

Series DS-2 Dry-Type Sprinklers 11.2K Pendent Extended Coverage, Light and Ordinary Hazard

General Description

TYCO Series DS-2 Dry-Type Sprinklers, 11.2K Pendent, Extended Coverage, Light and Ordinary Hazard (ECLH/ ECOH) 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 Number (SIN)

TY5238

Technical Data

Approvals

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

Refer to Table A.

(These Approvals apply to the service condition indicated in the Design Criteria section.)

Maximum Working Pressure

175 psi (12,1 bar)

Inlet Thread Connections

1 inch NPT or
ISO 7-R 1

Discharge Coefficient

Refer to Table D

Temperature Ratings

Refer to Table A

Finishes

Sprinkler: Refer to Table E
Escutcheon: Refer to Table E

Physical Characteristics

Inlet	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
Plug	Copper 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, Extended Coverage, Light and Ordinary Hazard 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	TY5238 with Flush Escutcheon (Figure 2) with Extended Escutcheon (Figure 4) without Escutcheon (Figure 5)			TY5238 with Recessed Escutcheon (Figure 3)		
		SPRINKLER FINISH					
		Natural Brass	Chromed Plated	Polyester**	Natural Brass	Chrome Plated	Polyester**
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						
286°F (141°C)*	Blue						
Notes: 1. UL Listed (maximum order length of 48 inches) 2. C-UL Listed (maximum order length of 48 inches) 3. Approved by the City of New York under MEA 173-02-E * 286 °F (141 °C) temperature rating applies to installations in Ordinary Hazard Occupancies only. ** Frame and deflector only							
TABLE A SERIES DS-2 ECLH/ECOH DRY-TYPE PENDENT SPRINKLERS LABORATORY LISTINGS AND APPROVALS							

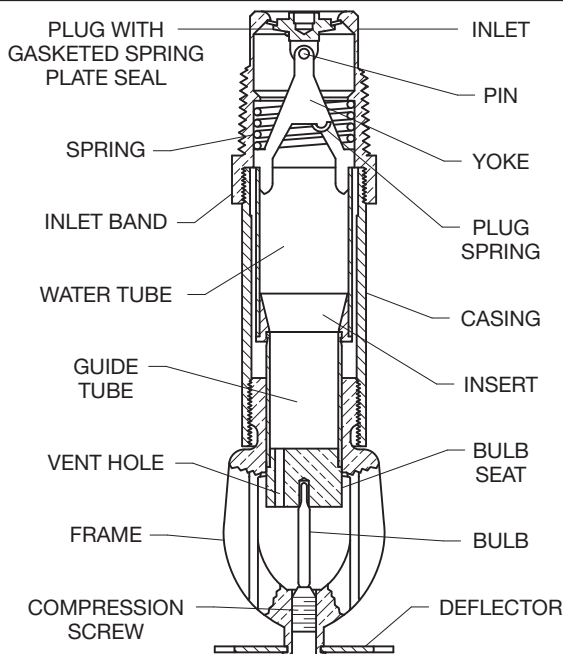


FIGURE 1
SERIES DS-2 ECLH/ECOH DRY-TYPE PENDENT SPRINKLER ASSEMBLY

Design Criteria

UL and C-UL Listing Requirements

TYCO Series DS-2 Dry-Type Sprinklers, 11.2K Pendent, Extended Coverage, Light and Ordinary Hazard are intended for use in fire sprinkler systems designed in accordance with the extended coverage installation rules recognized by the applicable Listing agency (e.g., UL Listing is based on NFPA 13 requirements). Refer to Table C for coverage and flow rate criteria.

Response Rating	Coverage Area ⁽⁴⁾ , ft x ft (m x m)	Minimum Flow ⁽¹⁾ Light Hazard ⁽²⁾ , (0.10 gpm/ft ²) gpm (lpm)	Minimum Flow ⁽¹⁾ Ordinary Hazard Group I ⁽³⁾ , (0.15 gpm/ft ²) gpm (lpm)	Minimum Flow ⁽¹⁾ Ordinary Hazard Group II ⁽³⁾ , (0.20 gpm/ft ²) gpm (lpm)	Escutcheon Type
Quick	16 x 16 (4,9 x 4,9)	30 (114)	—	—	Flush, Recessed, Extended
Quick	18 x 18 (5,5 x 5,5)	33 (125)	—	—	Flush, Extended
Standard ⁵	20 x 20 (6,1 x 6,1)	40 (151)	—	—	Flush, Recessed, Extended
Quick	14 x 14 (4,3 x 4,3)	—	30 (148)	39 (148)	Flush, Recessed, Extended
Standard	16 x 16 (4,9 x 4,9)	—	39 (148)	51 (193)	Flush, Recessed, Extended

