# Series DS-8 – 8.0 K-factor, Dry-Type Sprinklers Pendent and Horizontal Sidewall Standard Response, Standard Coverage

***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.*

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## General Description

The TYCO Series DS-8 8.0 K-factor, Pendent and Horizontal Sidewall (HSW), Standard Response, Standard Coverage Dry-Type Sprinklers are stainless steel sprinklers listed by UL and C-UL. The standard response bulb size is 5 mm. For information about the Series DS-8 Quick Response (3 mm bulb) sprinklers, see technical data sheet TFP513.

Use the sprinklers in wet-pipe, dry-pipe, or preaction systems based on the following criteria:

- On dry pipe systems that are exposed to freezing temperatures, for example, sprinkler drops from unheated portions of buildings
- When sprinklers and/or a portion of the connecting piping may be exposed to freezing temperatures, for example, sprinkler drops from wet systems into freezers, sprinkler sprigs from wet systems into unheated attics, or horizontal piping extensions through a wall to protect unheated areas of a building such as loading docks, overhangs, and building exteriors
- On systems that are seasonably drained to avoid freezing, for example, vacation resort areas

***NOTICE***

*The TYCO Series DS-8 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-8 Dry-Type Sprinklers must only be installed in fittings that meet the requirements of the Design Criteria section.*

## Sprinkler Identification Number (SIN)

**TY4255 . . . . . Pendent**
**TY4355 . . . . . Horizontal Sidewall**



## Technical Data

**Approvals**
UL and C-UL Listed

***Note:*** *For more information, see Table A and Table B.*

**Maximum Working Pressure**
175 psi (12,1 bar)

**Inlet Thread Connections**
1 in. NPT
ISO 7-R 1

**Discharge Coefficient**
K=8.0 gpm/psi$^{½}$ (115,2 lpm/bar$^{½}$)

**Temperature Ratings**
See Table A and Table B

**Finishes**
Sprinkler: See Table D
Escutcheon: See Table D

**Physical Characteristics**

| | |
|---|---|
| Inlet | Brass |
| Plug | Brass |
| Yoke | Stainless Steel |
| Casing | Galvanized Carbon Steel |
| Bulb Seat | Stainless Steel |
| Bulb (5 mm dia.) | Glass |
| Compression Screw | Brass |
| Deflector | Bronze |
| Frame | Brass |
| Guide Tube | Stainless Steel |
| Water Tube | Stainless Steel |
| Spring | Stainless Steel |
| Sealing Assembly | Beryllium Nickel w/TEFLON |
| Escutcheon | Brass Plated, Chrome Plated Polyester, or Stainless Steel |

| Sprinkler Type | Escutcheon Type | Temperature Rating | Bulb Liquid Color | Sprinkler Finish | | |
|---|---|---|---|---|---|---|
| | | | | Natural Brass | Chrome Plated | Polyester |
| Pendent (TY4255) | Standard | 155°F (68°C) | Red | 1, 2 | | 1, 2 |
| | | 175°F (79°C) | Yellow | | | |
| | | 200°F (93°C) | Green | | | |
| | | 286°F (141°C) | Blue | | | |
| | | 360°F (182°C) | Mauve | | | |
| | Recessed | 155°F (68°C) | Red | 1, 2 | | 1, 2 |
| | | 175°F (79°C) | Yellow | | | |
| | | 200°F (93°C) | Green | | | |
| | | 286°F (141°C) | Blue | | | |
| | | 360°F (182°C) | Mauve | N/A | | N/A |
| | Deep | 155°F (68°C) | Red | 1, 2 | | 1, 2 |
| | | 175°F (79°C) | Yellow | | | |
| | | 200°F (93°C) | Green | | | |
| | | 286°F (141°C) | Blue | | | |
| | | 360°F (182°C) | Mauve | | | |
| | Without | 155°F (68°C) | Red | 1, 2 | | 1, 2 |
| | | 175°F (79°C) | Yellow | | | |
| | | 200°F (93°C) | Green | | | |
| | | 286°F (141°C) | Blue | | | |
| | | 360°F (182°C) | Mauve | | | |

**Notes:**
1. Listed by Underwriters Laboratories, Inc. (UL), maximum order length of 48 in. 2. Listed by Underwriters Laboratories for use in Canada (C-UL), maximum order length of 48 in.

