Series DS-2 Dry-Type Sprinklers 11.2K Pendent Standard and Quick 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

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 - for example, sprinkler drops from unheated portions of buildings.
- Sprinklers and/or a portion of the connecting piping may be exposed to freezing temperatures - for example, 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.

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

Note: *For additional approvals information, See Table A.*

Maximum Working Pressure
175 psi (12,1 bar)

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

Discharge Coefficient
See Table B

Temperature Ratings
See Table A

Finishes
See 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 (see 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.

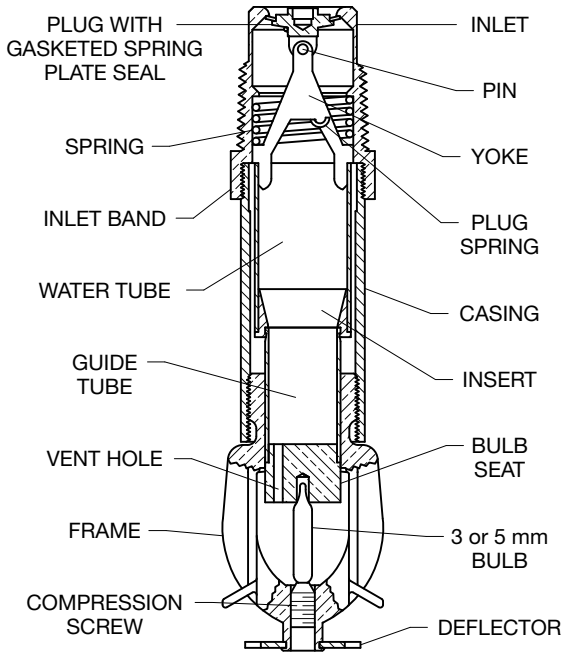


FIGURE 1
SERIES DS-2 STANDARD & QUICK RESPONSE
DRY-TYPE PENDENT SPRINKLER ASSEMBLY

Temperature Rating	Bulb Liquid Color	**TY5255** Standard Response **TY5235** Quick Response with Flush Escutcheon (see Figure 2) with Recessed Escutcheon (see Figure 3) with Extended Escutcheon (see Figure 4) without Escutcheon (see Figure 5)		
		Sprinkler Finish		
		Natural Brass	**Chromed Plated**	**Signal White**
155°F (68°C)	Red	1, 2		
175°F (79°C)	Yellow			
200°F (93°C)	Green			
286°F (141°C)	Blue			

NOTES
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

TABLE A
SERIES DS-2 STANDARD & QUICK RESPONSE, STANDARD COVERAGE
DRY-TYPE PENDENT SPRINKLERS
LABORATORY LISTINGS AND APPROVALS

K-factor Length in. (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 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 B
DISCHARGE COEFFICIENTS

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 in. NPT Series DS-2 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 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 in. 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. See the Exposure Length section.

For wet pipe system installations of 1 in. NPT Series DS-2 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-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.

NOTICE

Do not install Series DS-2 Dry-Type Sprinkler into any other type fitting. 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. See 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.

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

Installation

TYCO Series DS-2 Dry-Type Sprinklers, 11.2K Pendent, Standard (5 mm bulb) and Quick Response (3 mm bulb), and Standard Coverage must be installed in accordance with this section.

General Instructions
Series DS-2 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 grasp the sprinkler by the deflector, see Figure 7. Failure to follow this instruction may impair performance of the device.

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.

A leak-tight 1 in. NPT sprinkler joint should be obtained by applying a minimum-to-maximum torque of 20 ft-lb to 30 ft-lb (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 must 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. Do not grasp the sprinkler by the deflector, see Figure 7.

