

Series DS-1 – 5.6 K-factor, Dry-Type Sprinklers, Pendent, Standard Response, Standard Coverage VdS Approved Criteria

General Description

TYCO Series DS-1 5.6K Pendent, Standard Response (5 mm bulb), Standard Coverage Dry-Type Sprinklers 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, sprinkler sprigs from wet systems into unheated attics, to protect unheated areas of a building such as loading docks, overhangs, and building exteriors)
- sprinklers are used on systems that are seasonably drained to avoid freezing (e.g., vacation resort areas)

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 VdS CEA 4001 “Sprinkler System: Planning and Installation” or EN12845 “Fixed Firefighting Systems - Design, Installation and Maintenance”, in addition to the standards of any other authorities having

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.

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.

Sprinkler Identification Numbers (SINs)

TY3255 – Pendent

Technical Data

Approvals
VdS Approved

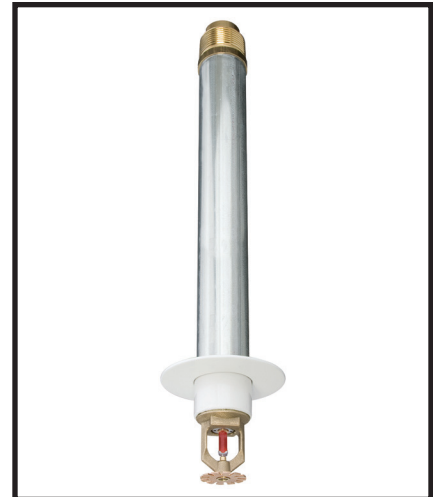
Maximum Working Pressure
175 psi (12,1 bar)

Inlet Thread Connections
ISO 7-R 1

Discharge Coefficient
K=5.6 gpm/psi^{1/2} (80,6 lpm/bar^{1/2})

Temperature Ratings
135°F (57°C)
155°F (68°C)
175°F (79°C)
200°F (93°C)
286°F (141°C)
360°F (182°C)

Finishes
Sprinkler: Natural Brass, Chrome Plated, Signal White (RAL9003) Polyester
Escutcheon: Brass Plated, Chrome Plated, Signal White (RAL9003) Polyester, Stainless Steel
Baffle Plate: Chrome Plated



Physical Characteristics

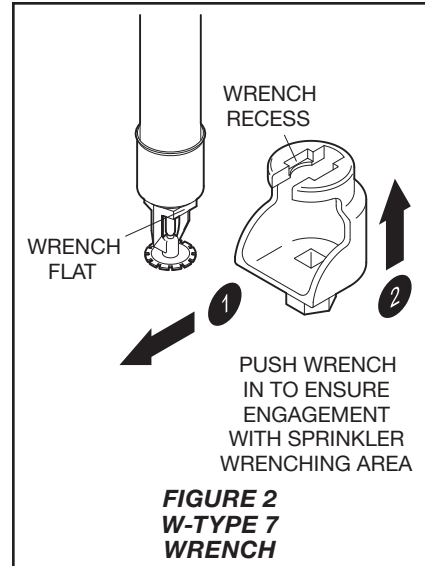
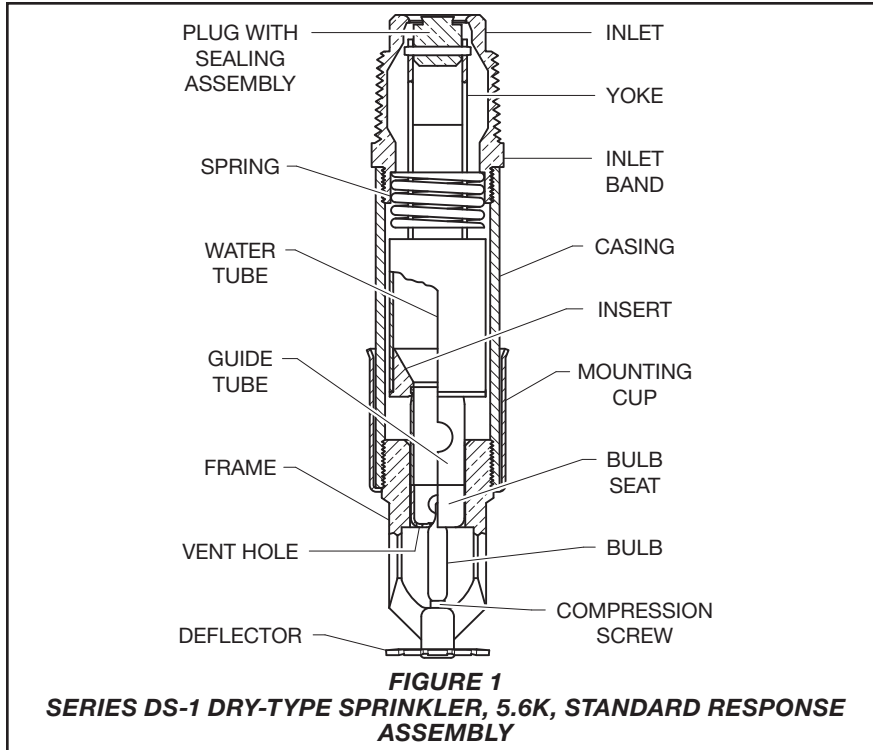
Inlet	Copper
Plug	Copper
Yoke	Stainless Steel
Casing	Galvanized Carbon Steel
Insert	Bronze
Bulb Seat	Stainless Steel
Bulb (5 mm dia.)	Glass
Compression Screw	Bronze
Deflector	Bronze
Frame	Bronze
Guide Tube	Stainless Steel
Water Tube	Stainless Steel
Spring	Stainless Steel
Sealing Assembly	Beryllium Nickel w/TEFLON
Escutcheon	Carbon Steel