***TABLE A***
***SERIES DS-8 DRY-TYPE SPRINKLERS, 8.0K, PENDENT, STANDARD RESPONSE***
***LABORATORY LISTINGS AND APPROVALS***

| Sprinkler Type | Escutcheon Type | Temperature Rating | Bulb Liquid Color | Sprinkler Finish | | |
|---|---|---|---|---|---|---|
| | | | | Natural Brass | Chrome Plated | Polyester |
| Horizontal Sidewall (TY4355) | Standard | 155°F (68°C) | Red | 1, 2 | | 1, 2 |
| | | 200°F (93°C) | Green | | | |
| | | 286°F (141°C) | Blue | | | |
| | Recessed | 155°F (68°C) | Red | 1, 2 | | 1, 2 |
| | | 200°F (93°C) | Green | | | |
| | | 286°F (141°C) | Blue | | | |
| | Deep | 155°F (68°C) | Red | 1, 2 | | 1, 2 |
| | | 200°F (93°C) | Green | | | |
| | | 286°F (141°C) | Blue | | | |
| | Without | 155°F (68°C) | Red | 1, 2 | | 1, 2 |
| | | 200°F (93°C) | Green | | | |
| | | 286°F (141°C) | Blue | | | |

**Notes:**
1. Listed by Underwriters Laboratories, Inc. (UL), maximum order length of 48 in. 2. Listed by Underwriters Laboratories for use in Canada (C-UL), maximum order length of 48 in.

***TABLE B***
***SERIES DS-8 DRY-TYPE SPRINKLERS, 8.0K, HORIZONTAL SIDEWALL, STANDARD RESPONSE***
***LABORATORY LISTINGS AND APPROVALS***

