

Series LFII Residential Flush Horizontal Sidewall Sprinklers 4.2 K-Factor

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 Sprinklers (TY2384) are to be used in 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; or, wet-pipe sprinkler systems for the residential portions of any occupancy per NFPA 13.

The Series LFII Sprinklers (TY2384) has a 4.2 (60,5) K-factor that provides the required residential flow rates at reduced pressures, enabling smaller pipe sizes and water supply requirements.

The flush design of the Series LFII Sprinklers (TY2384) features a separable escutcheon providing 3/16 inch (4,8 mm) horizontal adjustment. This adjustment reduces the accuracy to

which the pipe drops to the sprinklers must be cut to help assure a perfect fit installation.

The Series LFII Sprinklers (TY2384) has been designed with heat sensitivity and water distribution characteristics 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.

Owners are 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.

Model/Sprinkler Identification Number (SIN)

TY2384

Technical Data

Approvals
UL and C-UL Listed

Maximum Working Pressure
175 psi (12,1 bar)

Discharge Coefficient
K= 4.2 GPM/psi^{1/2} (60,5 LPM/bar^{1/2})

Temperature Rating
162°F/72°C



Horizontal Adjustment
3/16 inch (4,8 mm)

Finishes
Sprinkler and Escutcheon:
White, Chrome, or Black

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.

Design Criteria

The Series LFII Residential Flush Horizontal Sidewall Sprinklers (TY2384) are UL and C-UL Listed for installation in accordance with the following criteria.

Note: 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.

Hydraulic Design.

The minimum required sprinkler flow rate for systems designed to NFPA 13D or NFPA 13R 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.

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/sq. ft. 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 13 for residential sprinklers as well as with the obstruction criteria described within the TYCO technical data sheet TFP490.

Operational Sensitivity (Horizontal and Sloped Ceilings).

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.

ELEVATION		
Maximum Coverage Area ^(a) Width x Length ^(b) Ft. x Ft. (m x m)	Maximum Spacing Ft. (m)	Minimum Flow ^(c) and Residual Pressure
		Top-Of-Deflector - To - Ceiling: 4 to 6 Inches (100 to 150 mm)
		162°F/72°C
12 x 12 (3,7 x 3,7)	12 (3,7)	13 GPM (49,2 LPM) 9.6 psi (0,66 bar)
14 x 14 (4,3 x 4,3)	14 (4,3)	16 GPM (60,6 LPM) 14.5 psi (1,00 bar)
16 x 16 (4,9 x 4,9)	16 (4,9)	20 GPM (75,7 LPM) 22.7 psi (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) Width (backwall where sprinkler is located) x Length (horizontal throw of sprinkler).

(c) 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.

(d) Sidewall sprinklers, where installed under a ceiling with a slope greater than 0 inch rise for a 12 inch run to a slope up to 2 inch rise for 12 inch run, must be located per one of the following:

- Locate the sprinklers at the high point of the slope and positioned to discharge down the slope.
- Locate the sprinklers along the slope and positioned to discharge across the slope.

TABLE A
NFPA 13D AND NFPA 13R WET PIPE HYDRAULIC DESIGN CRITERIA FOR THE SERIES LFII RESIDENTIAL FLUSH HORIZONTAL SIDEWALL SPRINKLERS (TY2384) FOR HORIZONTAL CEILING (Maximum 2 Inch Rise for 12 Inch Run)

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 (for example, maximum 12 feet for a 12 ft. x 12 ft. coverage area, or 20 feet for a 20 ft. x 20 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