Operation

When TYCO Series DS-1 5.6K Pendent, Standard Response, Standard Coverage Dry-Type Sprinklers are in service, water is prevented from entering the assembly by the Plug with Sealing Assembly (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 Sealing Assembly from the Inlet, allowing the sprinkler to activate and flow water.



The unused outlet of the threaded tee is plugged as shown in Figure 6.

Series DS-1 Dry-Type Sprinkler may also be installed in the outlet of a GRINNELL G-FIRE Figure 522 Sprinkler Outlet Fittings with ISO 7-R1 threads; however, the use of the Figure 522 for this arrangement is limited to wet pipe systems.

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

NOTICE

Do not install Series DS-1 Dry-Type Sprinklers into any other type fitting without first consulting the Johnson Controls Technical Services. Failure to use the appropriate fitting may result in one of the following:

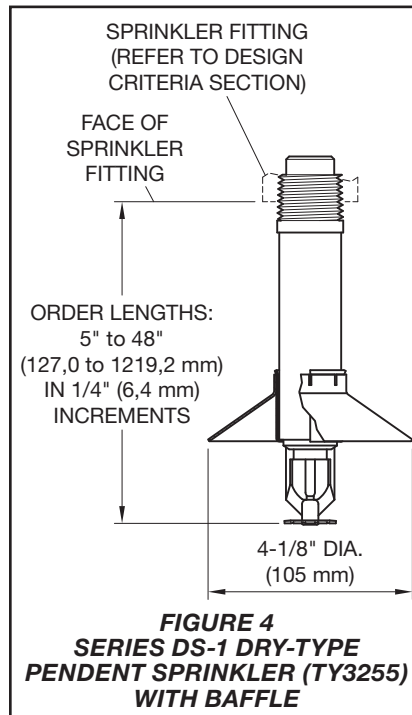
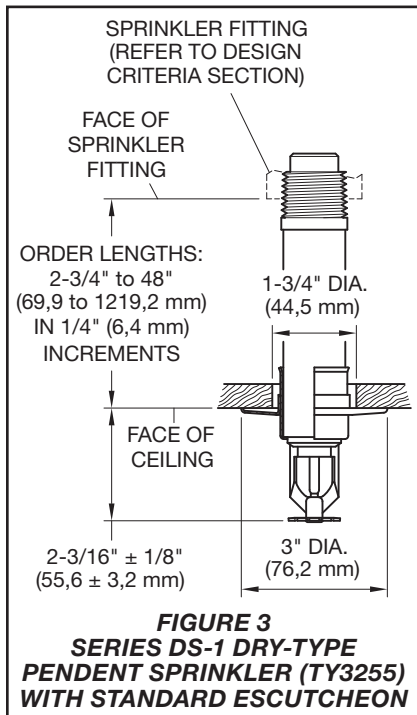
- failure of the sprinkler to operate properly due to formation of ice over the Inlet Plug or binding of the Inlet Plug
- insufficient engagement of the Inlet pipe-threads with consequent leakage