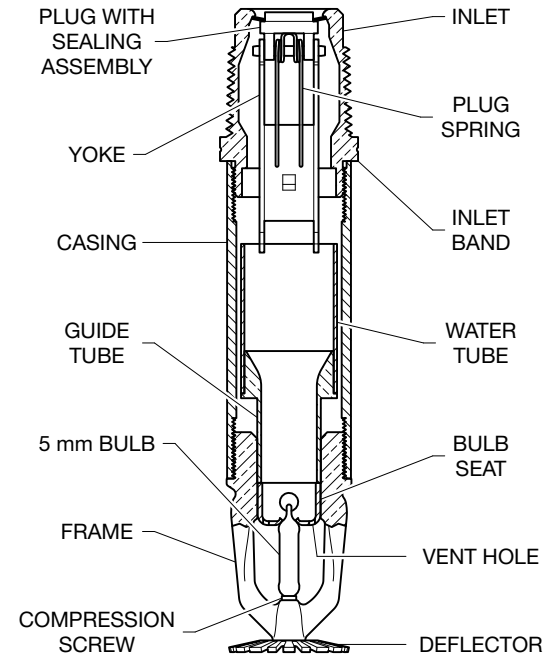



***FIGURE 1***
***SERIES DS-8 PENDENT DRY-TYPE SPRINKLER, 8.0K, STANDARD RESPONSE ASSEMBLY***

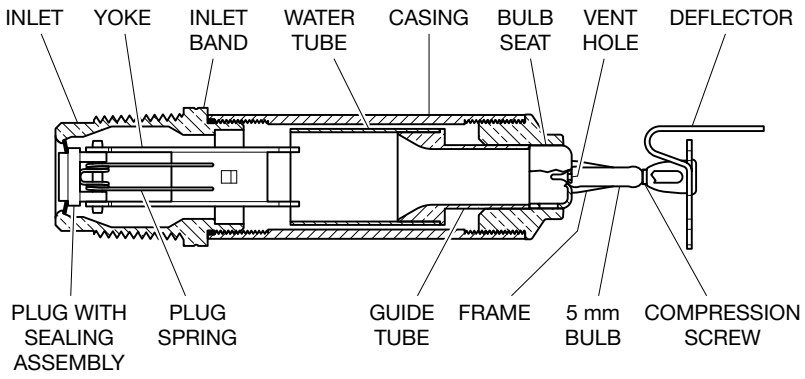



***FIGURE 2***
***SERIES DS-8 HORIZONTAL SIDEWALL DRY-TYPE SPRINKLER, 8.0K, STANDARD RESPONSE ASSEMBLY***

# *Operation*

When TYCO Series DS-8 8.0K Pendent and Horizontal Sidewall, Standard Response, Standard Coverage Dry-Type Sprinklers are in service, water is prevented from entering the assembly by the plug with sealing assembly as shown in Figure 1 and Figure 2 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.

Once the bulb seat is released, the compression holding the sealing assembly is released. The Spring is then able to flip off to the side and out of the waterway. This action pushes the water tube as well as the guide tube outward. This action allows the sprinkler to activate and water to flow.

# *Design Criteria*

TYCO Series DS-8 8.0K Pendent and Horizontal Sidewall, Standard Response, Standard Coverage 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, the UL Listing is based on NFPA 13 requirements.

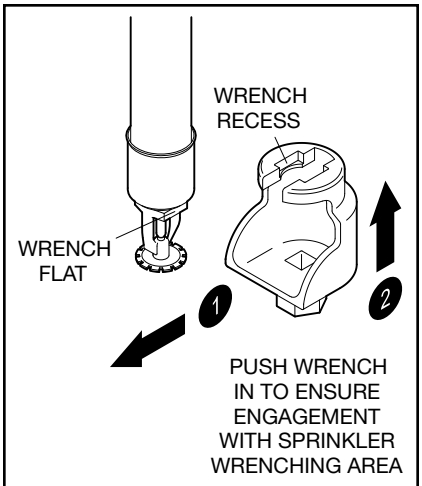



***FIGURE 3***
***W-TYPE 7 WRENCH***

| 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], in. (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***

### Sprinkler Fittings

Install 1 in. NPT Series DS-8 Dry-Type Sprinklers in the 1 in. 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 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 13.

You can also install Series DS-8 Dry-Type Sprinklers in the 1 in. NPT outlet of a GRINNELL Figure 730 Mechanical Tee and GRINNELL G-FIRE Figure 522; however, the use of the Figure 730 Tee and Figure 522 for this arrangement is limited to wet pipe systems.

The configuration shown in Figure 14 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 12. See the Exposure Length section.

For wet pipe system installations of 1 in. NPT Series DS-8 Dry-Type Sprinklers connected to CPVC piping, use the following CPVC fittings:

- 1 in. x 1 in. NPT female adapter
- 1 in. x 1 in. x 1 in. NPT sprinkler head adapter tee

***Note:*** *For more information on specific CPVC fitting design and installation criteria, refer to CPVC manufacturer.*

For dry pipe system installations, use only the side outlet of maximum 2 1/2 in. reducing tee when locating Series DS-8 Dry-Type Sprinklers directly below the branchline; otherwise, use the configuration shown in Figure 13 to assure complete water drainage from above Series DS-8 Dry-Type Sprinklers and the branchline. Failure to do so may result in pipe freezing and water damage.