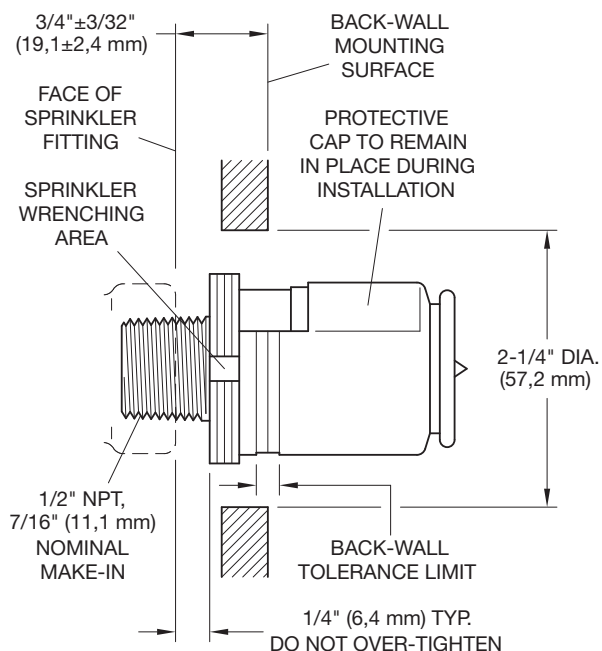


FIGURE 1A

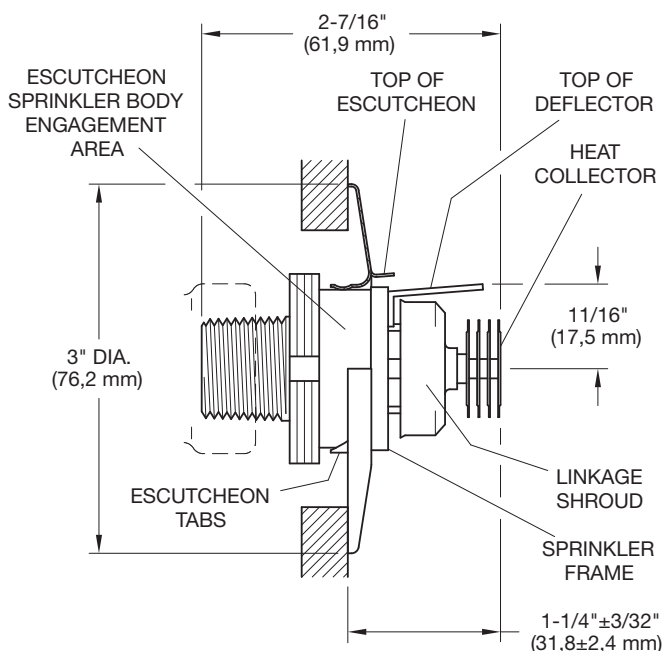


FIGURE 1B

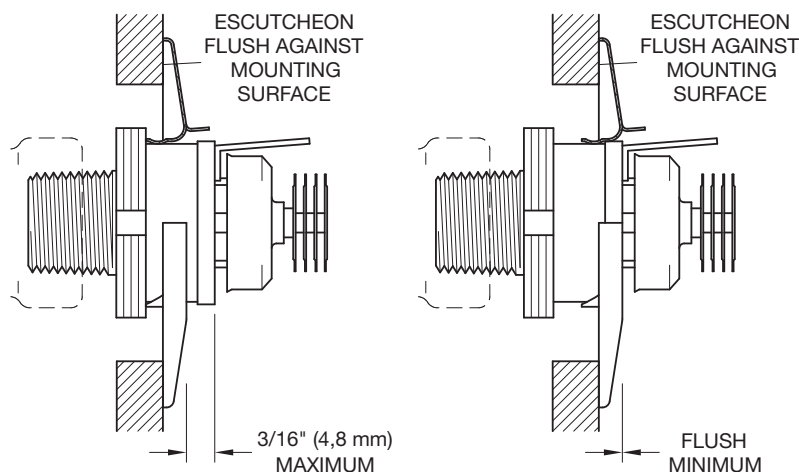


FIGURE 1C

FIGURE 1
SERIES LFII RESIDENTIAL FLUSH HORIZONTAL SIDEWALL SPRINKLER (TY2384)

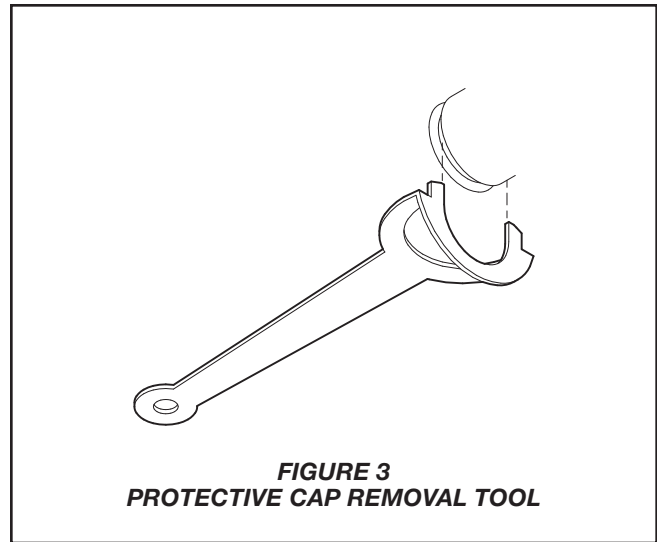
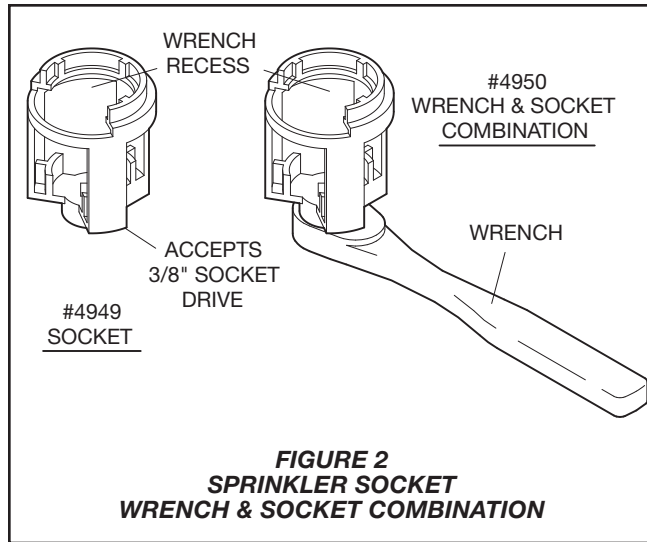
of the sprinkler head, or stress corrosion cracking, which in turn may cause the sprinklers heads to develop leaks, operate unexpectedly, or not operate properly.