Notes:

1. Requirement is based on minimum flow in gpm from each sprinkler. The required residual pressure is to be based on the use of a K-factor derived from Table D.
2. Light Hazard Occupancies are limited to a type of unobstructed construction consisting of flat, smooth ceilings.
3. Ordinary Hazard Occupancies may have either "combustible or non-combustible, unobstructed ceiling construction" or "noncombustible obstructed ceiling construction."
4. Minimum spacing between sprinklers is 12.5 feet (3,8 m).
5. For retrofit applications of projects installed prior to the NFPA Quick Response / Light Hazard requirement

TABLE B
UL AND C-UL LISTING
COVERAGE AND FLOW RATE CRITERIA

UL and C-UL Specific Application Listing Requirements for Installation Under Concrete Tees

TYCO Series DS-2 Dry-Type Pendent Sprinklers (TY5238) have a UL and C-UL Specific Application Listing for use under concrete tees when installed as follows:

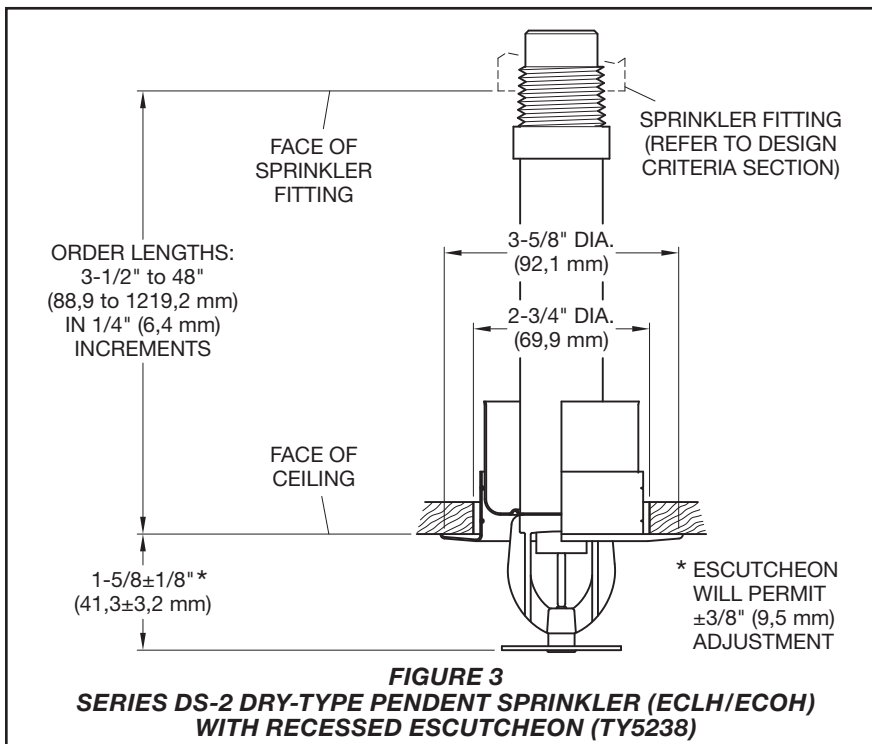
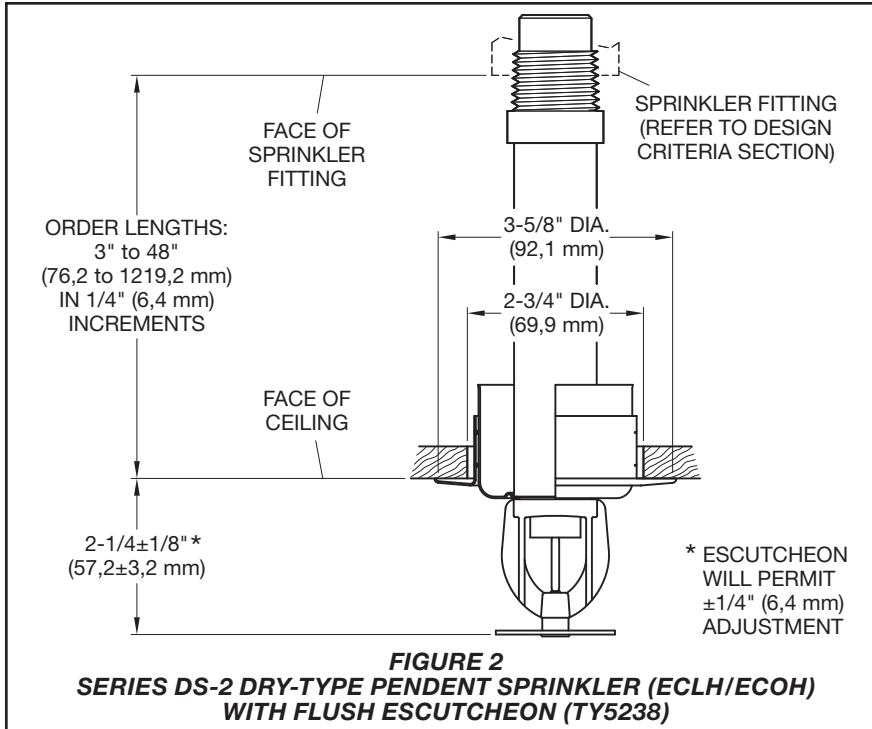
- Stems of the concrete tee construction must be spaced at less than 7.5 feet (2,3 m) on center but more than 3 feet (0,9 m) on center. The depth of the concrete tees must not exceed 30 inches (762 mm). The maximum permitted concrete tee length is 32 feet (9,8 m). However, where the concrete tee length exceeds 32 feet (9,8 m), non-combustible baffles, equal in height to the depth of the tees, can be installed to ensure that the space between the tees does not exceed 32 feet (9,8 m) in length.
- Sprinkler deflectors are to be located in a horizontal plane at or above 1 inch (25,4 mm) below the bottom of the concrete tee stems.
- When sprinkler deflectors are located higher than a horizontal plane 1 inch (25,4 mm) beneath the bottom of the concrete tee stems, obstruction to sprinkler discharge criteria requirements of NFPA 13 for extended coverage upright sprinklers applies.

