RAPID RESPONSE Series LFII Residential 4.9 K-factor Concealed Pendent Sprinkler Flat Plate, Wet Pipe and Dry Pipe Systems

General Description

The TYCO RAPID RESPONSE Series LFII Residential 4.9K Concealed Pendent Sprinklers (TY3596) are decorative, fusible solder sprinklers, available in both ordinary 160°F (71°C) and intermediate 212°F (100°C) temperature rated configurations. They are designed for use in residential occupancies such as homes, apartments, dormitories, and hotels.

The cover plate assembly conceals the sprinkler operating components above the ceiling. The flat profile of the cover plate provides the optimum aesthetically appealing sprinkler design. In addition, the concealed design of the Series LFII Residential Concealed Pendent Sprinklers provides 1/2 in. (12,7 mm) vertical adjustment. This adjustment provides a measure of flexibility when cutting fixed sprinkler drops.

The Series LFII Residential Concealed Pendent Sprinklers are intended for use in the following scenarios:

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

The Series LFII Residential Concealed Pendent Sprinklers have 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.

The Series LFII Residential Concealed Pendent Sprinklers (TY3596) are shipped with a Disposable Protective Cap. The Protective Cap is temporarily removed for installation, and then it can be replaced to help protect the sprinkler while the ceiling is being installed or finished. The tip of the Protective Cap can also be used to mark the center of the ceiling hole into the plaster board, ceiling tiles, and so on, by gently pushing the ceiling product against the Protective Cap. When the ceiling installation is complete the Protective Cap is removed and the Cover Plate Assembly is installed.

Dry Pipe System Application

The 160°F (71°C) temperature rated Series LFII Residential Concealed Pendent Sprinklers offer a laboratory approved option for designing dry pipe residential sprinkler systems, whereas, most residential sprinklers are laboratory approved for wet systems only.

Through extensive testing, it has been determined that the number of design sprinklers (hydraulic design area) for the Series LFII Residential Concealed Pendent Sprinklers need not be increased over the number of design sprinklers (hydraulic design area) as specified for wet pipe sprinkler systems, as is accustomed for density/area sprinkler systems designed per NFPA 13.

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.

Consequently, the Series LFII Residential Concealed Pendent Sprinklers offer the features of non-water filled pipe in addition to not having to increase the number of design sprinklers (hydraulic design area) for systems designed to NFPA 13, 13D, or 13R.

NOTICE

The Series LFII Residential Concealed Pendent Sprinklers (TY3596) described herein must be installed and maintained in compliance with this document and with the applicable standards of the NATIONAL FIRE PROTECTION ASSOCIATION (NFPA), 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. Contact the installing contractor or product manufacturer with any questions.

Sprinkler Identification Number (SIN)

TY3596

Technical Data

Approvals
UL and C-UL Listed
NYC Approved under MEA 44-03-E-2NSF
Certified to all requirements of
NSF/ANSI 61
Australian WaterMark Certified

The TYCO RAPID RESPONSE Series LFII Residential Concealed Pendent Sprinklers are Listed only when installed with LFII Concealed Cover Plates having factory-applied finishes.

Sprinklers and Cover Plates are separately ordered. See the Ordering Procedure section for more information.

Maximum Working Pressure
175 psi (12,1 bar)

Discharge Coefficient
K=4.9 GPM/psi½ (70,6 LPM/bar½)

Temperature Rating

Ordinary
160°F (71°C) Sprinkler/
139°F (59°C) Cover Plate

NOTE: Maximum Ambient Ceiling Temperature for the ordinary temperature configuration is 100°F (38°C)

Intermediate*
212°F (100°C) Sprinkler/
165°F (74°C) Cover Plate

*For wet pipe systems only
NOTE: Maximum Ambient Ceiling Temperature for the intermediate temperature configuration is 150°F (65°C)

Vertical Adjustment
1/2 in. (12,7 mm)

Finishes
See the Ordering Procedure section

Physical Characteristics

Body	Brass
Cap	Bronze
Saddle	Brass
Sealing Assembly	Beryllium Nickel w/TEFLON
Soldered Link Halves	Nickel
Lever	Bronze
Compression Screw	Brass
Deflector	Copper or Brass
Guide Pin Housing	Bronze
Guide Pins	Stainless Steel or Bronze
Support Cup	Steel
Cover Plate	Copper/Brass**
Retainer	Copper
Cover Plate Ejection Spring	Stainless Steel

** Brass Cover Plate is offered for Intermediate Temperature 165°F (74°C) only.

Operation

When exposed to heat from a fire, the Cover Plate, which is normally soldered to the Retainer at three points, falls away to expose the sprinkler assembly. At this point the Deflector supported by the Arms drops down to its operated position. The fusible link of the sprinkler assembly is comprised of two link halves that are soldered together with a thin layer of solder. When the rated temperature is reached, the solder melts and the two link-halves separate allowing the sprinkler to activate and flow water.

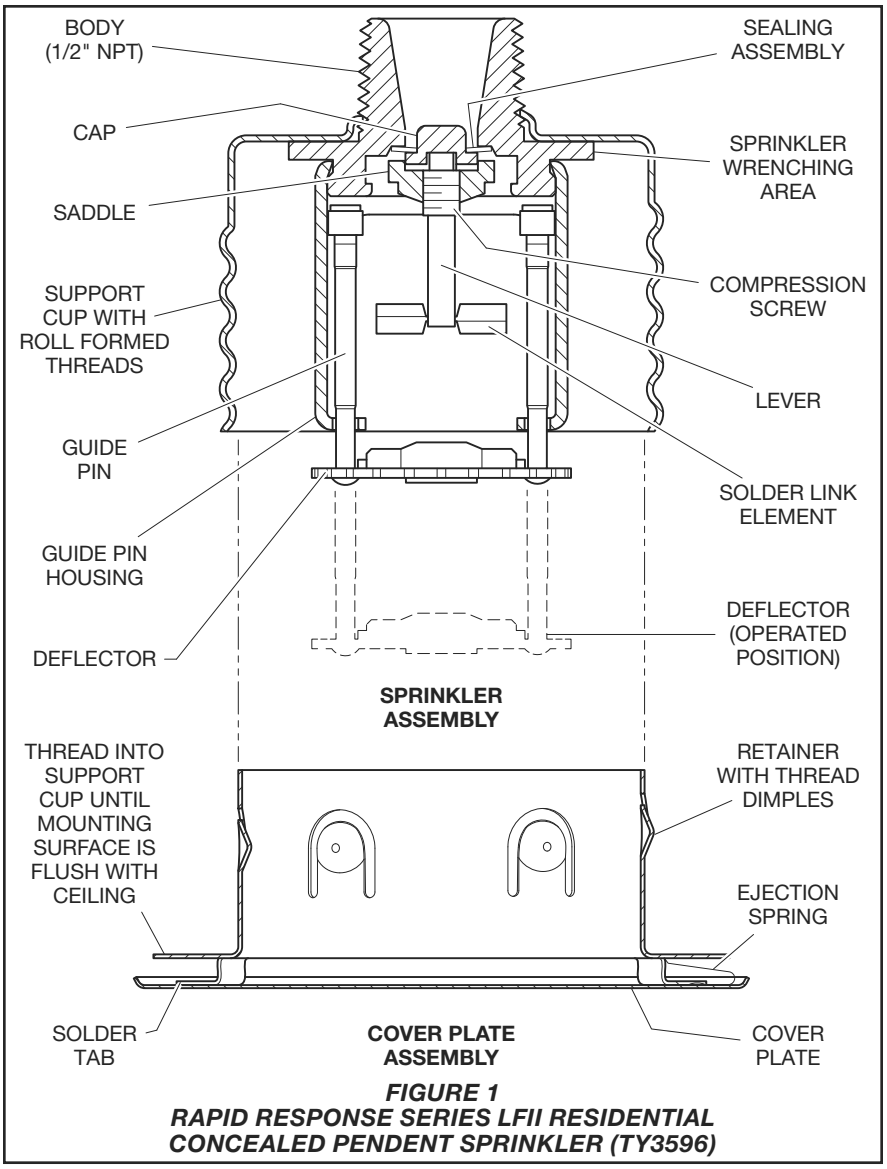


FIGURE 1
RAPID RESPONSE SERIES LFII RESIDENTIAL CONCEALED PENDENT SPRINKLER (TY3596)

Design Criteria

The TYCO RAPID RESPONSE Series LFII Residential Concealed Pendent Sprinklers (TY3596) are UL and C-UL Listed for installation in accordance with this section.

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 the authority having jurisdiction.*

System Types
Per the UL and C-UL Listing, the 160°F (71°C) and 212°F (100°C) LFII Residential Concealed Pendent Sprinklers may be utilized in wet pipe systems. Only the 160°F (71°C) LFII Residential Concealed Pendent Sprinklers may be utilized in dry pipe systems, per the UL and C-UL Listing.

Refer to Technical Data Sheet TFP485 about the use of residential sprinklers in residential dry pipe systems.

Ceiling Types
Smooth flat horizontal, beamed, or sloped in accordance with 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 rates are given in Tables A and B 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.

Maximum Coverage Area [1] ft x ft (m x m)	Maximum Spacing ft (m)	WET PIPE SYSTEM Minimum Flow and Residual Pressure [2, 3]				
		Temp. Rating 160°F (71°C), 212°F (100°C)		Deflector to Ceiling	Installation Type	Minimum Spacing ft (m)
		Flow GPM (LPM)	Pressure psi (bar)			
12 x 12 (3,7 x 3,7)	12 (3,7)	13 (49,2)	7.0 (0,48)	Smooth Ceilings 7/8 to 1-1/8 in. Beamed Ceilings per NFPA 13D or 13R, or 13. Installed in beam 7/8 to 1-1/8 in. below bottom of beam	Concealed	8 (2,4)
14 x 14 (4,3 x 4,3)	14 (4,3)	13 (49,2)	7.0 (0,48)			
16 x 16 (4,9 x 4,9)	16 (4,9)	13 (49,2)	7.0 (0,48)			
18 x 18 (5,5 x 5,5)	18 (5,5)	17 (64,3)	12.0 (0,83)			
20 x 20 (6,1 x 6,1)	20 (6,1)	20 (75,7)	16.7 (1,15)			

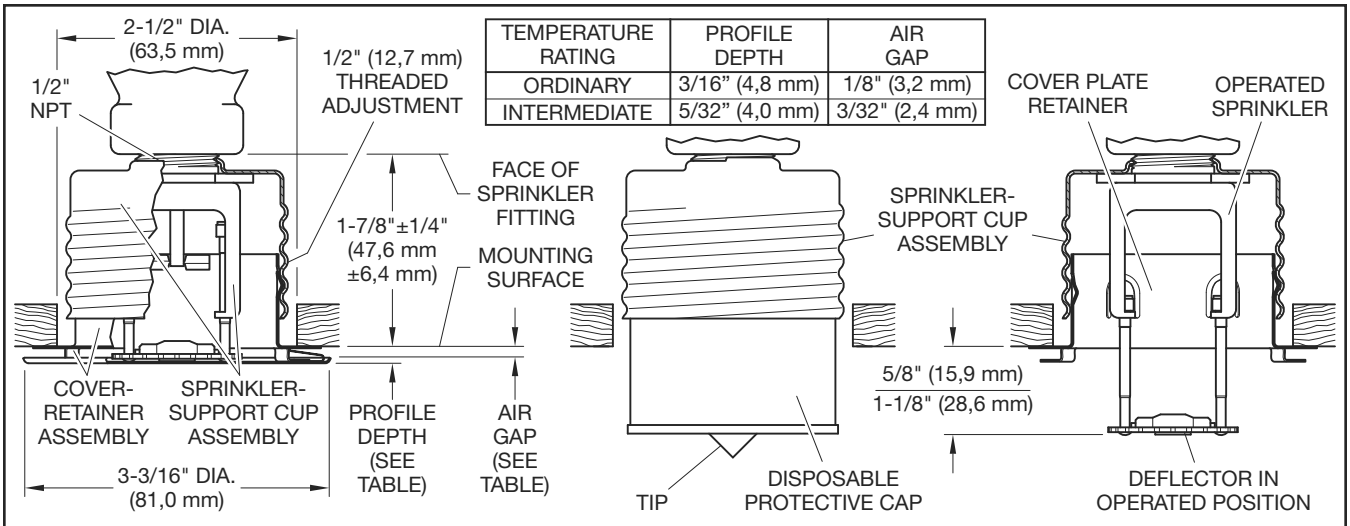
Notes:
1. For coverage area dimensions less than or between those indicated, use the minimum required flow for the next highest coverage area for which hydraulic design criteria are stated.
2. Requirement is based on minimum flow in GPM (LPM) from each sprinkler. The associated residual pressures are calculated using the nominal K-factor. See Hydraulic Design under the Design Criteria section.
3. For NFPA 13 residential applications, the greater of 0.1 GPM/ft² over the design area or the flow in accordance with the criteria in this table must be used.

TABLE A
WET PIPE SYSTEM
SERIES LFII RESIDENTIAL 4.9 K-FACTOR FLAT PLATE CONCEALED PENDENT SPRINKLER (TY3596)
NFPA 13D, 13R, AND 13 HYDRAULIC DESIGN CRITERIA

Maximum Coverage Area [1] ft x ft (m x m)	Maximum Spacing ft (m)	DRY PIPE SYSTEM Minimum Flow and Residual Pressure [2, 3]				
		Ordinary Temp. Rating 160°F (71°C)		Deflector to Ceiling	Installation Type	Minimum Spacing ft (m)
		Flow GPM (LPM)	Pressure psi (bar)			
12 x 12 (3,7 x 3,7)	12 (3,7)	13 (49,2)	7.0 (0,48)	Smooth Ceilings 7/8 to 1-1/8 in. Beamed Ceilings per NFPA 13D or 13R, or 13. Installed in beam 7/8 to 1-1/8 in. below bottom of beam	Concealed	8 (2,4)
14 x 14 (4,3 x 4,3)	14 (4,3)	14 (53,0)	8.2 (0,57)			
16 x 16 (4,9 x 4,9)	16 (4,9)	15 (56,8)	9.4 (0,65)			
18 x 18 (5,5 x 5,5)	18 (5,5)	18 (68,1)	13.5 (0,93)			
20 x 20 (6,1 x 6,1)	20 (6,1)	21 (79,5)	18.4 (1,27)			

Notes:
1. For coverage area dimensions less than or between those indicated, use the minimum required flow for the next highest coverage area for which hydraulic design criteria are stated.
2. Requirement is based on minimum flow in GPM (LPM) from each sprinkler. The associated residual pressures are calculated using the nominal K-factor. See Hydraulic Design under the Design Criteria section.
3. For NFPA 13 residential applications, the greater of 0.1 GPM/ft² over the design area or the flow in accordance with the criteria in this table must be used.

TABLE B
DRY PIPE SYSTEM
RAPID RESPONSE SERIES LFII RESIDENTIAL 4.9 K-FACTOR FLAT PLATE CONCEALED PENDENT (TY3596)
NFPA 13D, 13R, AND 13 HYDRAULIC DESIGN CRITERIA



TEMPERATURE RATING	PROFILE DEPTH	AIR GAP
ORDINARY	3/16" (4,8 mm)	1/8" (3,2 mm)
INTERMEDIATE	5/32" (4,0 mm)	3/32" (2,4 mm)

FIGURE 2
RAPID RESPONSE SERIES LFII RESIDENTIAL CONCEALED PENDENT SPRINKLER (TY3596)
INSTALLATION DIMENSIONS, PROTECTIVE CAP, AND ACTIVATED DEFLECTOR

The number of "design sprinklers" specified in NFPA 13D and 13R for wet pipe systems is to be applied when designing dry pipe systems.

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 Tables A and B as a function of temperature rating and the maximum allowable coverage area
- A minimum discharge of 0.1 GPM/ft^2 over the design area comprised of the four most hydraulically demanding sprinklers for actual coverage areas protected by the four sprinklers

The number of design sprinklers specified in NFPA 13 for wet pipe systems is to be applied when designing dry pipe systems.

Dry Pipe System Water Delivery
When using the Series LFII Residential Concealed Pendent Sprinklers in dry pipe sprinkler systems, the time for water delivery must not exceed 15 seconds for the most remote operating sprinkler.

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 relative to the ceiling mounting surface as shown in Figure 2.

Sprinkler Spacing
The minimum spacing between sprinklers is 8 ft (2,4 m). The maximum spacing between sprinklers cannot exceed the length of the coverage area (see Table A or B) being hydraulically calculated, for example, maximum 12 ft for a 12 ft x 12 ft coverage area, or 20 ft for a 20 ft x 20 ft coverage area.

The Series LFII must not be used in applications where the air pressure above the ceiling is greater than that below. Down drafts through the Support Cup could delay sprinkler operation in a fire situation.

Installation

The TYCO RAPID RESPONSE Series LFII Residential Concealed Pendent Sprinklers (TY3596) must be installed in accordance with this section.

General Instructions
Damage to the fusible Link Assembly during installation can be avoided by handling the sprinkler by the support cup only. Therefore, do not apply pressure to the fusible Link Assembly.

A 1/2 in. NPT sprinkler joint should be obtained with a minimum to maximum torque of 7 to 14 lb-ft (9,5 to 19,0 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 the Cover Plate Assembly by under-or over-tightening the Sprinkler. Readjust the position of the sprinkler fitting to suit.

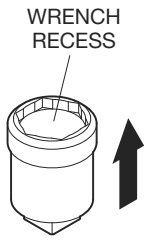


FIGURE 3
W-TYPE 18
SPRINKLER WRENCH

Step 1. The sprinkler must only be installed in the pendent position and with the centerline of the sprinkler perpendicular to the mounting surface.

Step 2. Remove the Protective Cap.

Step 3. With pipe thread sealant applied to the pipe threads, and using the W-Type 18 Wrench shown in Figure 3, install and tighten the Sprinkler/ Support Cup Assembly into the fitting. The W-Type 18 Wrench will accept a 1/2 in. ratchet drive.

Step 4. Replace the Protective Cap by pushing it upwards until it bottoms out against the Support Cup. The Protective Cap helps prevent damage to the Deflector and Guide Pins during ceiling installation and/or during application of the finish coating of the ceiling. It may also be used to locate the center of the clearance hole by gently pushing the ceiling material against the center point of the Cap.

Note: *As long as the protective Cap remains in place, the system is considered to be "Out Of Service."*

Step 5. After the ceiling has been completed with the 2-1/2 in. (63 mm) diameter clearance hole and in preparation for installing the Cover Plate Assembly, remove and discard the Protective Cap, and verify that the Deflector moves up and down freely.

If the sprinkler has been damaged and the Deflector does not move up and down freely, replace the entire sprinkler assembly. Do not attempt to modify or repair a damaged sprinkler.

Step 6. Push on the Cover Plate Assembly until its flange comes in contact with the ceiling.

Do not continue to push on the Cover Plate Assembly such that it lifts a ceiling panel out of its normal position.

If the Cover Plate Assembly cannot be engaged with the Mounting Cup or the Cover Plate Assembly cannot be engaged sufficiently to contact the ceiling, the Sprinkler Fitting must be repositioned.

Care and Maintenance

The TYCO RAPID RESPONSE Series LFII Residential Concealed Pendent Sprinklers (TY3596) 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 which it controls, permission to shut down the affected fire protection system must be obtained from the proper authorities and all personnel who may be affected by this action must be notified.

Absence of a Cover Plate may delay the sprinkler operation in a fire situation.

When properly installed, there is an air gap between the lip of the Cover Plate and the ceiling. The Ordinary Temperature Cover Plate assembly has a nominal 1/8 in. (3,2 mm) air gap. The Intermediate Temperature Cover Plate has a nominal 3/32 (2,4 mm) air gap, as shown in Figure 2. This air gap is necessary for proper operation of the sprinkler by allowing heat flow from a fire to pass below and above the Cover Plate to help assure appropriate release of the Cover Plate in a fire situation. If the ceiling is to be repainted after the installation of the Sprinkler, care must be exercised to ensure that the new paint does not seal off any of the air gap.

Factory painted Cover Plates must not be repainted. They should be replaced, if necessary, by factory painted units. Non-factory applied paint may adversely delay or prevent sprinkler operation in the event of a fire.

Do not pull the Cover Plate relative to the Enclosure. Separation 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 over heated sprinklers must be replaced.

Care must be exercised to avoid damage 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, for example, NFPA 25, in addition to the standards of any other authorities having jurisdiction. Contact the installing contractor or product manufacturer with any questions.

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, nonoperation in the event of a fire or inadvertent operation may result.

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

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).

Sprinkler Assemblies
Specify: Series LFII (TY3596) 4.9K Residential Concealed Pendent Sprinkler, P/N (specify):

160°F (71°C). 51-112-1-160
212°F (100°C). 51-112-1-212

Note: *Sprinkler and Cover Plates are separately sold. See below for Cover Plate ordering information.*

Cover Plate Assemblies
Specify: LFII Concealed Sprinkler Cover Plate Assembly, temperature rating (specify), (specify) finish, P/N (specify):

139°F (59°C)
Ivory (RAL1015) 56-204-0-135
Bright Chrome 56-204-1-135
Beige (RAL1001) 56-204-2-135
Pure White (RAL9010)* 56-204-3-135
Signal White (RAL9003)** 56-204-4-135
Grey White (RAL9002). 56-204-5-135
Brown (RAL8028). 56-204-6-135
Black (RAL9005) 56-204-7-135
Brushed Brass 56-204-8-135
Brushed Chrome 56-204-9-135
Custom Paint 56-204-X-135

165°F (74°C)
Ivory (RAL1015) 56-204-0-165
Bright Chrome 56-204-1 165
Beige (RAL1001) 56-204-2-165
Pure White (RAL9010)* 56-204-3-165
Signal White (RAL9003)** 56-204-4-165
Grey White (RAL9002). 56-204-5-165
Brown (RAL8028). 56-204-6-165
Black (RAL9005) 56-204-7-165
Brushed Brass 56-204-8-165
Brushed Chrome 56-204-9-165
Custom Paint 56-204-X-165

*Eastern Hemisphere sales only
**Previously known as Bright White

Note: *All Custom Cover Plates are painted using SHERWIN-WILLIAMS Interior Latex Paint. Contact Johnson Controls Customer Service with any questions related to custom orders.*

Sprinkler Wrench
Specify: W-Type 18 Sprinkler Wrench, P/N 56-000-1-265

1400 Pennbrook Parkway, Lansdale, PA 19446 | Telephone +1-215-362-0700

Johnson Controls

Technical Services
800-381-9312
+1-401-781-8220
www.tyco-fire.com

Series RFII — 5.6 K-factor "Royal Flush II" Concealed Pendent Sprinklers Quick & Standard Response, Standard Coverage

General Description

The TYCO Series RFII Quick Response (3-mm bulb) and Standard Response (5-mm bulb), 5.6 K-Factor, "Royal Flush II" Concealed Pendent Sprinklers are decorative sprinklers featuring a flat cover plate designed to conceal the sprinkler. These sprinklers are optimal for architecturally sensitive areas such as hotel lobbies, office buildings, churches, and restaurants.

Each sprinkler includes a Cover Plate/Retainer Assembly and a Sprinkler/Support Cup Assembly. The separable, two-piece assembly design provides the following benefits:

- Allows installation of the sprinklers and pressure testing of the fire protection system prior to installation of a suspended ceiling or application of the finish coating to a fixed ceiling.
- Permits the removal of suspended ceiling panels for access to building service equipment without having to first shut down the fire protection system and remove sprinklers.
- Provides for 1/2 inch (12,7 mm) of vertical adjustment to allow a measure of flexibility in determining the length of fixed piping to cut for the sprinkler drops.

The Series RFII Sprinklers are shipped with a Disposable Protective Cap. The Protective Cap is temporarily removed during installation and replaced to help protect the sprinkler during ceiling installation or finish. The tip of the Protective Cap can be used to mark the center of the ceiling hole into plaster board or ceiling tiles by gently pushing the ceiling product against the Protective Cap. When ceiling installation is complete, the Protective Cap is removed and the Cover Plate/Retainer Assembly is installed.

As an option, the Series RFII Standard Response (5-mm bulb) "Royal Flush II" Concealed Pendent Sprinklers can be fitted with a silicone Air and Dust Seal. (Refer to Figure 5.) The Air and Dust Seal is intended for sensitive areas where it is desirable to prevent air and dust from the area above the ceiling to pass through the cover plate.

NOTICE

The Series RFII Concealed Pendent Sprinklers 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.

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.

Sprinkler Identification Number (SIN)

TY3531 — 3 mm bulb
TY3551 — 5 mm bulb

Technical Data

Sprinkler Approvals
Approvals apply only to the service conditions indicated in the Design Criteria section.

- TY3531 (3-mm Bulb) is UL Listed, C-UL Listed, VdS Approved (Certificate No. G4090007), and NYC Approved (MEA 353-01-E) as Quick Response.
- TY3531 (3-mm Bulb) is FM and LPCB Approved (Ref. No. 094a/10) Approved as Standard Response. Factory Mutual and LPCB do not approve any concealed sprinklers for quick response.
- TY3551 (5-mm Bulb) is UL Listed, C-UL Listed, FM Approved, LPCB Approved (Ref. No. 094a/9), and NYC Approved (MEA 353-01-E) as Standard Response.

Approvals for Air and Dust Seal
UL and C-UL Listed for use with the RFII Standard Response Concealed Sprinkler (TY3551).

Maximum Working Pressure
Maximum 250 psi (17,3 bar) by UL, C-UL, and NYC

Maximum 175 psi (12,1 bar) by FM, VdS, and LPCB

Temperature Rating
155°F (68°C) Sprinkler with
139°F (59°C) Plate

200°F (93°C) Sprinkler with
165°F (74°C) Plate

Discharge Coefficient
K= 5.6 GPM/psi$^{1/2}$ (80,6 LPM/bar$^{1/2}$)

Adjustment
1/2 inch (12,7 mm)

Finishes
See the Ordering Procedure section.

Physical Characteristics

Frame	Bronze
Support Cup	Chrome Plated Steel
Guide Pins	Stainless Steel
Deflector	Bronze
Compression Screw	Brass
Bulb	Glass
Cap	Bronze or Copper
Sealing Assembly	Beryllium Nickel w/ TEFLON
Cover Plate	Brass
Retainer	Brass
Ejection Spring	Stainless Steel

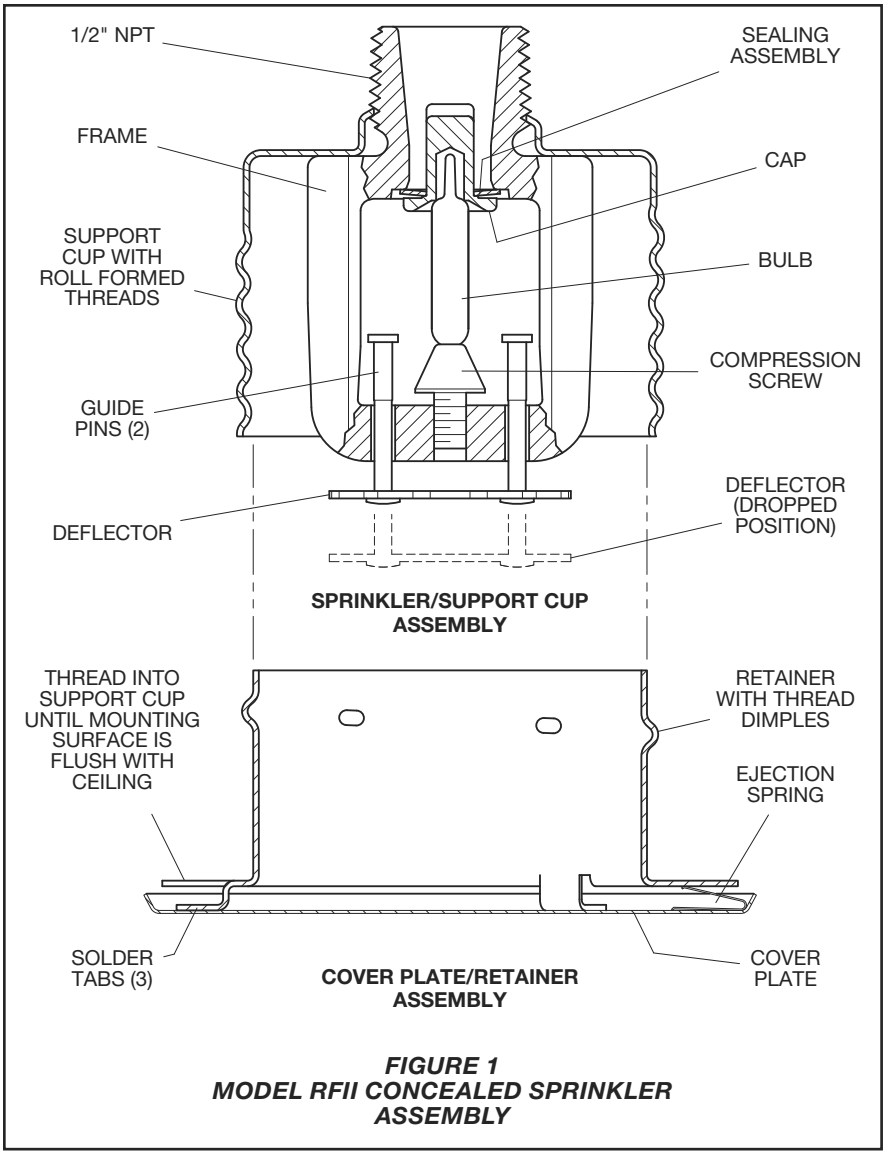
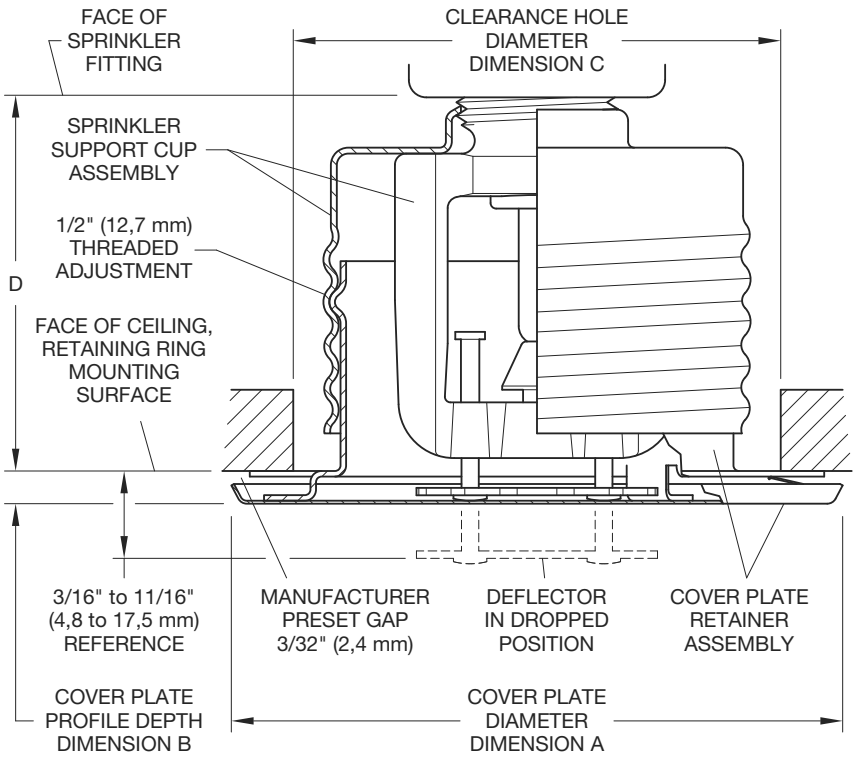


FIGURE 1
MODEL RFII CONCEALED SPRINKLER ASSEMBLY



A: 3-1/4 inches (82,6 mm)

B: 3/16 inches (4,8 mm)

C: 2-3/8 to 2-5/8 inches (60,3 to 66,7 mm)

D: 1-3/4 to 2-1/4 inches (44,5 to 57,2 mm)

FIGURE 2
SERIES CONCEALED SPRINKLER INSTALLATION DIMENSIONS

Design Criteria

The TYCO Series RFII Concealed Pendent Sprinklers are intended for fire protection systems designed in accordance with the standard installation rules recognized by the applicable Listing or Approval agency; for example, UL Listing is based on NFPA 13 and VdS Approval is based on the CEA 4001.

For more information on LPCB and VdS Approvals, contact Tyco Fire Suppression & Building Products at the following office:

Enschede, Netherlands
Telephone: 31-53-428-4444
Fax: 31-53-428-3377

The Series RFII Concealed Pendent Sprinklers are only listed and approved with the Series RFII Concealed Cover Plates having a factory applied finish.

NOTICE

Do not use the Series RFII in applications where the air pressure above the ceiling is greater than that below. Down drafts through the Sprinkler/Support Cup Assembly can delay sprinkler operation in a fire situation.

Operation

When exposed to heat from a fire, the Cover Plate, normally soldered to the Retainer at three points, falls away to expose the Sprinkler/Support Cup Assembly.

