

# Reliable®

## Model F3Res44 Dry (SIN RA5231) K4.4 (63 metric) Residential Dry Horizontal Sidewall Sprinkler

**UL Listed Residential Sprinkler**  
**Coverage area up to 16 ft. x 20 ft.**  
**(4.9m x 6.1m)**

### Features

1. Available in Ordinary, 155°F (68°C), or Intermediate, 175°F (79°C), temperature classification.
2. Flush, recessed, and extended installation options.
3. Standard inlet with 1-inch NPT threads. Optional inlets with 3/4-inch NPT, ISO 7-R1 or ISO 7-R3/4 threads.
4. Sprinkler available in lengths from 4-1/4 inches (108mm) to 24 inches (610mm) in 1/4-inch (6.35mm) increments (see Fig. 4-6).

### Approvals & Listings

1. Listed by Underwriters Laboratories and Certified for Canada (cULus) as a Residential sprinkler. UL Guide Number VKKW, Residential Automatic Sprinklers.

### Patents

Model F3Res44 Dry sprinklers may be covered by one or more of the following patents:

U.S. 5,775,431

U.S. 5,967,240

U.S. 7,353,882

### Application

The Model F3Res44 Dry sprinkler is a cULus Listed Residential sprinkler intended for use in accordance with NFPA 13, NFPA 13R, or NFPA 13D. The Model F3Res44 Dry sprinkler is cULus Listed for use in residential occupancies and residential portions of any occupancy, where permitted by NFPA 13, NFPA 13R, or NFPA 13D. For NFPA 13R and NFPA 13D applications, the design flow and pressure shall not be less than the minimum flow and pressure specified in the Listed Design Criteria table in this Bulletin. For NFPA 13 applications, the design density shall be a minimum of 0.1 gpm/sf (4.1 mm/min), but in no case shall the flow and pressure be less than the minimum flow and pressure specified in the Listed Design Criteria table in this Bulletin. See Bulletin 140, Residential Sprinkler Design and Installation Guide, for additional guidance on hydraulic design requirements.



Fig. 1  
Model F3Res44 Dry  
sprinkler with standard  
escutcheon



Fig. 2  
Model F3Res44 Dry  
sprinkler with Model HB  
extended escutcheon



Fig. 3  
Model F3Res44 Dry  
sprinkler with Model F2  
recessed escutcheon

The Model F3Res44 Dry sprinkler is typically used in situations where a wet-pipe sprinkler system in a temperature-controlled space is used to protect an adjacent space that is subject to freezing temperatures. The sprinkler must be installed on a wet-pipe sprinkler system.

### Product Description

The Reliable Model F3Res44 Dry sprinkler is a Dry Horizontal Sidewall sprinkler, where the sealing washer is located at the inlet end of the sprinkler assembly. The position of the sealing washer is controlled by a fluid-filled glass bulb thermal element at the opposite end of the sprinkler assembly. The sprinkler is installed with the thermal element in a protected space that may be subject to freezing temperatures and the inlet orifice located in a heated area that is separated from the protected space. Operation of thermal element allows the sealing washer to move out of the inlet orifice admitting water from the supply piping. The sprinkler uses a fast-response thermal element with an Ordinary, 155°F (69°C), or Intermediate, 175°F (79°C), temperature classification.

The Model F3Res44 Dry sprinkler is listed for installation flush, recessed with a Model F2 escutcheon, or extended with or without a Model HB escutcheon. The standard escutcheon includes up to 1-1/2-inch (38 mm) of adjustment and extends the base of the wrench boss of the sprinkler up to 2 inches (51 mm) beyond the surface of the wall. The Model HB escutcheon includes up to 1-inch (26 mm) of adjustment and extends to base of the wrench boss up to 3 inches (76 mm) beyond the surface of the wall.

The Model F2 escutcheon is the only recessed escutcheon listed for use with the Model F3Res44 sprinkler. The Model F2 escutcheon includes up to 1/2-inch (13 mm) of adjustment and permits the base of the wrench boss to be recessed a maximum of 1/2-inch (13 mm) inside the wall.

The Model F3Res44 Dry sprinkler is available in lengths ranging from 4-1/4 inches (108mm) to 24 inches (610mm) in 1/4-inch (6.35mm) increments (see Fig. 4-6). The length of the sprinkler must be selected to provide the Exposed Minimum Barrel Length in a Heated Area required by Fig. 7.

The Model F3Res44 Dry sprinkler has a standard 1-inch NPT threaded inlet. Threaded inlet fittings in 3/4-inch NPT, ISO 7-R1, or ISO 7-R3/4 are also available. The standard inlet fitting includes a long inlet designed to minimize the potential for water, scale, and sediment to accumulate on the sprinkler inlet. For applications where the standard inlet interferes with installation into existing pipe fittings, an inlet fitting is available with a short ("PL") inlet. See Fig. 8 for further information.

## Technical Data:

Nominal K-factor		Temperature Rating		Max. Ceiling Temperature		Inlet Thread Size	Sprinkler Identification Number (SIN)
gpm/(psi) <sup>1/2</sup>	L/min/(bar) <sup>1/2</sup>	°F	°C	°F	°C		
4.4	63	155	69	100	38	1-inch NPT ISO 7-R1	RA5231
		175	79	150	66	3/4-inch NPT ISO 7-R3/4	

**Minimum spacing between sprinklers:** 8 ft (2.44 m)

**Maximum spacing between sprinklers:** 16 ft (4.9 m), see Listed Design Criteria table for minimum flow rate and pressure requirements based on spacing.

