

## RAPID RESPONSE Series LFII Residential Sprinklers 4.2 K-factor Flush Horizontal Sidewall Wet Pipe Systems

### General Description

The TYCO RAPID RESPONSE Series LFII Residential Flush Horizontal Sidewall Sprinklers (TY2384) are decorative, fast response, fusible solder sprinklers designed for use in residential occupancies such as homes, apartments, dormitories, and hotels. When aesthetics is the major consideration, the Series LFII Sprinklers (TY2384) should be the first choice.

The Series LFII Residential Sprinklers (TY2384) are intended for use in the following scenarios:

- wet-pipe residential sprinkler systems for one- and two family dwellings and manufactured homes per NFPA 13D;
- wet-pipe residential sprinkler systems for residential occupancies up to and including four stories in height per NFPA 13R
- wet-pipe sprinkler systems for the residential portions of any occupancy per NFPA 13

The flush design of the Series LFII Residential Sprinklers (TY2384) features a separable escutcheon providing 3/16 inch (4,8 mm) horizontal adjustment. This adjustment reduces the accuracy to which the pipe nipples to the sprinklers must be cut to help assure a perfect fit installation.

The Series LFII Residential Sprinklers (TY2384) have been designed with heat sensitivity and water distribution char-

acteristics proven to help in the control of residential fires and to improve the chance for occupants to escape or be evacuated.

#### NOTICE

*The Series LFII Residential Flush Horizontal Sidewall Sprinklers (TY2384) described herein must be installed and maintained in compliance with this document and with 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. The installing contractor or sprinkler manufacturer should be contacted with any questions.*

### Sprinkler Identification Number (SIN)

TY2384

### Technical Data

#### Approvals

UL and C-UL Listed

For details on approvals, refer to the Design Criteria section.

#### Maximum Working Pressure

175 psi (12,1 bar)

#### Discharge Coefficient

K= 4.2 GPM/psi<sup>1/2</sup> (60,5 LPM/bar<sup>1/2</sup>)

#### Temperature Rating

162°F (72°C)

#### Horizontal Adjustment

3/16 inch (4,8 mm)