The Deflector—supported by the Guide Pins—then drops down to its operational position.

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, activating the sprinkler and allowing water to flow.

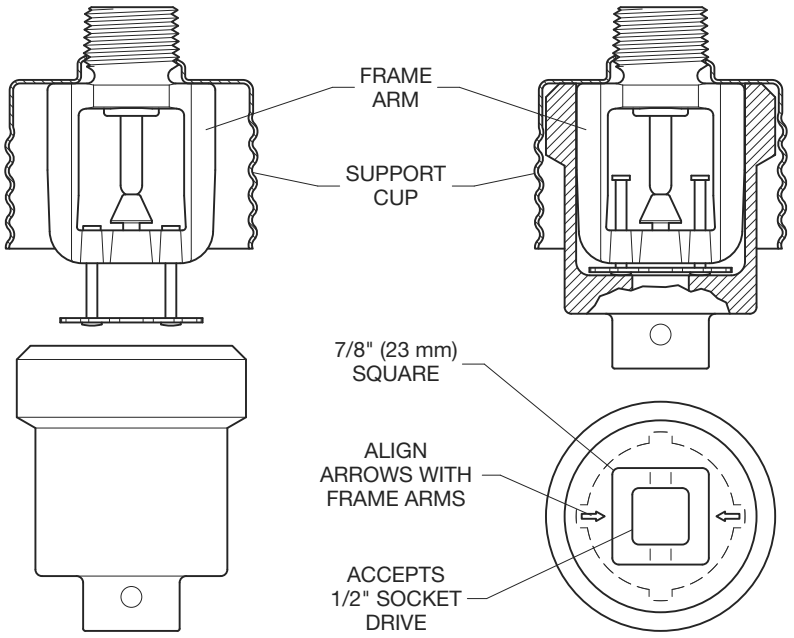


FIGURE 3
RFII SPRINKLER WRENCH

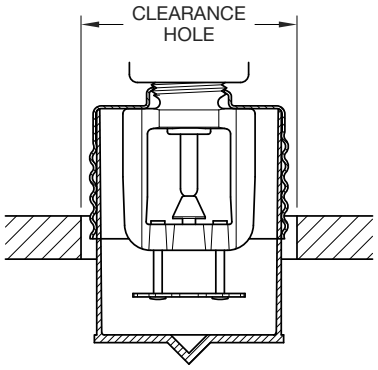


FIGURE 4
DISPOSABLE PROTECTIVE CAP

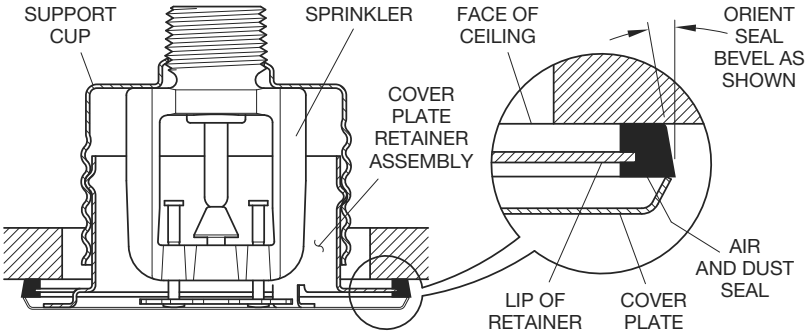


FIGURE 5
OPTIONAL AIR AND DUST SEAL FOR SERIES RFII (TY3551)

Installation

The TYCO Series RFII must be installed in accordance with the following instructions.

NOTICE

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 inch (1,6 mm) for the 155°F/68°C and 3/32 inch (2,4 mm) for the 200°F/93°C temperature ratings.

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.

Step 1. Install the sprinkler only in the pendent position with the center-line of the sprinkler perpendicular to the mounting surface.

Step 2. Remove the Protective Cap.

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 RFII Sprinkler Wrench. (Refer to Figure 3.) Apply the RFII Sprinkler Wrench to the Sprinkler as shown in Figure 3.

Step 5. Replace the Protective Cap by pushing it upwards until it bottoms out against the Support Cup. (Refer to Figure 4.) The Protective Cap helps prevent damage to the Deflector and Arms during ceiling installation and/or finish. You can also use the Protective Cap to locate the center of the clearance hole by gently pushing the ceiling material up against the center point of the Protective Cap.

NOTICE

As long as the Protective Cap remains in place, the system is considered "Out of Service".

Step 6. After the ceiling has been completed with the 2-1/2 inch (63,5 mm) diameter clearance hole and in preparation for installing the Cover Plate/Retainer Assembly, remove and discard the Protective Cap. Verify that the Deflector moves up and down freely.

If the Sprinkler is damaged and the Deflector does not move up and down freely, replace the entire Sprinkler. Do not attempt to modify or repair a damaged sprinkler.

Step 7. When installing an Air and Dust Seal, refer to Figure 5; otherwise, proceed to Step 8. To attach the Air and Dust Seal, verify the angle of the outside edge of the seal is oriented according to Figure 5. Start the edge of the Retainer in the grooved slot of the Air and Dust Seal and continue around the retainer until the entire Air and Dust Seal is engaged.

Step 8. Screw on the Cover Plate/Retainer Assembly until the Retainer (shown in Figure 2) or the Air and Dust Seal (shown in Figure 5) contacts the ceiling. Do not continue to screw on the Cover Plate/Retainer Assembly so that it lifts a ceiling panel out of its normal position. If you cannot engage the Cover Plate/Retainer Assembly with the Support Cup or you cannot engage the Cover Plate/Retainer Assembly sufficiently to contact the ceiling, you must reposition the Sprinkler Fitting.

Care and Maintenance

The TYCO Series RFII 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 the Cover Plate/Retainer Assembly can delay sprinkler operation in a fire situation.

When properly installed, there is a nominal 3/32 inch (2,4 mm) air gap between the lip of the Cover Plate and the ceiling, as shown in Figure 2.

This air gap is necessary for proper operation of the sprinkler. If the ceiling requires repainting after sprinkler installation, ensure that the new paint does not seal off any of the air gap.

Do not pull the Cover Plate relative to the Enclosure. Separation may result.

Replace sprinklers that:

- are leaking or exhibiting visible signs of corrosion.
- were modified or over-heated.

Never paint, plate, coat, or otherwise alter automatic sprinklers after they leave the factory. Never repaint factory-painted Cover Plates. If necessary, replace them with factory-painted units. Non-factory applied paint can adversely delay or prevent sprinkler operation in the event of a fire.

Exercise care to avoid damage to sprinklers before, during, and after installation. Replace sprinklers damaged by dropping, striking, wrench twisting, wrench slipping, or the like. Also, replace any sprinkler that has a cracked bulb or that has lost liquid from its bulb. (Refer to the Installation section.)

If you must remove a sprinkler, do not reinstall it or a replacement without reinstalling the Cover Plate/Retainer Assembly. If a Cover Plate/Retainer Assembly becomes dislodged during service, replace it immediately.

Responsibility lies with sprinkler 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 code.

Limited Warranty

Products manufactured by Tyco Fire Protection Products (TFPP) 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 TFPP. No warranty is given for products or components manufactured by companies not affiliated by ownership with TFPP 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 other Authorities Having Jurisdiction. Materials found by TFPP to be defective shall be either repaired or replaced, at TFPP's sole option. TFPP neither assumes, nor authorizes any person to assume for it, any other obligation in connection with the sale of products or parts of products. TFPP 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 TFPP 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 TFPP was informed about the possibility of such damages, and in no event shall TFPP'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.

Sprinkler/Support Cup Assembly
Specify: (SIN), (temperature rating from below) Series RFII Concealed Pendent Sprinkler, P/N (specify).

	155°F/68°C	200°F/93°C
TY3531	51-792-1-155	51-792-1-200
TY3551	51-790-1-155	51-790-1-200

Separately Ordered Cover Plate/ Retainer Assembly:
Specify: (temperature rating from below) Series RFII Concealed Cover Plate with (finish), P/N (specify).

	139°F/59°C(a)	165°F/74°C(b)
Brass	56-792-1-135	56-792-1-165
Chrome	56-792-9-135	56-792-9-165
Brushed Chrome	56-792-8-135	56-792-8-165
Signal White (RAL 9003)	56-792-4-135	56-792-4-165
Grey White (RAL 9002)	56-792-0-135	56-792-0-165
Pure White (c) (RAL 9010)	56-792-3-135	56-792-3-165
Custom	56-792-X-135	56-792-X-165

(a) For use with 155°F/68°C sprinklers.
(b) For use with 200°F/93°C sprinklers.
(c) Eastern Hemisphere sales only.

Sprinkler Wrench
Specify: RFII Sprinkler Wrench, P/N 56-000-1-075.

Air and Dust Seal
Specify: Air and Dust Seal, P/N 56-908-1-001.

tyco Fire Suppression & Building Products

Technical Services 800-381-9312 | +1-401-781-8220
www.tyco-fire.com

Series TY-FRB — 2.8, 4.2, 5.6, and 8.0 K-Factor Upright, Pendent, and Recessed Pendent Sprinklers Quick Response, Standard Coverage

General Description

The TYCO Series TY-FRB, 2.8, 4.2, 5.6, and 8.0 K-factor, Upright and Pendent Sprinklers described in this data sheet are quick response, standard coverage, decorative 3 mm glass bulb-type spray sprinklers designed for use in light or ordinary hazard, commercial occupancies such as banks, hotels, and shopping malls.

The recessed version of the Series TY-FRB Pendent Sprinkler, where applicable, is intended for use in areas with a finished ceiling. This recessed pendent sprinkler uses one of the following,

- A two-piece Style 10 (1/2 inch NPT) or Style 40 (3/4 inch NPT) Recessed Escutcheon with 1/2 inch (12,7 mm) of recessed adjustment or up to 3/4 inch (19,1 mm) of total adjustment from the flush pendent position, or a
- A two-piece Style 20 (1/2 inch NPT) or Style 30 (3/4 inch NPT) Recessed Escutcheon with 1/4 inch (6,4 mm) of recessed adjustment or up to 1/2 inch (12,7 mm) of total adjustment from the flush pendent position.

The adjustment provided by the Recessed Escutcheon reduces the accuracy to which the fixed pipe drops to the sprinklers must be cut.

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.

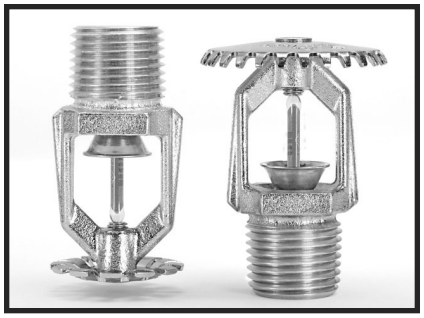
Corrosion-resistant coatings, where applicable, are utilized to extend the life of copper alloy sprinklers beyond that which would otherwise be obtained when exposed to corrosive atmospheres. Although corrosion-resistant coated sprinklers have passed the standard corrosion tests of the applicable approval agencies, the testing is not representative of all possible corrosive atmospheres. Consequently, it is recommended that the end user be consulted with respect to the suitability of these coatings for any given corrosive environment. The effects of ambient temperature, concentration of chemicals, and gas/chemical velocity, should be considered, as a minimum, along with the corrosive nature of the chemical to which the sprinklers will be exposed.

An intermediate level of the Series TY-FRB Pendent Sprinklers is detailed in Technical Data Sheet TFP356, and Sprinkler Guards are detailed in Technical Data Sheet TFP780.

NOTICE

The Series TY-FRB Concealed Pendent Sprinklers 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.

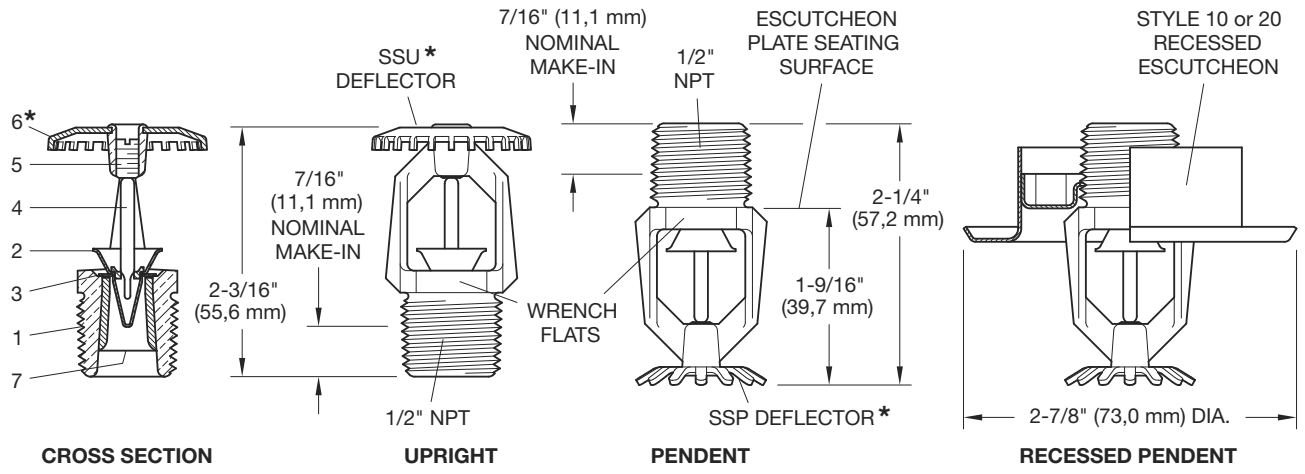
Owners are responsible for maintaining their fire protection system and devices in proper operating condition. The installing contractor or sprinkler manufacturer should be contacted with any questions.



Model/Sprinkler Identification Number (SIN)

TY1131:	Upright	2.8K, 1/2″ NPT
TY1231:	Pendent	2.8K, 1/2″ NPT
TY2131:	Upright	4.2K, 1/2″ NPT
TY2231:	Pendent	4.2K, 1/2″ NPT
TY3131:	Upright	5.6K, 1/2″ NPT
TY3231:	Pendent	5.6K, 1/2″ NPT
TY4131:	Upright	8.0K, 3/4″ NPT
TY4231:	Pendent	8.0K, 3/4″ NPT
TY4831:	Upright*	8.0K, 1/2″ NPT
TY4931:	Pendent*	8.0K, 1/2″ NPT

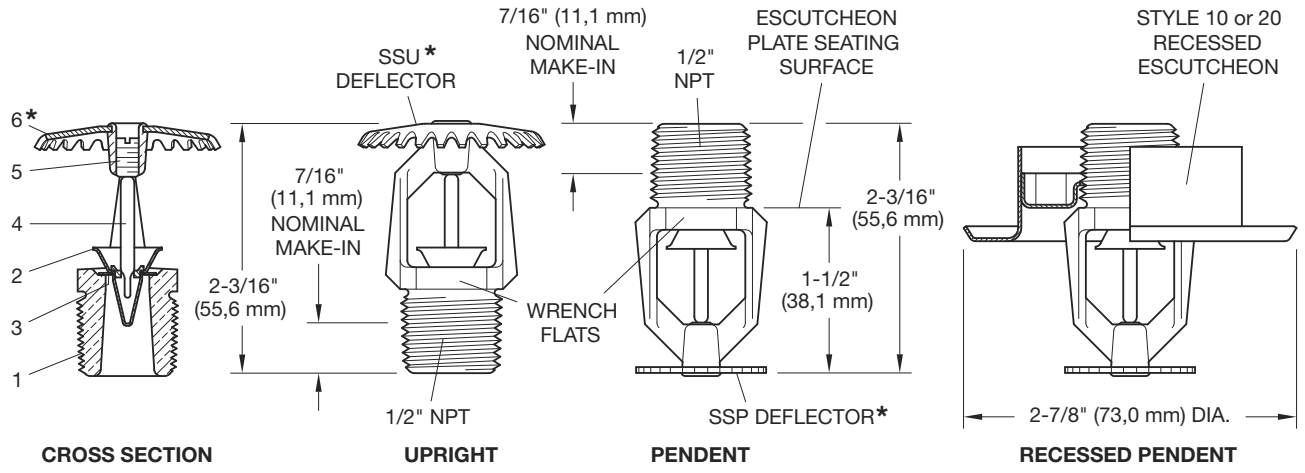
*Eastern Hemisphere Sales Only



1 - Frame
2 - Button
3 - Sealing Assembly
4 - Bulb
5 - Compression Screw
6 - Deflector
7 - Bushing

* Temperature rating is indicated on deflector or adjacent to orifice seat on frame.

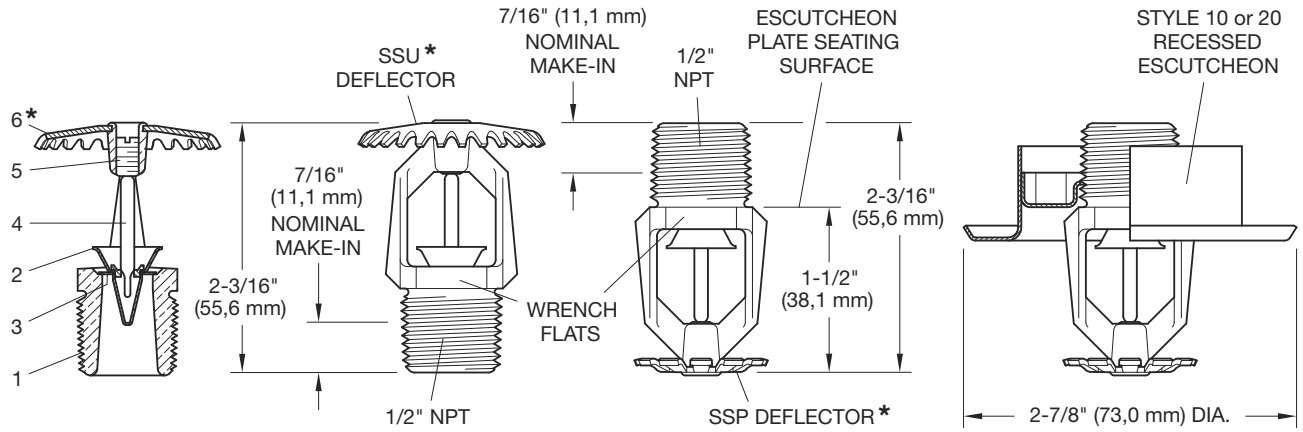
FIGURE 1
QUICK RESPONSE SERIES TY-FRB UPRIGHT (TY1131) AND PENDENT (TY1231) SPRINKLERS
2.8 K-FACTOR, 1/2 INCH NPT



1 - Frame
2 - Button
3 - Sealing Assembly
4 - Bulb
5 - Compression Screw
6 - Deflector

* Temperature rating is indicated on deflector or adjacent to orifice seat on frame.

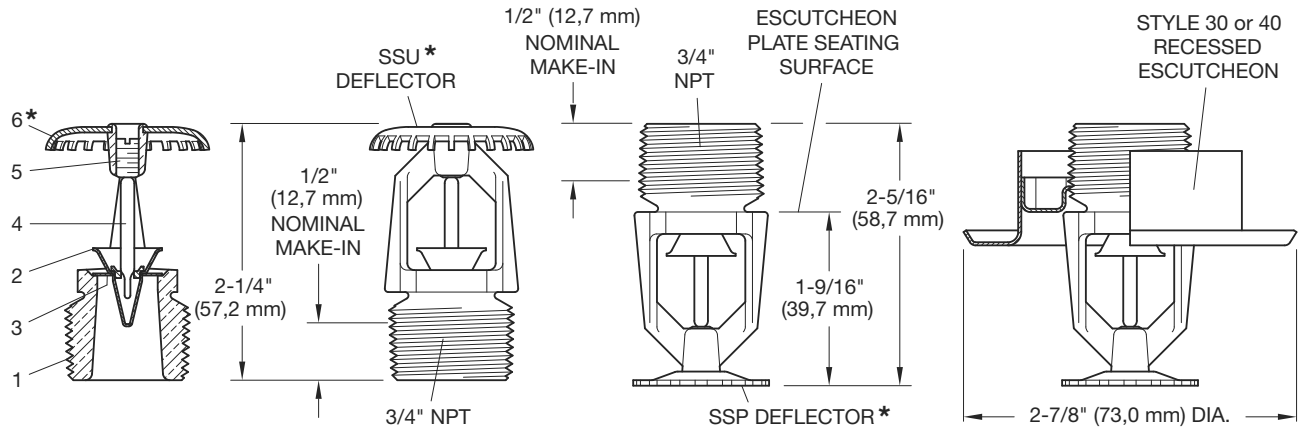
FIGURE 2
QUICK RESPONSE SERIES TY-FRB UPRIGHT (TY2131) AND PENDENT (TY2231) SPRINKLERS
4.2 K-FACTOR, 1/2 INCH NPT



1 - Frame
2 - Button
3 - Sealing Assembly
4 - Bulb
5 - Compression Screw
6 - Deflector

* Temperature rating is indicated on deflector or adjacent to orifice seat on frame.

FIGURE 3
QUICK RESPONSE SERIES TY-FRB UPRIGHT (TY3131) AND PENDENT (TY3231) SPRINKLERS
5.6 K-FACTOR, 1/2 INCH NPT



1 - Frame
2 - Button
3 - Sealing Assembly
4 - Bulb
5 - Compression Screw
6 - Deflector

* Temperature rating is indicated on deflector or adjacent to orifice seat on frame.

FIGURE 4
QUICK RESPONSE SERIES TY-FRB UPRIGHT (TY4131) AND PENDENT (TY4231) SPRINKLERS
8.0 K-FACTOR, 3/4 INCH NPT

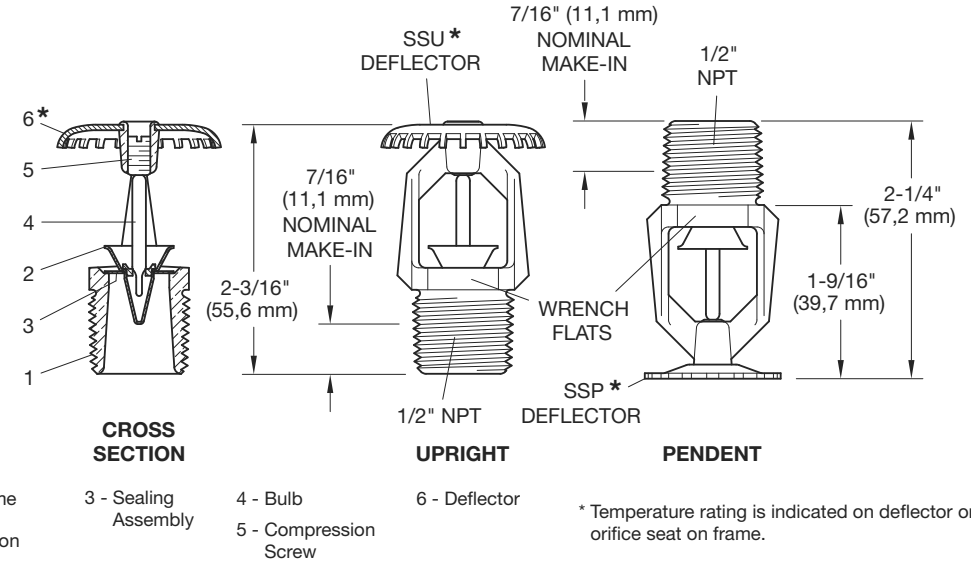


FIGURE 5
QUICK RESPONSE SERIES TY-FRB UPRIGHT (TY4831) AND PENDENT (TY4931) SPRINKLERS
8.0 K-FACTOR, 1/2 INCH NPT

Technical Data

Approvals
UL and C-UL Listed
FM, LPCB, and NYC Approved
Refer to Table A and B for complete approval information including corrosion-resistant status.

Maximum Working Pressure
Refer to Table C.

Discharge Coefficient

K=2.8 GPM/psi$^{1/2}$	(40,3 LPM/bar$^{1/2}$)
K=4.2 GPM/psi$^{1/2}$	(60,5 LPM/bar$^{1/2}$)
K=5.6 GPM/psi$^{1/2}$	(80,6 LPM/bar$^{1/2}$)
K=8.0 GPM/psi$^{1/2}$	(115,2 LPM/bar$^{1/2}$)

Temperature Rating
Refer to Table A and B.

Finishes
Sprinkler: Refer to Table A and B.
Recessed Escutcheon: White Coated, Chrome Plated, or Brass Plated.

Physical Characteristics

Frame	Bronze
Button	Brass/Copper
Sealing Assembly	Beryllium Nickel w/Teflon†
Bulb	Glass
Compression Screw	Bronze
Deflector	Copper/Bronze
Bushing (K=2.8)	Bronze

† Registered Trademark of Dupont

Operation

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, allowing the sprinkler to activate and water to flow.

Design Criteria

The TYCO Series TY-FRB Pendent and Upright Sprinklers are intended for fire protection systems designed in accordance with the standard installation rules recognized by the applicable Listing or Approval agency (such as, UL Listing is based on the requirements of NFPA 13, and FM Approval is based on the requirements of FM's Loss Prevention Data Sheets). Only the Style 10, 20, 30, or 40 Recessed Escutcheon, as applicable, is to be used for recessed pendent installations.

Installation

The TYCO Series TY-FRB Sprinklers must be installed in accordance with the following instructions.

NOTICE

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 inch (1,6 mm) for the 135°F/57°C and 3/32 inch (2,4 mm) for the 286°F/141°C temperature ratings.

Obtain a leak-tight 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 Escutcheon Plate by under- or over-tightening the sprinkler. Re-adjust the position of the sprinkler fitting to suit.

The Series TY-FRB Pendent and Upright Sprinklers must be installed in accordance with the following instructions.

1. Install Pendent sprinklers in the pendent position. Install upright sprinklers in the upright position.
2. With pipe-thread sealant applied to the pipe threads, hand-tighten the sprinkler into the sprinkler fitting.
3. Tighten the sprinkler into the sprinkler fitting using only the W-Type 6 Sprinkler Wrench (Figure 14). With reference to Figures 1 through 5, apply the W-Type 6 Sprinkler Wrench to the sprinkler wrench flats.

K FACTOR	TYPE	TEMPERATURE	SPRINKLER FINISH (See Note 5)			
			BULB LIQUID COLOR	NATURAL BRASS	CHROME PLATED	WHITE*** POLYESTER
2.8 1/2" NPT	PENDENT (TY1231) and UPRIGHT (TY1131)	135°F/57°C	Orange	1, 2, 3, 4		
		155°F/68°C	Red			
		175°F/79°C	Yellow			
		200°F/93°C	Green			
		286°F/141°C	Blue			
	RECESSED PENDENT (TY1231)* Figure 6	135°F/57°C	Orange	1, 2, 4		
		155°F/68°C	Red			
		175°F/79°C	Yellow			
		200°F/93°C	Green			
	RECESSED PENDENT (TY1231)** Figure 7	135°F/57°C	Orange			
		155°F/68°C	Red			
		175°F/79°C	Yellow			
		200°F/93°C	Green			
4.2 1/2" NPT	PENDENT (TY2231) and UPRIGHT (TY2131)	135°F/57°C	Orange	1, 2		
		155°F/68°C	Red			
		175°F/79°C	Yellow			
		200°F/93°C	Green			
		286°F/141°C	Blue			
	RECESSED PENDENT (TY2231)* Figure 8	135°F/57°C	Orange			
		155°F/68°C	Red			
		175°F/79°C	Yellow			
		200°F/93°C	Green			
	RECESSED PENDENT (TY2231)** Figure 9	135°F/57°C	Orange			
		155°F/68°C	Red			
		175°F/79°C	Yellow			
		200°F/93°C	Green			

NOTES:

1. Listed by Underwriters Laboratories, Inc., (UL) as Quick Response Sprinklers.
2. Listed by Underwriters Laboratories, Inc., for use in Canada (C-UL) as Quick Response Sprinklers.
3. Approved by Factory Mutual Research Corporation (FM) as Quick Response Sprinklers.
4. Approved by the City of New York under MEA 354-01-E.
5. Where Polyester Coated Sprinklers are noted to be UL and C-UL Listed, the sprinklers are UL and C-UL Listed as Corrosion-Resistant Sprinklers.

* Installed with Style 10 (1/2" NPT) or Style 40 (3/4" NPT) 3/4" Total Adjustment Recessed Escutcheon, as applicable.

** Installed with Style 20 (1/2" NPT) or Style 30 (3/4" NPT) 1/2" Total Adjustment Recessed Escutcheon, as applicable.

*** Frame and Deflector only. Listings and approvals apply to color (Special Order).

N/A: Not Available

TABLE A
LABORATORY LISTINGS AND APPROVALS FOR
2.8 AND 4.2 K-FACTOR SPRINKLERS

K FACTOR	TYPE	TEMPERATURE	SPRINKLER FINISH (See Note 8)				
			BULB LIQUID COLOR	NATURAL BRASS	CHROME PLATED	WHITE*** POLYESTER	LEAD COATED
5.6 1/2" NPT	PENDENT (TY3231) and UPRIGHT (TY3131)	135°F/57°C	Orange	1, 2, 3, 4, 5, 6, 7			1, 2, 3, 5
		155°F/68°C	Red				
		175°F/79°C	Yellow				
		200°F/93°C	Green				
		286°F/141°C	Blue				
	RECESSED PENDENT (TY3231)* Figure 10	135°F/57°C	Orange	1, 2, 4, 5			N/A
		155°F/68°C	Red				
		175°F/79°C	Yellow				
		200°F/93°C	Green				
		286°F/141°C	Blue				
	RECESSED PENDENT (TY3231)** Figure 11	135°F/57°C	Orange	1, 2, 3, 4, 5			N/A
		155°F/68°C	Red				
		175°F/79°C	Yellow				
		200°F/93°C	Green				
		286°F/141°C	Blue				
8.0 3/4" NPT	PENDENT (TY4231) and UPRIGHT (TY4131)	135°F/57°C	Orange	1, 2, 3, 4, 5, 6, 7			1, 2, 5
		155°F/68°C	Red				
		175°F/79°C	Yellow				
		200°F/93°C	Green				
		286°F/141°C	Blue				
	RECESSED PENDENT (TY4231)* Figure 12	135°F/57°C	Orange	1, 2, 5			N/A
		155°F/68°C	Red				
		175°F/79°C	Yellow				
		200°F/93°C	Green				
		286°F/141°C	Blue				
	RECESSED PENDENT (TY4231)** Figure 13	135°F/57°C	Orange	1, 2, 3, 5			N/A
		155°F/68°C	Red				
		175°F/79°C	Yellow				
		200°F/93°C	Green				
		286°F/141°C	Blue				
8.0 1/2" NPT	PENDENT (TY4931) and UPRIGHT (TY4831)	135°F/57°C	Orange	1, 2, 4, 5, 6			1, 2, 5
		155°F/68°C	Red				
		175°F/79°C	Yellow				
		200°F/93°C	Green				
		286°F/141°C	Blue				

NOTES:

1. Listed by Underwriters Laboratories, Inc., (UL) as Quick Response Sprinklers.
2. Listed by Underwriters Laboratories, Inc., for use in Canada (C-UL) as Quick Response Sprinklers.
3. Approved by Factory Mutual Research Corporation (FM) as Quick Response Sprinklers.
4. Approved by the Loss Prevention Certification Board (LPCB Ref. No. 007k/04) as Quick Response Sprinklers. However, LPCB does not rate the thermal sensitivity of recessed sprinklers.
5. Approved by the City of New York under MEA 354-01-E.
6. VdS Approved (For details, contact Tyco Fire Suppression & Building Products, Enschede, Netherlands, Tel. 31-53-428-4444/Fax 31-53-428-3377.)
7. Approved by the Loss Prevention Certification Board (LPCB Ref. No. 094a/06) as Quick Response Sprinklers.
8. Where Polyester Coated and Lead-Coated Sprinklers are noted to be UL and C-UL Listed, the sprinklers are UL and C-UL Listed as Corrosion-Resistant Sprinklers. Where Lead-Coated Sprinklers are noted to be FM Approved, the sprinklers are FM Approved as a Corrosion-Resistant Sprinklers.