**Maximum Working Pressure:** 175 psi (12 bar) – 100% factory hydrostatically tested to 500 psi (34.5 bar)

**Sprinkler Installation Wrenches:** Model F3R wrench for sprinklers with standard and HB escutcheons (Note: Model F3 wrenches are not compatible with the F3Res44 Dry sprinkler) and Model XLO2 for sprinklers with Model F2 recessed escutcheons.

Listed Design Criteria*							
Max. Coverage Area Width x Length		Deflector to Ceiling Distance		Min. Flow Rate		Min. Pressure	
ft. x ft.	m x m	inches	mm	gpm	l/min	psi	Bar
14 x 14	4.3 x 4.3	4 - 6	102 - 152	14	53	10.1	0.70
		6 - 12	152 - 305	18	68	16.7	1.15
16 x 16	4.9 x 4.9	4 - 6	102 - 152	17	64	14.9	1.03
		6 - 12	152 - 305	21	80	22.8	1.57
16 x 18	4.9 x 5.5	4 - 6	102 - 152	18	68	16.7	1.15
		6 - 12	152 - 305	21	80	22.8	1.57
16 x 20	4.9 x 6.1	4 - 6	102 - 152	25	95	32.3	2.23
		6 - 12	152 - 305	26	98	34.9	2.41

**Materials:** See Fig. 9

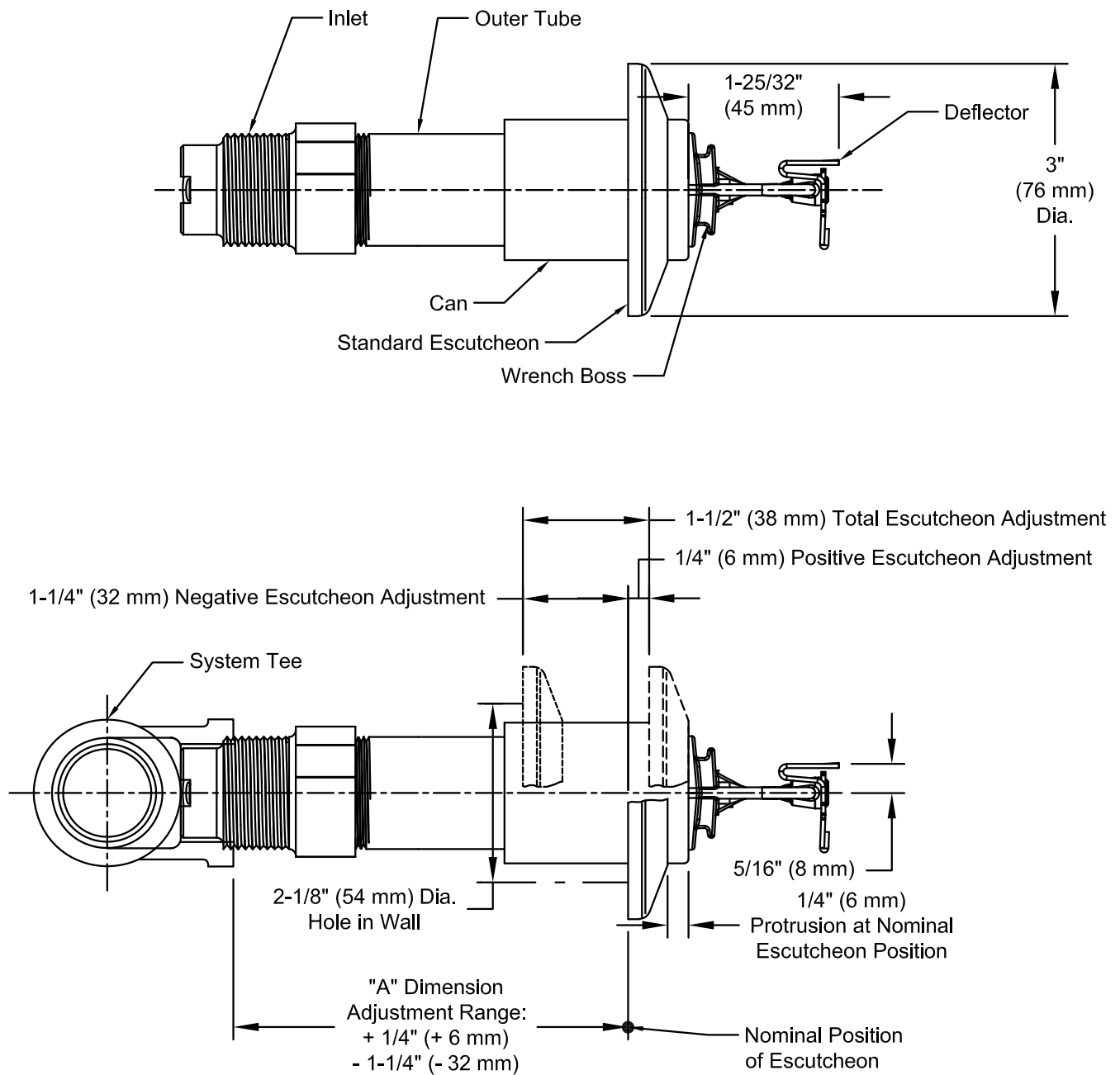
\*For NFPA 13 systems calculate for a minimum design density of 0.1 gpm/sf (4.1 mm/min), but in no case shall the flow and pressure be less than the Listed Design Criteria.