#### Finishes

Signal White  
Jet Black  
Chrome

#### Physical Characteristics

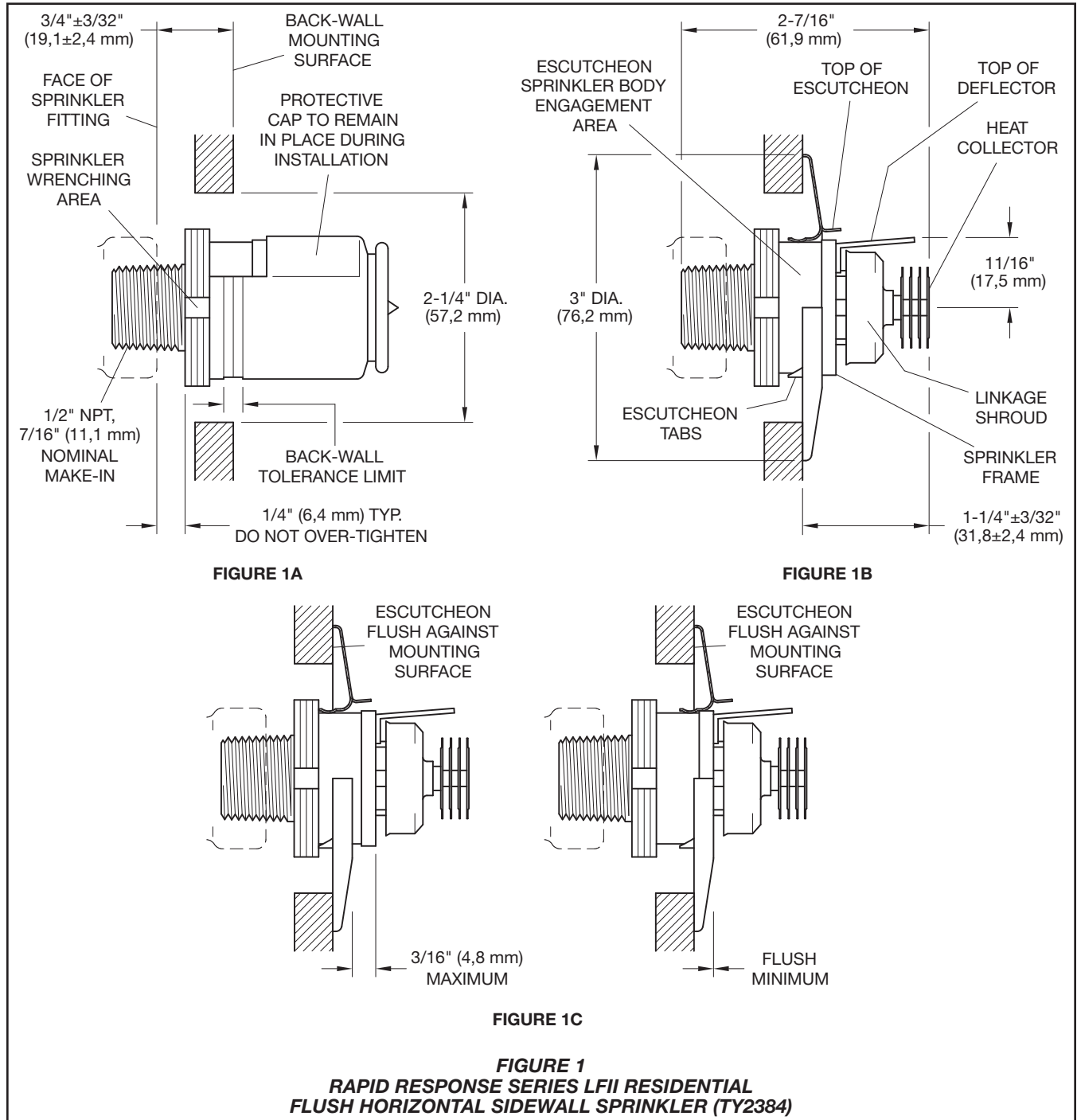
Body . . . . . Copper Alloy  
Deflector . . . . . Copper  
Valve Cap . . . . . Copper Alloy  
Orifice Seal . . . . . PTFE  
Heat Collectors . . . . . Copper

### Operation

The sprinkler assembly contains a small fusible solder element. When exposed to sufficient heat from a fire, the solder melts and enables the internal components of the sprinkler to fall away. At this point the sprinkler activates with the deflector dropping into its operated position (Figure 1C), permitting water to flow.

#### IMPORTANT

*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.*



Maximum Coverage Area <sup>(a)</sup> Width x Length <sup>(d)</sup> Ft. x Ft. (m x m)	Maximum Spacing Ft. (m)	WET PIPE SYSTEM Minimum Flow and Residual Pressure <sup>(b, c)</sup>				
		Ordinary Temp. Rating 162°F/72°C		Deflector to Ceiling	Installation Type	Minimum Spacing Ft. (m)
		Flow GPM (L/min)	Pressure PSI (bar)			
12 x 12 (3,7 x 3,7)	12 (3,7)	13 (49,2)	9.6 (0,66)	4 to 6 Inches	Flush	8 (2,4)
14 x 14 (4,3 x 4,3)	14 (4,3)	16 (60,6)	14.5 (1,00)			
16 x 16 (4,9 x 4,9)	16 (4,9)	20 (75,7)	22.7 (1,57 bar)			

- (a) For coverage area dimensions less than or between those indicated, it is necessary to use the minimum required flow for the next highest coverage area for which hydraulic design criteria are stated.
- (b) Requirement is based on minimum flow in GPM (LPM) from each sprinkler. The associated residual pressures are calculated using the nominal K-factor. Refer to Hydraulic Design Criteria Section for details.
- (c) For NFPA 13 residential applications, the greater of 0.1 gpm/ft<sup>2</sup> over the design area or the flow in accordance with the criteria in this table must be used.
- (d) The Width x Length dimension refers to the Width (backwall where the sprinkler is located) times the Length (horizontal throw of sprinkler).