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).

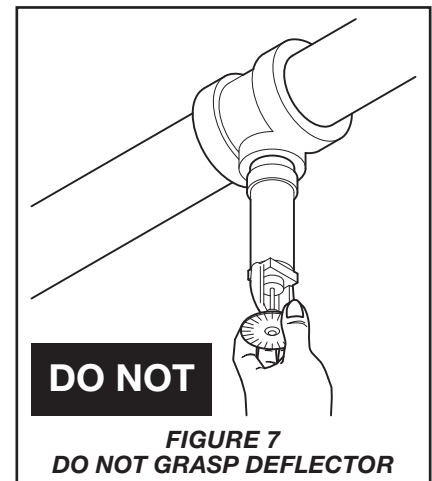
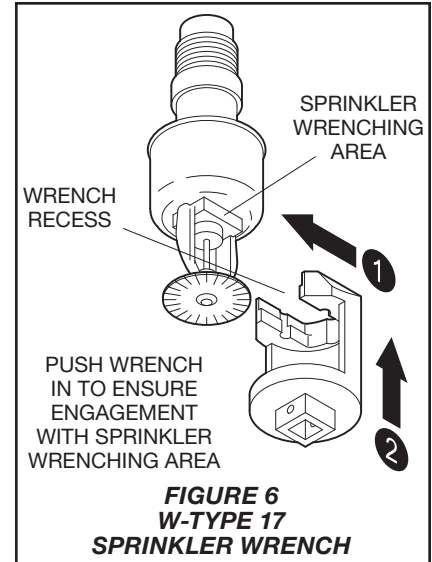
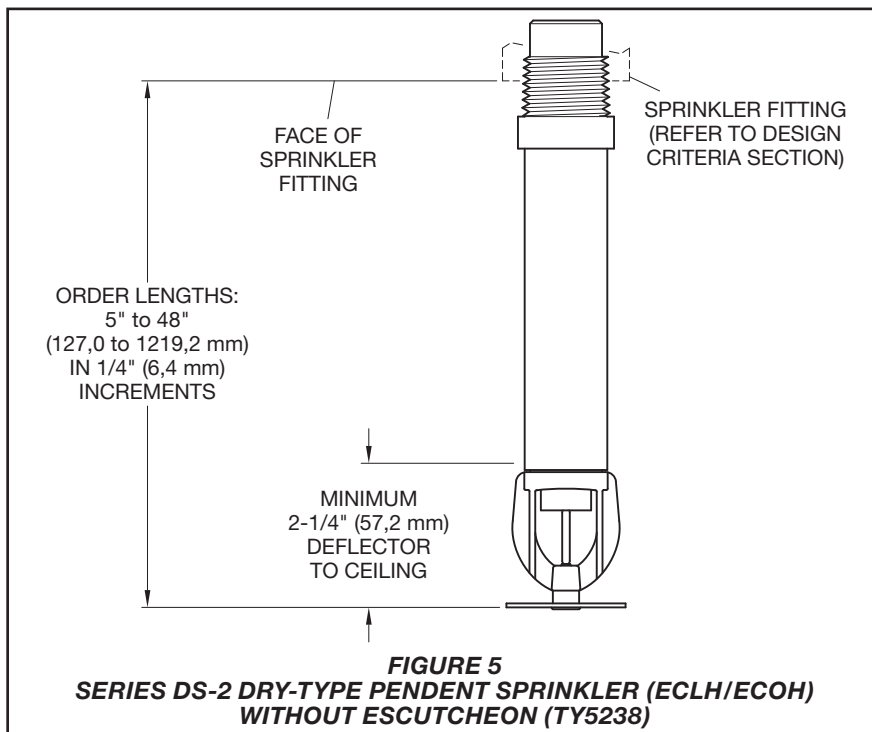
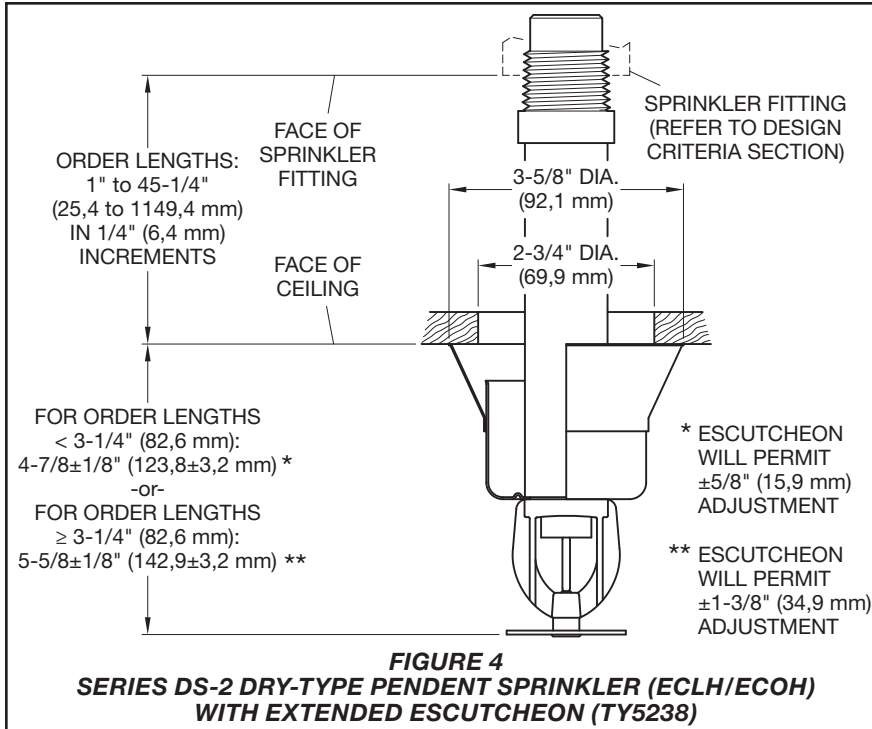
TABLE C
EXPOSED SPRINKLER BARRELS IN WET PIPE SYSTEMS
MINIMUM RECOMMENDED LENGTHS