## Installation Instructions

Model F3Res44 Dry sprinklers must only be installed in the side outlet of standard (ANSI B 16.3 class 150 and ANSI B 16.4 class 125) pipe tees. Model F3Res44 Dry sprinklers may be installed in the side outlet of a listed CPVC tee only in accordance with Fig. 8 and upon verification that the CPVC tee does not interfere with the sprinkler's inlet. Model F3Res44 Dry sprinklers shall not be installed into elbows or welded outlets. In all installations, including into CPVC piping, the dry sprinkler shall be installed with protrusion into the fitting in accordance with the installation diagrams in this Bulletin.

Installation of the Model F3Res44 Dry sprinkler is not recommended in copper pipe systems, as this may reduce the life expectancy of the sprinkler. Do not install Model F3Res44 Dry sprinklers with the standard (long) inlet fitting into CPVC fittings that have an internal obstruction (see Fig. 9); this will damage the sprinkler, the fitting, or both. Model F3Res44 Dry sprinklers must be installed with the Exposed Minimum Barrel Length required by Fig. 7 located in a Heated Area.

## Model F3Res44 Dry Sprinkler with Standard Escutcheon



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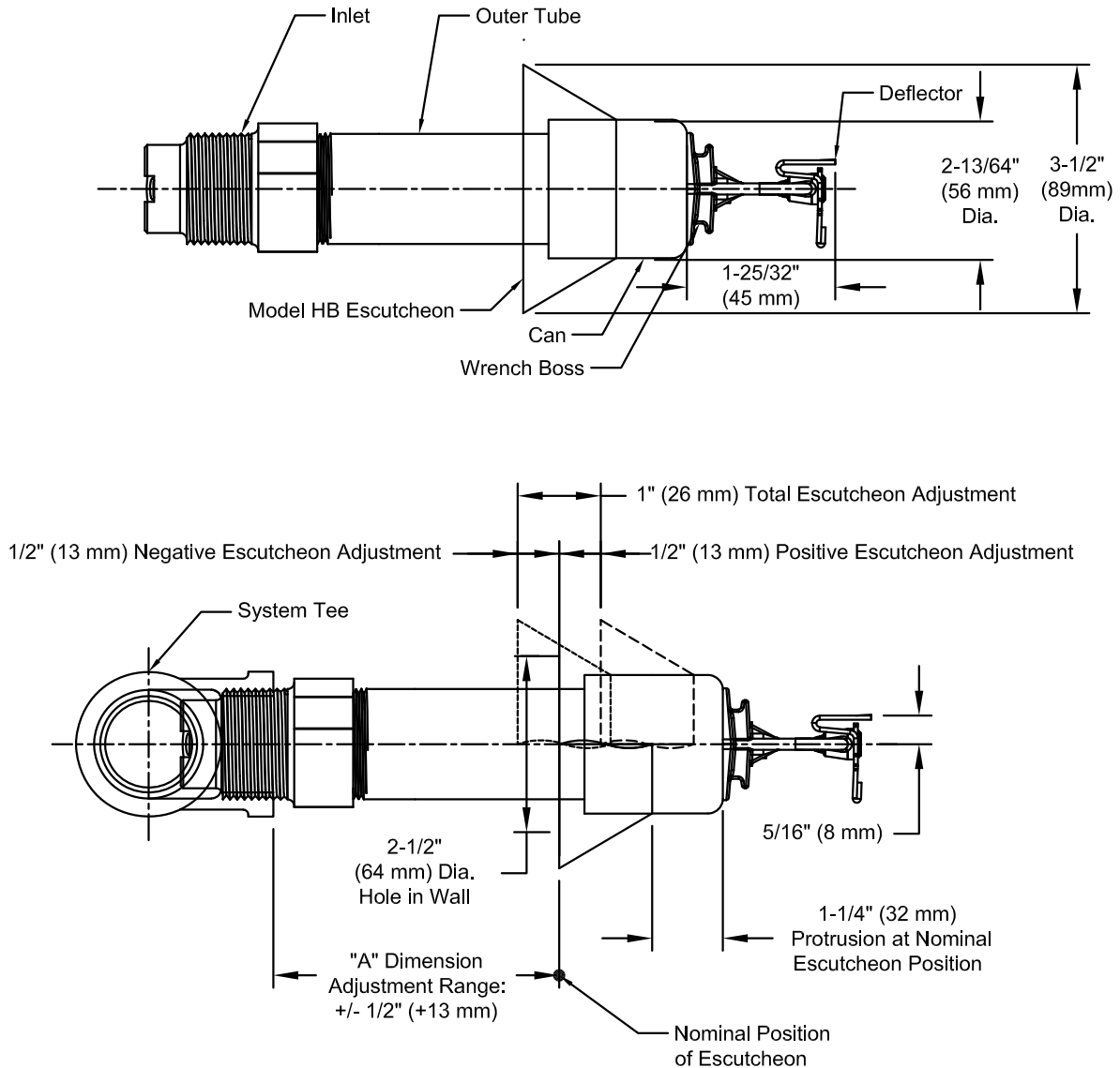
Fig. 4