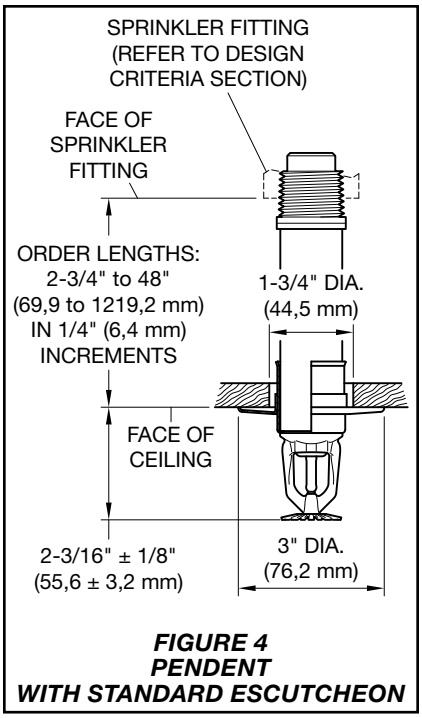



***FIGURE 4***
***PENDENT***
***WITH STANDARD ESCUTCHEON***

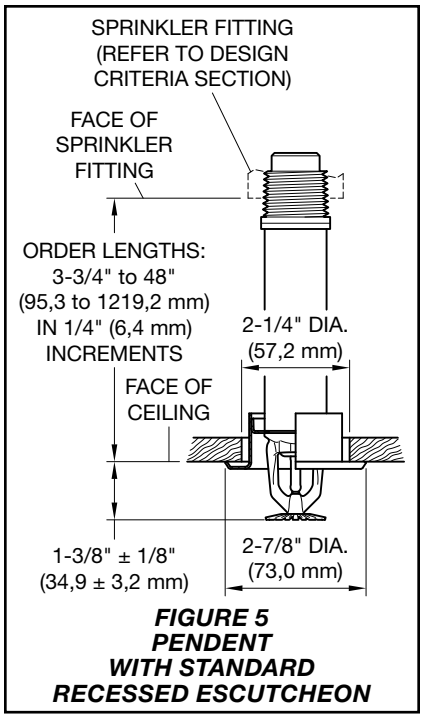



***FIGURE 5***
***PENDENT***
***WITH STANDARD***
***RECESSED ESCUTCHEON***

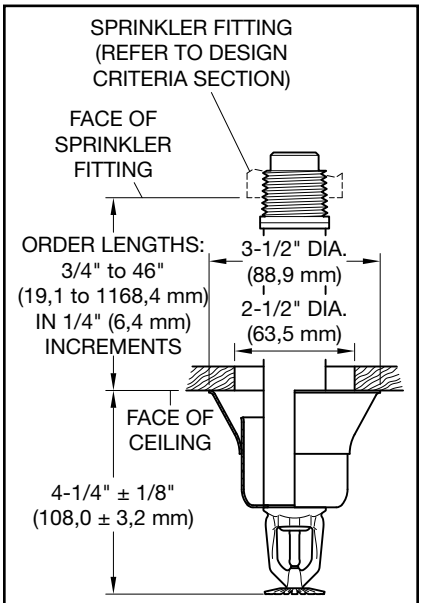



***FIGURE 6***
***PENDENT***
***WITH DEEP ESCUTCHEON***

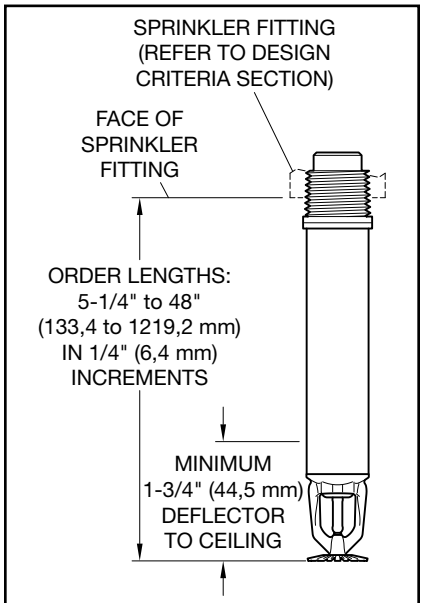



***FIGURE 7***
***PENDENT***
***WITHOUT ESCUTCHEON***

***NOTICE***

*Do not install Series DS-8 Dry-Type Sprinklers into any other type fitting without first consulting the JOHNSON CONTROLS INC. (JCI) Technical Services. 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-type 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 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 as shown in Figure 12.

For protected area temperatures between those given on the next page, 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-Type Sprinkler Boot, as described in technical data sheet TFP591, and as shown in Figure 15 and Figure 16, can provide the recommended seal.