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 NFPA13, 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: NFPA13, 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 Side-wall Sprinklers (TY2384) must be installed in accordance with the following instructions.

NOTICE

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.

Obtain a 1/2 inch NPT sprinkler joint 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.

1. The Sprinkler must be installed only in the pendent position and with the Sprinkler waterway centerline perpendicular to the mounting surface.
2. Install the sprinkler fitting so that the distance from the face of the fitting to the mounting surface will be nominally 29/32 inches (23,0 mm) as shown in Figure 1A.

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

Note: *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.*

5. 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.

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 (that is 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 the following instructions.

NOTICE

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.

Owners must assure that the sprinklers are not used for hanging of 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.

Exercise care to avoid damage to sprinklers before, during, and after installation. Never paint, plate, coat, or otherwise alter automatic sprinklers after they leave the factory.

Replace sprinklers that:

- were modified or over-heated.
- were damaged by dropping, striking, wrench twisting, wrench slippage, or the like.
- are leaking or exhibiting visible signs of corrosion.
- were exposed to corrosive products of combustion but have not operated, if you cannot easily remove combustion by-products with a cloth.
- have a cracked bulb or have lost liquid from the bulb. Refer to the Installation section in this data sheet.

Responsibility lies with owners 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 (for example, 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 should be inspected, tested, and maintained by a qualified Inspection Service in accordance with local requirements and/or national codes.

Limited Warranty

Products manufactured by Tyco Fire Suppression & Building Products (TFSBP) are warranted solely to the original Buyer for ten (10) years against defects in material and workmanship when paid for and properly installed and maintained under normal use and service. This warranty will expire ten (10) years from date of shipment by TFSBP. No warranty is given for products or components manufactured by companies not affiliated by ownership with TFSBP or for products and components which have been subject to misuse, improper installation, corrosion, or which have not been installed, maintained, modified or repaired in accordance with applicable Standards of the National Fire Protection Association, and/or the standards of any authorities having jurisdiction. Materials found by TFSBP to be defective shall be either repaired or replaced, at TFSBP's sole option. TFSBP neither assumes, nor authorizes any person to assume for it, any other obligation in connection with the sale of products or parts of products. TFSBP shall not be responsible for sprinkler system design errors or inaccurate or incomplete information supplied by Buyer or Buyer's representatives.

In no event shall TFSBP be liable, in contract, tort, strict liability or under any other legal theory, for incidental, indirect, special or consequential damages, including but not limited to labor charges, regardless of whether TFSBP was informed about the possibility of such damages, and in no event shall TFSBP's liability exceed an amount equal to the sales price.

The foregoing warranty is made in lieu of any and all other warranties, express or implied, including warranties of merchantability and fitness for a particular purpose.

This limited warranty sets forth the exclusive remedy for claims based on failure of or defect in products, materials or components, whether the claim is made in contract, tort, strict liability or any other legal theory.

This warranty will apply to the full extent permitted by law. The invalidity, in whole or part, of any portion of this warranty will not affect the remainder.

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 Residential Flush Horizontal Sidewall Sprinkler (TY2384), 4.2 K-Factor, (162°F/72°C temperature rating), (finish), and P/N (below).

Chrome..... P/N 51-124-9-162
White..... P/N 51-124-4-162
Black..... P/N 51-124-5-162

Escutcheon

Specify: Escutcheon for Series LFII Residential Flush Horizontal Sidewall Sprinkler (TY2384), 4.2 K-Factor, (162°F/72°C temperature rating), (finish), and P/N (below).

Chrome..... P/N 56-124-9-001
White..... P/N 56-124-4-001
Black..... P/N 56-124-5-001

Accessories

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

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

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