### The following steps must be followed for installation:

1. The centerline of the Model F3Res44 Dry sprinkler must be installed between 4-5/6 inches (110 mm) and 12-5/16 inches (312 mm) vertically below the finished ceiling and as required to comply with the Listed Design Criteria provided in this Bulletin based on a 5/16-inch (8 mm) deflector to centerline of sprin-

kler distance. A hole must be cut in the wall directly in-line with the outlet of the tee. For installations with the standard or Model HB escutcheon, cut a 2-1/8-inch (54 mm) diameter hole. For recessed installations with the Model F2 escutcheon, cut a 2-1/2-inch (63 mm) diameter hole.

## Model F3Res44 Dry Sprinkler with Model HB Extended Escutcheon



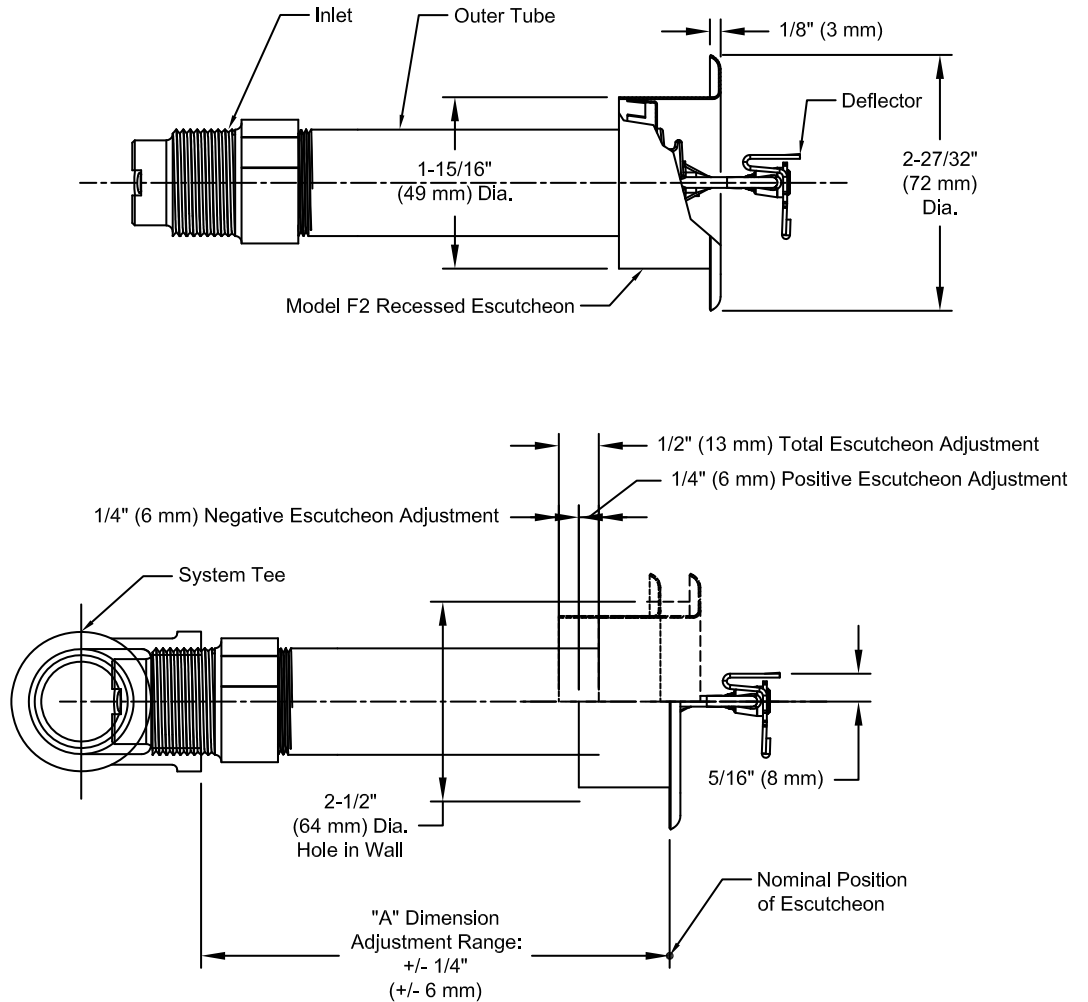
Note: "A" dimension is 3-1/2 inches (89mm) minimum, 24 inches (108mm) maximum.