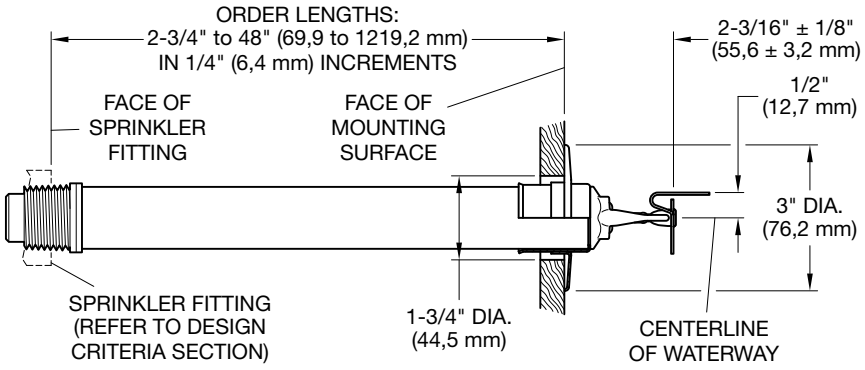



***FIGURE 8***
***HORIZONTAL SIDEWALL WITH STANDARD ESCUTCHEON***

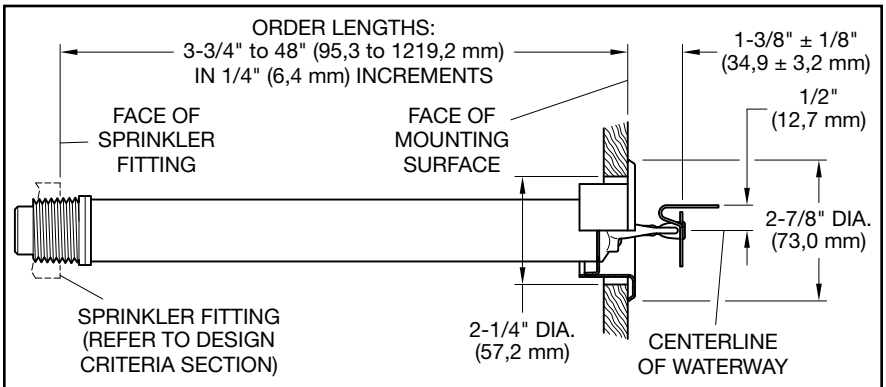



***FIGURE 9***
***HORIZONTAL SIDEWALL WITH STANDARD RECESSED ESCUTCHEON***

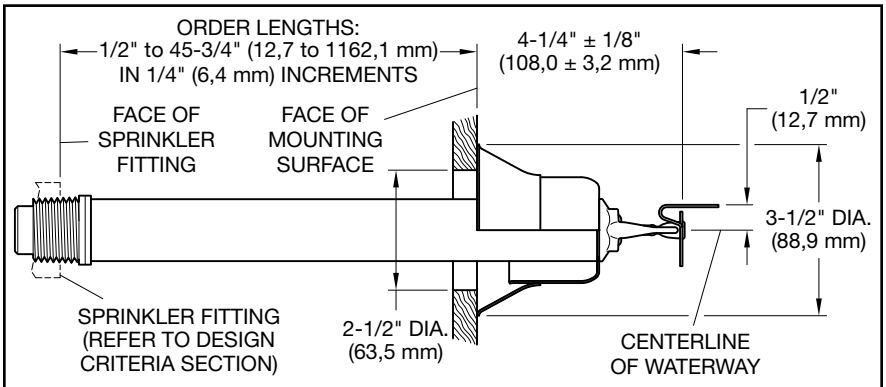



***FIGURE 10***
***HORIZONTAL SIDEWALL WITH DEEP ESCUTCHEON***

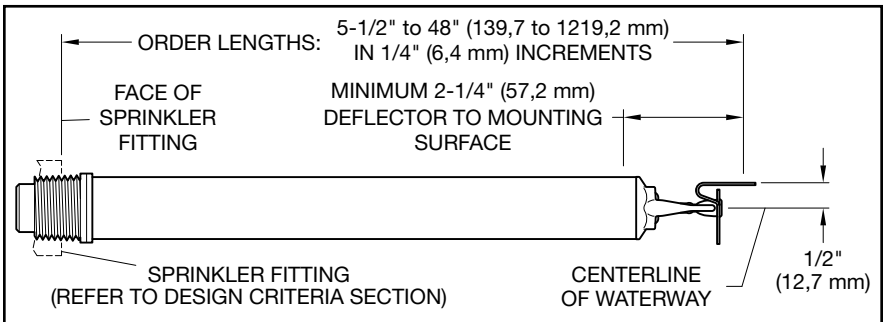



***FIGURE 11***
***HORIZONTAL SIDEWALL WITHOUT ESCUTCHEON***

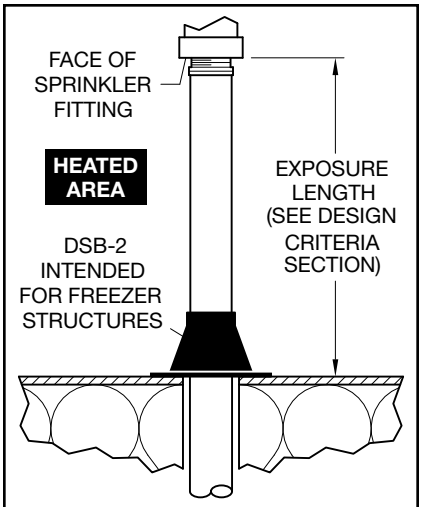



***FIGURE 12***
***EXPOSURE LENGTH***

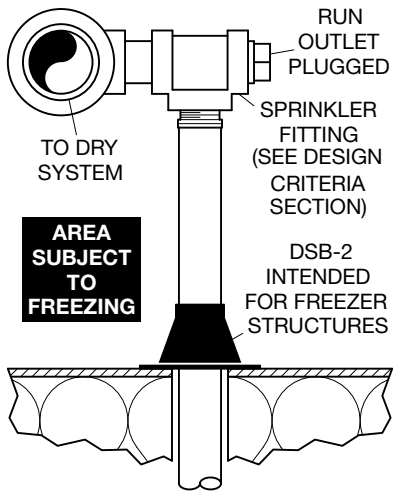



***FIGURE 13***
***SPRINKLER FITTING***
***UNHEATED AREA***

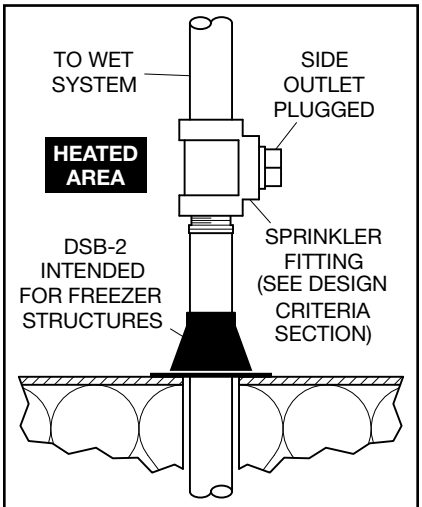



***FIGURE 14***
***SPRINKLER FITTING***
***HEATED AREA***

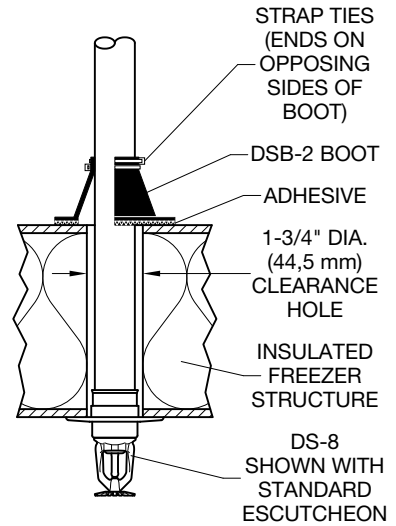



***FIGURE 15***
***MODEL DSB-2 DRY SPRINKLER BOOT WITH PENDENT SERIES DS-8 DRY-TYPE SPRINKLER***

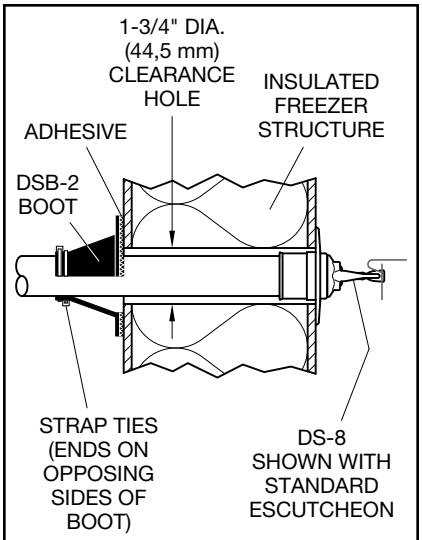



***FIGURE 16***
***MODEL DSB-2 DRY SPRINKLER BOOT WITH HORIZONTAL SIDEWALL SERIES DS-8 DRY-TYPE SPRINKLER***

# *Installation*

TYCO Series DS-8 8.0K Pendent and Horizontal Sidewall, Standard Response, Standard Coverage Dry-Type Sprinklers must be installed in accordance with this section.

**General Instructions**

Series DS-8 Dry-Type Sprinklers must only be installed in fittings that meet the requirements of the Design Criteria section. See the Design Criteria section for other important requirements regarding piping design and sealing of the clearance space around the sprinkler casing.

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 in. (1,6 mm) for the 155°F (68°C) rating to 1/8 in. (3,2 mm) for the 360°F (182°C) rating.