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

- Pipe wrench on the inlet band or the casing, see Figure 1
- W-Type 17 Sprinkler Wrench on the wrench flat, see Figure 2

Apply the wrench recess of the W-Type 17 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.*

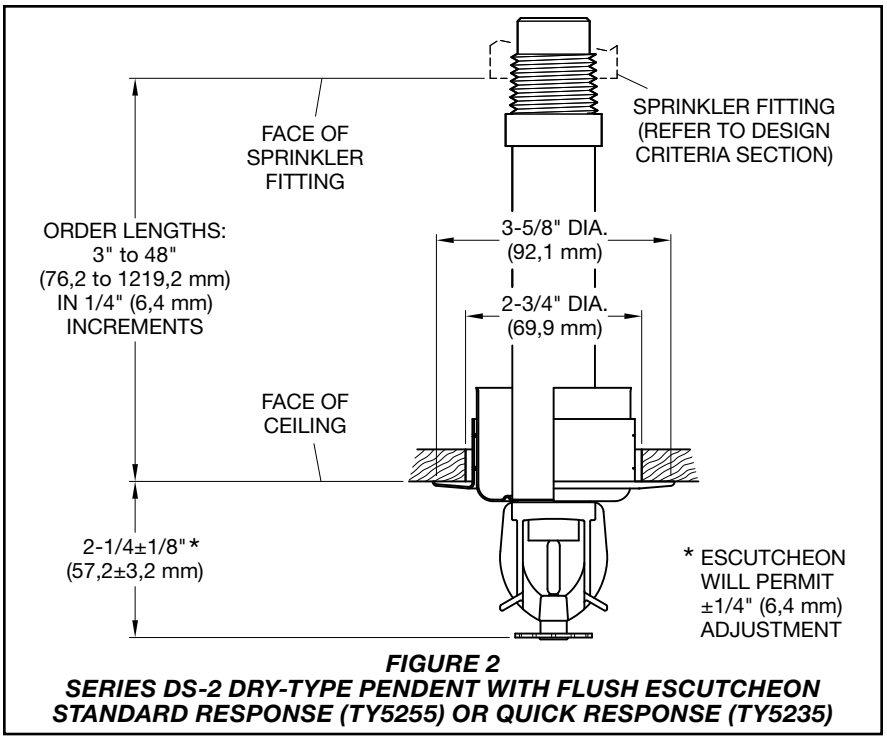


FIGURE 2
SERIES DS-2 DRY-TYPE PENDENT WITH FLUSH ESCUTCHEON STANDARD RESPONSE (TY5255) OR QUICK RESPONSE (TY5235)

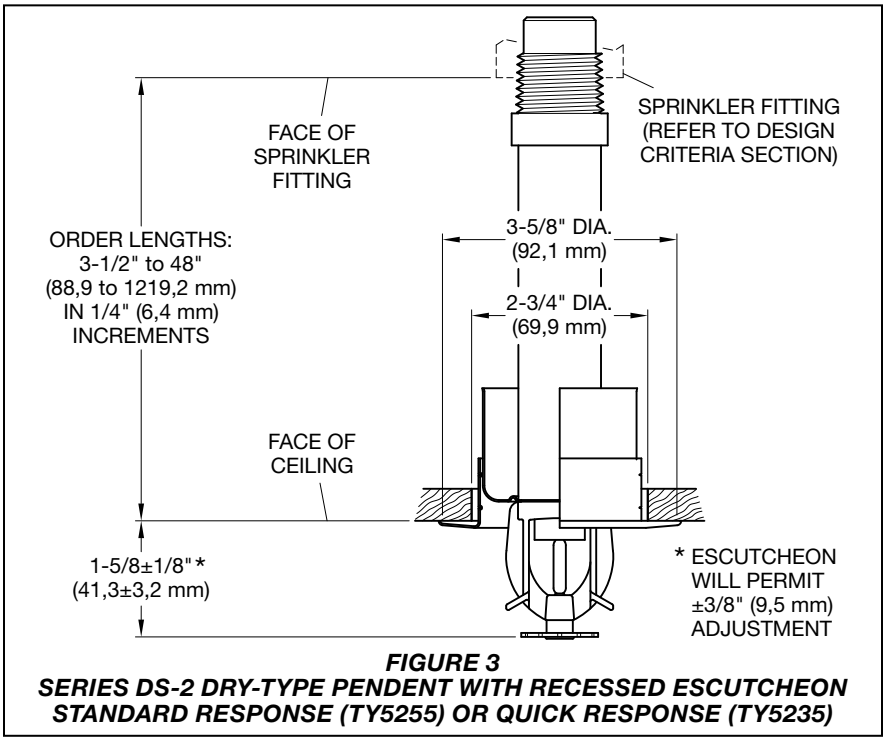


FIGURE 3
SERIES DS-2 DRY-TYPE PENDENT WITH RECESSED ESCUTCHEON STANDARD RESPONSE (TY5255) OR QUICK RESPONSE (TY5235)

Step 3. After installing the ceiling and applying a ceiling finish, slide on the outer piece of the escutcheon until it comes in contact with the ceiling. 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.

