Series DS-C Dry Type Sprinklers 5.6K Concealed Pendent Standard and Quick Response, Standard Coverage

General Description

TYCO Series DS-C Dry Type Sprinklers, 5.6K Concealed Pendent, Standard (5 mm Bulb) and Quick Response (3 mm Bulb) and Standard Coverage, are decorative sprinklers featuring a flat cover plate designed to conceal the sprinkler. This type of sprinkler is typically used to provide a sprinkler drop from an unheated attic into an area where aesthetics is a concern, such as nursing homes, restaurants, and schools.

Each unit includes a Cover Plate Assembly that conceals the sprinkler operating components above the ceiling. The separable two-piece design of the Cover Plate and Support Cup Assemblies allows installation of the sprinklers and pressure testing of the fire protection system prior to installation of a suspended ceiling or application of the finish coating to a fixed ceiling. They also permit removal of suspended ceiling panels for access to building service equipment without having to first shut down the fire protection system and remove sprinklers. Also, the separable two-piece design of the Sprinkler provides for 1/2 inch (12,7 mm) of vertical adjustment.

Series DS-C Sprinklers are shipped with a Disposable Protective Cap. The Protective Cap is temporarily removed for installation, and then it can be replaced to help protect the sprinkler while the ceiling is installed or finished. The tip of the Protective Cap can also be used to mark the center of the ceiling hole into plaster board and ceiling tiles by gently pushing the ceiling product against the Protective Cap. When the ceiling installation is complete the Protective Cap is removed and the Cover Plate Assembly installed.

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.

NOTICE

Series DS-C Dry Type Concealed Pendent Sprinklers described herein must be installed and maintained in compliance with this document and the applicable standards of the NATIONAL FIRE PROTECTION ASSOCIATION, in addition to the standards of any 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-C Dry Type Concealed Pendent Sprinklers must only be installed in fittings that meet the requirements of the Design Criteria section.

Sprinkler Identification Numbers (SINs)

TY3535 - 3 mm Bulb
TY3555 - 5 mm Bulb

Technical Data

Approvals
UL and C-UL Listed
NYC Approved under MEA 352-01-E-2

Maximum Working Pressure
175 psi (12,1 bar)

Inlet Thread Connections
1 inch NPT (Standard Order)
ISO 7-R1

Discharge Coefficient
K=5.6 GPM/psi$^{1/2}$ (80,6 LPM/bar$^{1/2}$)

Temperature Ratings
155°F (68°C) Sprinkler with
139°F (59°C) Cover Plate

200°F (93°C) Sprinkler with
165°F (74°C) Cover Plate

Adjustment
1/2 inch (12,7 mm)

Finishes
Refer to Ordering Procedure section

Physical Characteristics

Inlet	Copper
Plug	Copper
Yoke	Stainless Steel
Casing	Galvanized Carbon Steel
Insert	Bronze
Bulb Seat	Stainless Steel
Bulb	Glass
Deflector	Bronze
Frame	Bronze
Guide Tube	Stainless Steel
Water Tube	Stainless Steel
Spring	Stainless Steel Gasketed Spring
Plate Seal	Beryllium Nickel w/TEFLON
Support Cup	Chrome Plated Steel
Guide Pins	Stainless Steel
Compression Screw	Brass
Cover Plate	Brass
Retainer	Brass
Ejection Spring	Stainless Steel

Operation

When TYCO Series DS-C Dry Type Concealed Pendent Sprinklers is 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.

When exposed to heat from a fire, the Cover Plate, which is normally soldered to the Retainer at three points, falls away to expose the Sprinkler Assembly. At this point the Deflector supported by the Guide Pins drops down to its operational position.

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.