**TABLE A**  
**WET PIPE SYSTEM**  
**SERIES LFII RESIDENTIAL FLUSH HORIZONTAL SIDEWALL SPRINKLERS (TY2384)**  
**NFPA 13D, 13R, AND 13 HYDRAULIC DESIGN CRITERIA**

## Design Criteria

The TYCO RAPID RESPONSE Series LFII Residential Flush Horizontal Sidewall Sprinklers (TY2384) are UL and C-UL Listed for installation in accordance with this section.

**Residential Sprinkler Design Guide**  
When conditions exist that are outside the scope of the provided criteria, refer to the Residential Sprinkler Design Guide TFP490 for the manufacturer's recommendations that may be acceptable to any authority having jurisdiction.

**System Type**  
Only wet-pipe systems may be utilized.

**Ceiling Type**  
Smooth flat horizontal, or beamed, or sloped, in accordance with the 2013 Edition of NFPA 13D, 13R, or 13 as applicable.

**Hydraulic Design (NFPA 13D and 13R)**  
For systems designed to NFPA 13D or NFPA 13R, the minimum required sprinkler flow rate are given in Table A as a function of temperature rating and the maximum allowable coverage areas. The sprinkler flow rate is the minimum required discharge from each of the total number of "design sprinklers" as specified in NFPA 13D or NFPA 13R.

**Hydraulic Design (NFPA 13)**  
For systems designed to NFPA 13, the number of design sprinklers is to be the four most hydraulically demanding sprinklers. The minimum required discharge from each of the four sprinklers is to be the greater of the following:

- The flow rates given in Table A for NFPA 13D and 13R as a function of temperature rating and the maximum allowable coverage area.
- A minimum discharge of 0.1 gpm/ft<sup>2</sup> over the "design area" comprised of the four most hydraulically demanding sprinklers for the actual coverage areas being protected by the four sprinklers.

**Obstruction to Water Distribution**  
Sprinklers are to be located in accordance with the obstruction rules of NFPA 13D, 13R, and 13 as applicable for residential sprinklers as well as with the obstruction criteria described within the Technical Data Sheet TFP490.

**Operational Sensitivity**  
The sprinklers are to be installed in the flush position per Figure 1 with the provided escutcheon.

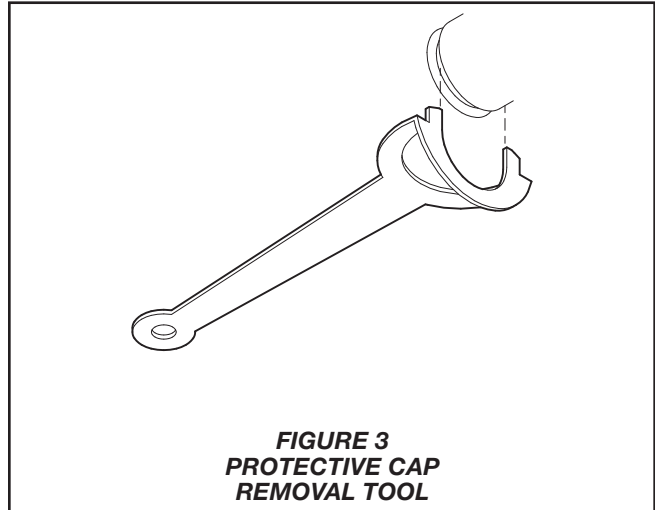
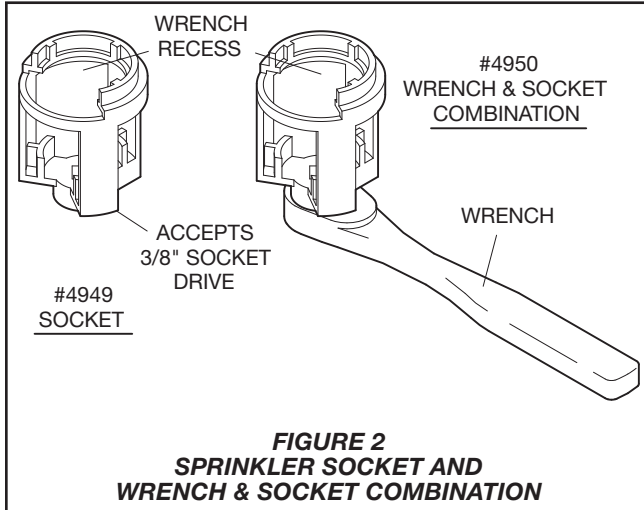
In addition the top-of-deflector-to-ceiling distance is to be within the range (Refer to Table A) being hydraulically calculated.