* Installed with Style 10 (1/2" NPT) or Style 40 (3/4" NPT) 3/4" Total Adjustment Recessed Escutcheon, as applicable.
** Installed with Style 20 (1/2" NPT) or Style 30 (3/4" NPT) 1/2" Total Adjustment Recessed Escutcheon, as applicable.
*** Frame and Deflector only. Listings and approvals apply to color (Special Order).
N/A: Not Available

TABLE B
LABORATORY LISTINGS AND APPROVALS FOR
5.6 AND 8.0 K-FACTOR SPRINKLERS

K FACTOR	TYPE	SPRINKLER FINISH			
		NATURAL BRASS	CHROME PLATED	WHITE POLYESTER	LEAD COATED
2.8 1/2" NPT	PENDENT (TY1231) and UPRIGHT (TY1131)	75 PSI (12,1 BAR)			N/A
	RECESSED PENDENT (TY1231)				
4.2 1/2" NPT	PENDENT (TY2231) and UPRIGHT (TY2131)	175 PSI (12,1 BAR)			N/A
	RECESSED PENDENT (TY2231)				
5.6 1/2" NPT	PENDENT (TY3231) and UPRIGHT (TY3131)	250 PSI (17,2 BAR) OR 175 PSI (12,1 BAR) (SEE NOTE 1)			175 PSI (12,1 BAR)
	RECESSED PENDENT (TY3231)				N/A
8.0 3/4" NPT	PENDENT (TY4231) and UPRIGHT (TY4131)	175 PSI (12,1 BAR)			175 PSI (12,1 BAR)
	RECESSED PENDENT (TY4231)				N/A
8.0 1/2" NPT	PENDENT (TY4931) and UPRIGHT (TY4831)	175 PSI (12,1 BAR)			175 PSI (12,1 BAR)

NOTES:
1. The maximum working pressure of 250 psi (17,2 bar) only applies to the Listing by Underwriters Laboratories Inc. (UL); the Listing by Underwriters Laboratories, Inc. for use in Canada (C-UL); and, the Approval by the City of New York.

TABLE C
MAXIMUM WORKING PRESSURE

The Series TY-FRB Recessed Pendent Sprinklers must be installed in accordance with the following instructions.

1. After installing the Style 10, 20, 30, or 40 Mounting Plate, as applicable, over the sprinkler threads and with pipe-thread sealant applied to the pipe threads, hand-tighten the sprinkler into the sprinkler fitting.
2. Tighten the sprinkler into the sprinkler fitting using only the W-Type 7 Recessed Sprinkler Wrench (Figure 15). With reference to Figures 1 to 4, apply the W-Type 7 Recessed Sprinkler Wrench to the sprinkler wrench flats.
3. After ceiling installation and finishing, slide on the Style 10, 20, 30, or 40 Closure over the Series TY-FRB Sprinkler and push the Closure over the Mounting Plate until its flange comes in contact with the ceiling.

Care and Maintenance

The TYCO Series TY-FRB 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 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, can delay sprinkler operation in a fire situation.

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.

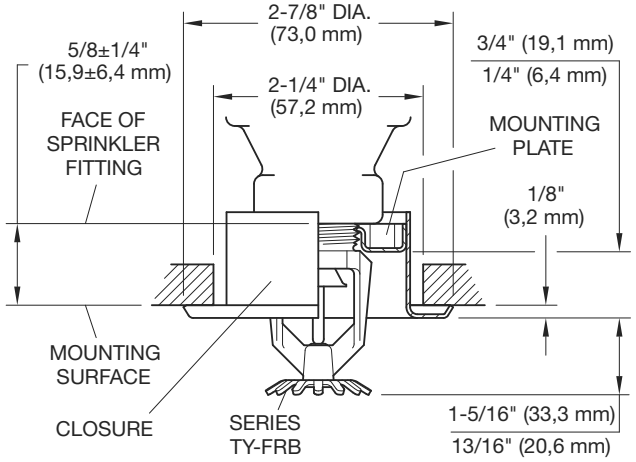


FIGURE 6
SERIES TY-FRB RECESSED PENDENT
WITH TWO-PIECE 3/4 INCH TOTAL ADJUSTMENT
STYLE 10 RECESSED ESCUTCHEON
2.8 K-FACTOR, 1/2 INCH NPT

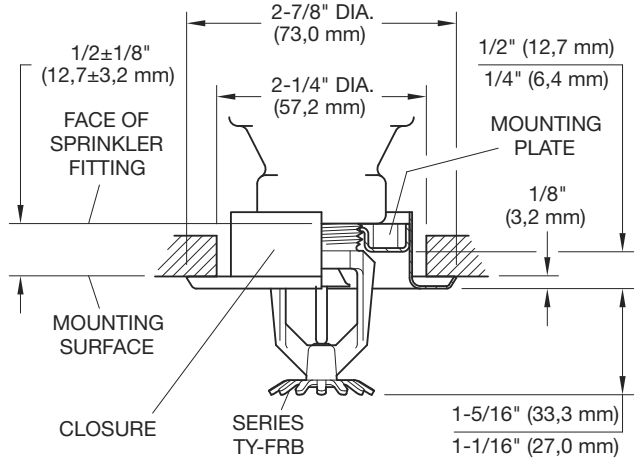


FIGURE 7
SERIES TY-FRB RECESSED PENDENT
WITH TWO-PIECE 1/2 INCH TOTAL ADJUSTMENT
STYLE 20 RECESSED ESCUTCHEON
2.8 K-FACTOR, 1/2 INCH NPT

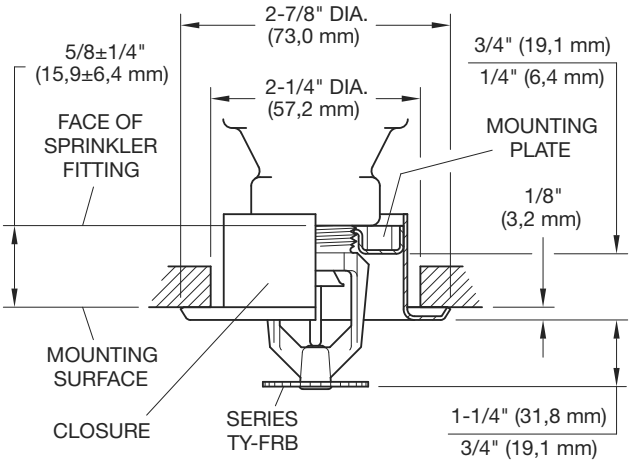


FIGURE 8
SERIES TY-FRB RECESSED PENDENT
WITH TWO-PIECE 3/4 INCH TOTAL ADJUSTMENT
STYLE 10 RECESSED ESCUTCHEON
4.2 K-FACTOR, 1/2 INCH NPT

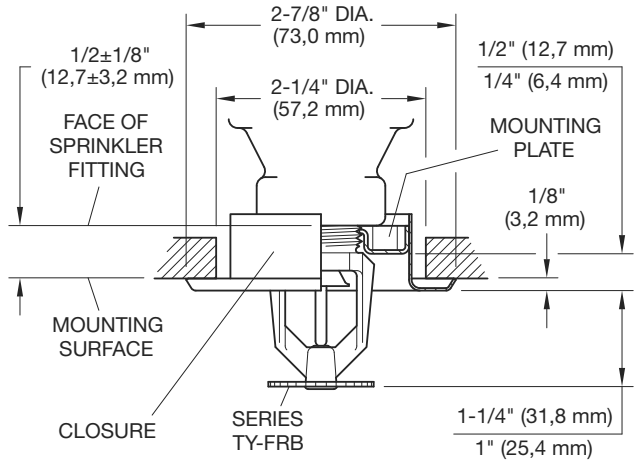


FIGURE 9
SERIES TY-FRB RECESSED PENDENT
WITH TWO-PIECE 1/2 INCH TOTAL ADJUSTMENT
STYLE 20 RECESSED ESCUTCHEON
4.2 K-FACTOR, 1/2 INCH NPT

Initial and frequent visual inspections of random samples are recommended for corrosion-resistant sprinklers to verify the integrity of the corrosion-resistant material of construction. Thereafter, annual inspections per NFPA 25 should suffice.

Inspections of corrosion-resistant sprinklers are recommended at close range, instead of from the floor level per NFPA. Inspection at close range can better determine the exact sprinkler condition and the long-term integrity of the corrosion-resistant material, which can be affected by the corrosive conditions present.

Responsibility lies with the owner 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 are recommended to be inspected, tested, and maintained by a qualified Inspection Service in accordance with local requirements and/or national codes.

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. (Ref. Installation Section).

Initial and frequent visual inspections of random samples are recommended for corrosion-resistant sprinklers to verify the integrity of the corrosion-resistant material of construction. Thereafter, annual inspections per NFPA 25 should suffice.

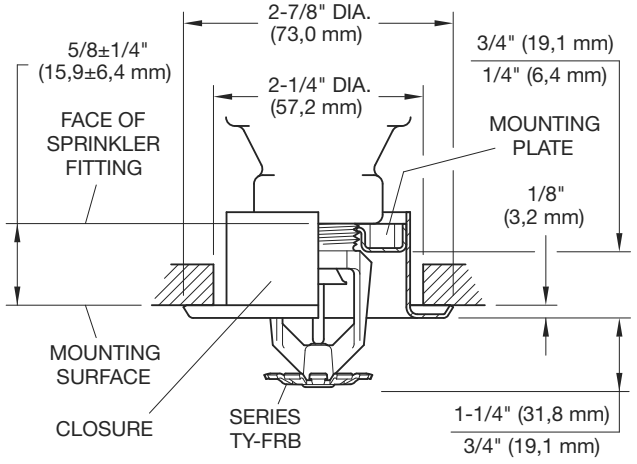


FIGURE 10
SERIES TY-FRB RECESSED PENDENT
WITH TWO-PIECE 3/4 INCH TOTAL ADJUSTMENT
STYLE 10 RECESSED ESCUTCHEON
5.6 K-FACTOR, 1/2 INCH NPT

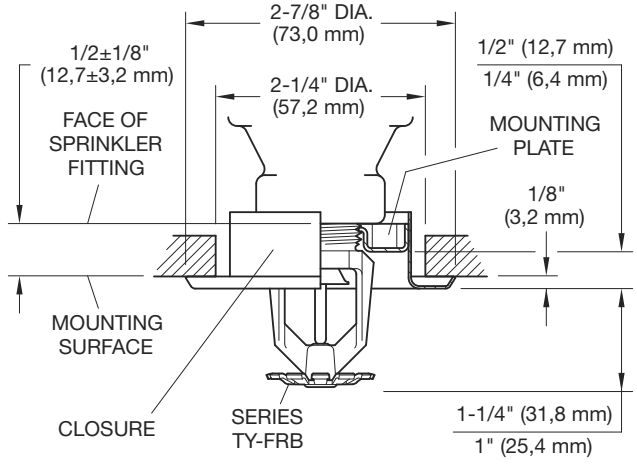


FIGURE 11
SERIES TY-FRB RECESSED PENDENT
WITH TWO-PIECE 1/2 INCH TOTAL ADJUSTMENT
STYLE 20 RECESSED ESCUTCHEON
5.6 K-FACTOR, 1/2 INCH NPT

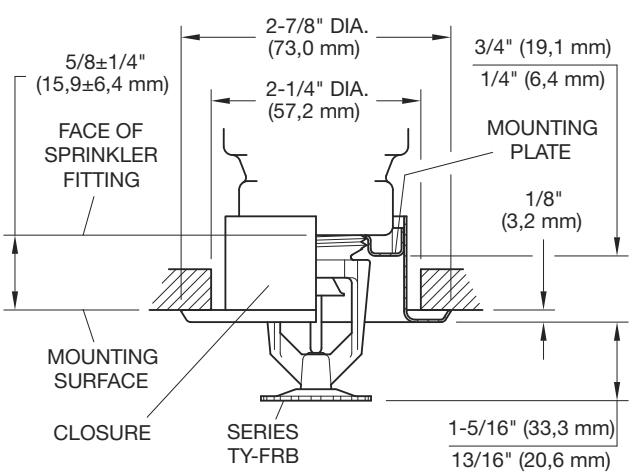


FIGURE 12
SERIES TY-FRB RECESSED PENDENT
WITH TWO-PIECE 3/4 INCH TOTAL ADJUSTMENT
STYLE 40 RECESSED ESCUTCHEON
8.0 K-FACTOR, 3/4 INCH NPT

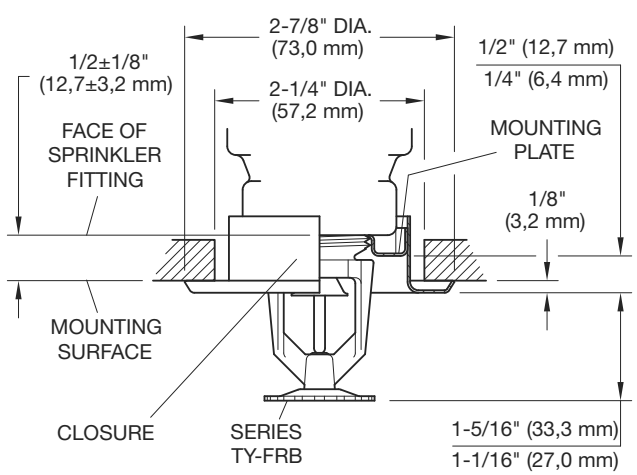


FIGURE 13
SERIES TY-FRB RECESSED PENDENT
WITH TWO-PIECE 1/2 INCH TOTAL ADJUSTMENT
STYLE 30 RECESSED ESCUTCHEON
8.0 K-FACTOR, 3/4 INCH NPT

Inspections of corrosion-resistant sprinklers are recommended at close range, instead of from the floor level per NFPA. Inspection at close range can better determine the exact sprinkler condition and the long-term integrity of the corrosion-resistant material, which can be affected by the corrosive conditions present.

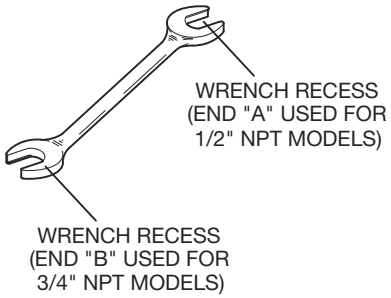


FIGURE 14
W-TYPE 6 SPRINKLER
WRENCH

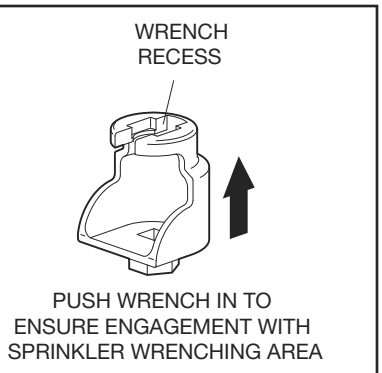


FIGURE 15
W-TYPE 7 RECESSED
SPRINKLER WRENCH

P/N 57 – XXX – X – XXX

		MODEL/SIN
330	2.8K UPRIGHT (1/2"NPT)	TY1131
331	2.8K PENDENT (1/2"NPT)	TY1231
340	4.2K UPRIGHT (1/2"NPT)	TY2131
341	4.2K PENDENT (1/2"NPT)	TY2231
370	5.6K UPRIGHT (1/2"NPT)	TY3131
371	5.6K PENDENT (1/2"NPT)	TY3231
390	8.0K UPRIGHT (3/4"NPT)	TY4131
391	8.0K PENDENT (3/4"NPT)	TY4231
360	8.0K UPRIGHT (1/2"NPT)	TY4831*
361	8.0K PENDENT (1/2"NPT)	TY4931*

	SPRINKLER FINISH
1	NATURAL BRASS
4	WHITE POLYESTER
3	WHITE (RAL9010)*
9	CHROME PLATED
7	LEAD COATED

	TEMPERATURE RATINGS
135	135°F (57°C)
155	155°F (68°C)
175	175°F (79°C)
200	200°F (93°C)
286	286°F (141°C)

* Eastern Hemisphere sales only.

TABLE D
PART NUMBER SELECTION
SERIES TY-FRB PENDENT AND UPRIGHT SPRINKLERS

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 other 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 Assemblies with NPT Thread Connections
Specify: (Specify Model/SIN), Quick Response, (specify K-factor), (specify temperature rating), Series TY-FRB (specify Pendent or Upright) Sprinkler with (specify type of finish or coating), P/N (specify from Table D).

Recessed Escutcheon:
Specify: Style (10, 20, 30, or 40) Recessed Escutcheon with (specify*) finish, P/N (specify*).

Sprinkler Wrench
Specify: W-Type 6 Sprinkler Wrench, P/N 56-000-6-387.

Specify: W-Type 7 Sprinkler Wrench, P/N 56-850-4-001.

* Refer to Technical Data Sheet TFP770.

RAPID RESPONSE Series LFII Residential 4.9 K-factor Pendent Sprinkler Wet Pipe and Dry Pipe Systems

General Description

TYCO RAPID RESPONSE Series LFII Residential 4.9K Pendent and Recessed Pendent Sprinklers (TY2234) are decorative, fast response, frangible bulb sprinklers designed for use in residential occupancies such as homes, apartments, dormitories, and hotels. When aesthetics and optimized flow characteristics are the major consideration, the Series LFII Residential Sprinklers (TY2234) should be the first choice.

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

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

The recessed version of the Series LFII Residential Sprinklers is intended for use in areas with finished ceilings. It employs a two-piece Style 20 Recessed Escutcheon. The Recessed Escutcheon provides 1/4 in. (6,4 mm) of recessed adjustment or up to 1/2 in. (12,7 mm) of total adjustment from the flush ceiling position. The adjustment provided by the Recessed Escutcheon reduces the accuracy to which the pipe drops to the sprinklers must be cut.

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.

The Series LFII Residential Sprinklers have 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.

Corrosion-resistant coatings, where applicable, are utilized to extend the life of copper alloy sprinklers beyond that which would otherwise be obtained when exposed to corrosive atmospheres. Although corrosion-resistant coated sprinklers have passed the standard corrosion tests of the applicable Approval agencies, the testing is not representative of all possible corrosive atmospheres. Consequently, it is recommended that the end user be consulted with respect to the suitability of these coatings for any given corrosive environment. The effects of ambient temperature, concentration of chemicals, and gas/chemical velocity should be considered, as a minimum, along with the corrosive nature of the chemical to which the sprinklers will be exposed.

Dry Pipe System Application

The Series LFII Residential Pendent and Recessed Pendent Sprinklers offers a laboratory approved option for designing dry pipe residential sprinkler systems, whereas, most residential sprinklers are laboratory approved for wet systems only.

Through extensive testing, it has been determined that the number of design sprinklers (hydraulic design area) for the Series LFII Residential Pendent and Recessed Pendent Sprinklers (TY2234) need not be increased over the number of design sprinklers (hydraulic design area) as specified for wet pipe sprinkler systems, as is accustomed for density/area sprinkler systems designed per NFPA 13.

NSF® Certified to NSF/ANSI 61

Consequently, the Series LFII Residential Sprinklers offer the features of non-water filled pipe in addition to not having to increase the number of design sprinklers (hydraulic design area) for systems designed to NFPA 13, 13D, or 13R.

NOTICE

The Series LFII Residential Pendent and Recessed Pendent Sprinklers (TY2234) described herein must be installed and maintained in compliance with this document and the applicable standards of the NATIONAL FIRE PROTECTION ASSOCIATION (NFPA), 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. Contact the installing contractor or product manufacturer with any questions.

Sprinkler Identification Number (SIN)

TY2234

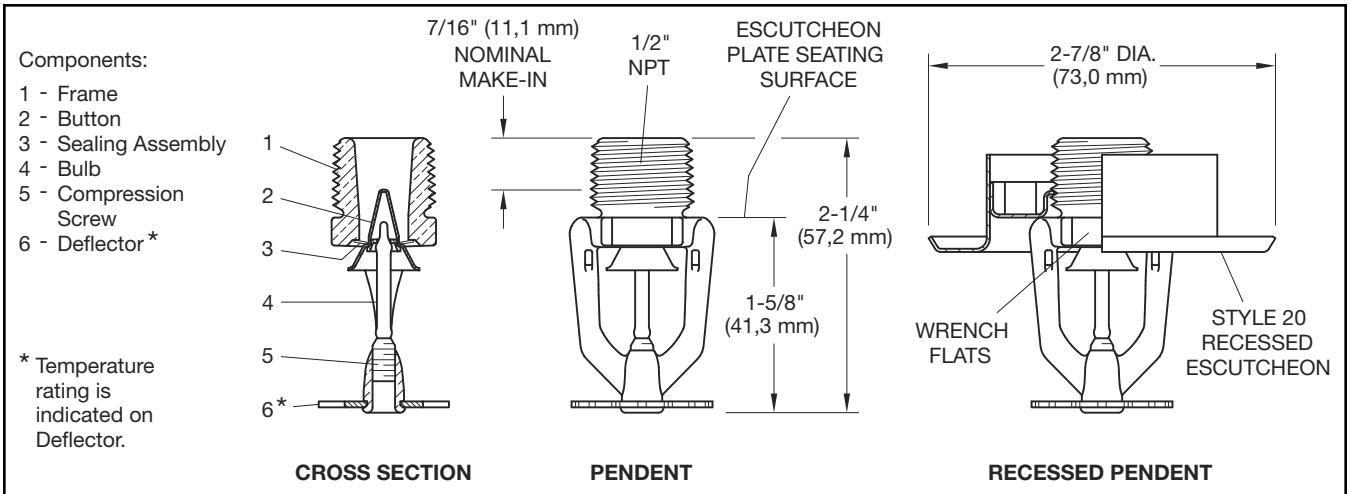


FIGURE 1
RAPID RESPONSE SERIES LFII RESIDENTIAL
4.9K PENDENT AND RECESSED PENDENT SPRINKLERS (TY2234)

Technical Data

Approvals
UL Listed (for use with wet pipe and dry pipe systems)

C-UL Listed (for use only with wet pipe systems)

Certified to all requirements of NSF/ANSI 61

Note: *Sprinklers with a polyester finish are UL Listed as corrosion-resistant sprinklers.*

See the Design Criteria section for details on these approvals.

Maximum Working Pressure
175 psi (12,1 bar)

Discharge Coefficient
K=4.9 GPM/psi½ (70,6 LPM/bar½)

Temperature Rating
155°F (68°C) or 175°F (79°C)

Finishes
Natural Brass, Pure White Polyester Coated, Signal White Polyester Coated, or Chrome Plated

Physical Characteristics

Frame	Brass
Button	Copper
Sealing Assembly	Beryllium Nickel w/TEFLON
Bulb (3 mm)	Glass
Compression Screw	Bronze
Deflector	Bronze

Operation

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, allowing the sprinkler to activate and flow water.

Design Criteria

The TYCO RAPID RESPONSE Series LFII Residential 4.9K Pendent and Recessed Pendent Sprinklers 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 the local authority having jurisdiction.

System Types
Per the UL Listing, wet pipe and dry pipe systems may be utilized. Per the C-UL Listing, only wet pipe systems may be utilized.

Refer to Technical Data Sheet TFP485 for the use of residential sprinklers in residential dry pipe systems.

Ceiling Types
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 rates are given in Tables A and B 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. The number of design sprinklers specified in NFPA 13D and 13R for wet pipe systems is to be applied when designing dry pipe systems.

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 or B as a function of temperature rating and the maximum allowable coverage area.
- A minimum discharge of 0.1 gpm/ft^2 over the design area comprised of the four most hydraulically demanding sprinklers for actual coverage areas protected by the four sprinklers.

The number of design sprinklers specified in NFPA 13 for wet pipe systems is to be applied when designing dry pipe systems.

Dry Pipe System Water Delivery
When using the Series LFII Residential Sprinklers (TY2234) in dry pipe sprinkler systems, the time for water delivery must not exceed 15 seconds for the most remote operating sprinkler.

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
Sprinklers are to be installed with a deflector-to-ceiling distance of 1-1/4 in. to 4 in.

Maximum Coverage Area [1] ft x ft (m x m)	WET PIPE SYSTEM Minimum Flow and Residual Pressure [2][3]						
	Ordinary Temperature Rating 155°F (68°C)		Intermediate Temperature Rating 175°F (79°C)		Deflector to Ceiling	Installation Type	Minimum Spacing ft (m)
	Flow gpm (l/min)	Pressure psi (bar)	Flow gpm (l/min)	Pressure psi (bar)			
12 x 12 (3,7 x 3,7)	13 (49,2)	7.0 (0,48)	13 (49,2)	7.0 (0,48)	Smooth Ceilings 1-1/4 in. to 4 in. Beamed Ceilings per NFPA 13D or 13R 1-1/4 in. to 1-3/4 in. below bottom of beam.	Recessed using Style 20 Escutcheon or non-recessed per NFPA 13D, 13R, or 13	8 (2,4)
14 x 14 (4,3 x 4,3)	13 (49,2)	7.0 (0,48)	13 (49,2)	7.0 (0,48)			
16 x 16 (4,9 x 4,9)	13 (49,2)	7.0 (0,48)	13 (49,2)	7.0 (0,48)			
18 x 18 (5,5 x 5,5)	17 (64,3)	12.0 (0,83)	17 (64,3)	12.0 (0,83)			
20 x 20 (6,1 x 6,1)	20 (75,7)	16.7 (1,15)	20 (75,7)	16.7 (1,15)			

Notes:
1. For coverage area dimensions less than or between those indicated, use the minimum required flow for the next highest coverage area for which hydraulic design criteria are stated.
2. Requirement is based on minimum flow in gpm (lpm) from each sprinkler. The associated residual pressures are calculated using the nominal K-factor. See Hydraulic Design under the Design Criteria section.
3. For NFPA 13 residential applications, the greater of 0.1 gpm/ft^2 over the design area or the flow in accordance with the criteria in this table must be used.

TABLE A
WET PIPE SYSTEM
SERIES LFII RESIDENTIAL 4.9K PENDENT AND RECESSED PENDENT SPRINKLERS (TY2234)
NFPA 13D, 13R, AND 13 HYDRAULIC DESIGN CRITERIA

Maximum Coverage Area [1] ft x ft (m x m)	DRY PIPE SYSTEM Minimum Flow and Residual Pressure [2][3]						
	Ordinary Temperature Rating 155°F (68°C)		Intermediate Temperature Rating 175°F (79°C)		Deflector to Ceiling	Installation Type	Minimum Spacing ft (m)
	Flow gpm (l/min)	Pressure psi (bar)	Flow gpm (l/min)	Pressure psi (bar)			
12 x 12 (3,7 x 3,7)	13 (49,2)	7.0 (0,48)	13 (49,2)	7.0 (0,48)	Smooth Ceilings 1-1/4 in. to 4 in. Beamed Ceilings per NFPA 13D or 13R 1-1/4 in. to 1-3/4 in. below bottom of beam.	Recessed using Style 20 Escutcheon or non-recessed per NFPA 13D, 13R, or 13	8 (2,4)
14 x 14 (4,3 x 4,3)	14 (53,0)	8.2 (0,57)	14 (53,0)	8.2 (0,57)			
16 x 16 (4,9 x 4,9)	15 (56,8)	9.4 (0,65)	15 (56,8)	9.4 (0,65)			
18 x 18 (5,5 x 5,5)	18 (68,1)	13.5 (0,93)	18 (68,1)	13.5 (0,93)			
20 x 20 (6,1 x 6,1)	21 (79,5)	18.4 (1,27)	21 (79,5)	18.4 (1,27)			

Notes:
1. For coverage area dimensions less than or between those indicated, use the minimum required flow for the next highest coverage area for which hydraulic design criteria are stated.
2. Requirement is based on minimum flow in gpm (lpm) from each sprinkler. The associated residual pressures are calculated using the nominal K-factor. See Hydraulic Design under the Design Criteria section.
3. For NFPA 13 residential applications, the greater of 0.1 gpm/ft^2 over the design area or the flow in accordance with the criteria in this table must be used.

TABLE B
DRY PIPE SYSTEM
SERIES LFII RESIDENTIAL 4.9K PENDENT AND RECESSED PENDENT SPRINKLERS (TY2234)
NFPA 13D, 13R, AND 13 HYDRAULIC DESIGN CRITERIA

Sprinkler Spacing
The minimum spacing between sprinklers is 8 ft (2,4 m). The maximum spacing between sprinklers cannot exceed the length of the coverage area (Table A or B) being hydraulically calculated (for example, maximum 12 ft for a 12 ft x 12 ft coverage area, or 20 ft for a 20 ft x 20 ft coverage area).

Installation

TYCO RAPID RESPONSE Series LFII Residential 4.9K Pendent and Recessed Pendent Sprinklers must be installed in accordance with this section.

General Instructions
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).

A leak-tight 1/2 in. NPT sprinkler joint should be obtained by applying a minimum-to-maximum torque of 7 to 14 lb-ft (9,5 to 19,0 N·m). 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 an Escutcheon Plate by under- or over- tightening the sprinkler. Re-adjust the position of the sprinkler fitting to suit.

Pendent Sprinklers
The Series LFII Residential Pendent Sprinklers must be installed in accordance with the following instructions:

Step 1. Install pendent sprinklers in the pendent position with the deflector parallel to the ceiling.

Step 2. With pipe thread sealant applied to the pipe threads, hand-tighten the sprinkler into the sprinkler fitting.

Step 3. Tighten the sprinkler into the sprinkler fitting using only the W-Type 6 Sprinkler Wrench (Figure 3). With reference to Figure 1, apply the W-Type 6 Sprinkler Wrench to the wrench flats.

Recessed Pendent Sprinklers
The Series LFII Residential Recessed Pendent Sprinklers must be installed in accordance with the following instructions:

Step A. Install recessed pendent sprinklers in the pendent position with the deflector parallel to the ceiling.

Step B. After installing the Style 20 Mounting Plate over the sprinkler threads and with pipe thread sealant applied to the pipe threads, hand-tighten the sprinkler into the sprinkler fitting.

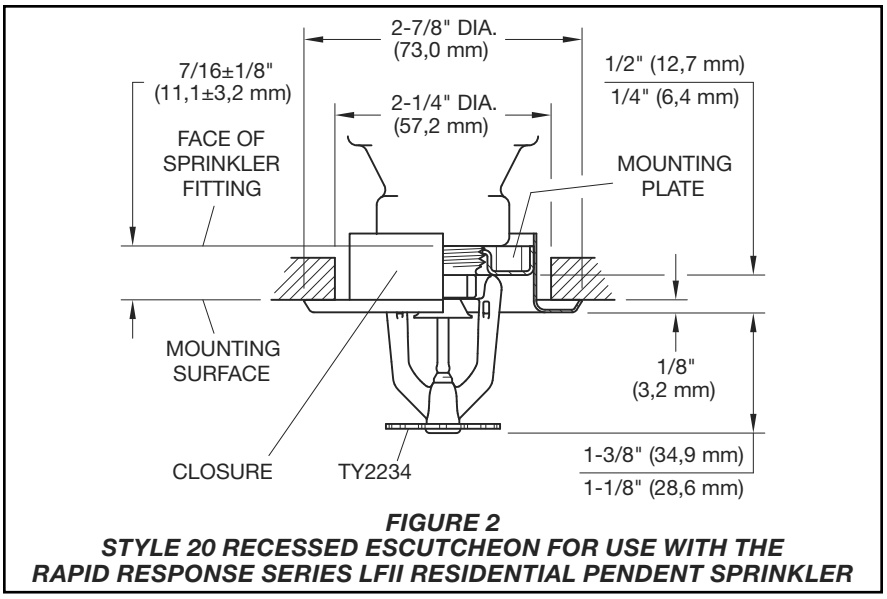


FIGURE 2
STYLE 20 RECESSED ESCUTCHEON FOR USE WITH THE RAPID RESPONSE SERIES LFII RESIDENTIAL PENDENT SPRINKLER

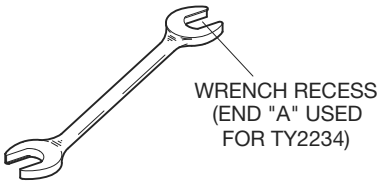


FIGURE 3
W-TYPE 6
SPRINKLER WRENCH

Step C. Tighten the sprinkler into the sprinkler fitting using only the W-Type 7 Recessed Sprinkler Wrench (Figure 4). With reference to Figure 1, apply the W-Type 7 Recessed Sprinkler Wrench to the sprinkler wrench flats.

Step D. After the ceiling has been installed or the finish coat has been applied, slide on the Style 20 Closure over the Series LFII Residential Sprinkler and push the Closure over the Mounting Plate until its flange comes in contact with the ceiling.

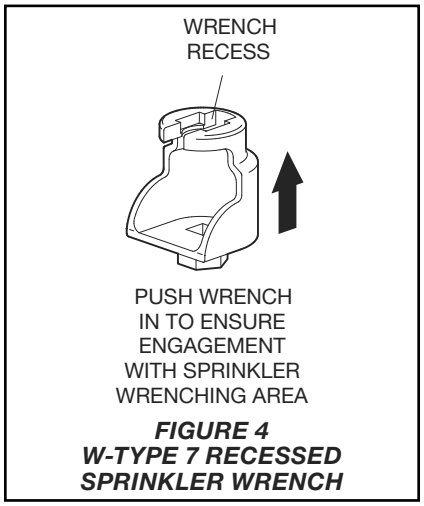


FIGURE 4
W-TYPE 7 RECESSED
SPRINKLER WRENCH

Care and Maintenance

TYCO RAPID RESPONSE Series LFII Residential 4.9K Pendent and Recessed Pendent 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, permission to shut down the affected fire protection system must be obtained 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, can delay sprinkler operation in a fire situation.

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 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 the 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, for example, NFPA 25, in addition to the standards of any 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.

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).