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Fig. 5

2. Apply pipe joint compound or Polytetrafluoroethylene (PTFE) tape to the threads of the sprinkler's inlet fitting. A red cap is factory installed on the sprinkler's inlet. Remove the red cap prior to installation by pulling the cap from the sprinkler by hand.
3. A clip is provided to protect the glass bulb thermal element from damage. The clip is factory installed on the sprinkler. The clip should remain in place during installation of the sprinkler and be removed when the sprinkler system is placed in service.
4. Install the sprinkler in the tee using the appropriate installation wrench (Model F3R wrench for sprinklers with standard and Model HB escutcheons; Model XLO2 wrench for sprinklers with Model F2 escutcheons). The Model F3R wrench is inserted into grooves in the sprinkler's wrench boss. Do NOT wrench any

### Model F3Res44 Dry Sprinkler with Model F2 Recessed Escutcheon



Note: "A" dimension is 3-1/2 inches (89mm) minimum, 24 inches (108mm) maximum.

052FG06A

Fig. 6

part of the sprinkler assembly other than the wrench boss. The sprinkler is then tightened into the pipe fitting to achieve a leak free connection. The recommended minimum to maximum installation torque is 22-30 lb-ft (30 – 40 N-m) for 1-inch NPT and ISO 7-R1 inlet sprinklers, and 14 – 20 lb-ft (19 – 27 N-m) for

3/4-inch NPT and ISO 7-R3/4 sprinklers. When inserting or removing the wrench from the sprinkler, care should be taken to prevent damage to the sprinkler.

4a. Alternatively, where access to the outer tube of the sprinkler is available, the Model F3Res44 Dry sprinkler may be installed using a pipe wrench.

**RECOMMENDED EXPOSED MINIMUM BARREL LENGTH BASED ON AMBIENT TEMPERATURE IN THE PROTECTED AREA**

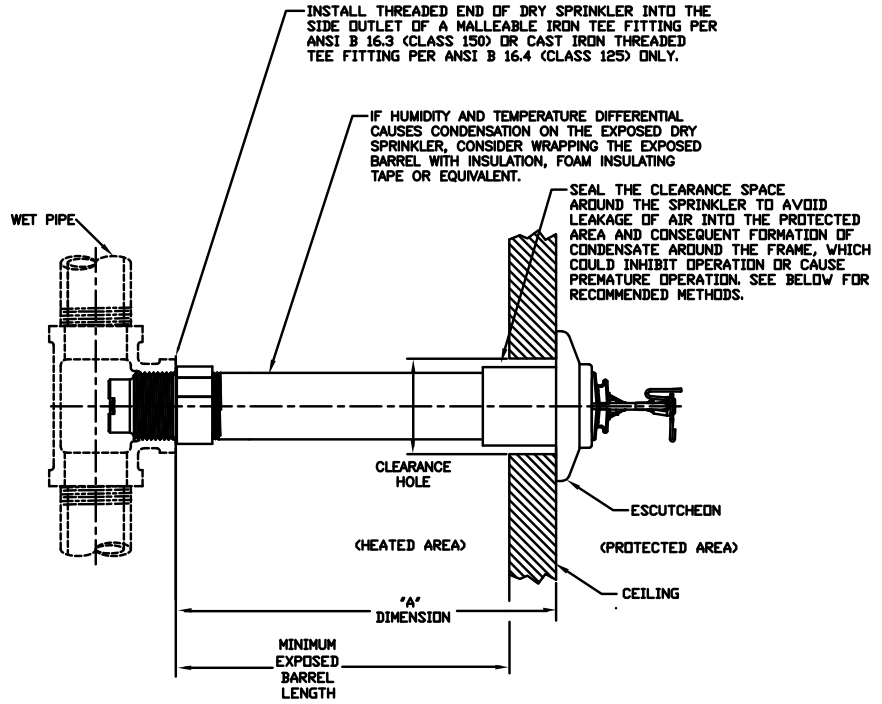
AMBIENT TEMPERATURE OF PROTECTED AREA* AT THE DISCHARGE END OF THE SPRINKLER	EXPOSED BARREL AMBIENT TEMPERATURE		
	40°F/4°C	50°F/10°C	60°F/16°C
	MINIMUM EXPOSED BARREL LENGTH** (FACE OF TEE TO TOP OF CEILING)		
	IN. (MM)	IN. (MM)	IN. (MM)
40°F (4°C)	0	0	0
30°F (-1°C)	0	0	0
20°F (-7°C)	4 (101)	0	0
10°F (-12°C)	8 (203)	1 (25.1)	0
0°F (-18°C)	12 (305)	3 (75)	0
-10°F (-23°C)	14 (356)	4 (101)	1 (25.1)
-20°F (-29°C)	14 (356)	6 (152)	3 (75)
-30°F (-34°C)	16 (408)	8 (203)	4 (101)
-40°F (-40°C)	18 (457)	8 (203)	4 (101)
-50°F (-46°C)	20 (508)	10 (254)	6 (152)
-60°F (-51°C)	20 (508)	10 (254)	6 (152)

\* THE PROTECTED AREA REFERS TO THE AREA WITHIN THE ROOM PROTECTED BY THE SPRINKLER.