**Sprinkler Spacing**  
The minimum spacing between sprinklers is 8 feet (2,4 m). The maximum spacing between sprinklers cannot exceed the length of the coverage area (Refer to Table A) being hydraulically calculated (e.g., maximum 12 feet for a 12 ft. x 12 ft. coverage area, or 16 feet for a 16 ft. x 16 ft. coverage area).

**Precautionary Warnings for Corrosive Environments**

The Series LFII Residential Flush Horizontal Sidewall Sprinkler (TY2384) must be installed in a non-corrosive environment. The improper use of corrosive agents such as flux, or other products that contain chloride ions, whether applied internally or externally to the sprinkler system, may result in corrosion of the sprinkler head, or stress corrosion cracking, which in turn may cause the sprinklers heads to develop leaks, operate unexpectedly, or not operate properly.

Accordingly, it is essential that the Series LFII Residential Flush Horizontal Sidewall Sprinkler (TY2384) be installed only by experienced fire sprinkler engineers, who comply fully with NFPA 13, 13D, 13R and 25, ASTM B 813, ASTM B 828 and Copper Development Association (CDA).



**Copper sprinkler system piping**  
 Any time copper piping is used in any part of a fire sprinkler system, the copper piping must be installed in conformance with all applicable standards and requirements for copper piping, including: NFPA 13, 13D, 13R and 25, ASTM B 813, ASTM B 828, and Copper Development Association (CDA). Any soldering in any part of a sprinkler system, either internally or externally, must be done with use of only an ASTM B 813 approved flux. Residual flux must be thoroughly removed from both the interior and exterior surfaces of the piping before installing the sprinkler heads. The use of improper flux, or the failure to thoroughly remove proper flux, may result in corrosion of the sprinkler head or stress cracking, which in turn may cause the sprinkler heads to develop leaks, operate unexpectedly, or not operate properly.

## Installation

The TYCO RAPID RESPONSE Series LFII Residential Flush Horizontal Sidewall Sprinklers (TY2384) must be installed in accordance with this section:

### General Instructions

The Protective Cap is to remain on the sprinkler during installation until the ceiling installation is complete. The Protective Cap must be removed to place the sprinkler in service.

A leak-tight 1/2 inch NPT sprinkler joint Should be obtained by applying a minimum to maximum torque of 7 to 14 ft.-lbs. (9,5 to 19,0 Nm). Higher levels of torque can distort the sprinkler Inlet with consequent leakage or impairment of the sprinkler.

Do not attempt to compensate for insufficient adjustment in the sprinkler by under- or over-tightening the Sprinkler/Support Cup Assembly. Re-adjust the position of the sprinkler fitting to suit.

Each sprinkler must be inspected before installation. Do not use any sprinkler that exhibits any deformations or cracks, including cracks on the protective cap.

**Step 1.** Horizontal sidewall sprinklers must be installed only in the horizontal position with their centerline of waterway perpendicular to the backwall and parallel to the ceiling. The top of the deflector is to face towards the ceiling, as depicted in Figure 1B, with the front edge of the deflector parallel to the ceiling.

**Step 2.** Install the sprinkler fitting so that the distance from the face of the fitting to the mounting surface will be nominally 3/4 inches (19,1 mm) as shown in Figure 1A.