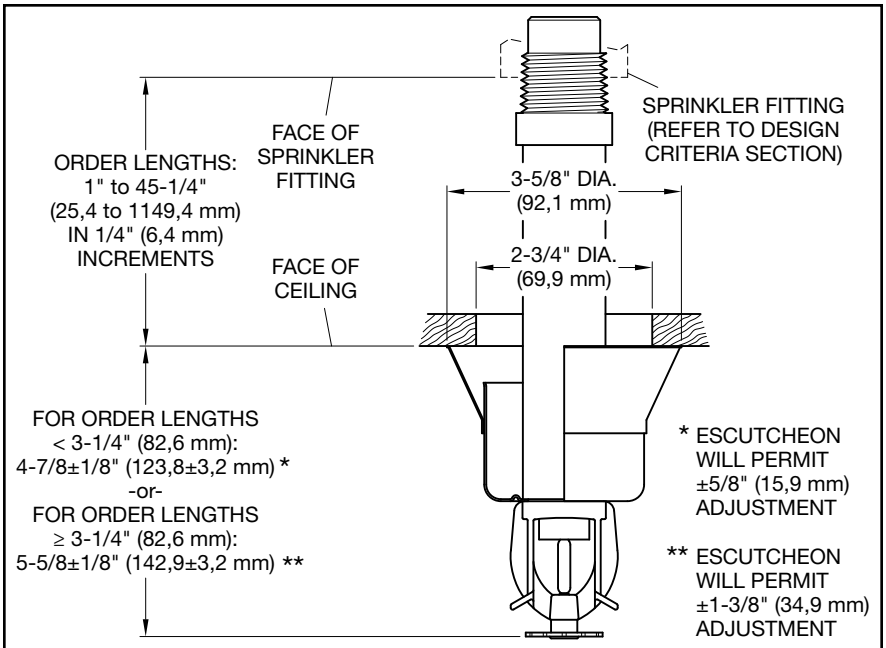


FIGURE 4
SERIES DS-2 DRY-TYPE PENDENT WITH EXTENDED ESCUTCHEON
STANDARD RESPONSE (TY5255) OR QUICK RESPONSE (TY5235)

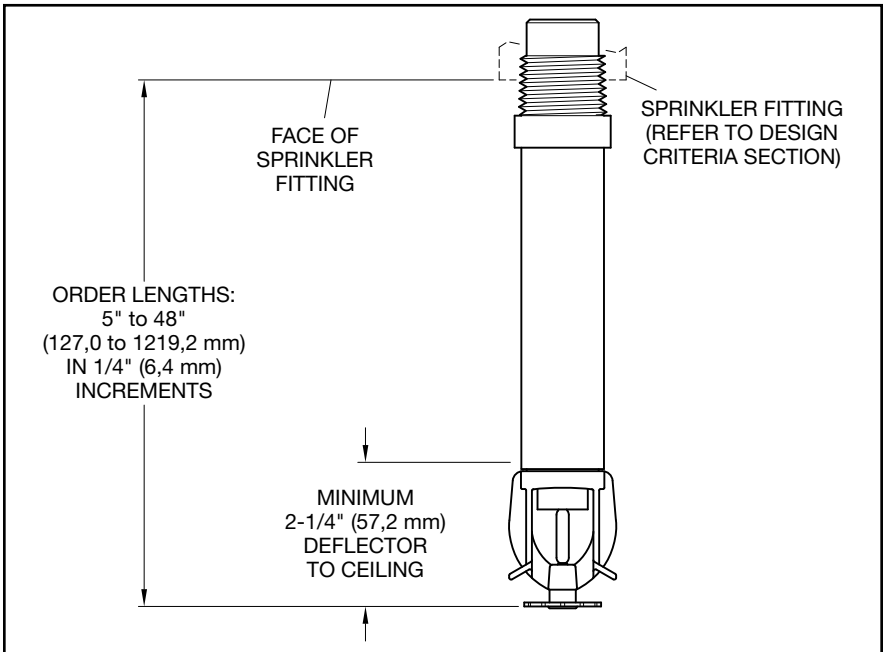


FIGURE 5
SERIES DS-2 DRY-TYPE PENDENT WITHOUT ESCUTCHEON
STANDARD RESPONSE (TY5255) OR QUICK RESPONSE (TY5235)

