Table A.

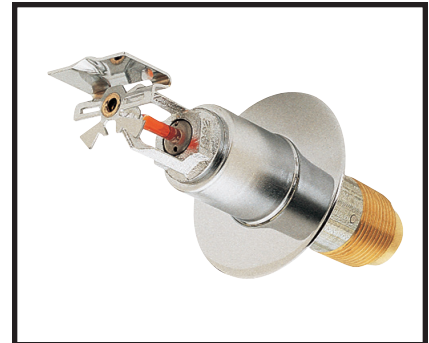
Finishes

Sprinkler: Natural Brass, Chrome Plated, or Signal White

Escutcheon: Signal White, Chrome Plated, or Brass Plated

Physical Characteristics

Inlet	Copper
Plug	Copper
Yoke	Stainless Steel
Casing	Galvanized Carbon Steel
Insert	Bronze
Bulb Seat	Stainless Steel
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
Escutcheon	Carbon Steel

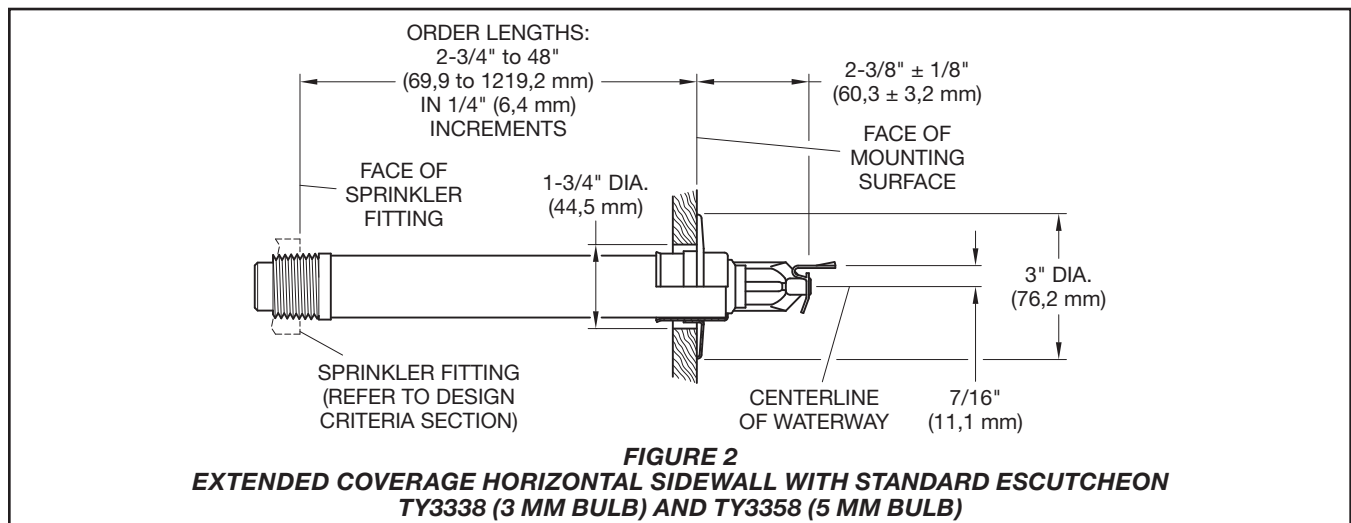
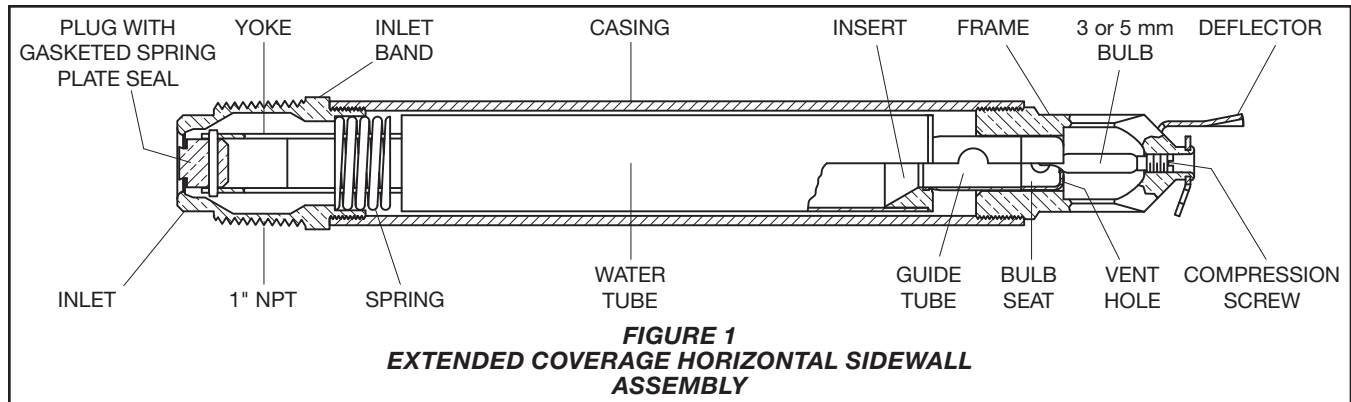