**Step 3.** With pipe thread sealant applied to the pipe threads, hand tighten the sprinkler into the sprinkler fitting.

**Step 4.** Wrench tighten the sprinkler using only the Sprinkler Socket or Wrench & Socket Combination (Figure 2). The wrench recess of the socket is to be applied to the sprinkler wrenching area (Figure 1A).

The Sprinkler Wrench must be correctly aligned to slide over the Protective Cap. After the leading edge of the Sprinkler Wrench passes over the flat portion of the Protective Cap, it must be rotated and realigned to engage with the sprinkler wrenching area.

*Conversely to remove the Sprinkler Wrench, sufficiently pull the Sprinkler Wrench so that it disengages from the sprinkler wrenching area, and then rotate the Sprinkler Wrench so that it can pass over the Protective Cap.*

**Step 5.** Use the “backwall tolerance limit” indicator (Figure 1A) on the Protective Cap to check for proper installation depth. The finished wall surface must line up within the 3/16 inch (4,8 mm) range of the “backwall tolerance limit”. Figure 1A illustrates the finished wall surface at the mid-point of the “backwall tolerance limit”. Relocate the sprinkler fitting as necessary. If desired the Protective Cap may also be used to locate the center of the clearance hole. Apply chalk to the center point of the Cap and then gently touch the wall material against the center point of the Cap.

**Step 6.** After the wall has been completed with the 2-1/4 inch (57,2 mm) diameter clearance hole, use the Protective Cap Removal Tool (Figure 3) to remove the Protective Cap and then push on the Escutcheon until its flange comes in contact with the wall.

If the Escutcheon cannot be engaged sufficiently to contact the wall and/or the Escutcheon cannot be engaged per Figure 1C (i.e., 3/16 inch (4,8 mm) to flush with respect to the face of the sprinkler body), relocate the sprinkler fitting.

## **Care and Maintenance**

The TYCO RAPID RESPONSE Series LFII Residential Flush Horizontal Sidewall Sprinklers (TY2384) 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 system from the proper authorities and notify all personnel who may be affected by this action.

Absence of an Escutcheon Plate may delay the time to sprinkler operation in a fire situation. This outer piece of the escutcheon is used to cover a clearance hole.

The owner must assure that the sprinklers are not used for hanging any objects and that the sprinklers are only cleaned by means of gently dusting with a feather-duster. Otherwise, non-operation in the event of a fire or inadvertent operation may result.

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 or overheated sprinklers must be replaced.

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.

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 (e.g., NFPA 25), in addition to the standards of any other authorities having jurisdiction. Contact the installing contractor or sprinkler manufacturer regarding 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.

## **Ordering Procedure**

Contact your local distributor for availability. When placing an order, indicate the full product name and part number (P/N).

### **Sprinkler Assembly**

Specify: Series LFII (TY2384), K=4.2, Residential Flush Horizontal Sidewall Sprinkler with 162°F (72°C) temperature rating, (specify) finish, and P/N (specify).

Signal White (RAL9003) . . . . .P/N 51-124-4-162  
Jet Black (RAL9005) . . . . .P/N 51-124-5-162  
Chrome. . . . .P/N 51-124-9-162

### **Escutcheon**

Specify: Escutcheon for Series LFII (TY2384), K=4.2, Residential Flush Horizontal Sidewall Sprinkler with (specify) finish, and P/N (specify).

Signal White (RAL9003) . . . . .P/N 56-124-4-001  
Jet Black (RAL9005) . . . . .P/N 56-124-5-001  
Chrome. . . . .P/N 56-124-9-001

### **Accessories**

Specify: Socket for Series LFII Residential Flush Horizontal Sidewall Sprinkler (TY2384), P/N 56-000-4-949.

Specify: Wrench & Socket for Series LFII Residential Flush Horizontal Sidewall Sprinkler (TY2384), P/N 56-000-4-950.

Specify: Protective Cap Removal Tool for Series LFII Residential Flush Horizontal Sidewall Sprinkler (TY2384), P/N 56-000-4-300.