Sprinkler Assemblies
Specify: Series LFII 4.9K Residential Pendent Sprinkler (TY2234), (specify temperature rating), with (specify) finish, P/N (specify):

155°F (68°C)
Natural Brass 51-201-1-155
Pure White (RAL 9010)
Polyester[1, 2] 51-201-3-155
Signal White (RAL 9003)
Polyester[1] 51-201-4-155
Chrome Plated 51-201-9-155

175°F (79°C)
Natural Brass 51-201-1-175
Pure White (RAL 9010)
Polyester[1, 2] 51-201-3-175
Signal White (RAL 9003)
Polyester[1] 51-201-4-175
Chrome Plated 51-201-9-175

1. UL Listed as corrosion-resistant.
2. Eastern Hemisphere sales only.

Recessed Escutcheon
Specify: Style 20 Recessed Escutcheon with (specify*) finish, P/N (specify*)

*** Refer to Technical Data Sheet TFP770.**

Sprinkler Wrenches
Specify: W-Type 6 Sprinkler Wrench, P/N 56-000-6-387

Specify: W-Type 7 Sprinkler Wrench, P/N 56-850-4-001

1400 Pennbrook Parkway, Lansdale, PA 19446 | Telephone +1-215-362-0700

Johnson Controls

Series TY-FRB, 5.6 K-factor Upright, Pendent, and Recessed Pendent Sprinklers Quick Response, Standard Coverage

General Description

The TYCO Series TY-FRB, 5.6 K-factor, Upright (TY313) and Pendent (TY323) Sprinklers described in this data sheet are quick response, standard coverage, decorative 3 mm glass bulb-type spray sprinklers designed for use in light or ordinary hazard, commercial occupancies such as banks, hotels, and shopping malls.

The recessed version of the Series TY-FRB Pendent Sprinkler, where applicable, is intended for use in areas with a finished ceiling. This recessed pendent sprinkler uses one of the following:

- A two-piece Style 15 Recessed Escutcheon with recessed adjustment up to 5/8 in. (15,9 mm) from the flush pendent position.
- A two-piece Style 20 Recessed Escutcheon with recessed adjustment up to 1/2 in. (12,7 mm) from the flush pendent position.

The adjustment provided by the Recessed Escutcheon reduces the accuracy to which the fixed pipe drops to the sprinklers must be cut.

Intermediate level versions of Series TY-FRB Sprinklers are described in Technical Data Sheet TFP357. Sprinkler guards and shields are described in Technical Data Sheet TFP780.

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.

NOTICE

The TYCO Series TY-FRB 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, 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.

Sprinkler Identification Number (SIN)

TY313 . . . . Upright 5.6K, 1/2 in. NPT
TY323 . . . .Pendent 5.6K, 1/2 in. NPT

Technical Data

Approvals
Refer to Table A

Maximum Working Pressure
175 psi (12.1 bar)
250 psi (17.2 bar)*

* The maximum working pressure of 250 psi (17.2 bar) only applies to the listing by Underwriters Laboratories, Inc. (UL).

Discharge Coefficient
K=5.6 GPM/psi$^{1/2}$ (80,6 LPM/bar$^{1/2}$)

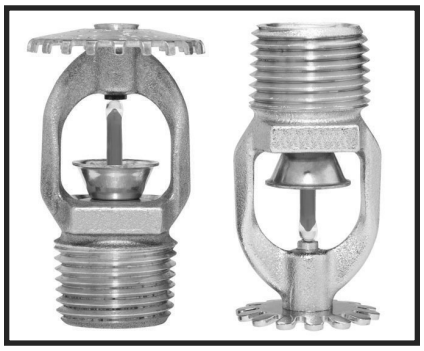
Temperature Rating
Refer to Table A

Finishes
Sprinkler: Refer to Table B

Recessed Escutcheon: White Coated, Black Coated, Chrome Plated, or Brass Plated

Physical Characteristics

Frame	Bronze
Button	Brass/Copper
Sealing Assembly	Stainless Steel w/TEFLON
Bulb	Glass
Compression Screw	Bronze
Deflector	Bronze



Operation

The glass bulb contains a fluid which expands when exposed to heat. When the rated temperature is reached, the fluid expands sufficiently to shatter the glass bulb, allowing the sprinkler to activate and water to flow.

Design Criteria

The TYCO Series TY-FRB, 5.6 K-factor, Upright (TY313) and Pendent (TY323) Sprinklers are intended for fire protection systems designed in accordance with the standard installation rules recognized by the applicable Listing or Approval agency (such as, UL Listing is based on the requirements of NFPA 13, and FM Approval is based on the requirements of FM's Loss Prevention Data Sheets). Only the Style 15 or Style 20 Recessed Escutcheon is to be used for recessed pendent installations.

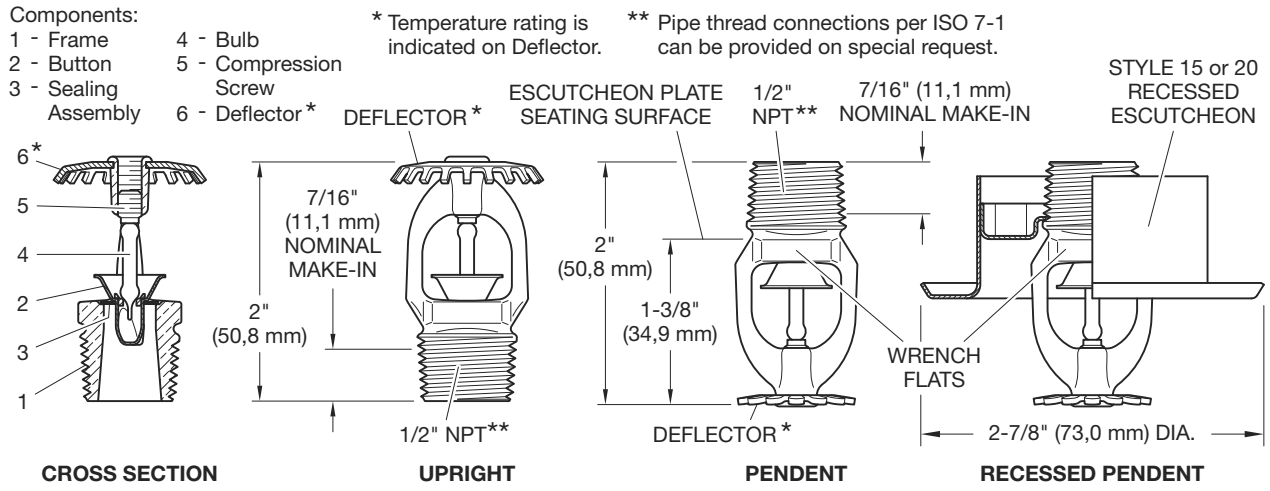


FIGURE 1
SERIES TY-FRB UPRIGHT (TY313) AND PENDENT (TY323) SPRINKLERS
5.6 K-FACTOR, 1/2 INCH NPT, QUICK RESPONSE

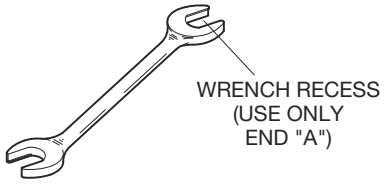


FIGURE 2
W-TYPE 6
SPRINKLER WRENCH

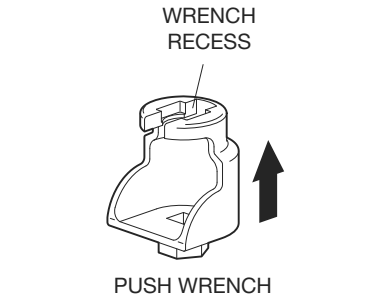


FIGURE 3
W-TYPE 7 RECESSED
SPRINKLER WRENCH

Installation

The TYCO Series TY-FRB, 5.6 K-factor, Upright (TY313) and Pendent (TY323) Sprinklers must be installed in accordance with this section.

General Instructions
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) and 3/32 in. (2,4 mm) for the 286°F (141°C) temperature ratings.

A leak-tight 1/2 in. NPT sprinkler joint should be obtained by applying a minimum to maximum torque of 7 to 14 lb-ft (9,5 to 19,0 N·m). 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 Escutcheon Plate by under- or over-tightening the sprinkler. Re-adjust the position of the sprinkler fitting to suit.

Upright and Pendent Sprinklers
The Series TY-FRB Upright and Pendent Sprinklers must be installed in accordance with the following instructions.

Step 1. Install Pendent sprinklers in the pendent position. Install upright sprinklers in the upright position.

Step 2. With pipe-thread sealant applied to the pipe threads, hand-tighten the sprinkler into the sprinkler fitting.

Step 3. Tighten the sprinkler into the sprinkler fitting using only the W-Type 6 Sprinkler Wrench (Figure 2). With reference to Figure 1, apply the W-Type 6 Sprinkler Wrench to the wrench flats. Torque sprinklers 7 to 14 lb-ft (9,5 to 19,0 N·m).

Recessed Pendent Sprinklers
The Series TY-FRB Recessed Pendent Sprinklers must be installed in accordance with the following instructions.

Step A. After installing the Style 15 or Style 20 Mounting Plate over the sprinkler threads, and with pipe-thread sealant applied to the pipe threads, hand-tighten the sprinkler into the sprinkler fitting.

Step B. Tighten the sprinkler into the sprinkler fitting using only the W-Type 7 Recessed Sprinkler Wrench (Figure 3). With reference to Figure 1, apply the W-Type 7 Recessed Sprinkler Wrench to the sprinkler wrench flats. Torque sprinklers 7 to 14 lb-ft (9,5 to 19,0 N·m).

Step C. After ceiling installation and finishing, slide on the Style 15 or Style 20 Closure over the Series TY-FRB Sprinkler and push the Closure over the Mounting Plate until its flange comes in contact with the ceiling.

Care and Maintenance

The TYCO Series TY-FRB, 5.6 K-factor, Upright (TY313) and Pendent (TY323) 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, can delay sprinkler operation in a fire situation.

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 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. (Ref. 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 (e.g., 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.

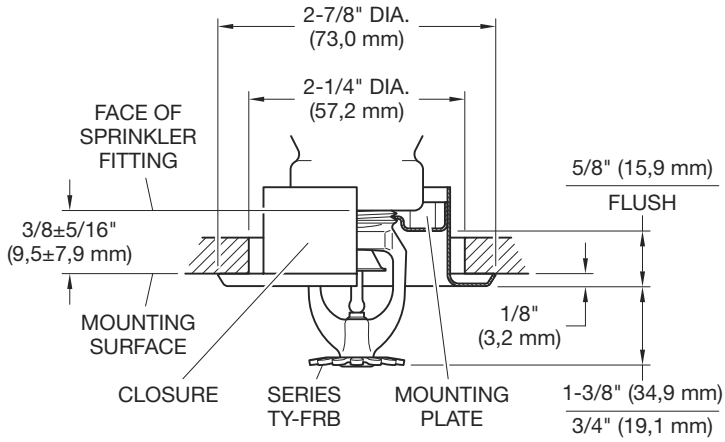


FIGURE 4
SERIES TY-FRB RECESSED PENDENT SPRINKLER ASSEMBLY (TY323) WITH TWO PIECE 5/8 INCH TOTAL ADJUSTMENT STYLE 15 RECESSED ESCUTCHEON

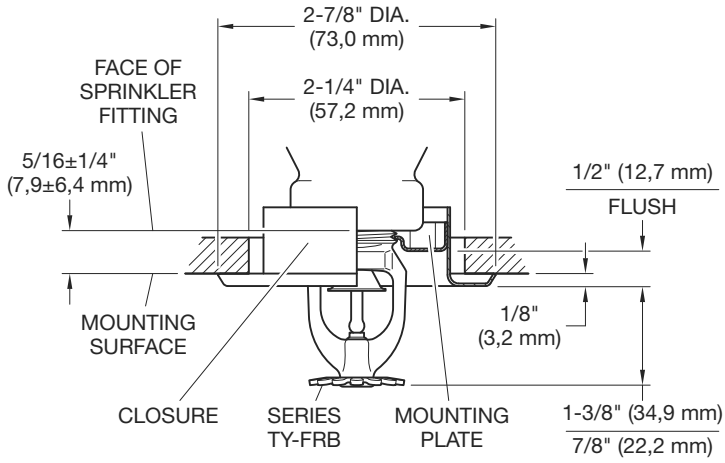


FIGURE 5
SERIES TY-FRB RECESSED PENDENT SPRINKLER ASSEMBLY (TY323) WITH TWO PIECE 1/2 INCH TOTAL ADJUSTMENT STYLE 20 RECESSED ESCUTCHEON

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).

Sprinkler Assemblies with NPT Thread Connections
Specify: Series TY-FRB Upright or Pendent (specify) Sprinkler, SIN (specify), K=5.6, Quick Response, (specify) temperature rating, (specify) finish, P/N (specify, refer to Table A).

Recessed Escutcheon
Specify: Style 15 Recessed Escutcheon with (specify*) finish, P/N (specify*)

Specify: Style 20 Recessed Escutcheon with (specify*) finish, P/N (specify*)

* Refer to Technical Data Sheet TFP770

Sprinkler Wrench
Specify: W-Type 6 Sprinkler Wrench, P/N 56-000-6-387

Specify: W-Type 7 Sprinkler Wrench, P/N 56-850-4-001

K FACTOR	TYPE	TEMPERATURE	SPRINKLER FINISH (See Note 7) BULB LIQUID COLOR	NATURAL BRASS	CHROME PLATED	POLYESTER[c]
5.6 1/2 in. NPT	UPRIGHT (TY313) and PENDENT (TY323)	135°F (57°C)	Orange	1, 2, 3, 4, 5, 6		
		155°F (68°C)	Red			
		175°F (79°C)	Yellow			
		200°F (93°C)	Green			
		286°F (141°C)	Blue			
	RECESSED PENDENT (TY323) Figures 4[a] and 5[b]	135°F (57°C)	Orange	1, 2, 3, 4		
		155°F (68°C)	Red			
		175°F (79°C)	Yellow			
		200°F (93°C)	Green			

Notes:
1. Listed by Underwriters Laboratories, Inc., (UL) as Quick Response Sprinklers.
2. Listed by Underwriters Laboratories, Inc., for use in Canada (C-UL) as Quick Response Sprinklers.
3. Approved by Factory Mutual Research Corporation (FM) as Quick Response Sprinklers.
4. Approved by the City of New York under MEA 354-01-E.
5. VdS Approved (For details, contact Johnson Controls, Enschede, Netherlands, Tel. 31-53-428-4444/Fax 31-54-428-3377.)
6. Approved by the Loss Prevention Certification Board (LPCB Ref. No. 094a/06) as Quick Response Sprinklers.
7. Where Polyester Coated Sprinklers are noted to be UL and C-UL Listed, the sprinklers are UL and C-UL Listed as Corrosion-Resistant Sprinklers.

a. Installed with Style 15 (1/2 in. NPT) 5/8 in. Total Adjustment Recessed Escutcheon, as applicable.
b. Installed with Style 20 (1/2 in. NPT) 1/2 in. Total Adjustment Recessed Escutcheon, as applicable.
c. Frame and Deflector only. Listings and approvals apply to color (Special Order).

TABLE A
LABORATORY LISTINGS AND APPROVALS FOR
5.6 K-FACTOR SPRINKLERS

P/N[a] 77 – XXX – X – XXX

		SIN
370	5.6K UPRIGHT (1/2 in.NPT)	TY313
371	5.6K PENDENT (1/2 in.NPT)	TY323

Notes:
a. Use suffix "I" for ISO 7-1 connection; for example, 77-370-4-175-I

	SPRINKLER FINISH
1	NATURAL BRASS
3	PURE WHITE (RAL9010)[a] POLYESTER
4	SIGNAL WHITE (RAL9003) POLYESTER
5	JET BLACK (RAL9005) POLYESTER
9	CHROME PLATED

Notes:
a. Eastern Hemisphere sales only

	TEMPERATURE RATINGS
135	135°F (57°C)
155	155°F (68°C)
175	175°F (79°C)
200	200°F (93°C)
286	286°F (141°C)

TABLE B
SERIES TY-FRB UPRIGHT AND PENDENT SPRINKLERS
PART NUMBER SELECTION

1400 Pennbrook Parkway, Lansdale, PA 19446 | Telephone +1-215-362-0700

Series TY-FRB — 5.6 K-factor Horizontal and Vertical Sidewall Sprinklers Quick Response, Standard Coverage

General Description

The Series TY-FRB, 5.6 K-factor, Horizontal and Vertical Sidewall Sprinklers described in this data sheet are quick response -standard coverage, decorative 3 mm glass bulb type spray sprinklers designed for use in light and ordinary hazard, commercial occupancies such as banks, hotels, shopping malls, etc. They are designed for installation along a wall or the side of a beam and just beneath a smooth ceiling. Sidewall sprinklers are commonly used instead of pendent or upright sprinklers due to aesthetics or building construction considerations, where piping across the ceiling is not desirable.

The recessed version of the Series TY-FRB Horizontal Sidewall Sprinkler is intended for use in areas with a finished wall. It uses a two-piece Style 10 Recessed Escutcheon with 1/2 in. (12,7 mm) of recessed adjustment or up to 3/4 in. (19,1 mm) of total adjustment from the flush sidewall position, or a two-piece Style 20 Recessed Escutcheon with 1/4 in. (6,4 mm) of recessed adjustment or up to 1/2 in. (12,7 mm) of total adjustment from the flush sidewall position. The adjustment provided by the Recessed Escutcheon reduces the accuracy to which the fixed pipe nipples to the sprinklers must be cut.

Corrosion resistant coatings, where applicable, are utilized to extend the life of copper alloy sprinklers beyond that which would otherwise be obtained when exposed to corrosive atmospheres. Although corrosion resistant coated sprinklers have passed the standard corrosion tests of the applicable approval agencies, the testing is not representative of all possible corrosive atmospheres. Consequently, it is recommended that the end user be consulted with respect to the suitability of these coatings for any given corrosive environment. The effects of ambient temperature, concentration of chemicals, and gas/chemical velocity, should be considered, as a minimum, along with the corrosive nature of the chemical to which the sprinklers will be exposed.

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.

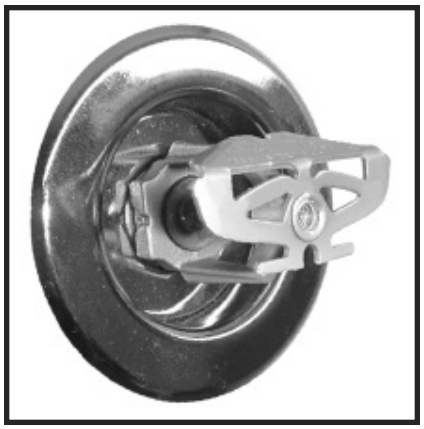
NOTICE

The Series TY-FRB 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, 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.

Sprinkler Identification Numbers

TY3331. . . . . Horizontal
TY3431. . . . . Vertical



Technical Data

Approvals
UL and C-UL Listed
FM Approved
LPCB Approved
NYC Approved

(Refer to Table A for complete approval information including corrosion resistant status.)

Maximum Working Pressure
Refer to Table B

Discharge Coefficient
K=5.6 GPM/psi$^{1/2}$ (80,6 LPM/bar$^{1/2}$)

Temperature Ratings
Refer to Table A

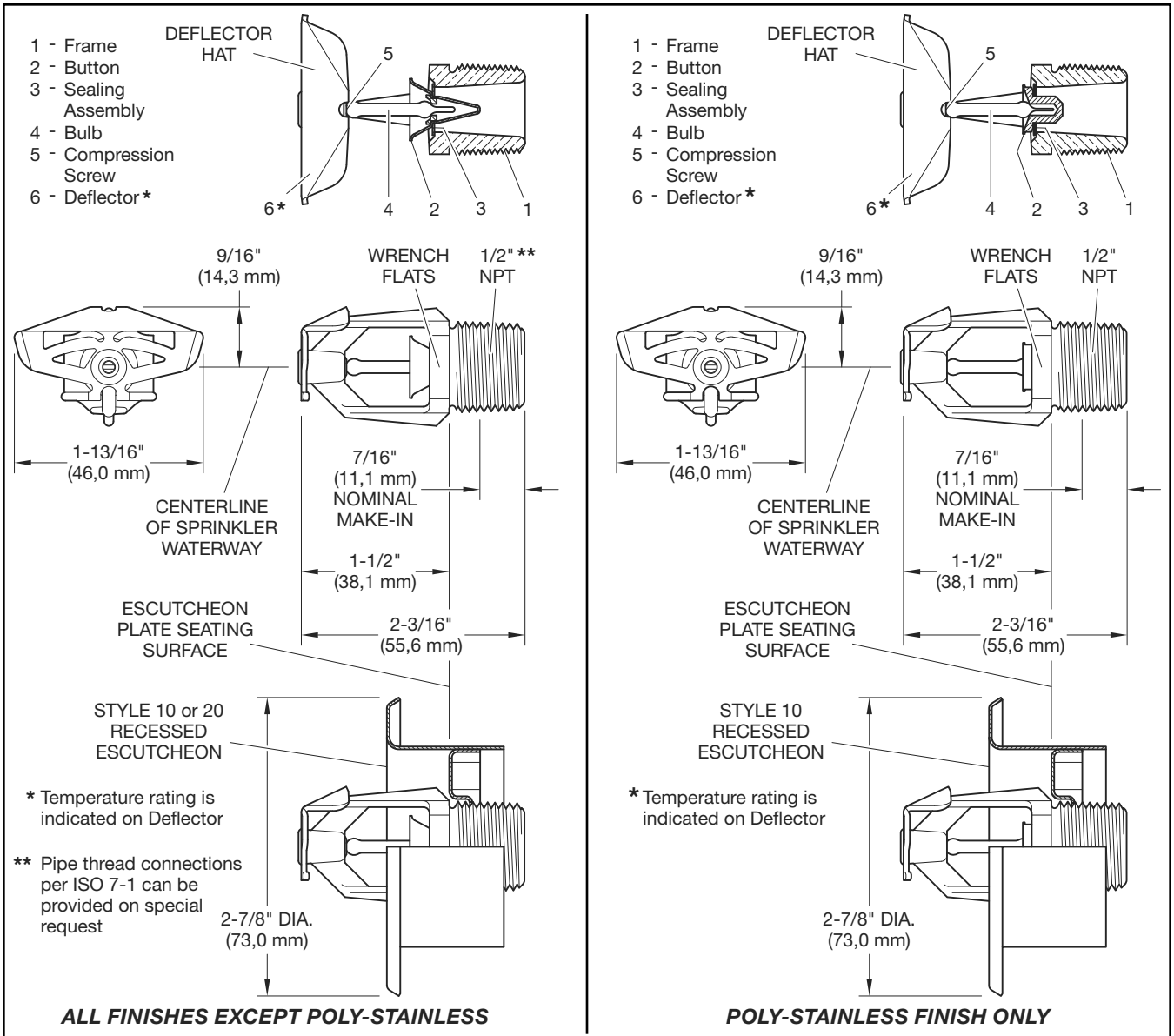


FIGURE 1
5.6 K-FACTOR QUICK RESPONSE
SERIES TY-FRB HORIZONTAL SIDEWALL (TY3331) SPRINKLERS

Finishes
Sprinkler: Refer to Table C

Recessed Escutcheon: Signal or Pure White, Jet Black, Grey Aluminum, Chrome Plated, or Brass Plated

Physical Characteristics

Frame	Bronze
Button	Brass/Copper
Sealing Assembly	Beryllium Nickel w/TEFLON
Bulb	Glass
Compression Screw	Bronze
HSW Deflector	Bronze
VSW Deflector	Copper

Poly-Stainless
Physical Characteristics

Frame	Bronze
Button	L316 Stainless Steel*
Bulb	Glass
Compression Screw	L316 Stainless Steel*
HSW Deflector	Copper/Bronze
Sealing Assembly	Gold Plated Beryllium Nickel w/TEFLON

*Type L316 stainless steel (UNS 31603) per ASTM A479/479M or BS EN 1008 WN1.4404.

Operation

The glass bulb contains a fluid which expands when exposed to heat. When the rated temperature is reached, the fluid expands sufficiently to shatter the glass bulb, allowing the sprinkler to activate and water to flow.

Design Criteria

The Series TY-FRB, 5.6 K-factor, Horizontal and Vertical Sidewall Sprinklers are intended for fire protection systems designed in accordance with the standard installation rules recognized by the applicable Listing or Approval agency (e.g., UL Listing is based on the requirements of NFPA 13, and FM Approval is based on the requirements of FM's Loss Prevention Data Sheets). Only the Style 10 or 20 Recessed Escutcheon, as applicable, is to be used for recessed horizontal installations.

Installation

The Series TY-FRB, 5.6 K-factor, Horizontal and Vertical Sidewall Sprinklers must be installed in accordance with this section.

General Instructions
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) to 3/32 in. (2,4 mm) for the 286°F (141°C) temperature ratings.

A leak tight 1/2 in. NPT sprinkler joint should be obtained with a torque of 7 to 14 lb-ft (9,5 to 19,0 N·m). Higher levels of torque may distort the sprinkler and cause leakage or impairment of the sprinkler.

Do not attempt to make-up for insufficient adjustment in the escutcheon plate by under-or over-tightening the sprinkler. Readjust the position of the sprinkler fitting to suit.

Series TY-FRB Horizontal and Vertical Sidewall Sprinkler Installation
The Series TY-FRB Horizontal and Vertical Sidewall Sprinklers must be installed in accordance with the following instructions.

Step 1. Horizontal sidewall sprinklers are to be installed in the horizontal position with their centerline of waterway perpendicular to the back wall and parallel to the ceiling. The word “TOP” on the Deflector is to face towards the ceiling.

Vertical sidewall sprinklers are to be installed in the pendent or upright position with the arrow on the Deflector pointing away from the wall.

Step 2. With pipe thread sealant applied to the pipe threads, hand tighten the sprinkler into the sprinkler fitting.

Step 3. Tighten the sprinkler into the sprinkler fitting using only the W-Type 6 Sprinkler Wrench (Ref. Figure 5), With reference to Figure 1 or 2, the W-Type 6 Sprinkler Wrench is to be applied to the wrench flats.

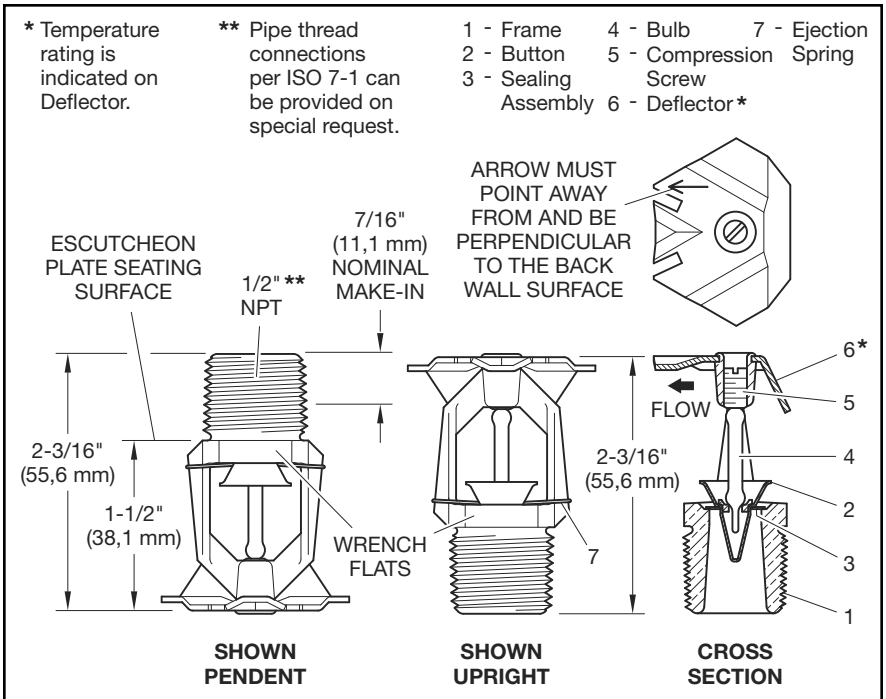


FIGURE 2
5.6 K-FACTOR QUICK RESPONSE
SERIES TY-FRB VERTICAL SIDEWALL (TY3431) SPRINKLERS

Series TY-FRB Recessed Horizontal Sidewall Sprinkler Installation
The Series TY-FRB Recessed Horizontal Sidewall Sprinklers must be installed in accordance with this section.

Step A. Recessed horizontal sidewall sprinklers are to be installed in the horizontal position with their centerline of waterway perpendicular to the back wall and parallel to the ceiling. The word “TOP” on the Deflector is to face towards the ceiling.

Step B. After installing the Style 10 or 20 Mounting Plate over the sprinkler threads, hand tighten the sprinkler into the sprinkler fitting.

Step C. Tighten the sprinkler into the sprinkler fitting using only the W-Type 7 Recessed Sprinkler Wrench (Ref. Figure 6). With reference to Figure 1, the W-Type 7 Recessed Sprinkler Wrench is to be applied to the sprinkler wrench flats.

Step D. After the ceiling has been installed or the finish coat has been applied, slide on the Style 10 or 20 Closure over the Series TY-FRB Sprinkler and push the Closure over the Mounting Plate until its flange comes in contact with the ceiling.

Care and Maintenance

The Series TY-FRB, 5.6 K-factor, Horizontal and Vertical Sidewall 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, permission to shut down the affected fire protection system must be obtained from the proper authorities and all personnel who may be affected by this action must be notified.

Absence of an escutcheon, which is used to cover a clearance hole, may delay the time to sprinkler operation in a fire situation.