Obtain a leak-tight 1 in. NPT sprinkler joint by applying a minimum-to-maximum torque of 20 lb-ft to 30 lb-ft (26,8 N·m to 40,2 N·m). 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.

***Note:*** *Install pendent sprinklers only in the pendent position. The deflector of a pendent sprinkler is to be parallel to the ceiling.*

**Step 1.** With a non-hardening pipe-thread sealant such as TEFLON applied to the inlet threads, hand-tighten the sprinkler into the sprinkler fitting.

**Step 2.** Wrench-tighten the sprinkler using either of the following tools:

- Pipe wrench on the inlet band or the casing, see Figure 1 and Figure 2
- W-Type 7 Sprinkler Wrench on the wrench flat, see Figure 3

Apply the wrench recess of the W-Type 7 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.*

**Step 3.** After installing the ceiling or wall and applying a ceiling finish, slide on the outer piece of the escutcheon until it comes in contact with the ceiling/wall. 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-8 8.0K Pendent and Horizontal Sidewall, Standard Response, Standard Coverage Dry-Type Sprinklers must be maintained and serviced in accordance with this section.

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 as shown in Figure 1 and Figure 2 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.

Sprinklers which are found to be leaking or exhibiting visible signs of corrosion must be replaced.

Automatic sprinklers must never be painted, plated, coated, or otherwise altered after leaving the factory. Modified sprinklers must be replaced. Sprinklers that have been exposed to corrosive products of combustion, but have not operated, should be replaced if they cannot be completely cleaned by wiping the sprinkler with a cloth or by brushing it with a soft bristle brush.