Drainage

Follow installation instructions according to VdS CEA 4001 to set pitch for proper drainage.

Exposure Length

When using Dry Sprinklers in wet pipe sprinkler systems to protect areas



Design Criteria

TYCO Series DS-1 5.6K Pendent, Standard Response, Standard Coverage Dry-Type Sprinklers are intended for use in fire sprinkler systems designed in accordance with the standard installation rules. For more information contact Johnson Controls Technical Services.

Sprinkler Fittings

Install ISO 7-R1 DS-1 Dry-Type Sprinklers in the ISO 7-R1 outlet or run of the ductile iron threaded tees fittings that meet the dimensional requirements of EN10242.

Do not install Series DS-1 Dry-Type Sprinklers into elbow fittings. The Inlet of the sprinkler can contact the interior of the elbow.

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 A
EXPOSED SPRINKLER BARRELS IN WET PIPE SYSTEMS
MINIMUM RECOMMENDED LENGTHS

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 5 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 VdS CEA 4001, 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 Figures 8, can provide the recommended seal.

Installation

TYCO Series DS-1 5.6K Pendent, Standard Response, Standard Coverage Dry-Type Sprinklers must be installed in accordance with this section.

General Instructions

Series DS-1 Dry-Type Sprinklers must only be installed in fittings that meet the requirements of the Design Criteria section. Refer to 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 135°F (57°C) rating to 1/8 in. (3,2 mm) for the 360°F (182°C) rating.

Obtain a leak-tight ISO 7-R1 sprinkler joint by applying a minimum-to-maximum torque of 20 to 30 lb-ft (26,8 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:

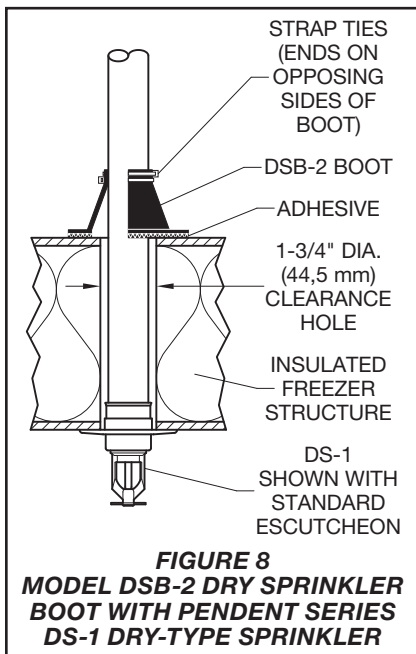
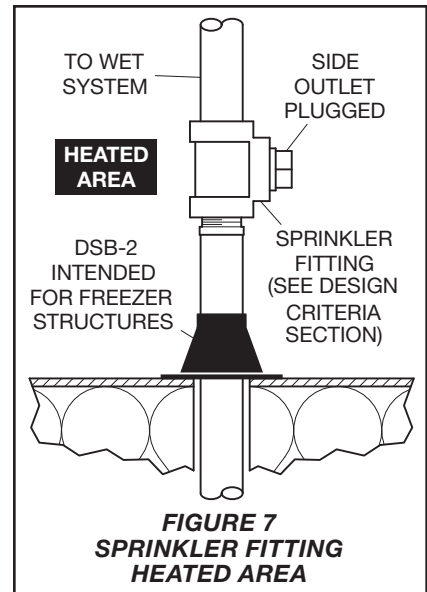
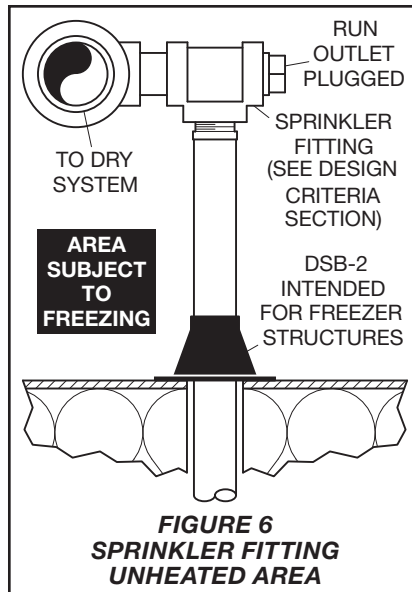
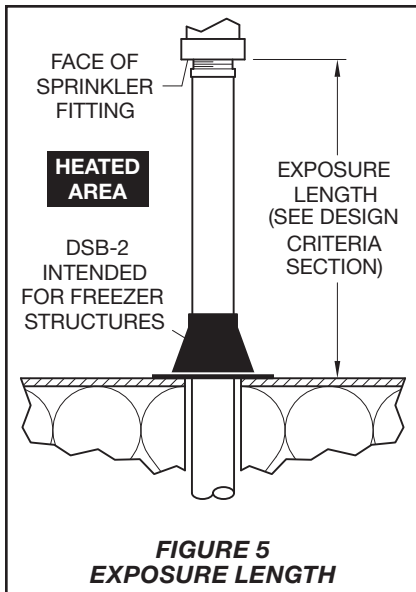
- a pipe wrench on the Inlet Band or the Casing (See Figure 1)
- the W-Type 7 Sprinkler Wrench on the Wrench Flat (See Figure 2)

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 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.

To install the baffle plate properly, push on until the top edge reaches the flared edge of the escutcheon.



Care and Maintenance

TYCO Series DS-1 5.6K Pendent, 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 (See 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 VdS CEA 4001, 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* I - 60 - XXX - X - XXX

TEMPERATURE RATING ⁽²⁾		SPRINKLER FINISH	ESCUTCHEON FINISH ⁽¹⁾	ORDER LENGTH ⁽³⁾	
0	135°F (57°C)	0	CHROME PLATED	055	5.50 in.
1	155°F (68°C)	2	NATURAL BRASS	082	8.25 in.
2	175°F (79°C)	4	SIGNAL WHITE (RAL9003) POLYESTER	180	18.00 in.
3	200°F (93°C)	8	CHROME PLATED	187	18.75 in.
4	286°F (141°C)	9	CHROME PLATED	372	37.25 in.
5	360°F (182°C)			480	48.00 in.

SIN		
96	Pendent with Standard Escutcheon	TY3255 (Figure 3)

Notes:

- Escutcheon Finish applies to sprinklers provided with escutcheons.
- 360°F (182°C) temperature rating applies to non-recessed sprinkler assemblies.
- Dry-type Sprinklers are furnished based upon "Order Length" as measured per Figures 3 through 10, 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.

TABLE B
SERIES DS-1 DRY-TYPE SPRINKLERS, 5.6K, STANDARD RESPONSE
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-1 5.6K Pendent, Standard Response, Standard Coverage Dry-Type Sprinklers, specify the following information:

- SIN:
TY3255 - Pendent

- Order Length:
Dry-Type Sprinklers are furnished based upon Order Length as measured per Figures 3 and 4, as applicable. After the measurement is taken, round it to the nearest 1/4 in. increment.
- Inlet Connections:
ISO 7-R 1
(For information on ISO Inlet Thread Connections, contact your Johnson Controls Sales Representative.)
- Temperature Rating
- Sprinkler Finish
- Escutcheon Type and Finish, as applicable
- P/N from Table B
Part numbers are for standard order sprinklers. Orders for all other sprinkler assemblies must be accompanied by a complete description.

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

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

Baffle Plate

Specify: Baffle Plate, P/N 91-070-9-444