Operation

When TYCO Series DS-1 Dry-Type Sprinklers are in service, water is prevented from entering the assembly by the Plug and 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 and Gasketed Spring Plate Seal from the Inlet allowing the sprinkler to activate and flow water.



Design Criteria

TYCO Series DS-1 Dry-Type Sprinklers are intended for use in fire sprinkler systems designed in accordance with the standard installation rules recognized by the applicable Listing or Approval agency; for example, UL Listing is based on NFPA 13 requirements.

Sprinkler Fittings

Install 1 inch NPT Series DS-1 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-1 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 5.

You can also install Series DS-1 Dry-Type Sprinklers in the outlet.

The configuration shown in Figure 6 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 6. Refer to the Exposure Length section.

For wet pipe system installations of 1 inch NPT Series DS-1 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 in. reducing tee when locating Series DS-1 Dry-Type Sprinklers directly below the branch line. Otherwise, use the configuration shown in Figure 4 to

assure complete water drainage from above Series DS-1 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-1 Dry-Type Sprinklers 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.

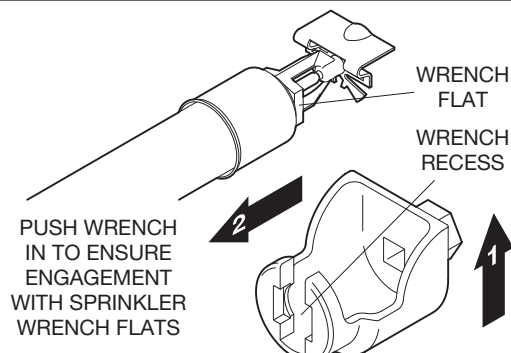


FIGURE 3
W-TYPE 7 SPRINKLER WRENCH

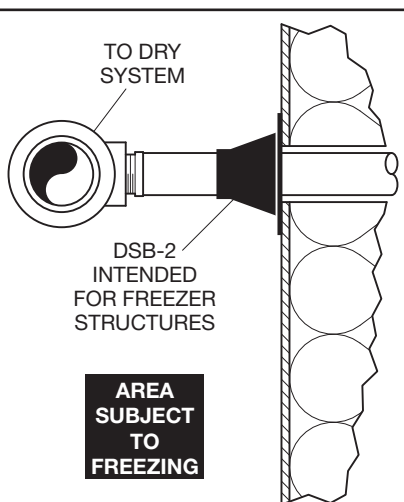


FIGURE 4
SPRINKLER FITTING
UNHEATED AREA

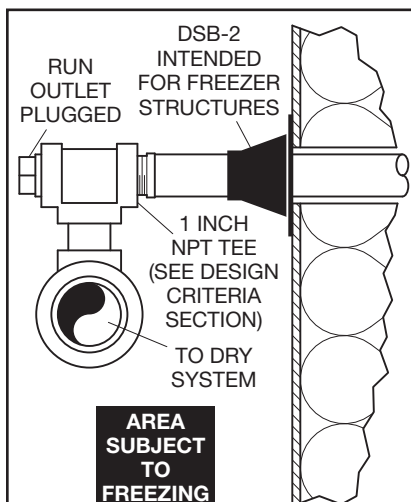


FIGURE 5
SPRINKLER FITTING
UNHEATED AREA

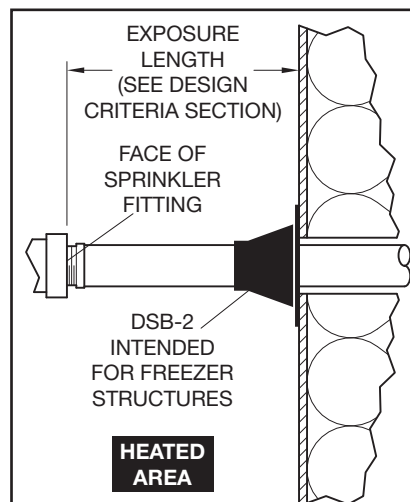


FIGURE 6
EXPOSURE LENGTH

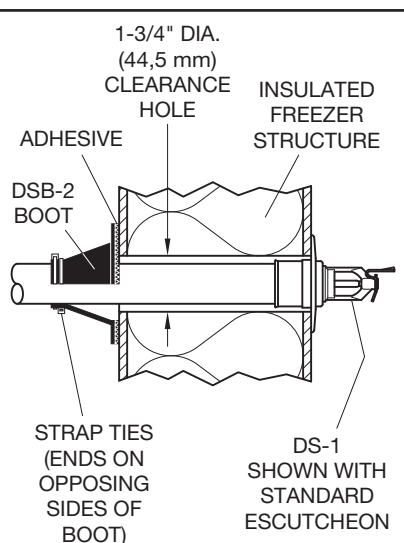


FIGURE 7
MODEL DSB-2
DRY SPRINKLER BOOT
WITH DRY-TYPE SPRINKLER

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 6 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 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 7, can provide the recommended seal.