Care must be exercised to avoid damage to the sprinklers before, during, and after installation. Sprinklers damaged by dropping, striking, wrench twist/slippage, or the like, must be replaced. Also, replace any sprinkler that has a cracked bulb or that has lost liquid from its bulb. See the Installation section.

The owner is responsible 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 such as NFPA 25, in addition to the standards of any other authorities having jurisdiction. Contact the installing contractor or product manufacturer with 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.

P/N* 65–XXX–X–XXX

| | Orientation | Escutcheon |
|---|---|---|
| 96 | Pendent | Standard |
| 93 | | Deep |
| 97 | | Recessed |
| 92 | | Without |
| 94 | Horizontal Sidewall | Standard |
| 53 | | Deep |
| 55 | | Recessed |
| 54 | | Without |

| | Temperature Rating[3] |
|---|---|
| 1 | 155°F (68°C) |
| 2 | 175°F (79°C) |
| 3 | 200°F (93°C) |
| 4 | 286°F (141°C) |
| 5 | 360°F (182°C) |

| | Sprinkler Finish | Escutcheon Finish[1] |
|---|---|---|
| 0 | Chrome Plated | Signal White (RAL9003) Polyester |
| 1 | Natural Brass | Signal White (RAL9003) Polyester |
| 2 | Natural Brass | Brass Plated |
| 4 | Signal White (RAL9003) Polyester | Signal White (RAL9003) Polyester |
| 8 | Chrome Plated | Stainless Steel[2] |
| 9 | Chrome Plated | Chrome Plated |

| | Order Length[4] |
|---|---|
| 055 | 5.50 in. |
| 082 | 8.25 in. |
| 180 | 18.00 in. |
| 187 | 18.75 in. |
| 372 | 37.25 in. |
| 480 | 48.00 in. |