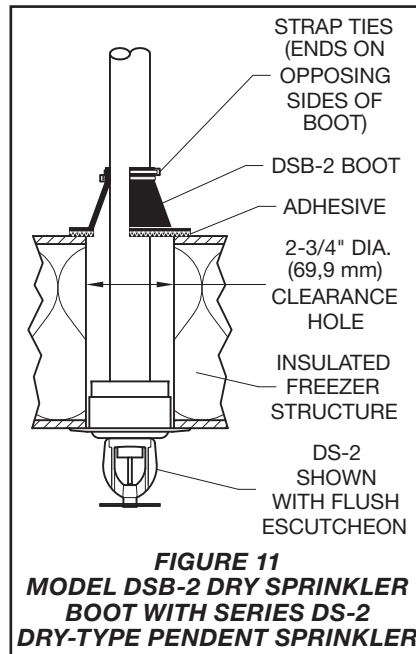
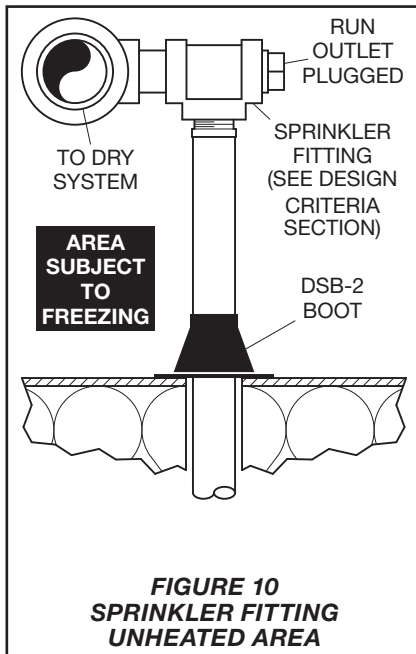
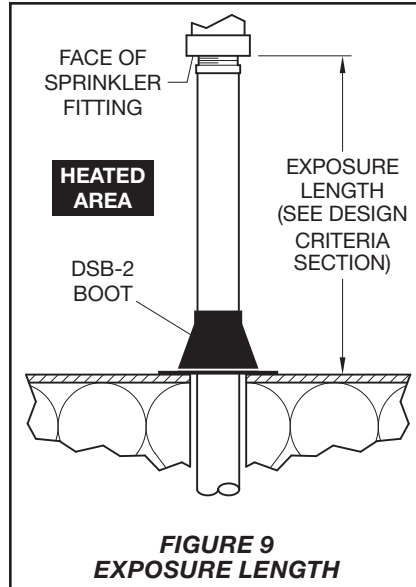
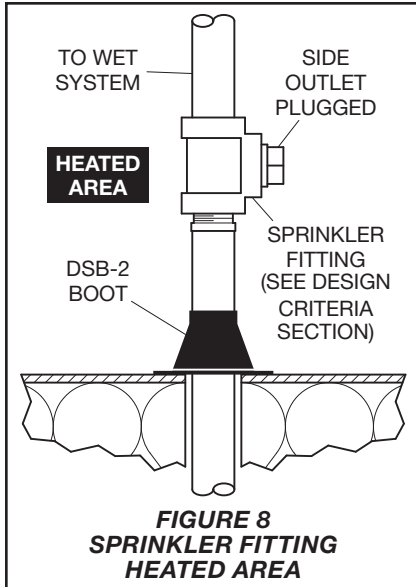


K-factor LENGTH, Inches (mm)	K-factor, gpm/psi^{1/2} (lpm/bar^{1/2})
2-1/2 to 6-1/4 (63 mm to 159 mm)	11.2 (161,3)
6-1/2 to 10-1/2 (165 mm to 267 mm)	11.1 (159,8)
10-3/4 to 14-3/4 (273 mm to 375 mm)	11.0 (158,4)
15 to 18-3/4 (381 mm to 476 mm)	10.9 (157,0)
19 to 23 (483 mm to 584 mm)	10.8 (155,5)
23-1/4 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 D
DISCHARGE COEFFICIENTS





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 10.

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 9. 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 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 branchline. Failure to do so may result in pipe freezing and water damage.

NOTICE

Do not install Series DS-2 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.

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 9 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.