Sprinklers that 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. Spriklers

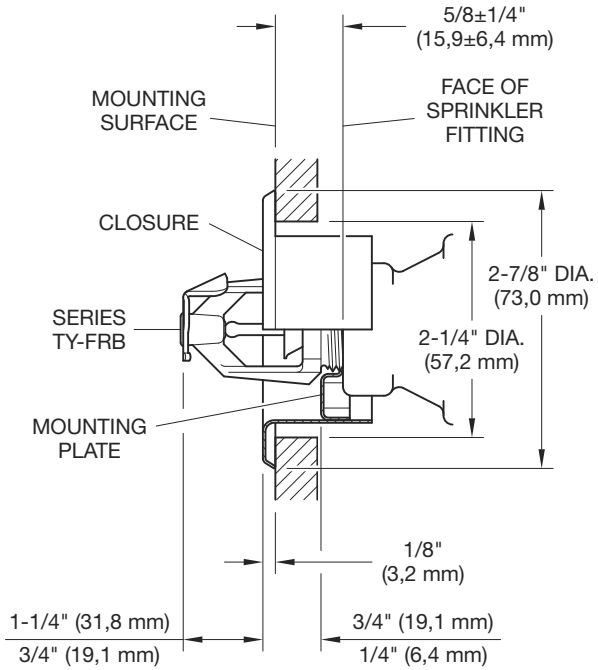


FIGURE 3
SERIES TY-FRB RECESSED HORIZONTAL SIDEWALL SPRINKLER WITH TWO-PIECE 3/4 INCH TOTAL ADJUSTMENT STYLE 10 RECESSED ESCUTCHEON

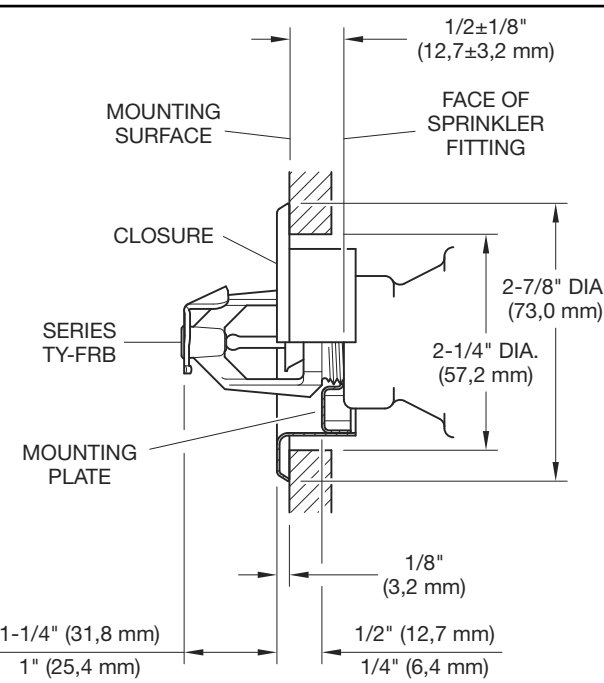


FIGURE 4
SERIES TY-FRB RECESSED HORIZONTAL SIDEWALL SPRINKLER WITH TWO-PIECE 1/2 INCH TOTAL ADJUSTMENT STYLE 20 RECESSED ESCUTCHEON

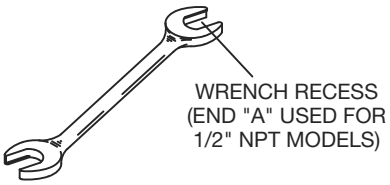


FIGURE 5
W-TYPE 6
SPRINKLER WRENCH

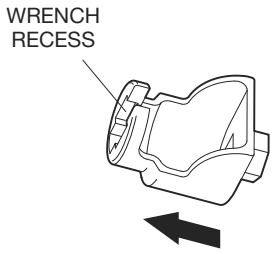


FIGURE 6
W-TYPE 7 RECESSED
SPRINKLER WRENCH

				SPRINKLER FINISH (See Note 11)				
K	**TYPE**	**TEMP.**	**BULB LIQUID**	**NATURAL BRASS**	**CHROME PLATED**	**POLYESTER[c]**	**POLY-STAINLESS[c]**	**LEAD COATED**
5.6 1/2 in. NPT	**HORIZ. SIDEWALL (TY3331)**	135°F (57°C)	Orange	1, 2, 3, 4, 9, 10		1, 2, 3, 9	1, 2	1, 2, 3, 9
		155°F (68°C)	Red					
		175°F (79°C)	Yellow					
		200°F (93°C)	Green					
		286°F (141°C)	Blue					
	RECESSED HORIZ. SIDEWALL (TY3331)[a] Figure 3	135°F (57°C)	Orange	1, 2, 4, 9, 10		1, 2, 9	1, 2	N/A
		155°F (68°C)	Red					
		175°F (79°C)	Yellow					
		200°F (93°C)	Green					
	RECESSED HORIZ. SIDEWALL (TY3331)[b] Figure 4	135°F (57°C)	Orange	1, 2, 3, 4, 9			N/A	N/A
		155°F (68°C)	Red					
		175°F (79°C)	Yellow					
		200°F (93°C)	Green					
5.6 1/2 in. NPT	**VERTICAL SIDEWALL (TY3431) Installed Pendent or Upright**	135°F (57°C)	Orange	5, 6, 7, 8, 9			N/A	5, 6, 7, 9
		155°F (68°C)	Red					
		175°F (79°C)	Yellow					
		200°F (93°C)	Green					
		286°F (141°C)	Blue					

NOTES:
1. Listed by Underwriters Laboratories, Inc. (UL) as Quick Response Sprinklers for use in Light and Ordinary Hazard Occupancies at a 4 to 12 in. (100 to 300 mm) top of deflector to ceiling distance.
2. Listed by Underwriters Laboratories Inc. for use in Canada (C-UL) as Quick Response Sprinklers for use in Light and Ordinary Hazard Occupancies at a 4 to 12 in. (100 to 300 mm) top of deflector to ceiling distance.
3. Approved by Factory Mutual Research Corporation (FM) as Quick Response Sprinklers for use in Light Hazard Occupancies at a 4 to 12 in. (100 to 300 mm) top of deflector to ceiling distance.
4. Approved by the Loss Prevention Certification Board (LPCB Ref. No. 007a/04) at a 4 to 6 in. (100 to 150 mm) top of deflector to ceiling distance. The LPC does not rate the thermal sensitivity of horizontal sidewall sprinklers.
5. Listed by Underwriters Laboratories, Inc. as Quick Response Sprinklers for use in Light and Ordinary Hazard Occupancies.
6. Listed by Underwriters Laboratories for use in Canada (C-UL) as Quick Response Sprinklers for use in Light and Ordinary Hazard Occupancies.
7. Approved by Factory Mutual Research Corporation (FM) as Quick Response Sprinklers for use in Light Hazard Occupancies.
8. Approved by the Loss Prevention Certification Board (LPCB Ref. No. 094a/06 & 007a/04) as Quick Response Sprinklers.
9. Approved by the City of New York under MEA 354-01-E.
10. Approved by the Loss Prevention Certification Board (LPCB Ref. No. 094a/06) at a 4 to 6 in. (100 to 150 mm) top of deflector to ceiling distance. The LPC does not rate the thermal sensitivity of horizontal sidewall sprinklers.
11. Where Polyester Coated and Lead Coated Sprinklers are noted to be UL and C-UL Listed, the sprinklers are UL and C-UL Listed as Corrosion Resistant Sprinklers. Where Lead Coated Sprinklers are noted to be FM Approved, the sprinklers are FM Approved as Corrosion Resistant Sprinklers.

a. Installed with Style 10 (1/2 in. NPT) 3/4 in.Total Adjustment Recessed Escutcheon.
b. Installed with Style 20 (1/2 in. NPT) 1/2 in. Total Adjustment Recessed Escutcheon.
c. Frame and deflector only.

TABLE A
LABORATORY LISTINGS AND APPROVALS

damaged by dropping, striking, wrench twist/slippage, or the like, must be replaced. Also, replace any sprikler that has a cracked bulb or that has lost liquid from its bulb. (Ref. Installation Section).

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.

Frequent visual inspections are recommended to be initially performed for corrosion resistant coated sprinklers, after the installation has been completed, to verify the integrity of the corrosion resistant coating. Thereafter, annual inspections per NFPA 25 should suffice; however, instead of inspecting from the floor level, a random sampling of close-up visual inspections should be made, so as to better determine the exact sprinkler condition and the long term integrity of the corrosion resistant coating, as it may be affected by the corrosive conditions present.

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 product manufacturer with any questions.

It is recommended that automatic sprinkler systems be inspected, tested, and maintained by a qualified Inspection Service in accordance with local requirements and/or national codes.

K	TYPE	SPRINKLER FINISH			
		NATURAL BRASS	CHROME PLATED	POLYESTER	LEAD COATED
5.6 1/2 in. NPT	HORIZONTAL SIDEWALL (TY3331)	250 PSI (17,2 BAR) or 175PSI (12,1 BAR) (SEE NOTE 1)			
	RECESSED HORIZ. SIDEWALL (TY3331)				
	VERTICAL SIDEWALL (TY3431)	175 PSI (12,1 BAR)			

NOTES:
1. The maximum working pressure of 250 psi (17,2 bar) only applies to the Listing by Underwriters Laboratories, Inc. (UL); the Listing by Underwriters Laboratories, Inc. for use in Canada (C-UL); and, the Approval by the City of New York.

TABLE B
MAXIMUM WORKING PRESSURE

P/N 57 – XXX – X – XXX

		SIN
378	HORIZONTAL SIDEWALL	TY3331
375	VERTICAL SIDEWALL	TY3431

	SPRINKLER FINISH
1	NATURAL BRASS
2	POLY-STAINLESS GREY ALUMINUM (RAL9007)[1] POLYESTER
3	PURE WHITE (RAL9010)[2] POLYESTER
4	SIGNAL WHITE (RAL9003) POLYESTER
5	JET BLACK (RAL9005)[3] POLYESTER
7	LEAD COATED
9	CHROME PLATED

	TEMPERATURE RATINGS
135	135°F (57°C)
155	155°F (68°C)
175	175°F (79°C)
200	200°F (93°C)
286	286°F (141°C)

NOTES:
1. Available for TY3331 only.
2. Eastern Hemisphere sales only.
3. Available in 155°F (68°C) or 200°F (93°C temperature rating only.

TABLE C
PART NUMBER SELECTION
SERIES TY-FRB HORIZONTAL AND VERTICAL SIDEWALL SPRINKLERS

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).

Sprinkler Assemblies with NPT Thread Connections:
Specify: Series TY-FRB (specify SIN), (specify K-factor), (specify) Horizontal Sidewall or Vertical Sidewall Sprinkler, Standard Response, Standard Coverage, (specify) temperature rating, (specify) finish or coating, P/N (specify from Table C)

Recessed Escutcheon
Specify: Style (10 or 20) Recessed Escutcheon with (specify*) finish, P/N (specify*)

* Refer to Technical Data Sheet TFP770

Sprinkler Wrench
Specify: W-Type 6 Sprinkler Wrench, P/N 56-000-6-387

Specify: W-Type 7 Sprinkler Wrench, P/N 56-850-4-001

1400 Pennbrook Parkway, Lansdale, PA 19446 | Telephone +1-215-362-0700

Series LFII Residential 4.2 K-factor Concealed Horizontal Sidewall Sprinkler Wet Pipe Systems

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.

Scan the QR code or enter the URL in a web browser to access the most up-to-date electronic version of this document. Data rates may apply.

docs.jci.com/tycofire/tfp445

General Description

The TYCO Series LFII Residential 4.2 K-factor Concealed Horizontal Sidewall Sprinkler (TY2324) is a decorative, fast response, fusible link sprinkler designed for use in residential occupancies such as homes, apartments, dormitories, and hotels. The Series LFII Concealed Horizontal Sidewall Sprinkler is intended for use in the following scenarios:

- Wet pipe residential sprinkler systems for one- and two- family dwellings and mobile 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 Series LFII Concealed Horizontal Sidewall Sprinkler is intended for use in areas with finished walls, and provides ¼ in. (6,4 mm) of recessed adjustment. The adjustment reduces the accuracy to which the pipe nipples to the sprinklers must be cut.

The Series LFII Concealed Horizontal Sidewall Sprinkler 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.

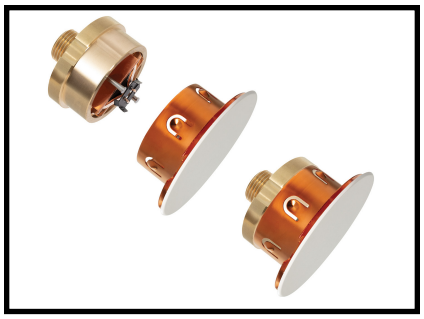
NOTICE

The Series LFII Concealed Horizontal Sidewall Sprinkler described herein must be installed and maintained in compliance with this document and the applicable standards of the NATIONAL FIRE PROTECTION ASSOCIATION (NFPA), 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. Contact the installing contractor or product manufacturer with any questions.

Sprinkler Identification Number (SIN)

TY2324



NSF Certified to NSF/ANSI 61

Technical Data

Approvals
UL and C-UL Listed (for use with wet pipe systems)

Certified to all requirements of NSF/ANSI 61

See the Design Criteria section for details on these approvals.

Maximum Working Pressure
175 psi (12,1 bar)

Discharge Coefficient
K=4.2 gpm/psi^{½} (60,5 lpm/bar^{½})

Temperature Rating
160°F (71°C) Sprinkler with
139°F (59°C) Cover Plate

***Note**: The maximum ambient ceiling temperature for the ordinary temperature configuration is 100°F (38°C).*

Horizontal Adjustment
¼ in. (6,35 mm)

Finishes
See the Ordering Procedure section

Physical Characteristics

Body	Brass
Bridge	Bronze
Button	Bronze
Sealing Assembly	Beryllium Nickel w/TEFLON
Soldered Link Halves	Nickel
Compression Screw	Stainless Steel
Trepan	Brass
Deflector	Copper
Deflector Guide Pin	Stainless Steel
Plug	Polyethylene
Lever	Bronze
Retainer	Copper Plated Steel
Cover Plate	Copper
Cover Plate Ejection Spring	Stainless Steel

1 – Body
2 – 1/2 in. NPT
3 – Wrenching Notch
4 – Sprinkler Waterway
5 – Deflector
6 – Deflector Guide Pin
7 – Frame
8 – Button
9 – Sealing Assembly
10 – Bridge
11 – Plug
12 – Lever
13 – Compression Screw
14 – Link
15 – Protective Cap
16 – Retainer
17 – Retainer Friction Grip
18 – Cover Plate Solder Tab
19 – Cover Plate
20 – Cover Plate Ejection Spring

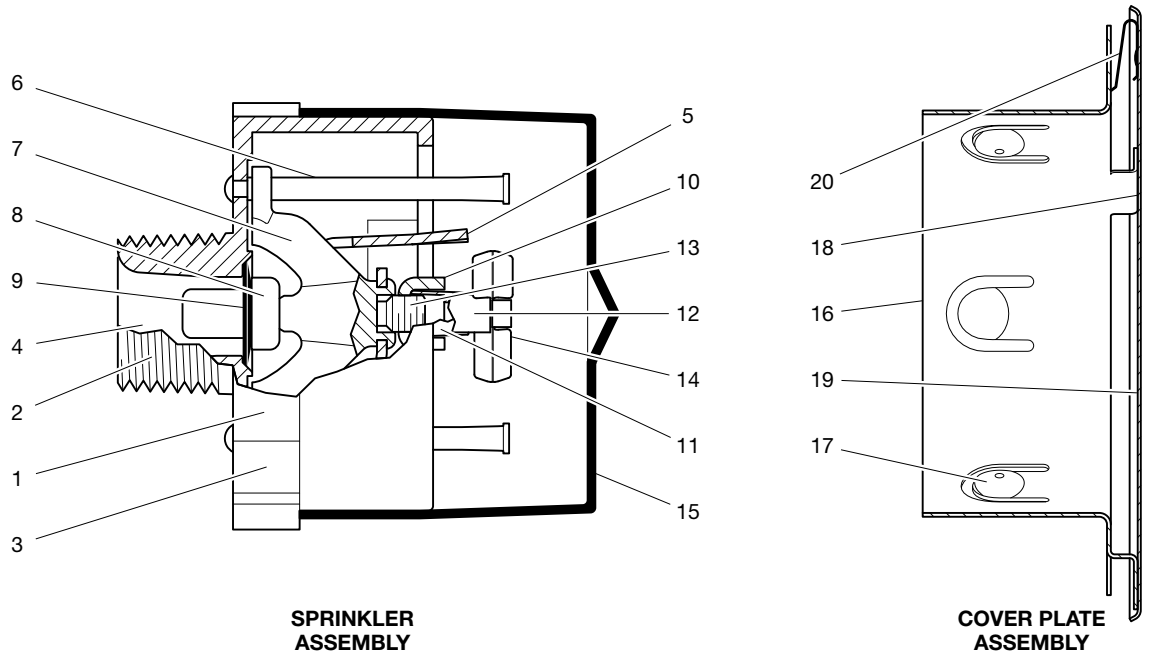


FIGURE 1
SERIES LFII RESIDENTIAL CONCEALED HORIZONTAL SIDEWALL SPRINKLER ASSEMBLY AND FEATURES

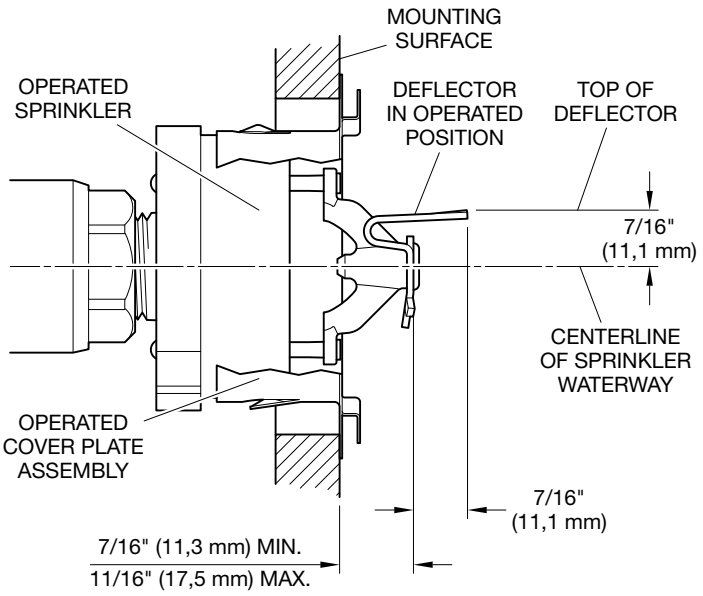


FIGURE 2
SERIES LFII RESIDENTIAL CONCEALED HORIZONTAL SIDEWALL SPRINKLER OPERATED CONDITION

Maximum Coverage Area Width x Length ft x ft (m x m)	Maximum Spacing ft (m)	Wet Pipe System Minimum Flow and Residual Pressure				
		Ordinary Temp. Rating 160°F (71°C)		Top-of-Deflector-to-Ceiling Distance	Center-of-Sprinkler-to-Ceiling Distance	Minimum Spacing ft (m)
		Flow gpm (lpm)	Pressure psi (bar)			
12 x 12 (3,7 x 3,7)	12 (3,7)	12 (45,4)	8.2 (0,57)	4 in. to 6 in.	4-7/16 in. to 6-7/16 in.	8 (2,4)
14 x 14 (4,3 x 4,3)	14 (4,3)	13 (49,2)	9.6 (0,66)			
16 x 16 (4,9 x 4,9)	16 (4,9)	18 (68,1)	18.4 (1,27)			
16 x 18 (4,9 x 5,5)	16 (4,9)	21 (79,5)	25 (1,72)			
12 x 12 (3,7 x 3,7)	12 (3,7)	13 (49,2)	9.6 (0,66)	6 in. to 12 in.	6-7/16 in. to 12-7/16 in.	
14 x 14 (4,3 x 4,3)	14 (4,3)	15 (56,8)	12.8 (0,88)			
16 x 16 (4,9 x 4,9)	16 (4,9)	18 (68,1)	18.4 (1,27)			
16 x 18 (4,9 x 5,5)	16 (4,9)	22 (83,3)	27.4 (1,89)			

TABLE A
WET PIPE SYSTEM
SERIES LFII RESIDENTIAL CONCEALED HORIZONTAL SIDEWALL SPRINKLER
NFPA 13D, 13R, AND 13 HYDRAULIC DESIGN CRITERIA

Operation

When exposed to heat from a fire, the Cover Plate, which is soldered to the Retainer Ring at three points, falls away to expose the Sprinkler Assembly. The link's solder melts when exposed to heat. When the rated temperature is reached, the melted solder releases the link, activating the sprinkler and allowing water to flow.

Design Criteria

The Series LFII Concealed Horizontal Sidewall Sprinkler is UL and C-UL Listed for installation in accordance with the following criteria.

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 the local authority having jurisdiction.

Ceiling Types
Smooth flat horizontal, beamed, or sloped, in accordance with the 2019 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 rates 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 as a function of deflector to ceiling distance and the maximum allowable coverage area.
- A minimum discharge of 0.1 gpm/ft^2 over the "design area" comprised of the four most hydraulically demanding sprinklers for actual coverage areas 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 TYCO Technical Data Sheet TFP490.

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

Sprinkler Spacing
The minimum spacing between sprinklers is 8 ft (2,4 m). The maximum spacing between sprinklers cannot exceed the width of the coverage area (see Table A) being hydraulically calculated, for example, maximum 12 ft for a 12 ft x 12 ft coverage area, or 16 ft for a 16 ft x 18 ft coverage area.

Series LFII Residential 4.2 K-factor Concealed Horizontal Sidewall Sprinkler Wet Pipe Systems

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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docs.jci.com/tycofire/tfp445

General Description

The TYCO Series LFII Residential 4.2 K-factor Concealed Horizontal Sidewall Sprinkler (TY2324) is a decorative, fast response, fusible link sprinkler designed for use in residential occupancies such as homes, apartments, dormitories, and hotels. The Series LFII Concealed Horizontal Sidewall Sprinkler is intended for use in the following scenarios:

- Wet pipe residential sprinkler systems for one- and two- family dwellings and mobile 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 Series LFII Concealed Horizontal Sidewall Sprinkler is intended for use in areas with finished walls, and provides ¼ in. (6,4 mm) of recessed adjustment. The adjustment reduces the accuracy to which the pipe nipples to the sprinklers must be cut.

The Series LFII Concealed Horizontal Sidewall Sprinkler 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.

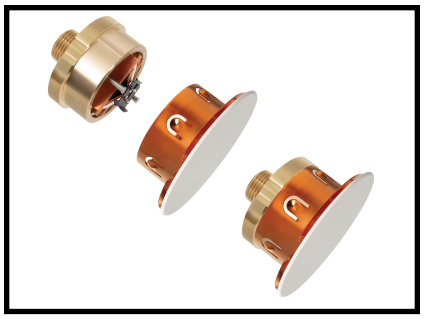
NOTICE

The Series LFII Concealed Horizontal Sidewall Sprinkler described herein must be installed and maintained in compliance with this document and the applicable standards of the NATIONAL FIRE PROTECTION ASSOCIATION (NFPA), 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. Contact the installing contractor or product manufacturer with any questions.

Sprinkler Identification Number (SIN)

TY2324



NSF Certified to NSF/ANSI 61

Technical Data

Approvals
UL and C-UL Listed (for use with wet pipe systems)

Certified to all requirements of NSF/ANSI 61

See the Design Criteria section for details on these approvals.

Maximum Working Pressure
175 psi (12,1 bar)

Discharge Coefficient
K=4.2 gpm/psi^{½} (60,5 lpm/bar^{½})

Temperature Rating
160°F (71°C) Sprinkler with
139°F (59°C) Cover Plate

***Note**: The maximum ambient ceiling temperature for the ordinary temperature configuration is 100°F (38°C).*

Horizontal Adjustment
¼ in. (6,35 mm)

Finishes
See the Ordering Procedure section

Physical Characteristics

Body	Brass
Bridge	Bronze
Button	Bronze
Sealing Assembly	Beryllium Nickel w/TEFLON
Soldered Link Halves	Nickel
Compression Screw	Stainless Steel
Trepan	Brass
Deflector	Copper
Deflector Guide Pin	Stainless Steel
Plug	Polyethylene
Lever	Bronze
Retainer	Copper Plated Steel
Cover Plate	Copper
Cover Plate Ejection Spring	Stainless Steel

1 – Body
2 – 1/2 in. NPT
3 – Wrenching Notch
4 – Sprinkler Waterway
5 – Deflector
6 – Deflector Guide Pin
7 – Frame
8 – Button
9 – Sealing Assembly
10 – Bridge
11 – Plug
12 – Lever
13 – Compression Screw
14 – Link
15 – Protective Cap
16 – Retainer
17 – Retainer Friction Grip
18 – Cover Plate Solder Tab
19 – Cover Plate
20 – Cover Plate Ejection Spring

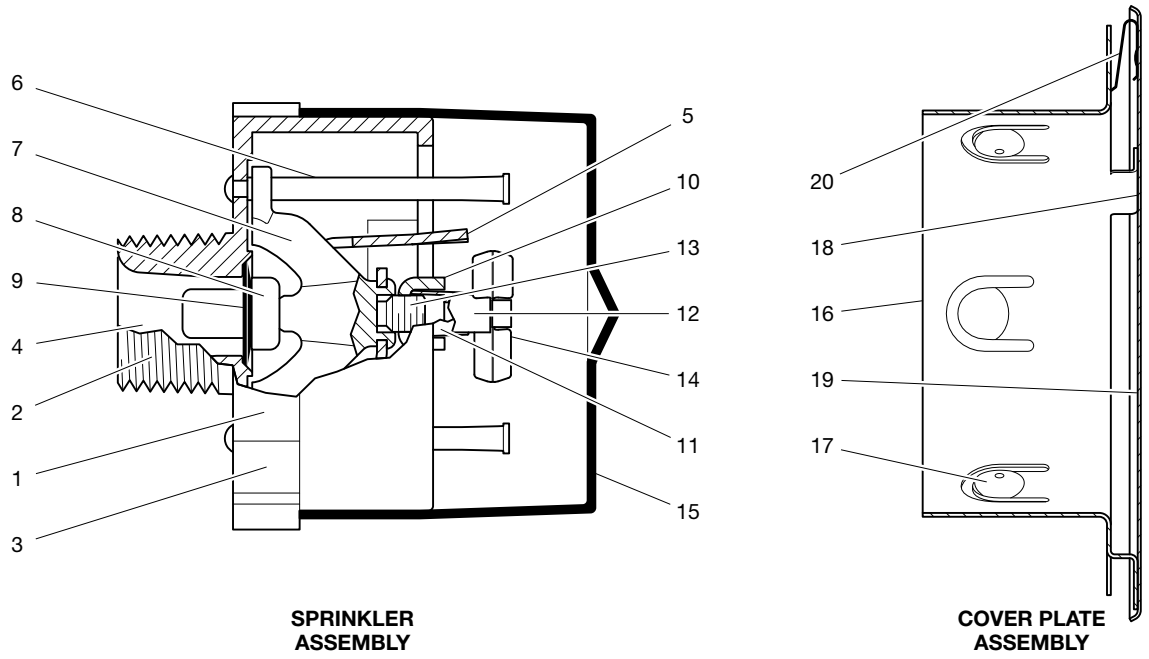


FIGURE 1
SERIES LFII RESIDENTIAL CONCEALED HORIZONTAL SIDEWALL SPRINKLER ASSEMBLY AND FEATURES

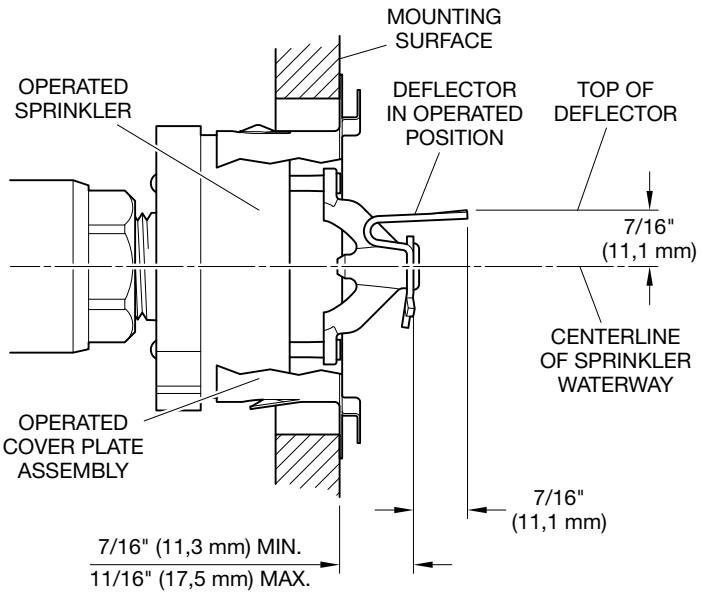


FIGURE 2
SERIES LFII RESIDENTIAL CONCEALED HORIZONTAL SIDEWALL SPRINKLER OPERATED CONDITION

Maximum Coverage Area Width x Length ft x ft (m x m)	Maximum Spacing ft (m)	Wet Pipe System Minimum Flow and Residual Pressure				
		Ordinary Temp. Rating 160°F (71°C)		Top-of-Deflector-to-Ceiling Distance	Center-of-Sprinkler-to-Ceiling Distance	Minimum Spacing ft (m)
		Flow gpm (lpm)	Pressure psi (bar)			
12 x 12 (3,7 x 3,7)	12 (3,7)	12 (45,4)	8.2 (0,57)	4 in. to 6 in.	4-7/16 in. to 6-7/16 in.	8 (2,4)
14 x 14 (4,3 x 4,3)	14 (4,3)	13 (49,2)	9.6 (0,66)			
16 x 16 (4,9 x 4,9)	16 (4,9)	18 (68,1)	18.4 (1,27)			
16 x 18 (4,9 x 5,5)	16 (4,9)	21 (79,5)	25 (1,72)			
12 x 12 (3,7 x 3,7)	12 (3,7)	13 (49,2)	9.6 (0,66)	6 in. to 12 in.	6-7/16 in. to 12-7/16 in.	
14 x 14 (4,3 x 4,3)	14 (4,3)	15 (56,8)	12.8 (0,88)			
16 x 16 (4,9 x 4,9)	16 (4,9)	18 (68,1)	18.4 (1,27)			
16 x 18 (4,9 x 5,5)	16 (4,9)	22 (83,3)	27.4 (1,89)			

TABLE A
WET PIPE SYSTEM
SERIES LFII RESIDENTIAL CONCEALED HORIZONTAL SIDEWALL SPRINKLER
NFPA 13D, 13R, AND 13 HYDRAULIC DESIGN CRITERIA

Operation

When exposed to heat from a fire, the Cover Plate, which is soldered to the Retainer Ring at three points, falls away to expose the Sprinkler Assembly. The link's solder melts when exposed to heat. When the rated temperature is reached, the melted solder releases the link, activating the sprinkler and allowing water to flow.

Design Criteria

The Series LFII Concealed Horizontal Sidewall Sprinkler is UL and C-UL Listed for installation in accordance with the following criteria.

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 the local authority having jurisdiction.

Ceiling Types
Smooth flat horizontal, beamed, or sloped, in accordance with the 2019 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 rates 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.

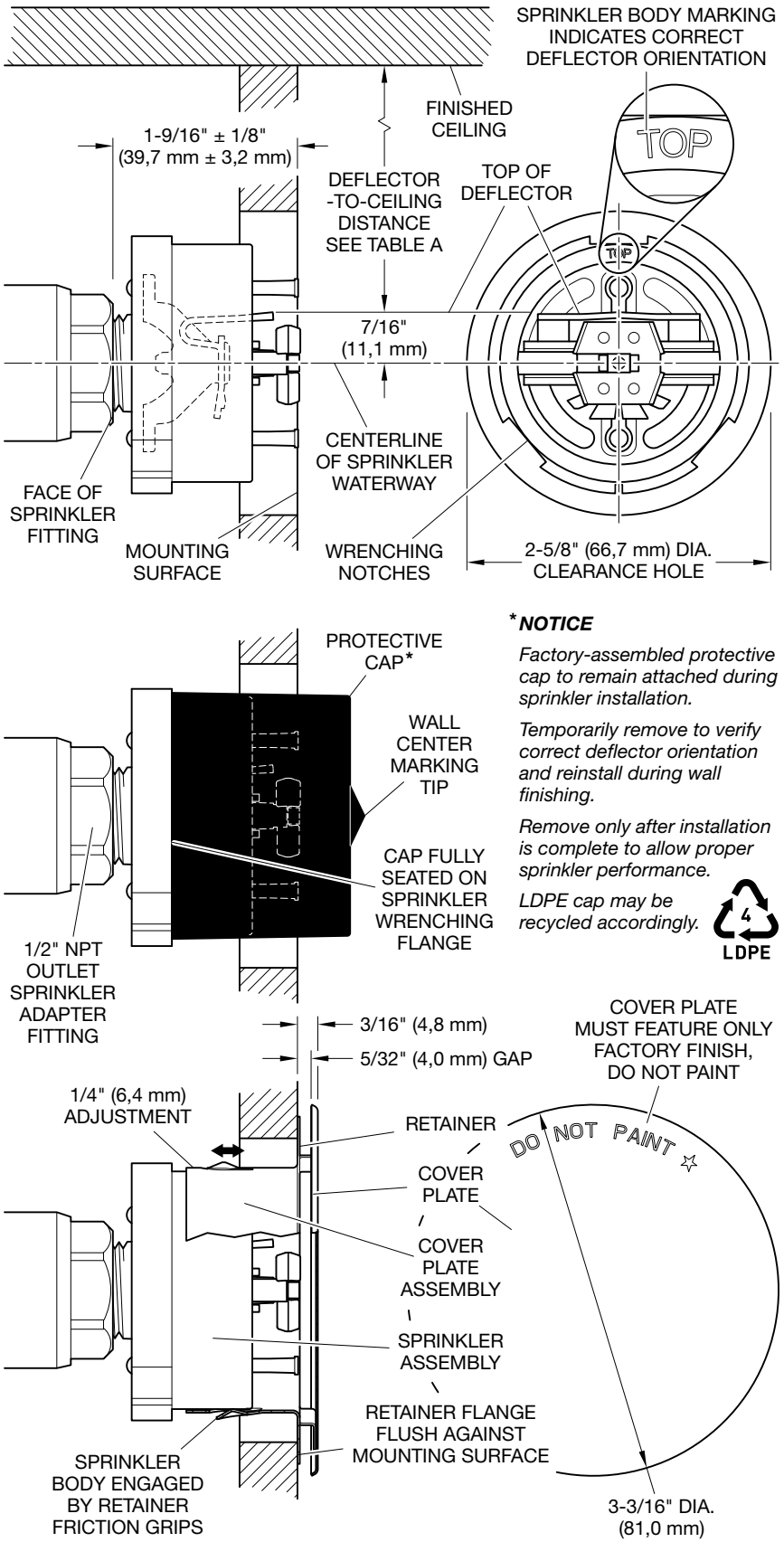
Hydraulic Design (NFPA 13)
For systems designed to NFPA 13, the number of design sprinklers is to be the four most hydraulically demanding sprinklers. The minimum required discharge from each of the four sprinklers is to be the greater of the following:

- The flow rates given in Table A as a function of deflector to ceiling distance and the maximum allowable coverage area.
- A minimum discharge of 0.1 gpm/ft^2 over the "design area" comprised of the four most hydraulically demanding sprinklers for actual coverage areas 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 TYCO Technical Data Sheet TFP490.

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

Sprinkler Spacing
The minimum spacing between sprinklers is 8 ft (2,4 m). The maximum spacing between sprinklers cannot exceed the width of the coverage area (see Table A) being hydraulically calculated, for example, maximum 12 ft for a 12 ft x 12 ft coverage area, or 16 ft for a 16 ft x 18 ft coverage area.



NOTICE

Factory-assembled protective cap to remain attached during sprinkler installation.

Temporarily remove to verify correct deflector orientation and reinstall during wall finishing.

Remove only after installation is complete to allow proper sprinkler performance.

LDPE cap may be recycled accordingly.