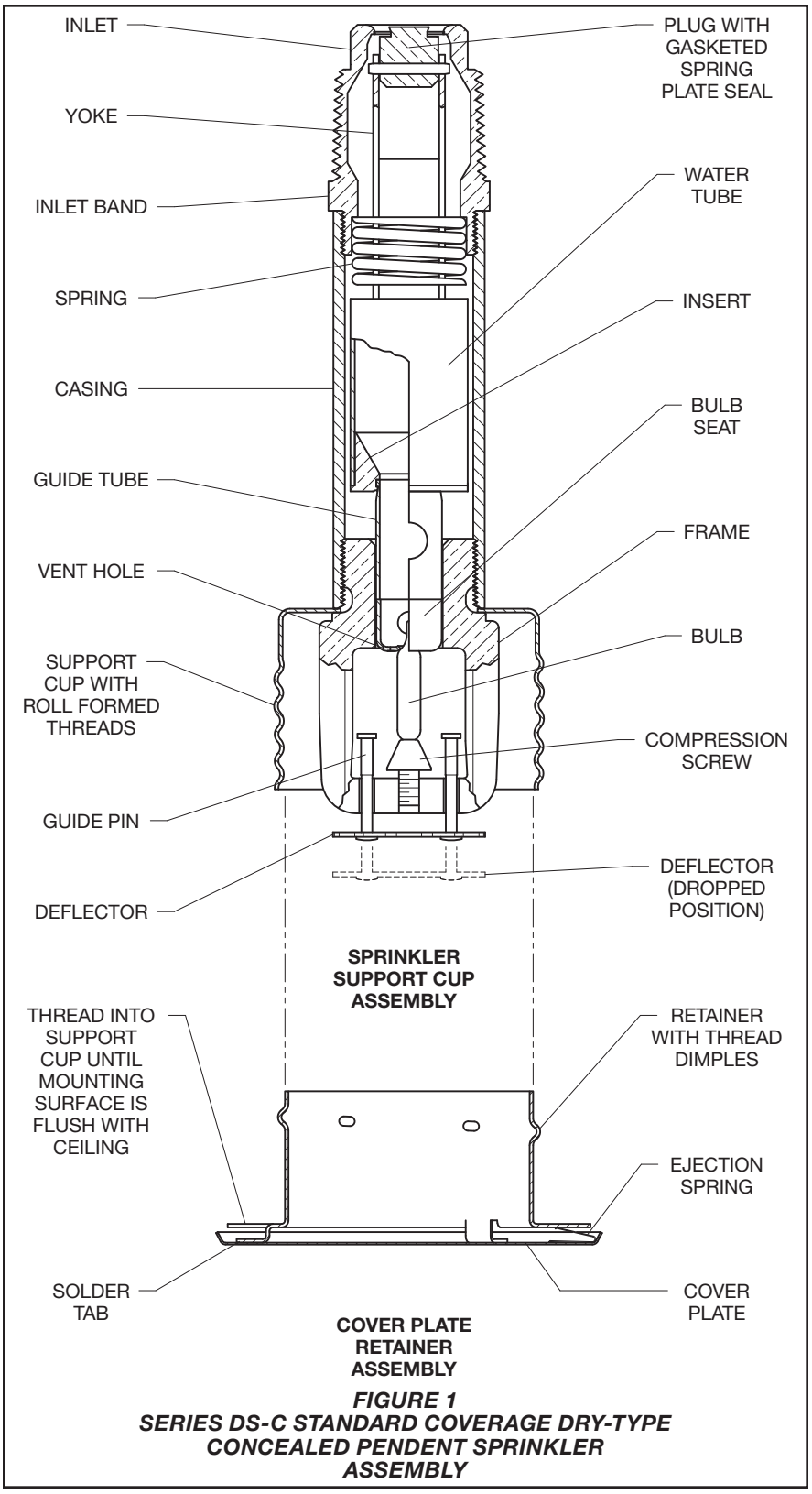

FIGURE 1
SERIES DS-C STANDARD COVERAGE DRY-TYPE CONCEALED PENDENT SPRINKLER ASSEMBLY

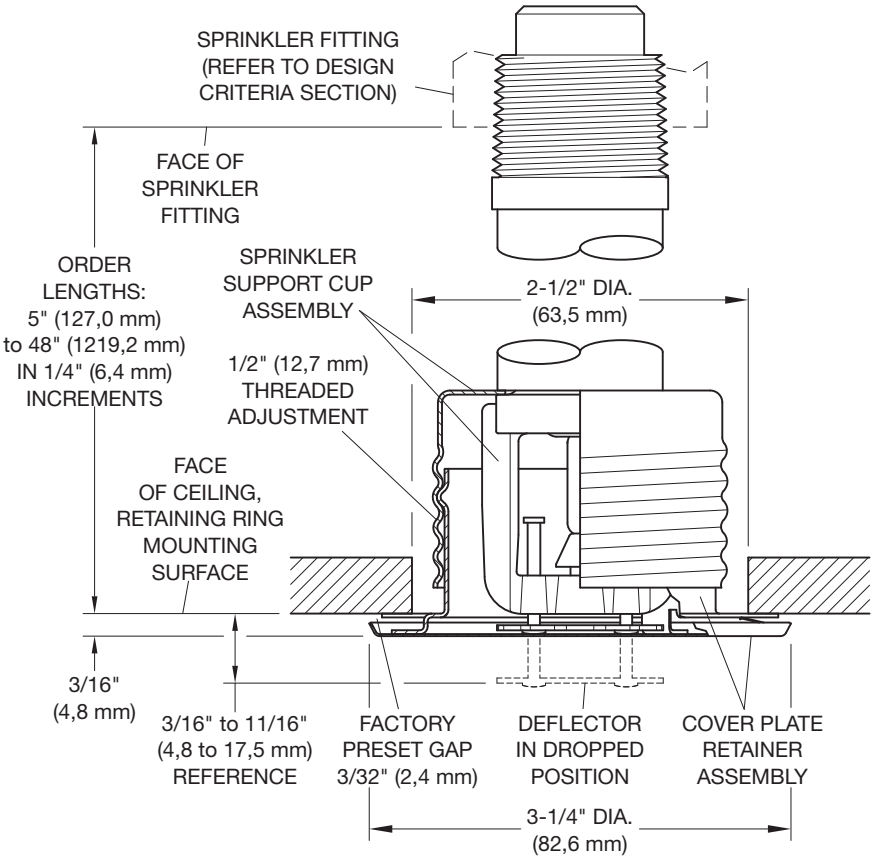

FIGURE 2
SERIES DS-C STANDARD COVERAGE DRY-TYPE
CONCEALED PENDENT SPRINKLER
INSTALLATION DIMENSIONS

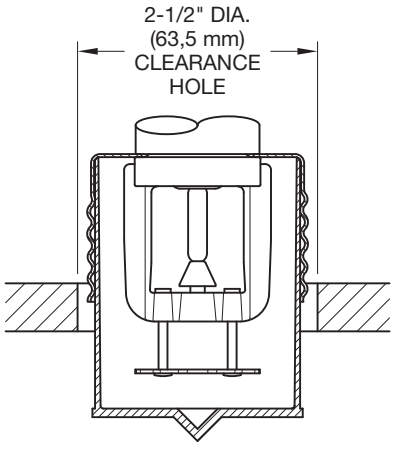

FIGURE 3
DISPOSABLE
PROTECTIVE CAP

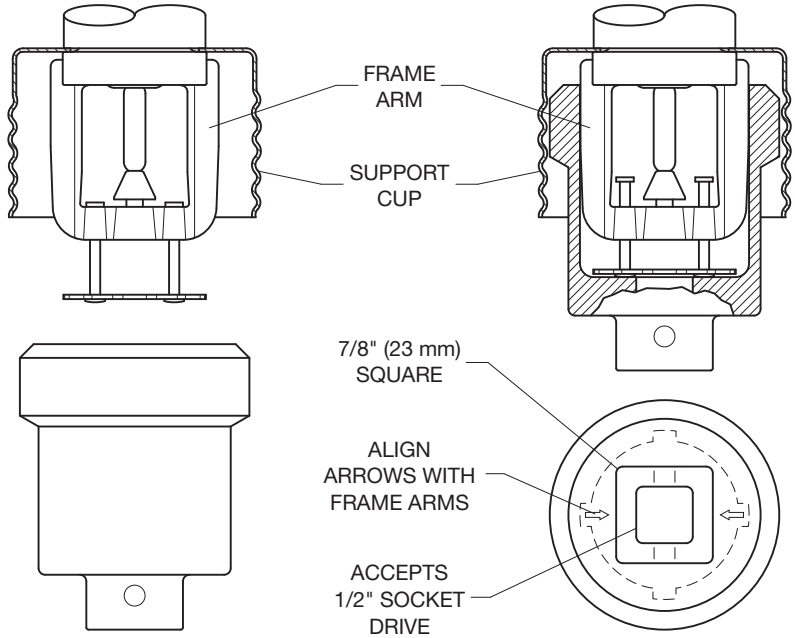

FIGURE 4
RFII SPRINKLER WRENCH

Design Criteria

TYCO Series DS-C 3 mm bulb-type Dry Type Concealed Pendent Sprinklers (TY3535) are UL and C-UL Listed as quick response, standard spray sprinklers for use in accordance with the current NFPA standard.

Series DS-C 5 mm bulb-type Dry Type Concealed Pendent Sprinklers (TY3555) are UL and C-UL Listed as standard response, standard spray sprinklers for use in accordance with the current NFPA standard.

Series DS-C Dry Type Sprinklers are only listed when installed with Series RFII Concealed Cover Plates having a factory-applied painted or metallic finish.

Series DS-C Dry Type Sprinklers must not be used in applications where the air pressure above the ceiling is greater than that below. Down drafts through the Support Cup could delay sprinkler operation in a fire situation.

Sprinkler Fittings

Install 1 inch NPT Series DS-C Dry Type Concealed Pendent 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-C Dry Type Concealed Pendent 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 Figures 5 and 6.

Install Series DS-C Dry-Type Sprinklers in the tee run or branch outlet.

The configuration shown in Figure 5 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 7. Refer to the Exposure Length section.

For wet pipe system installations of 1 inch NPT Series DS-C 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-C Dry Type Sprinklers directly below the branch line. Otherwise, use the configuration shown in Figure 6 to assure complete water drainage from above Series DS-C 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-C 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 Type Sprinklers in wet pipe sprinkler systems to protect areas subject to freezing temperatures, use Table A 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 7 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.

Do not attempt to add additional insulation around the barrel in the heated area as a method to minimize condensation. This will reduce the calculated "Exposure Length".

Clearance Space

In accordance with NFPA 13, where dry sprinklers are connected to wet pipe sprinkler systems protecting insulated freezer structures, 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 8, will provide the recommended seal.

NOTICE

For applications where a bore greater than 1-3/4 inches in diameter has been cut through the entire height of an insulated freezer ceiling creating a cavity above the sprinkler support cup (Ref. Figure 8), the cavity must not be filled.