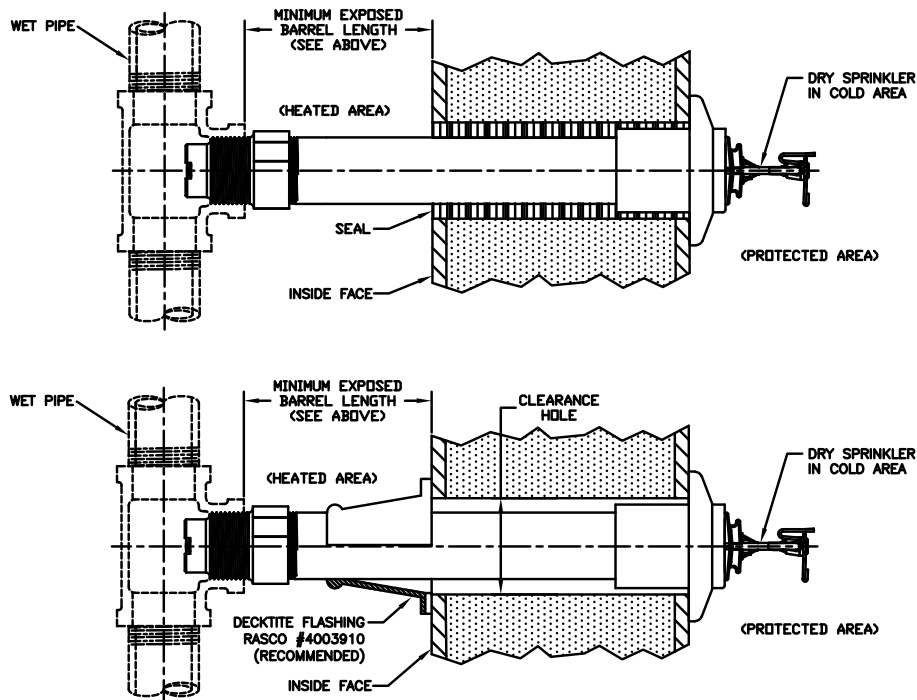
FOR PROTECTED AREA TEMPERATURES THAT OCCUR BETWEEN THE VALUES LISTED, USE THE NEXT COOLER TEMPERATURE.

\*\*THE MINIMUM EXPOSED BARREL LENGTH IS NOT THE SAME AS THE "A" DIMENSION.

NOTE: MINIMUM EXPOSED BARREL LENGTHS ARE INCLUSIVE OF UP TO 30MPH WIND VELOCITIES IN THE PROTECTED AREA.



**RECOMMENDED DRY SPRINKLER SEAL ARRANGEMENTS**



052FG07

Fig. 7

The pipe wrench shall only be permitted to interface with the steel outer tube portion of the sprinkler (Item #8 in Fig. 9). Do NOT wrench any other portion of the sprinkler assembly. A pipe wrench can install the sprinkler into the fitting with a large amount of torque; consideration should be given to the need for future removal of the sprinkler because the installation torque will have to be matched or exceeded to remove the sprinkler. The recommended minimum to maximum installation torque is 22-30 lb-ft (30 – 40 N-m) for 1-inch NPT and ISO 7-R1 sprinklers, and 14 – 20 lb-ft (19 – 27 N-m) for 3/4-inch NPT and ISO 7-R3/4 sprinklers.

5. Remove the protective clip when placing the sprinkler system in service.

### Maintenance

The Model F3Res44 Dry sprinkler should be inspected and the sprinkler system maintained in accordance with NFPA 25. Do not clean sprinklers with soap and water, ammonia or any other cleaning fluids. Replace any sprinkler that has been painted (other than factory applied) or damaged in any way. A stock of spare sprinklers should be maintained to allow for quick replacement of damaged or operated sprinklers. Prior to installation, sprinklers should be maintained in the original cartons and packaging to minimize the potential for damage to sprinklers that would cause improper operation or non-operation.

### Engineering Specification

#### Model F3Res44 Residential Dry Horizontal Sidewall Sprinkler

Dry Horizontal Sidewall sprinklers shall be cULus Listed as Residential sprinklers. Sprinklers shall be available in lengths from 4-1/4 inches (108mm) to 24 inches (610mm) in 1/4-inch (6.35mm) increments based on face of fitting to finished ceiling distance. Sprinkler length shall be selected to provide the Exposed Minimum Barrel Length based on the minimum design temperature in the protected area and the minimum temperature in the conditioned space where the barrel is located in accordance with the Manufacturer's written installation instructions. Sprinklers shall have [1-inch NPT][ISO 7-1 R1][3/4-inch NPT][ISO 7-R3/4] threaded inlet fittings with [standard length inlets][short length inlets designed for use with existing pipe fittings having internal obstructions]. Sprinklers shall have a PTFE coated beryllium nickel Belleville spring washer inlet seal and brass alloy cap that prevent water entry from the sprinkler system piping into the sprinkler prior to actuation. Sprinklers shall have a fast-response glass bulb thermal element that controls the movement of the inlet seal and cap through a mechanism consisting of link arms, a seat adapter, an orifice adapter, an inner tube, and a yoke. Sprinklers shall be [Ordinary temperature classification, 155°F (68°C)][Intermediate temperature classification, 175°F (79°C)]. Sprinklers finish shall be [Bronze][White][Chrome][Special Application – Specify] finish. Residential Dry Horizontal Sidewall sprinklers shall be Reliable Model F3Res44 Dry (SIN RA5231).