FIGURE 3
SERIES LFII RESIDENTIAL CONCEALED HORIZONTAL SIDEWALL SPRINKLER INSTALLATION CRITERIA

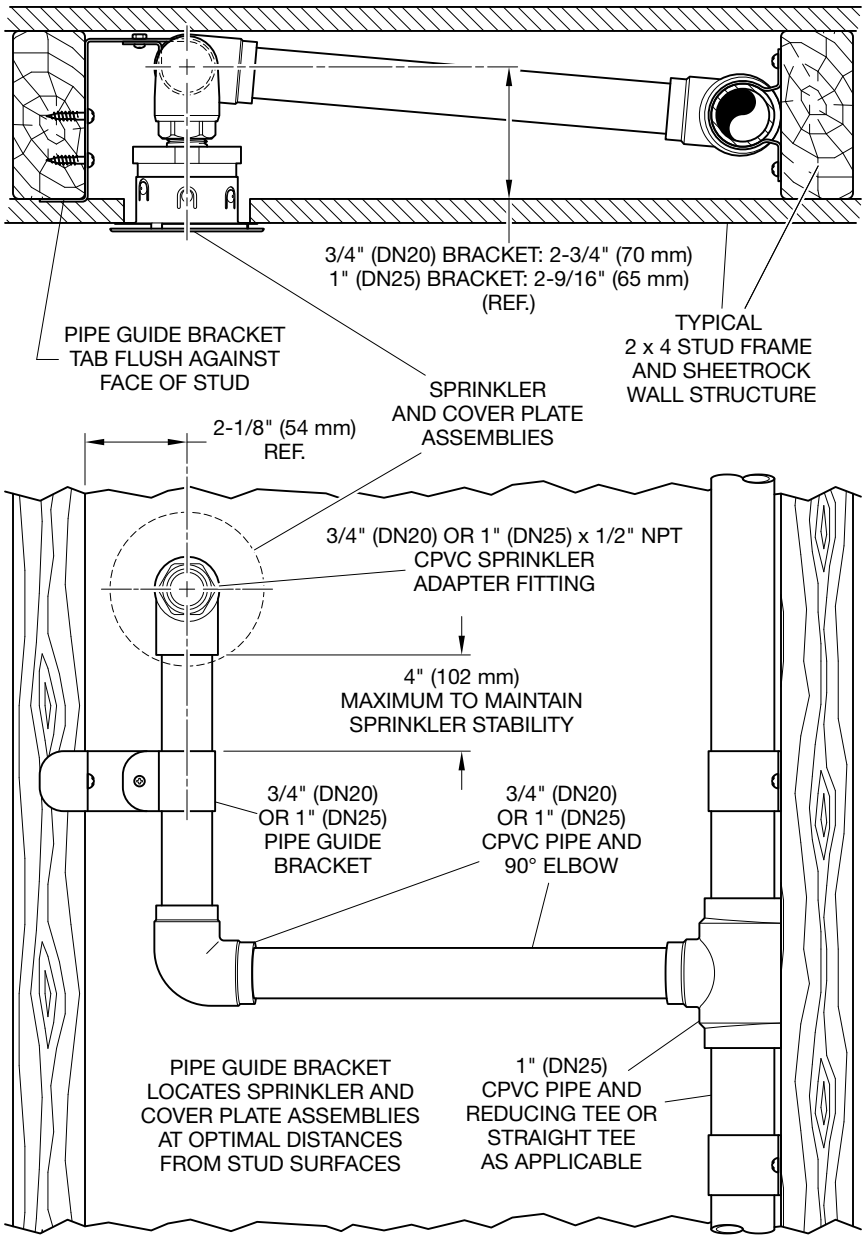


FIGURE 4
SERIES LFII RESIDENTIAL CONCEALED HORIZONTAL SIDEWALL SPRINKLER
PIPE GUIDE BRACKET WALL INSTALLATION

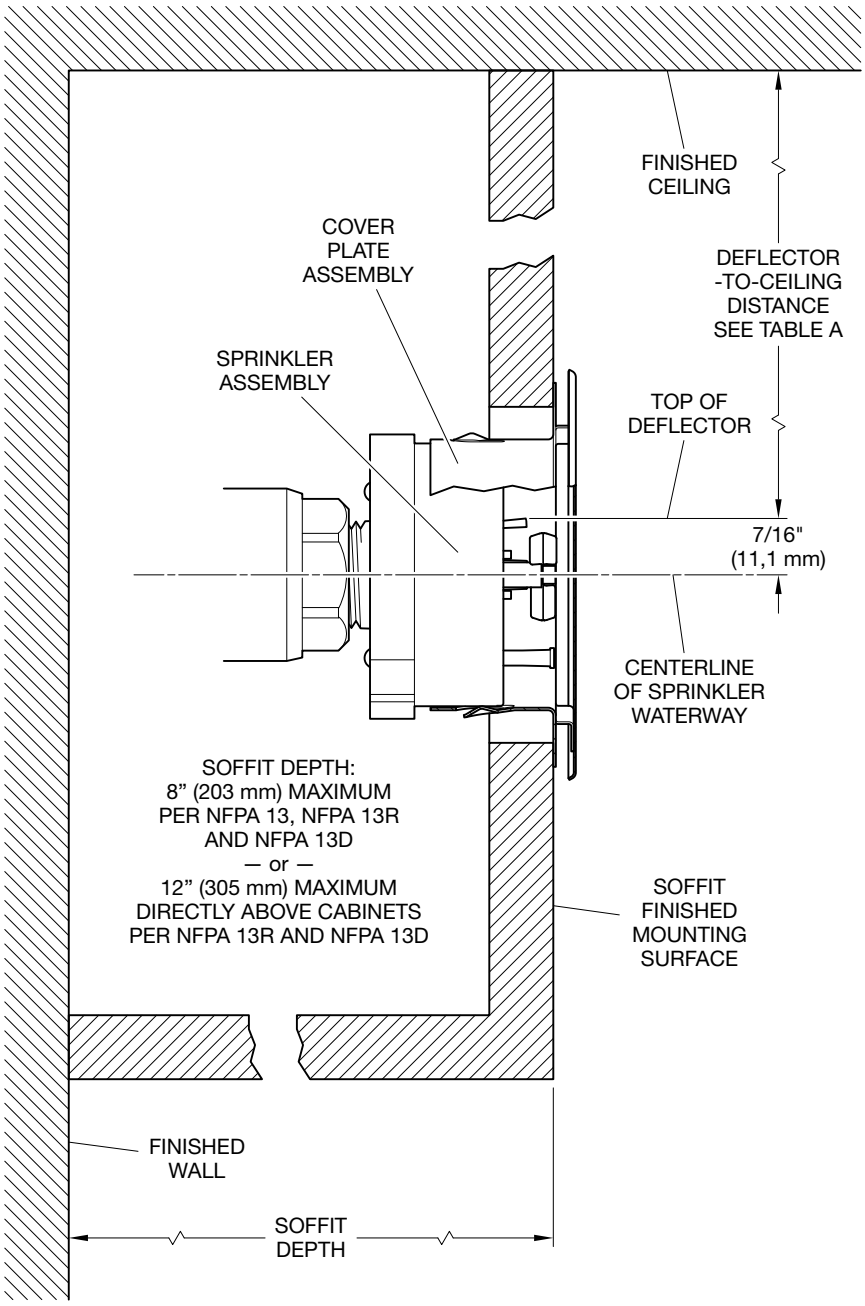


FIGURE 5
SERIES LFII RESIDENTIAL CONCEALED HORIZONTAL SIDEWALL SPRINKLER SOFFIT INSTALLATION CRITERIA

Installation

The Series LFII Concealed Horizontal Sidewall Sprinkler must be installed in accordance with this section.

General Instructions
Damage to the fusible link assembly during installation can be avoided by handling the sprinkler by the body only. Do not apply pressure to the fusible link assembly.

A leak-tight ½ in. NPT sprinkler joint should be obtained by applying a minimum to maximum torque of 7 to 14 lb-ft (9,5 to 19,0 N·m).

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 a Cover Plate by under- or over-tightening the sprinkler. Re-adjust the position of the sprinkler fitting to suit.

Series LFII Residential Concealed Horizontal Sidewall Sprinklers
The Series LFII Concealed Horizontal Sidewall Sprinkler must be installed in accordance with the following instructions.

Step 1. To ensure that the sprinkler is located the correct distance from the face of the surface wall, use the provided pipe guide, included with each sprinkler TY2324, and attach it to the 3/4 or 1 in. CPVC pipe and the 2 x 4 inside the wall, as shown in Figure 4. The sprinkler must only be installed with its centerline perpendicular to the back wall and parallel to the ceiling. Use a W-Type 37 Wrench for installation. The wrench contains an outer flat surface reference that correlates with the sprinkler deflector orientation. The word “UP” on the installation wrench is to face towards the ceiling to ensure proper alignment.

Note: *The TYCO Sprinkler can be installed in both CPVC and standard steel piping/fittings.*

NOTICE

Do not remove the Protective Cap until the Cover Plate Assembly is installed and/or the fire protection sprinkler system is ready to be placed in service.

Step 2. With pipe thread sealant applied to the sprinkler threads, align the sprinkler alignment slot with the W-Type 37 Sprinkler Wrench alignment slot and engage by inserting the sprinkler into the wrench cavity, fully seating the wrench shoulder against the sprinkler wrenching flange. Hand tighten the sprinkler into the sprinkler fitting.

Step 3. Once hand tight, attach an ½ in. (12,7 mm) drive to the sprinkler wrench and wrench tighten to ensure proper seal and alignment.

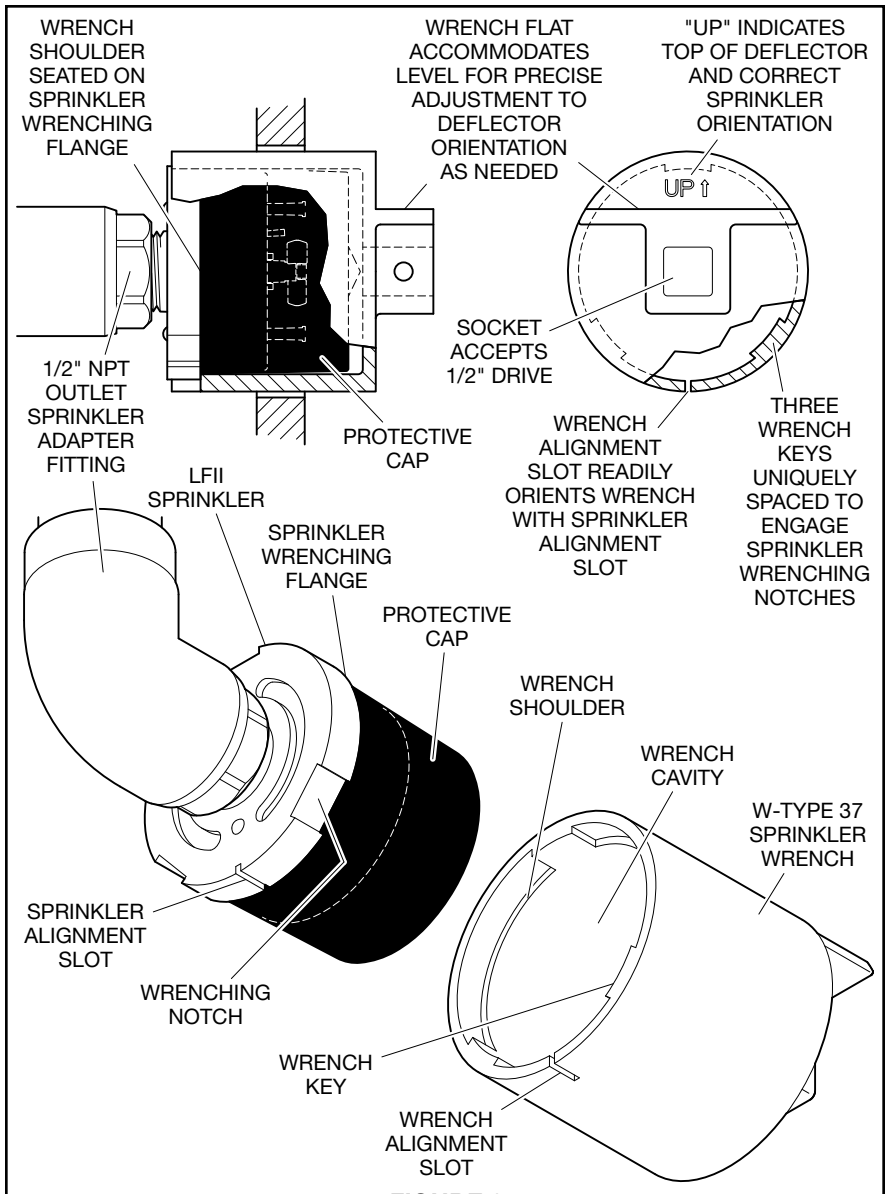


FIGURE 6
W-TYPE 37 SPRINKLER WRENCH

Step 4. After the wall has been completed with the nominal 2-5/8 in. (66,7 mm) diameter clearance hole and in preparation for installing the Cover Plate Assembly, remove and discard the Protective Cap. If the sprinkler has been damaged in any way including accidental over spray from finishing the wall, replace the entire sprinkler.

NOTICE

The sprinkler must be installed in neutral or negative pressure plenums only.

Step 5. Push the Cover Plate Assembly onto the sprinkler, and as necessary, make the final adjustment of the Cover Plate with respect to the wall by pushing the Cover Plate Assembly until the retainer flange is flush against the wall. If it becomes necessary to remove the Cover Plate, it can be removed by gently pulling the Cover Plate Assembly way from the sprinkler body.

Note: *A Cover Plate Assembly not adequately engaging the sprinkler body, that is not securely attached, indicates the sprinkler is positioned at a distance from the mounting surface greater than is described if Figure 3. A Cover Plate Assembly fully engaged on the sprinkler body while the retainer flange is not in contact with the wall indicates the sprinkler is positioned at a distance from the mounting surface lesser than described in Figure 3. If either condition is encountered when attempting to install the Cover Plate Assembly, the sprinkler fitting must me repositioned.*

Care and Maintenance

The Series LFII Concealed Horizontal Sidewall Sprinkler 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.

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, for example, NFPA 25, in addition to the standards of any 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.

When properly installed, there is a nominal 5/32 in. (4,0 mm) air gap between the lip and the Cover Plate and the wall, as shown in Figure 3. This air gap is necessary for the proper operation of the sprinkler. If the wall is to be repainted after installation of the sprinkler, care must be exercised to ensure that the new paint does not seal off any of the air gap.

Factory painted cover plates must not be repainted. They should be replaced if necessary, by factory painted units. Non-factory applies paints may adversely delay or prevent sprinkler operation in the event of a fire.

If removal of the Cover Plate is necessary relative to the enclosure, be conscious not to be too forceful, where separation may result.

Sprinklers that are found to be leaking or exhibiting visible signs of corrosion must be replaced.

Automatic sprinklers must never be painted, plated, coated, or other- wise altered after leaving the factory. Modified 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.

If a sprinkler must be removed, do not reinstall it or a replacement without reinstalling the Cover Plate Assembly. If a Cover Plate Assembly becomes dislodged during service, replace it immediately.

Sprinklers that 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 over heated 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.

If a sprinkler must be removed, do not reinstall it or a replacement without reinstalling the Cover Plate Assembly. If a Cover Plate Assembly becomes dislodged during service, replace it immediately.

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).

Sprinkler Assembly
Specify: Series LFII (TY2324), K=4.2, Residential Horizontal Sidewall Sprinkler, without Cover Plate Assembly, P/N 50-520-1-160

Note: *Sprinkler and Cover Plates are separately ordered. See below for Cover Plate ordering information.*

Cover Plate Assembly (Separately Ordered)
Specify: Series LFII Concealed Sprinkler Cover Plate Assembly, (specify finish), P/N (specify):

Ivory (RAL1015)	56-204-0-135
Beige (RAL1001)	56-204-2-135
Pure White (RAL9010)*	56-204-3-135
Signal White (RAL9003)**	56-204-4-135
Grey White (RAL9002)	56-204-5-135
Brown (RAL8028)	56-204-6-135
Black (RAL9005)	56-204-7-135
Brushed Brass	56-204-8-135
Brushed Chrome	56-204-9-135
Custom Paint	56-204-X-135

*Eastern Hemisphere sales only
**Previously known as Bright White

Note: *All Custom Cover Plates are painted using SHERWIN-WILLIAMS Interior Latex Paint. Contact Johnson Controls Customer Service with any questions related to custom orders.*

Sprinkler Wrench
Specify: W-Type 37 Sprinkler Wrench, P/N 56-320-1-015

Pipe Guide Bracket
Pipe Guide Bracket accessory for sprinkler installation adjacent to framing member such as 2 x 4 within wall structure, includes mounting screws.

Specify: Pipe Guide Bracket, (specify) Size, P/N (specify):

3/4 in. (DN20)	91-520-115
1 in. (DN25)	91-520-1-117

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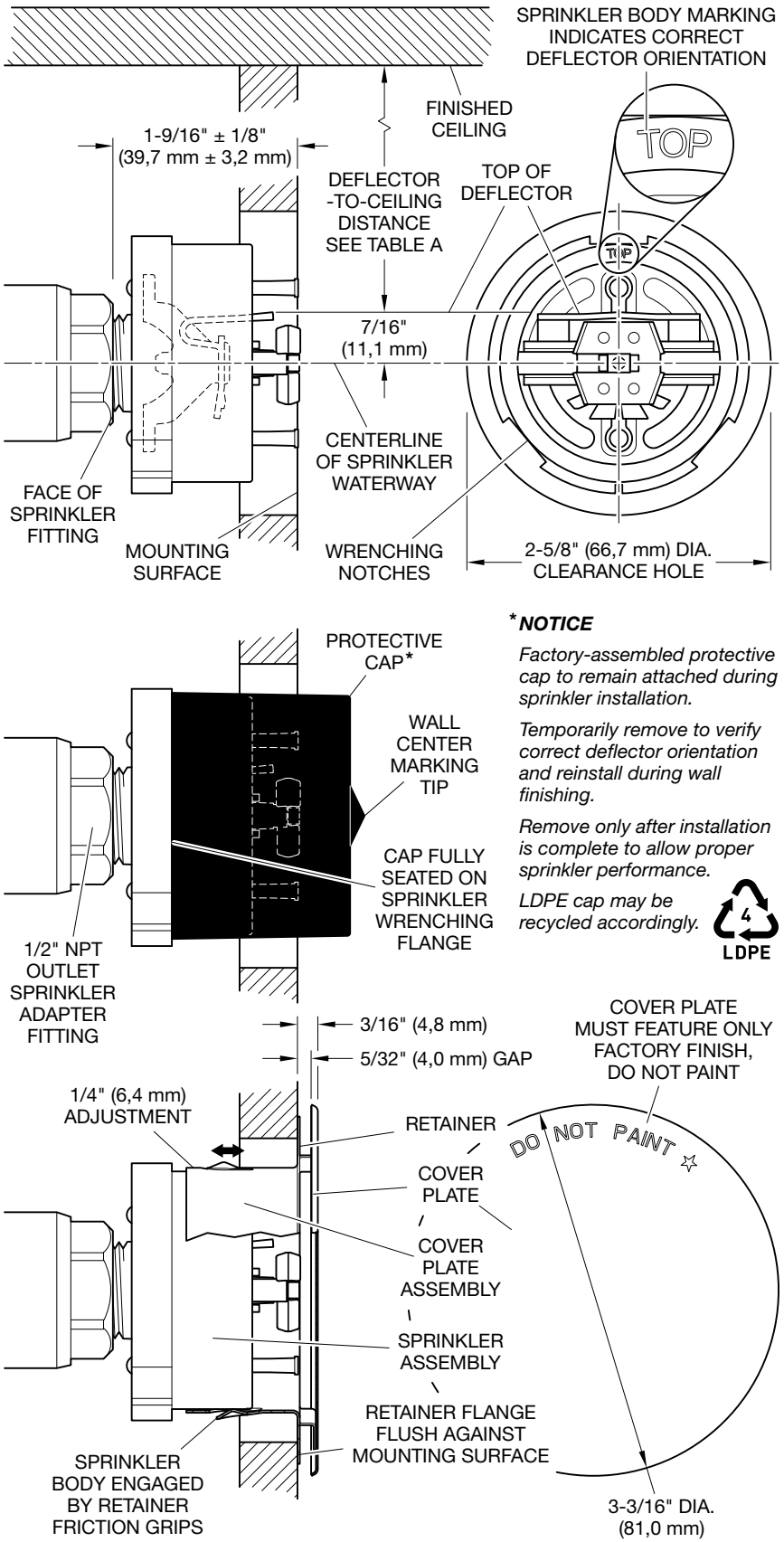

NOTICE

Factory-assembled protective cap to remain attached during sprinkler installation.

Temporarily remove to verify correct deflector orientation and reinstall during wall finishing.

Remove only after installation is complete to allow proper sprinkler performance.

LDPE cap may be recycled accordingly.

FIGURE 3
SERIES LFII RESIDENTIAL CONCEALED HORIZONTAL SIDEWALL SPRINKLER INSTALLATION CRITERIA

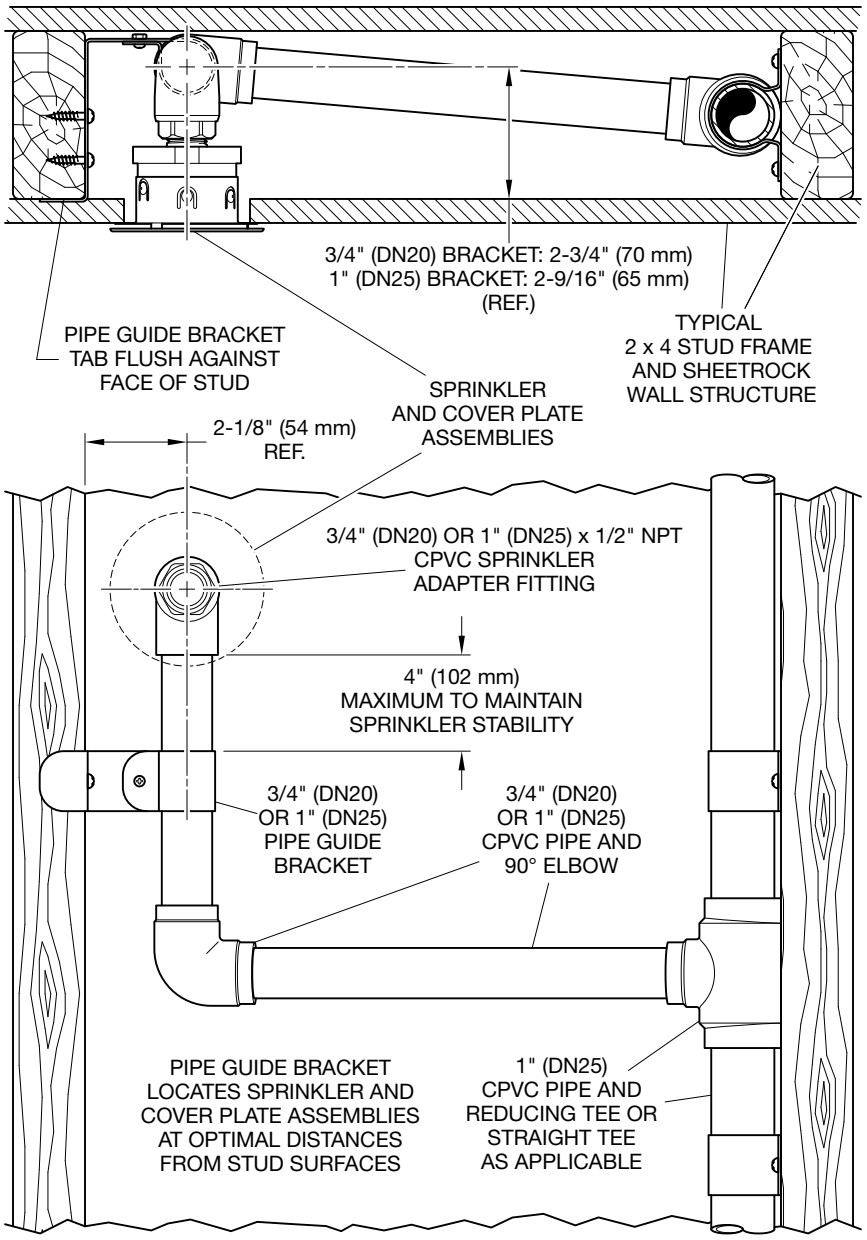

FIGURE 4
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PIPE GUIDE BRACKET WALL INSTALLATION

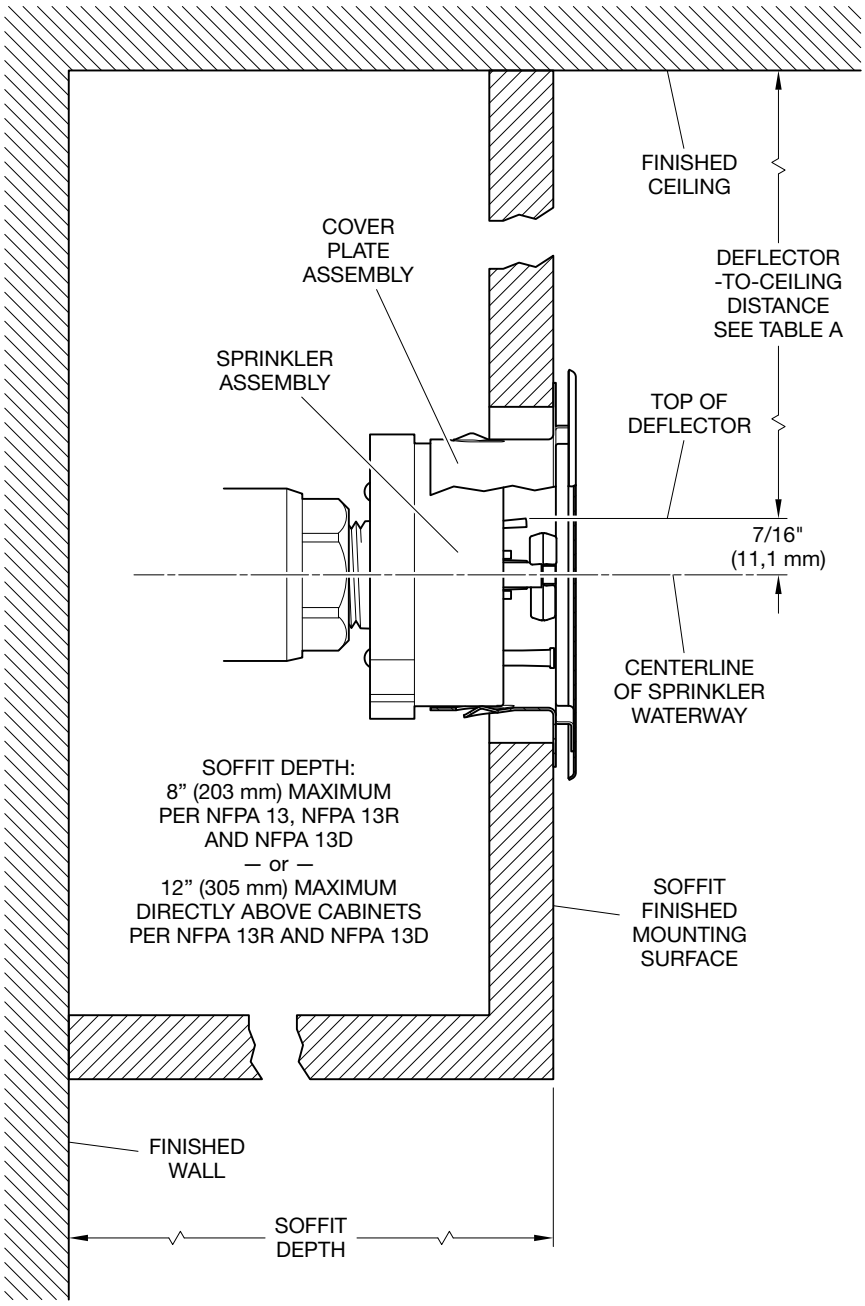

FIGURE 5
SERIES LFII RESIDENTIAL CONCEALED HORIZONTAL SIDEWALL SPRINKLER SOFFIT INSTALLATION CRITERIA

Installation

The Series LFII Concealed Horizontal Sidewall Sprinkler must be installed in accordance with this section.

General Instructions
Damage to the fusible link assembly during installation can be avoided by handling the sprinkler by the body only. Do not apply pressure to the fusible link assembly.

A leak-tight ½ in. NPT sprinkler joint should be obtained by applying a minimum to maximum torque of 7 to 14 lb-ft (9,5 to 19,0 N·m).

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 a Cover Plate by under- or over-tightening the sprinkler. Re-adjust the position of the sprinkler fitting to suit.

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The Series LFII Concealed Horizontal Sidewall Sprinkler must be installed in accordance with the following instructions.

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Note: *The TYCO Sprinkler can be installed in both CPVC and standard steel piping/fittings.*

NOTICE

Do not remove the Protective Cap until the Cover Plate Assembly is installed and/or the fire protection sprinkler system is ready to be placed in service.

Step 2. With pipe thread sealant applied to the sprinkler threads, align the sprinkler alignment slot with the W-Type 37 Sprinkler Wrench alignment slot and engage by inserting the sprinkler into the wrench cavity, fully seating the wrench shoulder against the sprinkler wrenching flange. Hand tighten the sprinkler into the sprinkler fitting.

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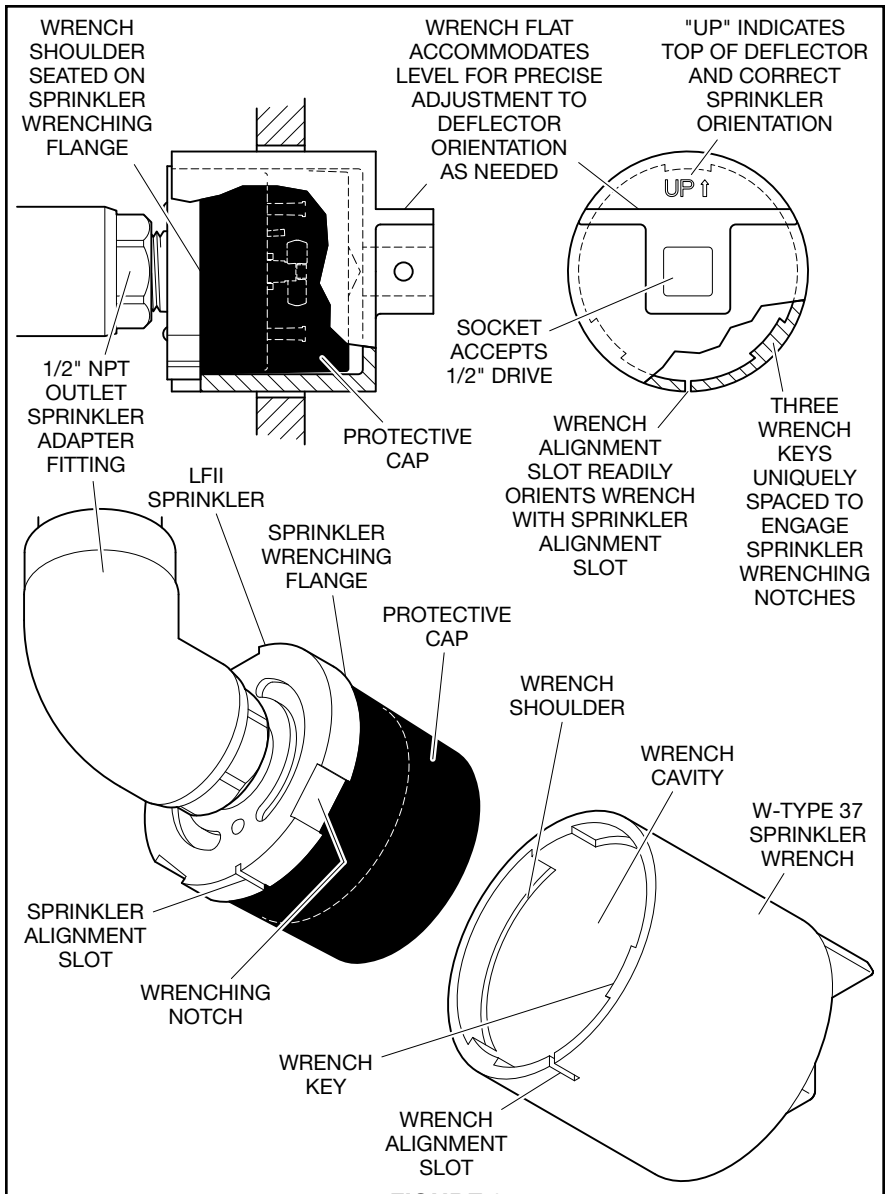

FIGURE 6
W-TYPE 37 SPRINKLER WRENCH

Step 4. After the wall has been completed with the nominal 2-5/8 in. (66,7 mm) diameter clearance hole and in preparation for installing the Cover Plate Assembly, remove and discard the Protective Cap. If the sprinkler has been damaged in any way including accidental over spray from finishing the wall, replace the entire sprinkler.