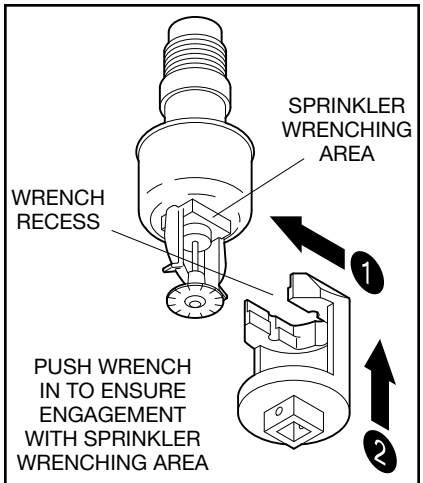


FIGURE 6
W-TYPE 17
SPRINKLER WRENCH

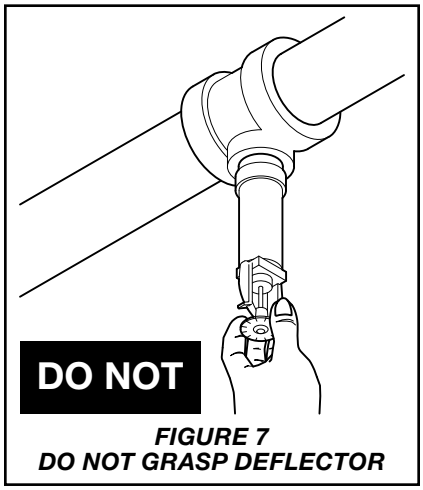


FIGURE 7
DO NOT GRASP DEFLECTOR

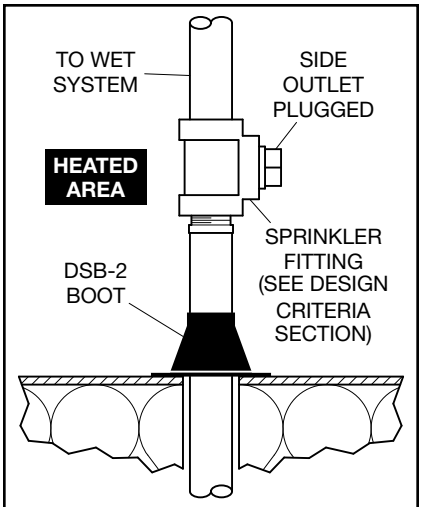


FIGURE 8
SPRINKLER FITTING
HEATED AREA

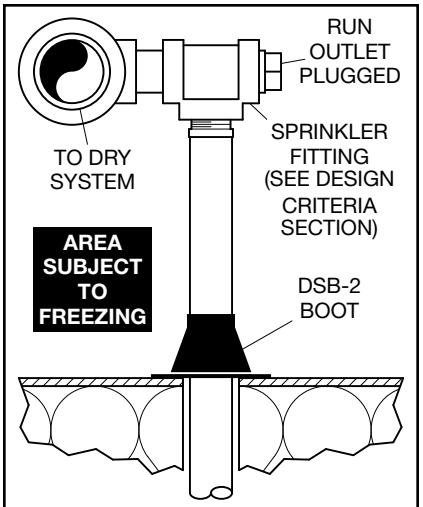


FIGURE 9
SPRINKLER FITTING
UNHEATED AREA

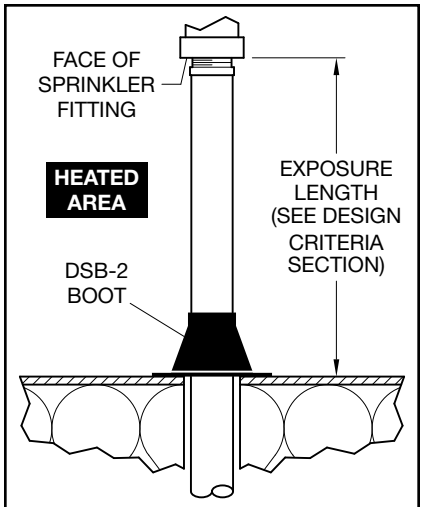


FIGURE 10
EXPOSURE LENGTH

Care and Maintenance

TYCO Series DS-2 Dry-Type Sprinklers, 11.2K Pendent, Standard (5 mm bulb) and Quick Response (3 mm bulb), and Standard Coverage 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 (Figure 1) 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 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.