### Finishes

Available Sprinkler/Escutcheon Finishes
White Paint
Black Paint
Custom Color Paint – Specify
White Polyester Coated
Custom Color Polyester Coated – Specify
Bright Brass
Bronze
Bright Chrome
Brushed Chrome
Electroless Nickel PTFE (ENT)

### Ordering Information

Specify:

1. Sprinkler: Model F3Res44 Dry
2. Threads:
  - a. [1-inch NPT - standard]
  - b. [ISO 7-R1]
  - c. [3/4-inch NPT]
  - d. [ISO 7-R3/4]
3. Inlet Length:
  - a. [Standard]
  - b. [Short – for existing installations only]
4. Escutcheon type:
  - a. [Standard]
  - b. [F2 Recessed]
  - c. [HB Extended]
5. Sprinkler/Escutcheon Finish:  
See Finishes table above
6. Sprinkler Temperature Classification:
  - a. [Ordinary, 155°F (69°C)]
  - b. [Intermediate, 175°F (79°C)]
7. Nominal Sprinkler Length (face of fitting to face of ceiling - "A" Dimension from Fig. 4-6): [Specify length – Lengths available from 4¼ inches to 24 inches (108mm to 610mm) in 1/4-inch (6mm) increments]

# **\*CAUTION\***

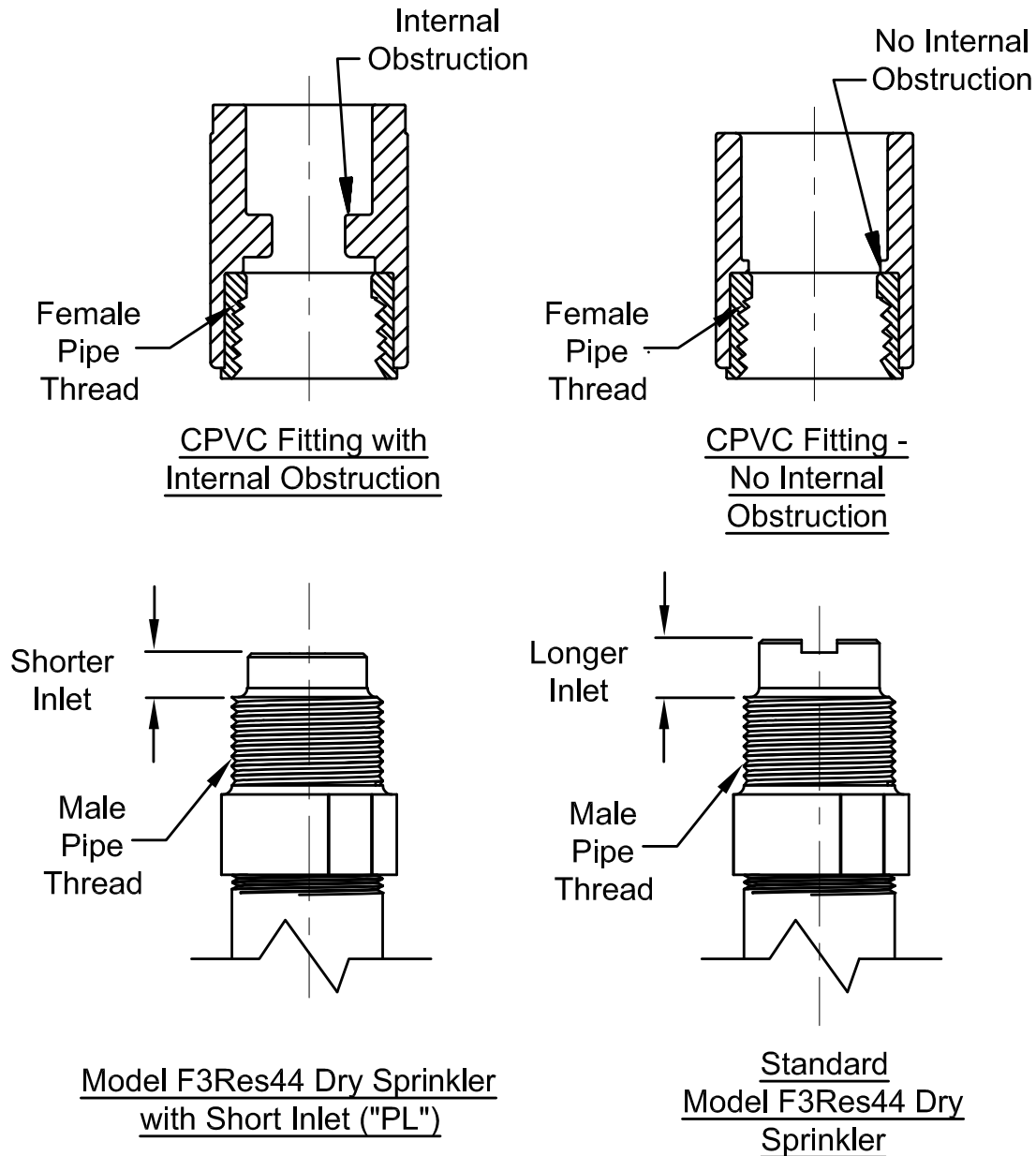
THE MODEL F3RES44 DRY SPRINKLER MAY BE INSTALLED IN THE SIDE OUTLET OF A LISTED CPVC TEE, ONLY UPON VERIFICATION THAT THE FITTING DOES NOT INTERFERE WITH THE SPRINKLER'S INLET.