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Step 5. Push the Cover Plate Assembly onto the sprinkler, and as necessary, make the final adjustment of the Cover Plate with respect to the wall by pushing the Cover Plate Assembly until the retainer flange is flush against the wall. If it becomes necessary to remove the Cover Plate, it can be removed by gently pulling the Cover Plate Assembly way from the sprinkler body.

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Care and Maintenance

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If removal of the Cover Plate is necessary relative to the enclosure, be conscious not to be too forceful, where separation may result.

Sprinklers that are found to be leaking or exhibiting visible signs of corrosion must be replaced.

Automatic sprinklers must never be painted, plated, coated, or other- wise altered after leaving the factory. Modified 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.

If a sprinkler must be removed, do not reinstall it or a replacement without reinstalling the Cover Plate Assembly. If a Cover Plate Assembly becomes dislodged during service, replace it immediately.

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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).

Sprinkler Assembly
Specify: Series LFII (TY2324), K=4.2, Residential Horizontal Sidewall Sprinkler, without Cover Plate Assembly, P/N 50-520-1-160

Note: *Sprinkler and Cover Plates are separately ordered. See below for Cover Plate ordering information.*

Cover Plate Assembly (Separately Ordered)
Specify: Series LFII Concealed Sprinkler Cover Plate Assembly, (specify finish), P/N (specify):

Ivory (RAL1015)	56-204-0-135
Beige (RAL1001)	56-204-2-135
Pure White (RAL9010)*	56-204-3-135
Signal White (RAL9003)**	56-204-4-135
Grey White (RAL9002)	56-204-5-135
Brown (RAL8028)	56-204-6-135
Black (RAL9005)	56-204-7-135
Brushed Brass	56-204-8-135
Brushed Chrome	56-204-9-135
Custom Paint	56-204-X-135

*Eastern Hemisphere sales only
**Previously known as Bright White

Note: *All Custom Cover Plates are painted using SHERWIN-WILLIAMS Interior Latex Paint. Contact Johnson Controls Customer Service with any questions related to custom orders.*

Sprinkler Wrench
Specify: W-Type 37 Sprinkler Wrench, P/N 56-320-1-015

Pipe Guide Bracket
Pipe Guide Bracket accessory for sprinkler installation adjacent to framing member such as 2 x 4 within wall structure, includes mounting screws.

Specify: Pipe Guide Bracket, (specify) Size, P/N (specify):

3/4 in. (DN20)	91-520-115
1 in. (DN25)	91-520-1-117

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Fire Sprinkler Pipe

Schedule 10 and Schedule 40

Submittal Data Sheet

FM Approved and Fully Listed Sprinkler Pipe
Wheatland Tube's Schedule 10 and Schedule 40 steel fire sprinkler pipe is FM Approved and UL® and C-UL Listed.

Approvals and Specifications
Both products meet or exceed the following standards:

- ASTM A135, Type E, Grade A (Schedule 10)
- ASTM A795, Type E, Grade A (Schedule 40)
- NFPA® 13 and NFPA 14

Manufacturing Protocols
Schedule 10 and Schedule 40 are subjected to the toughest possible testing protocols to ensure the highest quality and long-lasting performance.

Finishes and Coatings
All Wheatland black steel fire sprinkler pipe receives a proprietary mill coating to ensure a clean, corrosion-resistant surface that outperforms and outlasts standard lacquer coatings. This coating allows the pipe to be easily painted, without special preparation. Schedule 10 and Schedule 40 can be ordered in black, or with hot-dip galvanizing, to meet FM/UL requirements for dry systems that meet the zinc coating specifications of ASTM A795 or A53. All Wheatland galvanized material is also UL Listed.

Product Marking
Each length of Wheatland fire sprinkler pipe is continuously stenciled to show the manufacturer, type of pipe, grade, size and length. Barcoding is acceptable as a supplementary identification method.

SCHEDULE 10 SPECIFICATIONS

NPS	NOM OD		NOM ID		NOMINAL WALL		NOMINAL WEIGHT		UL	PIECES
	in.	mm	in.	mm	in.	mm	lbs./ft.	kg/m	CRR*	Lift
1¼	1.660	42.2	1.442	36.6	0.109	2.77	1.81	2.69	7.3	61
1½	1.900	48.3	1.682	42.7	0.109	2.77	2.09	3.11	5.8	61
2	2.375	60.3	2.157	54.8	0.109	2.77	2.64	3.93	4.7	37
2½	2.875	73.0	2.635	66.9	0.120	3.05	3.53	5.26	3.5	30
3	3.500	88.9	3.260	82.8	0.120	3.05	4.34	6.46	2.6	19
4	4.500	114.3	4.260	108.2	0.120	3.05	5.62	8.37	1.6	19
5	5.563	141.3	5.295	134.5	0.134	3.40	7.78	11.58	1.5	13
6	6.625	168.3	6.357	161.5	0.134	3.40	9.30	13.85	1.0	10
8	8.625	219.1	8.249	209.5	0.188	4.78	16.96	25.26	2.1	7

** Calculated using Standard UL CRR formula, UL Fire Protection Directory, Category VIZY. The CRR is a ratio value used to measure the ability of a pipe to withstand corrosion. Threaded Schedule 40 steel pipe is used as the benchmark (value of 1.0).*

SCHEDULE 40 SPECIFICATIONS

NPS	NOM OD		NOM ID		NOMINAL WALL		NOMINAL WEIGHT		UL	PIECES
	in.	mm	in.	mm	in.	mm	lbs./ft.	kg/m	CRR*	Lift
1	1.315	33.4	1.049	26.6	0.133	3.38	1.68	2.50	1.00	70
1¼	1.660	42.2	1.380	35.1	0.140	3.56	2.27	3.39	1.00	51
1½	1.900	48.3	1.610	40.9	0.145	3.68	2.72	4.05	1.00	44
2	2.375	60.3	2.067	52.5	0.154	3.91	3.66	5.45	1.00	30

** Calculated using Standard UL CRR formula, UL Fire Protection Directory, Category VIZY. The CRR is a ratio value used to measure the ability of a pipe to withstand corrosion. Threaded Schedule 40 steel pipe is used as the benchmark (value of 1.0).*

SUBMITTAL INFORMATION

PROJECT: _____ CONTRACTOR: _____ DATE: _____

ENGINEER: _____ SPECIFICATION REFERENCE: _____ SYSTEM TYPE: _____

LOCATIONS: _____ COMMENTS: _____

☐ BLACK ☐ HOT-DIP GALVANIZED

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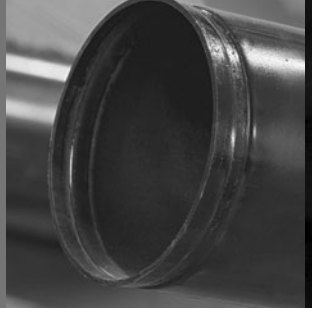
A DIVISION OF ZEKELMAN INDUSTRIES

Fire Sprinkler Pipe

Mega-Flow and Mega-Thread

Submittal Data Sheet



FM Approved and Fully Listed Sprinkler Pipe
Wheatland Tube's Mega-Flow steel fire sprinkler pipe is FM Approved for roll-grooved, plain-end and welded joints for wet systems; and UL® and C-UL Listed and FM Approved for use with roll-grooved, swage groove, plain-end couplings and welded joints for wet, dry preaction and deluge systems. Mega-Thread is FM Approved for use in wet systems and is UL and C-UL Listed and FM Approved for wet, dry and preaction sprinkler systems.

Approvals and Specifications
Both products meet or exceed these standards:

- ASTM A795, Type E, Grade A
- NFPA® 13 and NFPA 14
- Mega-Thread is approved for standard hanger spacing

Manufacturing Protocols
Mega-Flow and Mega-Thread are subjected to the toughest possible testing protocols to ensure the highest quality and long-lasting performance.

Finishes and Coatings
Mega-Flow, like all Wheatland black steel fire sprinkler pipe, receives a proprietary mill coating to ensure a clean, corrosion-resistant surface that outperforms and outlasts standard lacquer coatings. This coating allows the pipe to be easily painted without special preparation. Mega-Thread is hot-dip galvanized to meet FM requirements for dry systems.

Product Marking
Each length of Wheatland fire sprinkler pipe is continuously stenciled to show the manufacturer, type of pipe, grade, size and length. Barcoding is acceptable as a supplementary identification method.

MEGA-FLOW SPECIFICATIONS

NPS	NOM OD	NOM ID			UL CRR*		MEGA-FLOW	
		Mega-Flow	Schedule 10	Schedule 40	Mega-Flow	Schedule 40	Nominal wt./ft.	Pcs./Lift
1¼	1.660	1.530	1.442	1.380	1.80	1.00	1.108	61
1½	1.900	1.740	1.682	1.610	2.64	1.00	1.556	61
2	2.375	2.215	2.157	2.067	2.14	1.00	1.961	37
2½	2.875	2.707	2.635	2.469	1.43	1.00	2.504	30
3	3.500	3.316	3.260	3.068	1.34	1.00	3.349	19
4	4.500	4.316	4.260	4.026	1.00	1.00	4.331	19
6	6.625	6.395	6.357	6.065	0.75	1.00	8.000	10

** Calculated using Standard UL CRR formula, UL Fire Protection Directory, Category VIZY. The CRR is a ratio value used to measure the ability of a pipe to withstand corrosion. Threaded Schedule 40 steel pipe is used as the benchmark (value of 1.0).*

MEGA-THREAD SPECIFICATIONS

NPS	NOM OD	NOM ID		UL CRR*			MEGA-THREAD	
		Mega-Thread	Schedule 40	Mega-Thread	Schedule 40	L.W.T. Pipe	Nominal wt./ft.	Pcs./Lift
1	1.315	1.087	1.049	1.00	1.00	0.61	1.462	70
1¼	1.660	1.416	1.380	1.00	1.00	0.39	1.989	51
1½	1.900	1.650	1.610	1.00	1.00	0.31	2.370	44
2	2.375	2.117	2.067	1.00	1.00	0.25	3.094	30

** Calculated using Standard UL CRR formula, UL Fire Protection Directory, Category VIZY. The CRR is a ratio value used to measure the ability of a pipe to withstand corrosion. Threaded Schedule 40 steel pipe is used as the benchmark (value of 1.0).*

SUBMITTAL INFORMATION

PROJECT: _____ CONTRACTOR: _____ DATE: _____

ENGINEER: _____ SPECIFICATION REFERENCE: _____ SYSTEM TYPE: _____

LOCATIONS: _____ COMMENTS: _____

☐ MEGA-FLOW — BLACK ☐ MEGA-THREAD — HOT-DIP GALVANIZED

WFS-012318

700 South Dock Street
Sharon, PA 16146
P 800.257.8182
F 724.346.7260

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Cast Iron Threaded Fittings

SMITH-COOPER®
INTERNATIONAL

Cast Iron Threaded Fittings

Specifications

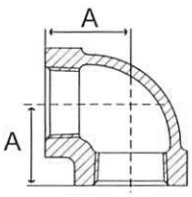
- SCI branded cast iron threaded fittings are UL Listed and FM Approved at 300psi
- Rated to 125# WSP
- Casting date on each fitting
- Grey iron castings conform to ASTM A126
- Cast iron fitting dimensions conform to ASME B16.4 Class 125
- NPT threads on fittings conform to ASME B1.20.1
- Cast iron fittings have SCI Trademark and are 100% air tested
- Manufacturing facility is ISO 9001:2008 and ISO 14001

c UL US LISTED

FM APPROVED

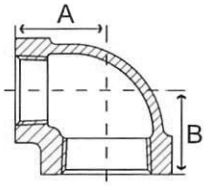
c UL us LISTED FM APPROVED

Fig. 37E 1 – 90° Elbow



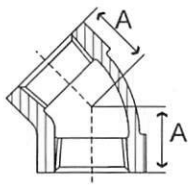
Size IN	Part Number	A IN	Packing Inner	Packing Master	Weight LB
1/2	37E 1004	1.13	90	180	0.3
3/4	37E 1006	1.31	50	100	0.5
1	37E 1010	1.50	35	70	0.8
1-1/4	37E 1012	1.75	20	40	1.3
1-1/2	37E 1014	1.94	15	30	1.7
2	37E 1020	2.25	7	14	2.7
2-1/2	37E 1024	2.70	4	8	4.3

Fig. 37RE1 – 90° Reducing Elbow



Size IN	Part Number	A IN	B IN	Packing Inner	Packing Master	Weight LB
1 x 1/2	37RE1010004	1.36	1.26	50	100	0.5
1 x 3/4	37RE1010006	1.45	1.38	40	80	0.7
1-1/4 x 1/2	37RE1012004	1.53	1.34	32	64	0.8
1-1/4 x 3/4	37RE1012006	1.63	1.45	28	56	0.9
1-1/4 x 1	37RE1012010	1.67	1.58	25	50	1.0
1-1/2 x 1/2	37RE1014004	1.75	1.52	25	50	1.0
1-1/2 x 3/4	37RE1014006	1.75	1.52	20	40	1.1
1-1/2 x 1	37RE1014010	1.80	1.65	18	36	1.3
1-1/2 x 1-1/4	37RE1014012	1.88	1.82	14	28	1.5
2 x 1/2	37RE1020004	1.97	1.60	15	30	1.4
2 x 3/4	37RE1020006	1.97	1.60	15	30	1.6
2 x 1	37RE1020010	2.02	1.73	12	24	1.8
2 x 1-1/2	37RE1020014	2.16	2.02	10	20	2.3

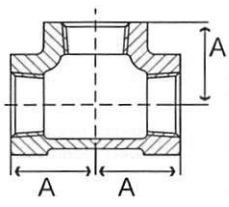
Fig. 37F 1 – 45° Elbow



Size IN	Part Number	A IN	Packing Inner	Packing Master	Weight LB
1	37F 1010	1.26	40	80	0.7
1-1/4	37F 1012	1.29	22	44	1.2
1-1/2	37F 1014	1.44	16	32	1.5
2	37F 1020	1.69	8	16	2.6

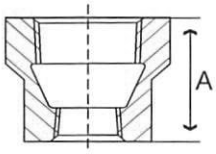
CAST IRON

Fig. 37T 1 – Tee



Size IN	Part Number	A IN	Packing Inner	Packing Master	Weight LB
1/2	37T 1004	1.13	60	120	0.4
3/4	37T 1006	1.31	30	60	0.7
1	37T 1010	1.50	20	40	1.1
1-1/4	37T 1012	1.75	12	24	1.8
1-1/2	37T 1014	1.94	8	16	2.4
2	37T 1020	2.25	5	10	3.8

Fig. 37RC1 – Hex Coupling



Size IN	Part Number	A IN	Packing Inner	Packing Master	Weight LB
1 x 1/2	37RC1010004	1.69	60	120	0.5
1 x 3/4	37RC1010006	1.69	50	100	0.6
2 x 1 (not hex)	37RC1020010	2.81	16	32	1.5

c UL us LISTED FM APPROVED

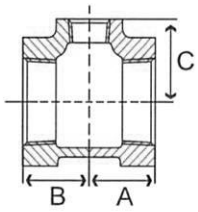


Fig. 37RT1 – Reducing Tee

Size IN	Part Number	A IN	B IN	C IN	Packing Inner	Packing Master	Weight LB
1 x 1/2	37RT1010004	1.26	1.26	1.36	25	50	0.9
1 x 1/2 x 1	37RT1010004010	1.50	1.36	1.50	24	48	0.9
1 x 3/4	37RT1010006	1.38	1.38	1.45	22	44	1.0
1 x 3/4 x 1	37RT1010006010	1.50	1.45	1.50	20	40	1.0
1 x 1-1/4	37RT1010012	1.67	1.67	1.58	15	30	1.4
1-1/4 x 1/2	37RT1012004	1.34	1.34	1.53	18	36	1.3
1-1/4 x 1/2 x 1-1/4	37RT1012004012	1.75	1.53	1.75	18	36	1.4
1-1/4 x 3/4	37RT1012006	1.45	1.45	1.62	15	30	1.4
1-1/4 x 3/4 x 1-1/4	37RT1012006012	1.75	1.62	1.75	15	30	1.5
1-1/4 x 1	37RT1012010	1.58	1.58	1.67	15	30	1.6
1-1/4 x 1 x 1/2	37RT1012010004	1.34	1.26	1.53	20	40	1.1
1-1/4 x 1 x 3/4	37RT1012010006	1.45	1.38	1.63	16	32	1.2
1-1/4 x 1 x 1	37RT1012010010	1.58	1.50	1.69	15	30	1.4
1-1/4 x 1 x 1-1/4	37RT1012010012	1.75	1.69	1.75	12	24	1.6
1-1/4 x 1 x 1-1/2	37RT1012010014	1.88	1.80	1.82	12	24	1.8
1-1/4 x 1-1/2	37RT1012014	1.88	1.88	1.82	10	20	2.0
1-1/2 x 1/2	37RT1014004	1.41	1.41	1.66	12	24	1.6
1-1/2 x 1/2 x 1-1/4	37RT1014004012	1.81	1.56	1.88	12	24	1.7
1-1/2 x 1/2 x 1-1/2	37RT1014004014	1.94	1.66	1.94	12	24	1.8
1-1/2 x 3/4	37RT1014006	1.52	1.52	1.75	12	24	1.8
1-1/2 x 3/4 x 1-1/4	37RT1014006012	1.94	1.66	1.88	12	24	1.7
1-1/2 x 3/4 x 1-1/2	37RT1014006014	1.94	1.75	1.94	12	24	1.9
1-1/2 x 1	37RT1014010	1.65	1.65	1.80	10	20	1.9
1-1/2 x 1 x 1/2	37RT1014010004	1.44	1.25	1.69	18	36	1.3
1-1/2 x 1 x 3/4	37RT1014010006	1.50	1.44	1.75	15	30	1.4
1-1/2 x 1 x 1	37RT1014010010	1.65	1.50	1.80	12	24	1.6
1-1/2 x 1 x 1-1/4	37RT1014010012	1.82	1.67	1.88	10	20	1.8
1-1/2 x 1 x 1-1/2	37RT1014010014	1.94	1.80	1.94	8	16	2.1
1-1/2 x 1-1/4	37RT1014012	1.82	1.82	1.88	8	16	2.2
1-1/2 x 1-1/4 x 1/2	37RT1014012004	1.41	1.34	1.66	15	30	1.5
1-1/2 x 1-1/4 x 3/4	37RT1014012006	1.52	1.45	1.75	12	24	1.6
1-1/2 x 1-1/4 x 1	37RT1014012010	1.65	1.58	1.80	12	24	1.8
1-1/2 x 1-1/4 x 1-1/4	37RT1014012012	1.82	1.75	1.88	10	20	2.1
1-1/2 x 1-1/4 x 1-1/2	37RT1014012014	1.94	1.88	1.94	8	16	2.3
1-1/2 x 1-1/4 x 2	37RT1014012020	2.16	2.10	2.02	6	12	2.7
1-1/2 x 2	37RT1014020	2.16	2.16	2.02	5	10	2.9
2 x 1/2	37RT1020004	1.49	1.49	1.88	8	16	2.6
2 x 3/4	37RT1020006	1.60	1.60	1.97	8	16	2.6
2 x 1	37RT1020010	1.73	1.73	2.02	6	12	2.9
2 x 1 x 2	37RT1020010020	2.25	2.02	2.25	5	10	3.1
2 x 1-1/4	37RT1020012	1.90	1.90	2.10	5	10	3.2
2 x 1-1/4 x 2	37RT1020012020	2.25	2.10	2.25	5	10	3.2
2 x 1-1/2	37RT1020014	2.02	2.02	2.16	5	10	3.3
2 x 1-1/2 x 1/2	37RT1020014004	1.49	1.41	1.88	8	16	2.1
2 x 1-1/2 x 3/4	37RT1020014006	1.60	1.52	1.97	8	16	2.2
2 x 1-1/2 x 1	37RT1020014010	1.73	1.65	2.02	8	16	2.4
2 x 1-1/2 x 1-1/4	37RT1020014012	1.90	1.82	2.10	7	14	2.7
2 x 1-1/2 x 1-1/2	37RT1020014014	2.02	1.94	2.16	7	14	2.9
2 x 1-1/2 x 2	37RT1020014020	2.25	2.16	2.25	5	10	3.4
2 x 2-1/2	37RT1020024	2.60	2.60	2.39	3	6	4.6

Submittal Information for Spears® Manufacturing Company FlameGuard ® CPVC Fire Sprinkler System

Date: 08/01/2019

GSFG-0718

Job Name: Towneplace Suites **Location:** Rancho Cordova

Engineer: Tim McBride **Contractor:** Discount Fire Protection

Scope:
This submittal covers the Spears® FlameGuard® CPVC Fire Sprinkler System suitable for residential and light hazard occupancies in accordance with The National Fire Protection Association (NFPA). The FlameGuard® System shall be sold as a complete system which consists of pipe, fittings and a specially formulated one-step primerless cement intended for use in wet, dry and pre-action systems in residential and light hazard Applications where the operating temperature/pressure does not exceed 175psi @ 150° F. (1.2 MPa @ 66° C)

Product Specification:
All CPVC fire sprinkler fittings and pipe shall be Spears® FlameGuard®. All solvent cement shall be Spears® FS-5 One-Step, and all thread sealant shall be Spears® Blue 75™ as produced by Spears® Manufacturing Company.

All Spears® FlameGuard® CPVC fire sprinkler fittings shall be manufactured in the U.S.A. from a Chlorinated Polyvinyl Chloride (CPVC) compound having a minimum cell classification of 23447 in accordance with ASTM D1784. Fittings shall be manufactured in strict compliance to ASTM F438 or F439, as applicable. All CPVC fire sprinkler piping shall be manufactured in the U.S.A. from a Chlorinated Polyvinyl Chloride (CPVC) compound having a minimum cell classification of 23447 in accordance with ASTM D1784. Piping shall be manufactured in strict compliance to ASTM F442. All CPVC solvent cement shall be a primerless, one-step type manufactured in strict compliance to ASTM F493 and approved for use with CPVC fire sprinkler systems. All CPVC fire sprinkler fittings, pipe and solvent cement shall be listed by Underwriters Laboratories (UL®), Underwriters Laboratories Canada (ULC®) and/or Factory Mutual Research Corporation (FM Global) for use in residential and light hazard wet, dry and pre-action systems and bear their authorized certification marks. Thread sealant shall be approved by the fitting manufacturer for use with CPVC fire sprinkler products. All CPVC fittings, pipe, solvent cement and thread sealant shall be certified by NSF International as applicable.

Product Marking:
FlameGuard® system components shall be orange in color for identification and include required markings and approvals prescribed in ASTM F442 for pipe and ASTM F438 or 439 for fittings.

Installation:
Spears® FlameGuard® CPVC Fire Sprinkler System shall carry a working pressure of 175 psi @ 150F (1.2 MPa @ 66° C) and shall be installed in accordance with Spears® Manufacturing Company FlameGuard® CPVC Fire Sprinkler Products Installation Instructions (FG-3) and Addendums. National Fire Protection Association (NFPA) Standards 13, 13D, and 13R must be referenced for design and installation requirements in conjunction with the Installation Instructions and applicable local codes. Installation practices such as pipe support spacing, bracing, allowance for thermal expansion/contraction, solvent cementing and handling and storage shall be in accordance with the manufacturer's instructions and this specification. Buried pipe shall be in accordance with NFPA 24 for supply mains. The piping system shall be joined using a chemically resistant one-step primerless solvent cement joining process conforming to ASTM F493. The system shall be protected from ultra violet (UV) light exposure from the sun or other source and protected from any chemicals that are not compatible with the CPVC materials including but not limited to fire stopping materials, plasticizers, incompatible thread sealants, etc.

NOTE: FlameGuard® CPVC piping systems can be leak tested using oil-free compressed air up to 25psi but must also be hydrostatically tested as required per NPFA standard.

Referenced Standards:
ASTM D1784 – Rigid Vinyl Compounds
ASTM F438 – CPVC Schedule 40 Fittings
ASTM F439 – CPVC Schedule 80 Fittings
ASTM F442 – CPVC SDR Pipe
ASTM F493 – Solvent Cements for CPVC Pipe & Fittings
NFPA 13, 13D, 13R – National Fire Protection Association Standards
NFPA 24 – Installation – Private Fire Service Mains
NSF International Standard 14/61 – Potable Water

Approvals:
NSF® – NSF International Standard 14/61 – Potable Water
Underwriters Laboratories – Listing Agency
FM Global –Listing Agency

FlameGuard®
CPVC FIRE SPRINKLER PIPING PRODUCTS

TECHNICAL INFORMATION
WEIGHTS & DIMENSIONS

November 2015
SUPERSEDES ALL PREVIOUS EDITIONS

Assessed to ISO 9001: 2008
Certificate number 293

Visit our web site:
www.spearsmfg.com

FG-4-1115

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General Information

RECOMMENDATIONS FOR INSTALLERS AND USERS:

Plastic piping systems should be **ENGINEERED, INSTALLED** and **OPERATED** in accordance with **ESTABLISHED DESIGN AND ENGINEERING STANDARDS AND PROCEDURES** for plastic piping systems. Suitability for the intended service application should be determined by the installer and/or user prior to installation of a plastic piping system. All Installation and maintenance personnel should be trained in the proper handling and installation requirements and precautions of plastic piping systems. **PRIOR TO ASSEMBLY, all piping system components should be inspected for damage or irregularities. Mating components should be checked to assure that tolerances and engagements are compatible. Do not use any components that appear irregular or do not fit properly. Contact the appropriate manufacturer of the component product in question to determine usability. Consult all applicable codes and regulations for compliance prior to installation.**

Installation must be made in accordance with Spears® Manufacturing Company
FlameGuard® CPVC Fire Sprinkler Piping Products Installation Instructions - FG-3

NOTE — Individual or group instruction in correct solvent welding procedures is available by contacting your local distributor or your servicing Spears® Regional Distribution Center.

SOLVENT CEMENT CONNECTIONS — Spears® Manufacturing Company recommends the use of Spears® FS-5 One Step solvent cement for joining Spears® products. Use of solvent cementing products not approved for CPVC fire sprinkler systems, or failure to follow installation instructions will automatically void the warranty.

THREADED CONNECTION — Spears® Manufacturing Company recommends the use of Spears® **BLUE 75™** Thread Sealant. This product has been tested by Spears® and the sealant manufacturer for compatibility with the Spears® CPVC fire sprinkler products. Consult the sprinkler head manufacturer before using this product. **WARNING: OTHER PIPE JOINT COMPOUNDS OR PASTES MAY CONTAIN SUBSTANCES THAT COULD CAUSE STRESS CRACKING IN THE CPVC OR OTHER FITTING COMPONENTS.** Care must be taken to avoid over torquing - generally 1 to 2 turns beyond finger tight is all that is required to make up a threaded connection. Factory testing has indicated 10-25 ft. lbs. of torque is adequate to obtain a leak free seal.

GASKET SEALED THREAD CONNECTIONS — This type of connection can only be made with Spears® TorqueSafe™, SofTorque™ or QuickTorque™ style Gasket Sealed Female Sprinkler Adapters. DO NOT USE ANY TYPE OF THREAD SEALANT WHEN INSTALLING THIS TYPE OF ADAPTER. Tape or paste may impair proper sealing and function. Testing has shown that hand tight until snug for the TorqueSafe™ adapter and finger tight plus 1-turn is all that is needed to seal this special connection. Sprinkler heads in these specialty fittings can then be additionally tightened clockwise to bring sprinkler frames into desired alignment without stressing the fitting. See specific adapter instructions in package for details.

GripLoc™ CONNECTIONS — This type of connection can only be made with Spears® GripLoc™ Couplings or Repair Couplings. DO NOT USE ANY TYPE OF SOLVENT CEMENT OR SEALANT WHEN INSTALLING THIS TYPE OF CONNECTION. Uses an internal stainless steel gripper ring with an internal elastomer gasket seal. Connection allows immediate system use. See specific instructions in package for details.

Installation Training Available - Contact Spears® Technical Services for Details

FlameGuard® Products must be installed in accordance with Spears® FlameGuard® CPVC Fire Sprinkler Piping Products Installation Instructions, National Fire Protection Association Standards 13, 13R, 13D, and in accordance with local codes. Code requirements and field conditions may differ. It is the responsibility of the installing contractor to insure that the product is suitable to meet these requirements.

Dimension Reference

G = (LAYING LENGTH) Intersection of center lines to bottom of socket/thread; 90° elbows, tees, crosses; ± 1/32 inch.
H = Intersection of center lines to face of fitting; 90° elbows tees, crosses; ± 1/32 inch.
J = Intersection of center lines to bottom of socket/thread; 45° elbows; ± 1/32 inch
L = Overall length of fittings; ± 1/16 inch.
M = Outside diameter of socket/thread hub; ± 1/16 inch.
N = Socket bottom to socket bottom; couplings; ± 1/16 inch.
Q = Width of flats; ±1/16 inch.
W = Height of cap; ± 1/16 inch.

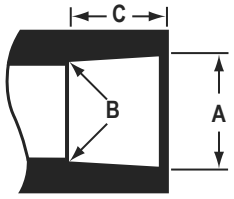
CPVC FIRE SPRINKLER PIPE SDR 13.5 (ASTM F 442)

Part Number	Nominal Size		Average O.D.		Average I.D.		Approx. Weight Lbs./Ft.
	Inches	(mm)	Inches	(mm)	Inches	(mm)	
CP-007	3/4	(19.1)	1.050	(26.7)	.874	(22.5)	0.168
CP-010	1	(25.4)	1.315	(33.4)	1.101	(28.2)	0.262
CP-012	1-1/4	(31.8)	1.660	(42.2)	1.394	(35.6)	0.418
CP-015	1-1/2	(38.1)	1.900	(48.3)	1.598	(40.7)	0.548
CP-020	2	(50.8)	2.375	(60.3)	2.003	(50.9)	0.859
CP-025	2-1/2	(63.5)	2.875	(73.0)	2.423	(61.5)	1.257
CP-030	3	(76.2)	3.500	(88.9)	2.950	(75.0)	1.867

"Lead Free" low lead certification – unless other wise specified, all Spears® FlameGuard® fittings specified here-in are certified by NSF International to ANSI/NSF® Standard 61, Annex G and is in compliance with California's Health & Safety Code Section 116825 (commonly known as AB1953) and Vermont Act 193. Weighted average lead content <=0.25%. Spears® PVC and CPVC Pipe, Fittings and Valves have always been lead-free and Certified by NSF International for use in potable water systems. Spears® offers a wide range of lead-free specialty fittings and transition adapters for plumbing applications. However, certain brass threaded adapter fittings for applications that are not intended to convey water for human consumption through drinking or cooking are still produced and available.