**NOTES**
1. Escutcheon finish applies to sprinklers provided with escutcheons.
2. The stainless steel escutcheon finish is available for the pendent sprinkler only.
3. 175°F (79°C) and 360°F (182°C) temperature ratings apply to pendent sprinkler assemblies only; 360°F (182°C) temperature rating applies to non-recessed sprinkler assemblies.
4. Dry-type sprinklers are furnished based upon "Order Length" as measured according to Figures 3 to 6, 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 in. increment.

* Use Prefix "I" for ISO 7-R 1 Connection (for example, I-65-961-9-180).

***TABLE D***
***SERIES DS-8 DRY-TYPE SPRINKLERS***
***8.0 K-FACTOR, 1 IN. NPT, STANDARD RESPONSE, STANDARD COVERAGE***
***PART NUMBER SELECTION***

# *Limited Warranty*

For warranty terms and conditions, visit www.tyco-fire.com.

# *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-type Sprinklers**
When ordering Series DS-8 8.0K Pendent or Horizontal Sidewall, Standard Response, Standard Coverage Dry-Type Sprinklers, specify the following information:

- SIN:
  TY4255 – Pendent
  TY4355 – Horizontal Sidewall (HSW)
- Order Length:
  Pendent Dry-Type Sprinklers are furnished based on Order Length as measured according to Figures 4 to 7, as applicable. After the measurement is taken, round it to the nearest 1/4 in. increment.

  Horizontal Sidewall Dry-Type Sprinklers are furnished based upon order length as measured according to Figures 8 to 11, as applicable. After the measurement is taken, round it to the nearest 1/4 in. increment.
- Inlet Connections:
  1 in. NPT (Standard)
  ISO 7-R 1

  ***Note:*** *For information on ISO Inlet Thread Connections, contact Johnson Controls Technical Services.*
- Temperature Rating
- Sprinkler Finish
- Escutcheon Type and Finish, as applicable
- P/N from Table D
  Part numbers are for 1 in. NPT standard order sprinklers. Orders for all other sprinkler assemblies must be accompanied by a complete description.

**Replacement Escutcheons**
Order separately.

***Note:*** *Style 10 Recessed Escutcheons are shipped as assemblies comprised of closure ring and mounting plate. The included mounting plate is not used for dry type sprinkler applications, discard accordingly.*

Specify: (specify type), (specify) finish, P/N (specify):

**Recessed (Style 10)**
Brass Plated. . . . . 91-960-2-010
Signal White (RAL9003). . . . . 91-960-4-010
Chrome Plated. . . . . 91-960-9-010
Stainless Steel . . . . . 91-960-0-010

**Standard (Push-On)**
White Color . . . . . 91-106-0-007
Brass Plated. . . . . 91-106-2-007
Chrome Plated. . . . . 91-106-9-007
Stainless Steel . . . . . 91-106-8-007

**Standard Horizontal Sidewall**
Brass Plated. . . . . 854922
Signal White (RAL9003). . . . . 854902
Chrome Plated. . . . . 854912

**Deep**
Brass Plated. . . . . 91-107-2-010
White . . . . . 91-107-4-007
Chrome Plated. . . . . 91-107-9-007
Stainless Steel . . . . . 91-107-0-007

**Sprinkler Wrench**
Specify W-Type 7 Sprinkler Wrench, P/N 56-850-4-001

**Sprinkler Boot**
Specify Model DSB-2 Dry Sprinkler Boot, P/N 63-000-0-002

This part number includes one (1) Boot, two (2) Strap Ties, and 1/3 oz of Adhesive (a sufficient quantity for installing one boot).

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