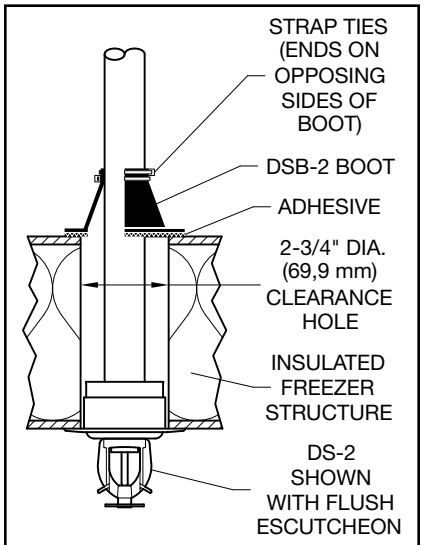


FIGURE 11
MODEL DSB-2 DRY SPRINKLER BOOT WITH SERIES DS-2 DRY-TYPE PENDENT SPRINKLER

P/N*61–XXX–X–XXX

	Standard Response Pendent	SIN
10	With Flush Escutcheon	TY5255
11	With Recessed Escutcheon	TY5255
12	With Extended Escutcheon	TY5255
13	Without Escutcheon	TY5255

	Quick Response Pendent	SIN
30	With Flush Escutcheon	TY5235
31	With Recessed Escutcheon	TY5235
32	With Extended Escutcheon	TY5235
35	Without Escutcheon	TY5235

	Temperature Rating
1	155°F (68°C)
2	175°F (79°C)
3	200°F (93°C)
4	286°F (141°C)

	Sprinkler Finish	Escutcheon Finish[1]
0	Chrome Plated	Signal White (RAL9003)
1	Natural Brass	Signal White (RAL9003)
4	Signal White (RAL9003)	Signal White (RAL9003)
5	Natural Brass	Brass Plated
9	Chrome Plated	Chrome Plated

	Order Length[2]
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 with escutcheons.
2. Dry-Type Sprinklers are furnished based upon "Order Length" as measured per Figures 2 through 5, 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 inch increment.

* Use Prefix "I" for ISO 7-R1 Connection (e.g., I-61-101-1-180).

TABLE D
SERIES DS-2 STANDARD AND QUICK RESPONSE, STANDARD COVERAGE, DRY-TYPE SPRINKLERS
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 and part number (P/N).

Dry-Type Sprinkler
When ordering Series DS-2 Dry-Type Sprinklers, 11.2K Pendent, Standard (5 mm bulb) and Quick Response (3 mm bulb), and Standard Coverage, specify the following information:

- SIN
  TY5255 – Standard Response
  TY5235 – Quick Response
- Order length
  Dry-Type Sprinklers are furnished based upon Order Length as measured from the face of the ceiling to the face of the sprinkler fitting, see Figures 2 through 5. After the measurement is taken, round it to the nearest 1/4 in. increment.
- Inlet connection
  1 in. NPT (Standard Order)
  ISO 7-R 1

  Note: *For information on ISO Inlet Thread Connections, contact your Johnson Controls Sales Representative.*
- Temperature rating
- Sprinkler finish
- Escutcheon type and finish, as applicable
- Part number from Table D

Replacement Escutcheons
Order replacement escutcheons separately.

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

Flush and Recessed
White Color 854902
Chrome Plated 854912
Brass Plated. 854922

Deep
White Color 854802
Chrome Plated 854812
Brass Plated. 854822

Sprinkler Wrench
Specify W-Type 17 Sprinkler Wrench, P/N 56-010-4-118

Model DSB-2 Dry Sprinkler Boot
Model DSB-2 Dry Sprinkler Boot includes one boot, two strap ties, and 1/3 oz of adhesive, quantity of adhesive is sufficient for one boot installation.

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

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