Temperature Rating	Bulb Color Code	TY3338 Horizontal Sidewall with Standard Escutcheon (3 mm Bulb Type)		
		TY3358 Horizontal Sidewall with Standard Escutcheon (5 mm Bulb Type) (Ref. Figure 2)		
		SPRINKLER FINISH		
		Natural Brass	Chrome Plated	Signal White
135°F (57°C)	Orange	1, 2, 3		
155°F (68°C)	Red			
Notes: 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 352-01-E.				
TABLE A SERIES DS-1 EXTENDED COVERAGE HORIZONTAL SIDEWALL DRY-TYPE SPRINKLERS LABORATORY LISTINGS AND APPROVALS				

Application	Coverage ¹ W. x L. ft x ft (m x m)	Minimum Flow, gpm (lpm)	Minimum Pressure, psi (bar)	Temperature Rating	Top of Deflector-to-Ceiling Distance ² , Inches (mm)
TY3338 Horizontal Sidewall (3 mm Bulb Type) For Quick Response, Light Hazard Extended Coverage per NFPA 13	16 x 16 (4,9 x 4,9)	26 (98)	21.6 (1,49)	135 °F and 155 °F (57 °C and 68 °C)	4 to 12 (100 to 300)
	16 x 18 (4,9 x 5,5)	29 (110)	26.8 (1,85)		
	16 x 20 (4,9 x 6,1)	32 (121)	32.7 (2,25)		
	18 x 16 (5,5 x 4,9)	29 (110)	26.8 (1,85)		
TY3358 Horizontal Sidewall (5 mm Bulb Type) For Standard Response, Light Hazard Extended Coverage per NFPA 13	16 x 16 (4,9 x 4,9)	26 (98)	21.6 (1,49)		
	16 x 18 (4,9 x 5,5)	29 (110)	26.8 (1,85)		
	16 x 20 (4,9 x 6,1)	32 (121)	32.7 (2,25)		
	18 x 16 (5,5 x 4,9)	29 (110)	26.8 (1,85)		
Notes: 1. The minimum allowable spacing between sprinklers to prevent cold soldering is 14 feet (4,3 m). 2. To meet the deflector-to-ceiling distance of 4 to 12 inches (100 to 300 mm), the centerline of the sprinkler waterway must be 4-7/16 to 12-7/16 inches below the ceiling.					
TABLE B SERIES DS-1 EXTENDED COVERAGE HORIZONTAL SIDEWALL DRY-TYPE SPRINKLERS UL AND C-UL INSTALLATION CRITERIA					

Ambient Temperature Exposed to Discharge End of Sprinkler	Temperatures for Heated Area ¹		
	40°F (4°C)	50°F (10°C)	60°F (16°C)
	Minimum Exposed Barrel Length ² , 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).			
<p align="center">TABLE C EXPOSED SPRINKLER BARRELS IN WET PIPE SYSTEMS MINIMUM RECOMMENDED LENGTHS</p>			