Do not install Model F3Res44 Dry sprinklers with standard inlets into CPVC fittings that have an internal obstruction; this will damage the sprinkler, the fitting, or both.

CPVC fittings with internal obstructions are commonly found during the retrofitting process of Reliable's older Model G3 Dry sprinklers.

A short inlet ("PL") version of the Model F3Res 44 Dry sprinkler is available that may or may not be compatible with fittings having internal obstructions in existing installations.

In all cases, verify sprinkler and fitting dimensions prior to installation to avoid interference.



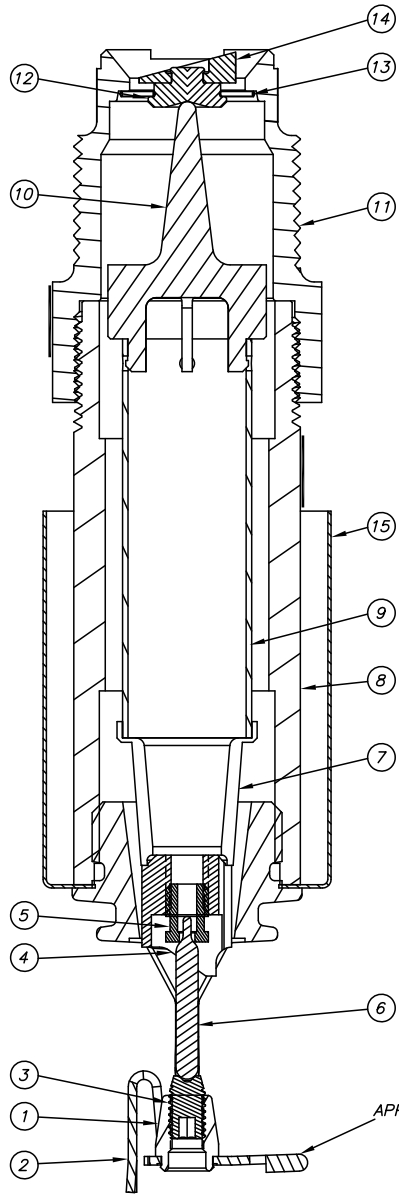
**BE SURE TO ORDER THE CORRECT SPRINKLERS FOR YOUR APPLICATION**

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Fig. 8



# MATERIAL SPECIFICATIONS



ITEM #	DESCRIPTION	MATERIAL SPECIFICATION
1	FRAME	BRASS PER UNS C83600
2	DEFLECTOR	BRONZE PER UNS C51000
3	LOAD SCREW	BRASS PER UNS C22000
4	SEAT ADAPTOR	BRASS ALLOY PER UNS C36000
5	BULB INSERT	COPPER ALLOY PER UNS C331400
6	GLASS BULB	GLASS W/GLYCERIN SOLUTION
7	ORIFICE ADAPTOR	BRASS ALLOY PER UNS C36000
8	OUTER TUBE	GALVANIZED STEEL
9	INNER TUBE	BRASS ALLOY PER UNS C23000
10	YOKE	BRASS ALLOY PER UNS C38000
11	INLET	BRASS ALLOY PER UNS C35330
12	CAP	BRASS ALLOY PER UNS C54400
13	SPRING WASHER/SEAL	PTFE COATED BERYLLIUM NICKEL
14	FLIP DISK	BRASS ALLOY PER UNS C54400
15	CAN/ESCUTCHEON	PAINTED OR PLATED MILD STEEL

(PIPE WRENCH MAY ONLY BE USED ON OUTER STEEL PIPE OF SPRINKLER)

052FG09

APPEARANCE OF DEFLECTOR MAY VARY DEPENDING ON MODEL

Fig. 9

# Reliable...For Complete Protection

Reliable offers a wide selection of sprinkler components. Following are some of the many precision-made Reliable products that guard life and property from fire around the clock.

- Automatic sprinklers
- Flush automatic sprinklers
- Recessed automatic sprinklers
- Concealed automatic sprinklers
- Adjustable automatic sprinklers
- Dry automatic sprinklers
- Intermediate level sprinklers
- Open sprinklers
- Spray nozzles
- Alarm valves
- Retarding chambers
- Dry pipe valves
- Accelerators for dry pipe valves
- Mechanical sprinkler alarms
- Electrical sprinkler alarm switches
- Water flow detectors
- Deluge valves
- Detector check valves
- Check valves
- Electrical system
- Sprinkler emergency cabinets
- Sprinkler wrenches
- Sprinkler escutcheons and guards
- Inspectors test connections
- Sight drains
- Ball drips and drum drips
- Control valve seals
- Air maintenance devices
- Air compressors
- Pressure gauges
- Identification signs
- Fire department connection

The equipment presented in this bulletin is to be installed in accordance with the latest published Standards of the National Fire Protection Association, Factory Mutual Research Corporation, or other similar organizations and also with the provisions of governmental codes or ordinances whenever applicable.

Products manufactured and distributed by Reliable have been protecting life and property for over 90 years, and are installed and serviced by the most highly qualified and reputable sprinkler contractors located throughout the United States, Canada and foreign countries.

Manufactured by

**Reliable**<sup>®</sup>

**Reliable Automatic Sprinkler Co., Inc.**

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