SOCKET DIMENSIONS

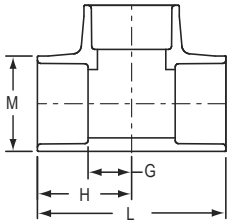
SCH 40 - ASTM F438
SCH 80 - ASTM F439



Size	Socket Entrance A	Socket Bottom B	Tolerance	SCH 40 Minimum Socket Length C	SCH 80 Minimum Socket Length C
3/4	1.058	1.046	± .004	.719	1.000
1	1.325	1.130	± .005	.875	1.125
1-1/4	1.670	1.655	± .005	.938	1.250
1-1/2	1.912	1.894	± .006	1.094	1.375
2	2.387	2.369	± .005	1.156	1.500
2-1/2	2.889	2.868	± .007	1.750	1.750
3	3.516	3.492	± .008	1.875	1.875

TEE

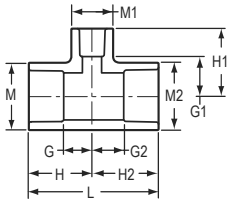
Socket x Socket x Socket



Part Number	Size	G	H	L	M	Approx. Wt. (Lbs.)
4201-007	3/4	9/16	1-1/2	2-31/32	1-5/16	.11
4201-010	1	7/8	1-13/16	3-5/8	1-5/8	.20
4201-012	1-1/4	15/32	2-3/32	4-7/32	2	.29
4201-015	1-1/2	1-5/32	2-9/16	5-3/32	2-11/32	.54
4201-020	2	1-13/32	2-15/16	5-7/8	2-7/8	.86
4201-025	2-1/2	1-23/32	3-1/2	7	3-15/32	1.62
4201-030	3	2-1/16	3-31/32	7-15/16	4-5/32	2.53

REDUCING TEE

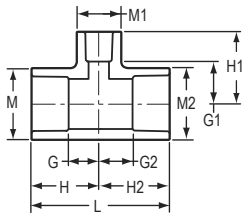
Socket x Socket x Socket



Part Number	Size	G	G1	G2	H	H1	H2	L	M	M1	M2	Approx. Wt. (Lbs.)
4201-102	3/4x3/4x1	3/4	3/4	3/4	1-11/16	1-25/32	1-11/16	3-13/32	1-5/16	1-21/32	1-5/16	.13
4201-125	1x3/4x3/4	23/32	7/8	23/32	1-25/32	1-13/16	1-21/32	3-7/16	1-19/32	1-11/32	1-5/16	.16
4201-126	1x3/4x1	23/32	23/32	3/4	1-27/32	1-27/32	1-3/4	3-19/32	1-5/8	1-5/8	1-5/16	.17
4201-131	1x1x3/4	11/16	13/16	11/16	1-13/16	1-13/16	1-13/16	3-5/8	1-5/8	1-5/16	1-5/8	.17
4201-157	1-1/4x1x3/4	11/16	1-1/32	11/16	1-15/16	2-1/32	1-13/16	3-25/32	2-3/32	1-13/32	1-23/32	.32

REDUCING TEE (continued)

Socket x Socket x Socket



Part Number	Size	G	G1	G2	H	H1	H2	L	M	M1	M2	Approx. Wt. (Lbs.)
4201-158	1-1/4x1x1	27/32	29/32	25/32	2-1/16	2-1/32	1-29/32	3-15/16	1-31/32	1-5/8	1-5/8	.24
4201-159	1-1/4x1x1-1/4	31/32	31/32	31/32	2-7/32	2-7/32	2-3/32	4-11/32	2-1/8	2-1/8	1-23/32	.36
4201-167	1-1/4x1-1/4x3/4	21/32	1	21/32	1-29/32	2	1-29/32	3-13/16	2	1-5/16	2	.22
4201-168	1-1/4x1-1/4x1	13/16	1	13/16	2-1/16	2-1/8	2-1/16	4-1/8	1-31/32	1-21/32	1-31/32	.24
4201-169	1-1/4x1-1/4x1-1/2	1-1/8	15/16	1-1/8	2-3/8	2-11/32	2-3/8	4-3/4	2-3/32	2-11/32	2-3/32	.51
4201-201	1-1/2x1-1/4x3/4	11/16	1	1/4	2-1/16	2	1-15/16	4	2-5/16	1-3/8	2-1/16	.41
4201-202	1-1/2x1-1/4x1	27/32	1-1/32	1	2-7/32	2-5/32	2-1/4	4-15/32	2-5/16	1-11/16	2-1/16	.42
4201-210	1-1/2x1-1/2x3/4	11/16	1-1/32	11/16	2-1/16	2-1/32	2-1/16	4-5/32	2-11/32	1-13/32	2-11/32	.39
4201-211	1-1/2x1-1/2x1	13/16	1-3/32	13/16	2-3/16	2-1/4	2-3/16	4-3/8	2-11/32	1-3/4	2-11/32	.41
4201-212	1-1/2x1-1/2x1-1/4	1-1/32	1-3/32	1-1/32	2-13/32	2-11/32	2-13/32	4-13/16	2-11/32	2-1/8	2-11/32	.49
4201-213	1-1/2x1-1/2x2	1-9/32	1-5/32	1-9/32	2-21/32	2-21/32	2-21/32	5-11/32	2-11/32	2-29/32	2-11/32	.64
4201-248	2x2x3/4	11/16	1-13/32	11/16	2-7/32	2-7/16	2-7/32	4-7/16	2-27/32	1-3/8	2-27/32	.52
4201-249	2x2x1	27/32	1-13/32	27/32	2-11/32	2-9/16	2-11/32	4-23/32	2-7/8	1-3/4	2-7/8	.58
4201-250	2x2x1-1/4	1-1/32	1-11/32	1-1/32	2-17/32	2-19/32	2-17/32	5-3/32	2-7/8	2-3/32	2-7/8	.65
4201-251	2x2x1-1/2	1-5/32	1-7/16	1-5/32	2-11/16	2-13/32	2-11/16	5-3/8	2-7/8	2-13/32	2-7/8	.79
4201-289	2-1/2x2-1/2x1	27/32	1-23/32	27/32	2-5/8	2-27/32	2-5/8	5-1/4	3-17/32	1-23/32	3-17/32	1.01
4201-290	2-1/2x2-1/2x1-1/4	1-3/32	1-23/32	1-1/32	2-13/16	2-31/32	2-13/16	5-21/32	3-9/16	2-3/32	3-9/16	1.13
4201-291	2-1/2x2-1/2x1-1/2	1-3/16	1/2	1-3/16	2-15/16	1-7/8	2-15/16	5-7/8	3-15/32	2-11/32	3-15/32	1.26
4201-292	2-1/2x2-1/2x2	1-13/32	1-5/8	1-13/32	3-3/16	3-1/8	3-3/16	6-3/8	3-1/2	2-7/8	3-1/2	1.37
4201-335	3x3x1	7/8	1-15/16	7/8	2-3/4	3-1/16	2-3/4	5-15/32	4-3/16	1-23/32	4-3/16	1.26
4201-336*	3x3x1-1/4	1-3/8	1-3/4	1-3/8	3-5/16	3-1/2	3-5/16	6-5/8	4-1/8	2-7/8	4-1/8	1.94
4201-337	3x3x1-1/2	1-5/32	2-1/16	1-5/32	3-1/32	3-7/16	3-1/32	6-3/32	4-3/16	2-3/8	4-3/16	1.46
4201-338	3x3x2	1-7/16	1-13/16	1-7/16	3-5/16	3-5/16	3-5/16	6-19/32	4-3/16	2-7/8	4-3/16	1.69
4201-339	3x3x2-1/2	1-3/4	1-31/32	1-3/4	3-5/8	3-23/32	3-5/8	7-1/4	4-3/16	3-17/32	4-3/16	2.11

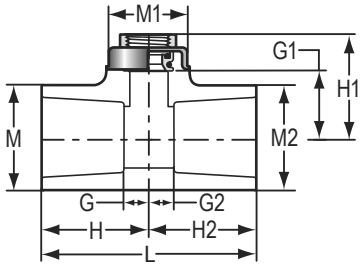
*** Branch Outlet Sized with Bushing**

TorqueSafe™ SPRINKLER HEAD TEE

Gasket Sealed Brass Thread Insert Style

Socket x Socket x Gasket Fipt

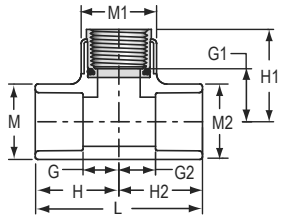
With Elastomer Seal - Use NO Thread Sealant



Part Number	Size	G	G1	G2	H	H1	H2	L	M	M1	M2	Approx. Wt. (Lbs.)
4202-101 G	3/4x3/4x1/2	7/16	1-3/16	7/16	1-7/16	1-7/16	1-17/32	2-29/32	1-3/8	1-3/8	1-3/8	.22
4202-124 G	1x3/4x1/2	7/16	1-11/32	9/16	1-9/16	1-11/16	1-9/16	3-1/8	1-11/16	1-3/8	1-3/8	.26
4202-130 G	1x1x1/2	7/16	1-11/32	7/16	1-9/16	1-11/16	1-9/16	3-1/8	1-23/32	1-3/8	1-23/32	.28
4202-131 G	1x1x3/4	17/32	15/16	17/32	1-11/16	1-5/8	1-11/16	3-11/32	1-23/32	1-9/16	1-23/32	.31
4202-166 G	1-1/4x1-1/4x1/2	7/16	1-5/8	7/16	1-11/16	1-15/16	1-11/16	3-3/8	2-1/16	1-3/8	2-1/16	.34
4202-209 G	1-1/2x1-1/2x1/2	1/2	1-13/16	1/2	1-7/8	2-3/32	1-7/8	3-3/4	2-11/32	1-3/8	2-11/32	.41
4202-247 G	2x2x1/2	1/2	2-1/16	1/2	2	2-11/32	2	4-1/32	2-27/32	1-3/8	2-27/32	.54

Not intended to convey or dispense water for human consumption through drinking or cooking

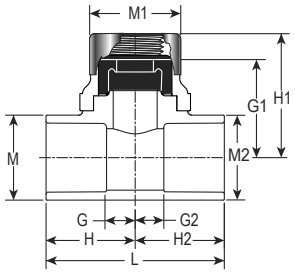
SPRINKLER HEAD TEE
Brass Thread Insert Style
Socket x Socket x Fipt



Part Number	Size	G	G1	G2	H	H1	H2	L	M	M1	M2	Approx. Wt. (Lbs.)
4202-010	1x1x1	21/31	1-1/8	21/31	1-25/32	1-29/32	1-25/32	3-19/32	1-23/32	1-23/32	1-23/32	.37

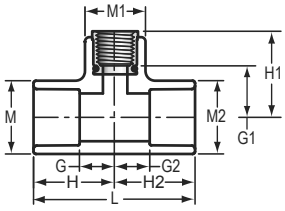
Not intended to convey or dispense water for human consumption through drinking or cooking

SofTorque™ SR REDUCING TEE
Gasket Sealed Special Reinforced Plastic Thread Style
Socket x Socket x SR Fipt
With Elastomer Seal - Use NO Thread Sealant



Part Number	Size	G	G1	G2	H	H1	H2	L	M	M1	M2	Approx. Wt. (Lbs.)
4202-101GSR	3/4x3/4x1/2	7/16	1-1/2	7/16	1-3/8	1-7/8	1-3/8	2-3/4	1-5/16	1-3/8	1-5/16	.16
4202-130GSR	1x1x1/2	7/16	1-5/8	7/16	1-1/2	2	1-1/2	3	1-5/8	1-3/8	1-5/8	.20

SPRINKLER REDUCING HEAD TEE
Brass Thread Insert Style
Socket x Socket x Fipt

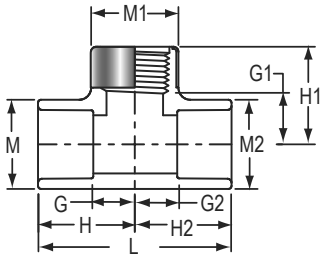


Part Number	Size	G	G1	G2	H	H1	H2	L	M	M1	M2	Approx. Wt. (Lbs.)
4202-101	3/4x3/4x1/2	7/16	1-1/16	7/16	1-15/32	1-5/8	1-15/32	2-29/32	1-13/32	1-3/16	1-13/32	.20
4202-124	1x3/4x1/2	7/16	1-11/32	9/16	1-9/16	1-11/16	1-9/16	3-1/8	1-11/16	1-3/8	1-3/8	.26
4202-130	1x1x1/2	7/16	1-7/32	7/16	1-9/16	1-25/32	1-9/16	3-1/8	1-3/4	1-3/16	1-3/4	.26
4202-156	1-1/4x1x1/2	7/16	1-7/16	9/16	1-11/16	2-1/32	1-11/16	3-3/8	2-3/32	1-3/16	1-23/32	.30
4202-166	1-1/4x1-1/4x1/2	7/16	1-15/32	7/16	1-11/16	2-1/32	1-11/16	3-3/8	2-3/32	1-3/16	2-3/32	.31
4202-199	1-1/2x1-1/4x1/2	1/2	1-5/8	9/16	1-7/8	2-3/16	1-13/16	3-11/16	2-11/32	1-3/16	2-1/16	.37
4202-209	1-1/2x1-1/2x1/2	1/2	1-5/8	1/2	1-7/8	2-3/16	1-7/8	3-3/4	2-11/32	1-3/16	2-11/32	.38
4202-237	2x1-1/2x1/2	1/2	1-27/32	17/32	2	2-7/16	1-29/32	3-15/16	2-7/8	1-3/16	2-11/32	.47
4202-247	2x2x1/2	1/2	1-7/8	1/2	2	2-7/16	2	4-1/32	2-27/32	1-3/16	2-27/32	.50

Not intended to convey or dispense water for human consumption through drinking or cooking

SPRINKLER HEAD TEE
Special Reinforced
Plastic Thread Style

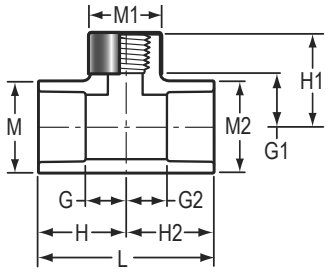
Socket x Socket x SR Fipt



Part Number	Size	G	G1	G2	H	H1	H2	L	M	M1	M2	Approx. Wt. (Lbs.)
4202-010SR	1x1x1	21/32	3/4	21/32	1-25/32	1-5/8	1-25/32	3-19/32	1-23/32	1-11/16	1-23/32	.26

SPRINKLER REDUCING HEAD TEE
Special Reinforced
Plastic Thread Style

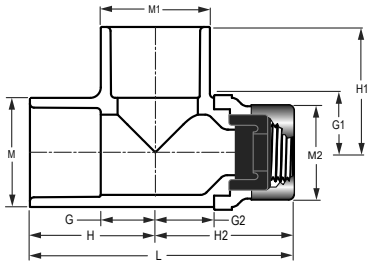
Socket x Socket x SR Fipt



Part Number	Size	G	G1	G2	H	H1	H2	L	M	M1	M2	Approx. Wt. (Lbs.)
4202-101SR	3/4x3/4x1/2	19/32	25/32	19/32	1-19/32	1-7/16	1-19/32	3-7/32	1-13/32	1-3/16	1-13/32	.15
4202-124SR	1x3/4x1/2	7/16	29/32	9/16	1-19/32	1-5/8	1-9/16	3-5/32	1-23/32	1-3/16	1-17/32	.19
4202-130SR	1x1x1/2	7/16	29/32	7/16	1-9/16	1-5/8	1-9/16	3-1/8	1-23/32	1-3/16	1-23/32	.20
4202-156SR	1-1/4x1x1/2	15/32	1-5/32	19/32	1-23/32	1-7/8	1-23/32	3-13/32	2-3/32	1-3/16	1-23/32	.26
4202-166SR	1-1/4x1-1/4x1/2	7/16	1-1/8	7/16	1-11/16	1-27/32	1-11/16	3-3/8	2-3/32	1-3/16	2-3/32	.26
4202-168SR	1-1/4x1-1/4x1	27/32	1-1/32	27/32	2-3/32	1-29/32	2-3/32	4-7/32	2-3/32	1-11/16	2-3/32	.34
4202-199SR	1-1/2x1-1/4x1/2	9/16	1-9/32	17/32	1-15/16	2	1-25/32	3-23/32	2-11/32	1-3/16	2-3/32	.33
4202-209SR	1-1/2x1-1/2x1/2	1/2	1-1/4	1/2	1-7/8	1-31/32	1-7/8	3-3/4	2-11/32	1-3/16	2-11/32	.35
4202-211SR	1-1/2x1-1/2x1	27/32	1-7/32	27/32	2-7/32	2-1/8	2-7/32	4-15/32	2-11/32	1-23/32	2-11/32	.44
4202-237SR	2x1-1/2x1/2	23/32	1-9/16	3/8	2-7/32	2-9/32	1-3/4	3-31/32	2-7/8	1-3/16	2-11/32	.45
4202-247SR	2x2x1/2	1/2	31/32	1/2	2	1-11/16	19/32	4	2-7/8	1-3/16	2-7/8	.48
4202-287SR	2-1/2x2-1/2x1/2	17/32	1-3/4	17/32	2-9/32	2-1/2	2-9/32	4-19/32	3-1/2	1-7/32	3-1/2	.78

SOFTORQUE™
SR SPRINKLER HEAD TEE
Gasket Sealed Special
Reinforced Plastic Thread Style

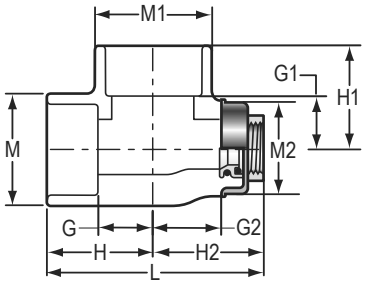
Socket x SR Fipt x Socket
Stainless Steel Collar With Elastomer Seal - Use NO Thread Sealant



Part Number	Size	G	G1	G2	H	H1	H2	L	M	M1	M2	Approx. Wt. (Lbs.)
4203-122GSR	1x1/2x1	13/16	13/16	1-1/2	1-27/32	1-27/32	1-31/32	3-13/16	1-5/8	1-5/8	1-3/8	.22

TorqueSafe™
SPRINKLER HEAD TEE
Gasket Sealed
Brass Thread Insert Style

Socket x Gasket Fipt x Socket
With Elastomer Seal - Use NO Thread Sealant

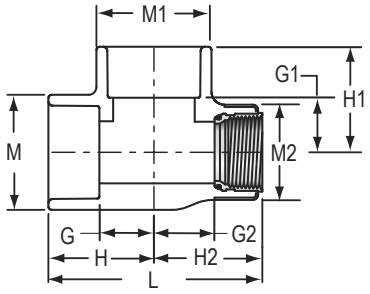


Part Number	Size	G	G1	G2	H	H1	H2	L	M	M1	M2	Approx. Wt. (Lbs.)
4203-122 G	1x1/2x1	19/32	13/16	1-13/32	1-19/32	1-27/32	1-3/4	3-11/32	1-5/8	1-5/8	1-3/8	.25

Not intended to convey or dispense water for human consumption through drinking or cooking

SPRINKLER HEAD TEE
Brass Thread Insert Style

Socket x Fipt x Socket

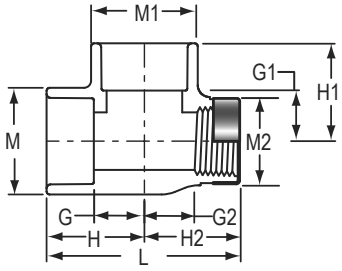


Part Number	Size	G	G1	G2	H	H1	H2	L	M	M1	M2	Approx. Wt. (Lbs.)
4203-122	1x1/2x1	23/32	3/4	1-1/4	1-5/8	1-5/8	1-15/16	3-1/2	1-23/32	1-23/32	1-3/16	.25

Not intended to convey or dispense water for human consumption through drinking or cooking

SPRINKLER HEAD TEE
Special Reinforced
Plastic Thread Style

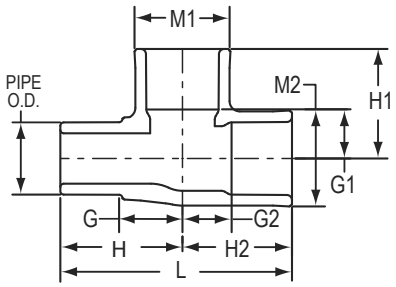
Socket x SR Fipt x Socket



Part Number	Size	G	G1	G2	H	H1	H2	L	M	M1	M2	Approx. Wt. (Lbs.)
4203-122SR	1x1/2x1	27/32	23/32	1-3/32	1-23/32	1-5/8	1-25/32	3-13/32	1-3/4	1-3/4	1-3/16	.21

STREET TEE

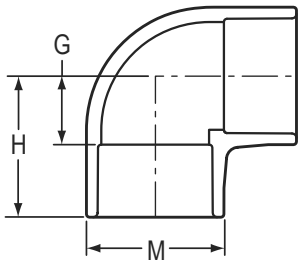
Spigot x Socket x Socket



Part Number	Size	G	G1	G2	H	H1	H2	L	M1	M2	Approx. Wt. (Lbs.)
4244-007	3/4	13/16	27/32	27/32	1-13/16	1-7/8	1-7/8	3-5/8	1-13/32	1-13/32	.16
4244-010	1	1-5/32	1-1/32	1-1/32	2-1/8	1-29/32	1-29/32	4-3/16	1-3/4	1-3/4	.27
4244-012	1-1/4	1-1/4	1	1	2-7/16	2-9/32	2-9/32	4-27/32	2-3/32	2-3/32	.42
4244-015	1-1/2	1-13/16	1-1/8	1-1/8	2-7/8	2-9/16	2-9/16	5-11/32	2-11/32	2-11/32	.56
4244-020	2	1-23/32	1-7/16	1-13/32	3-1/4	2-15/16	2-15/16	6-5/32	2-7/8	2-7/8	.84

90° ELBOW

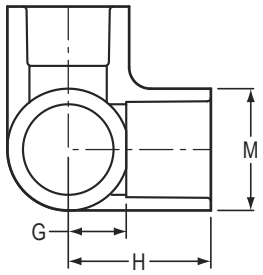
Socket x Socket



Part Number	Size	G	H	M	Approx. Wt. (Lbs.)
4206-007	3/4	9/16	1-1/2	1-5/16	.07
4206-010	1	3/4	1-5/8	1-5/8	.11
4206-012	1-1/4	15/16	2-3/16	2	.22
4206-015	1-1/2	1-5/32	2-17/32	2-3/8	.41
4206-020	2	1-13/32	2-29/32	2-7/8	.62
4206-025	2-1/2	1-15/32	3-3/8	3-1/2	1.15
4206-030	3	1-5/32	3-3/32	4-3/16	1.83

SIDE OUTLET ELBOW

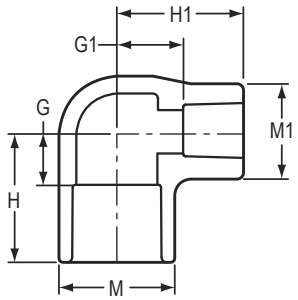
Socket x Socket x Socket



Part Number	Size	G	H	M	Approx. Wt. (Lbs.)
4213-007	3/4	27/32	1-19/32	1-5/16	.09
4213-010	1	13/16	1-7/8	1-5/8	.18

REDUCING 90° ELBOW

Socket x Socket



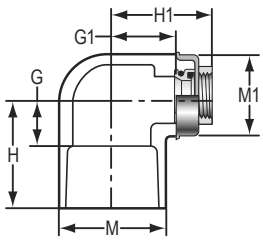
Part Number	Size	G	G1	H	H1	M	M1	Approx. Wt. (Lbs.)
4206-131	1x3/4	21/32	13/16	1-25/32	1-13/16	1-19/32	1-5/16	.11

TorqueSafe™ 90° SPRINKLER HEAD ELBOW

Gasket Sealed Brass Thread Insert Style

Socket x Gasket Fipt

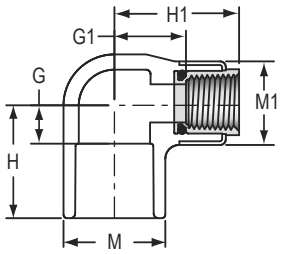
With Elastomer Seal - Use NO Thread Sealant



Part Number	Size	G	G1	H	H1	M	M1	Approx. Wt. (Lbs.)
4207-101 G	3/4x1/2	9/16	1-7/32	1-13/32	1-17/32	1-13/32	1-3/8	.19
4207-130 G	1x1/2	7/16	1-3/16	1-9/16	1-11/16	1-23/32	1-3/8	.23
4207-166 G	1-1/4x1/2	15/32	1-19/32	1-15/16	1-11/16	2-3/32	1-3/8	.25

Not intended to convey or dispense water for human consumption through drinking or cooking

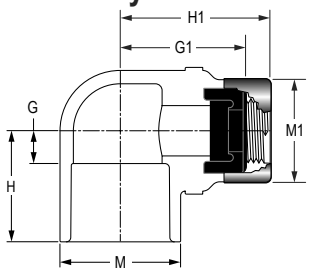
SPRINKLER HEAD 90° ELBOW
Brass Thread Insert Style
Socket x Fipt



Part Number	Size	G	G1	H	H1	M	M1	Approx. Wt. (Lbs.)
4207-101	3/4x1/2	1/2	1-3/32	1-1/2	1-5/8	1-13/32	1-3/16	.17
4207-130	1x1/2	7/16	1-7/32	1-19/32	1-25/32	1-23/32	1-3/16	.21
4207-131	1x3/4	17/32	1-11/32	1-21/32	1-31/32	1-23/32	1-3/8	.25
4207-166	1-1/4x1/2	15/32	1-17/32	1-11/16	1-15/16	2-3/32	1-17/32	.33

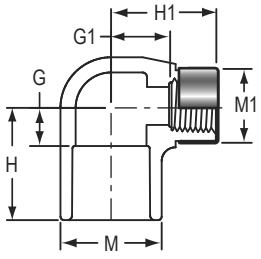
Not intended to convey or dispense water for human consumption through drinking or cooking

SofTorque™ SR 90° ELBOW SPRINKLER HEAD ADAPTER
Gasket Sealed Special Reinforced Plastic Thread Style
Socket x SR Fipt
With Elastomer Seal - Use NO Thread Sealant



Part Number	Size	G	G1	H	H1	M	M1	Approx. Wt. (Lbs.)
4207-101GSR	3/4x1/2	7/16	1-17/32	1-3/8	1-27/32	1-11/32	1-3/8	.17
4207-130GSR	1x1/2	7/16	1-11/16	1-1/2	2	1-21/32	1-3/8	.19
4207-166GSR	1-1/4x1/2	7/16	1-7/8	1-11/16	2-7/32	2	1-3/8	.22

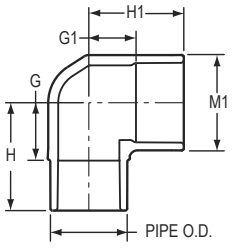
SPRINKLER HEAD 90° ELBOW
Special Reinforced Plastic Thread Style
Socket x SR Fipt



Part Number	Size	G	G1	H	H1	M	M1	Approx. Wt. (Lbs.)
4207-101SR	3/4x1/2	11/32	13/16	1-15/32	1-1/2	1-13/32	1-3/16	.14
4207-130SR	1x1/2	7/16	7/8	1-9/16	1-5/8	1-23/32	1-3/8	.20
4207-131SR	1x3/4	1/2	7/8	1-5/8	1-9/16	1-23/32	1-3/8	.16
4207-166SR	1-1/4x1/2	13/32	1-1/32	1-21/32	1-23/32	2-3/32	1-7/32	.19

90° STREET ELBOW

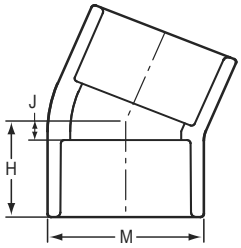
Spigot x Socket



Part Number	Size	G	G1	H	H1	M1	Approx. Wt. (Lbs.)
4209-007	3/4	29/32	19/32	1-15/16	1-11/16	1-13/32	.12
4209-010	1	1-9/32	23/32	2-13/32	1-27/32	1-3/4	.21
4209-012	1-1/4	1-9/16	27/32	2-13/16	2-3/32	2-3/32	.32
4209-015	1-1/2	1-15/32	1-3/16	2-27/32	2-9/16	2-11/32	.42
4209-020	2	1-23/32	1-3/8	3-7/32	2-15/16	2-27/32	.65

22-1/2° ELBOW

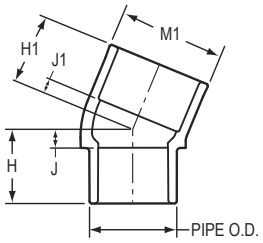
Socket x Socket



Part Number	Size	H	J	M	Approx. Wt. (Lbs.)
4216-007	3/4	1-3/16	7/32	1-13/32	.09
4216-010	1	1-3/8	9/32	1-25/32	.14
4216-012	1-1/4	1-1/2	5/16	2-3/32	.20
4216-015	1-1/2	1-7/16	13/32	1-3/8	.19
4216-020	2	1-7/8	3/8	2-27/32	.43
4216-030	3	2-3/8	1/2	4-5/32	1.00

22-1/2° STREET ELBOW

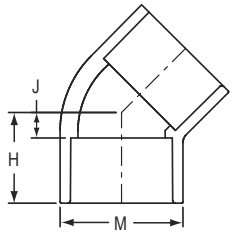
Spigot x Socket



Part Number	Size	H	H1	J	J1	M1	Approx. Wt. (Lbs.)
4242-007	3/4	1-1/4	1-1/2	1/4	1/2	1-3/8	.08
4242-010	1	1-7/16	1-11/32	5/16	7/32	1-23/32	.14
4242-012	1-1/4	1-9/16	1-25/32	17/32	11/16	2-1/16	.21
4242-015	1-1/2	1-13/32	1-23/32	1/2	11/32	2-11/32	.28
4242-020	2	1-29/32	2-1/8	7/32	5/8	2-7/8	.42
4242-025	2-1/2	2-1/8	2-1/4	13/32	1/2	3-1/2	.68
4242-030	3	2-13/32	2-13/32	9/16	17/32	4-5/32	.99

45° ELBOW

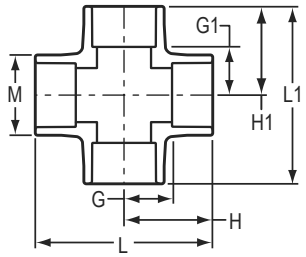
Socket x Socket



Part Number	Size	H	J	M	Approx. Wt. (Lbs.)
4217-007	3/4	1-5/16	5/16	1-5/16	.07
4217-010	1	1-13/32	3/8	1-5/8	.11
4217-012	1-1/4	1-5/8	3/8	2-5/32	.21
4217-015	1-1/2	1-27/32	15/32	2-11/32	.32
4217-020	2	2-1/8	21/32	2-7/8	.48
4217-025	2-1/2	2-17/32	3/4	3-1/2	.88
4217-030	3	2-29/32	29/32	4-5/32	1.17

CROSS

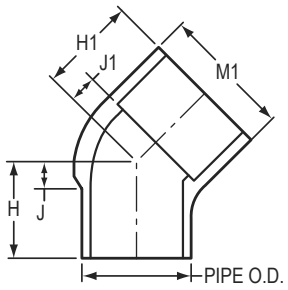
Socket x Socket x Socket x Socket



Part Number	Size	G	G1	H	H1	L	L1	M	Approx. Wt. (Lbs.)
4220-007	3/4	5/8	5/8	1-21/32	1-21/32	3-5/16	3-5/16	1-13/32	.22
4220-010	1	3/4	3/4	1-5/8	1-5/8	3-1/4	3-1/4	1-23/32	.20
4220-012	1-1/4	1-1/8	1-1/8	2-3/8	2-3/8	4-3/4	4-3/4	2-3/32	.63
4220-015	1-1/2	1-7/32	1-7/32	2-5/8	2-5/8	5-7/32	5-7/32	2-3/8	.80
4220-020	2	1-1/2	1-1/2	3	3	6	6	3	1.43
4220-025	2-1/2	1-11/16	1-11/16	3-7/16	3-7/16	6-7/8	6-7/8	3-17/32	2.16
4220-030	3	2-3/32	2-3/32	3-31/32	3-31/32	7-15/16	7-15/16	4-7/16	3.37

45° STREET ELBOW

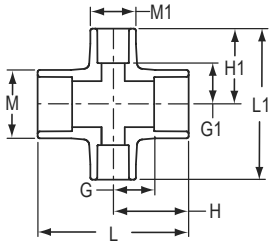
Spigot x Socket



Part Number	Size	H	H1	J	J1	M1	Approx. Wt. (Lbs.)
4227-010	1	1-1/2	1-5/16	1/2	1/4	1-5/8	.10
4227-012	1-1/4	1-25/32	1-9/16	9/16	11/32	1-31/32	.15
4227-015	1-1/2	2-1/32	2-1/8	19/32	25/32	2-11/32	.29
4227-020	2	2-5/16	1-15/16	25/32	13/32	2-7/8	.44

REDUCING CROSS

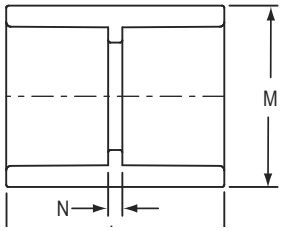
Socket x Socket x Socket x Socket



Part Number	Size	G	G1	H	H1	L	L1	M	M1	Approx. Wt. (Lbs.)
4220-131	1x3/4	23/32	5/8	1-5/8	1-5/8	3-1/4	3-1/4	1-7/8	1-1/2	.31
4220-167	1-1/4x3/4	1-1/16	23/32	2-1/16	1-31/32	4-3/32	3-31/32	2-1/16	1-13/32	.35
4220-210	1-1/2x3/4	11/16	1-5/32	2-3/32	2-3/16	4-3/16	4-11/32	2-3/8	1-13/32	.42
4220-248	2x3/4	11/16	1-7/16	2-7/32	2-7/16	4-13/32	4-7/8	2-29/32	1-13/32	.56
4220-289	2-1/2x1	29/32	1-3/4	2-11/16	2-7/8	5-11/32	5-3/4	3-1/2	1-3/4	.98

COUPLING

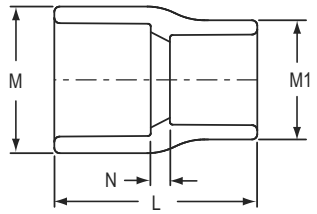
Socket x Socket



Part Number	Size	L	M	N	Approx. Wt. (Lbs.)
4229-007	3/4	2-1/8	1-5/16	3/16	.05
4229-010	1	2-3/16	1-5/8	3/32	.08
4229-012	1-1/4	2-19/32	2	3/32	.13
4229-015	1-1/2	2-7/8	2-11/32	3/32	.22
4229-020	2	3-1/8	2-7/8	1/8	.33
4229-025	2-1/2	3-11/16	3-15/32	3/16	.48
4229-030	3	4	4-3/16	1/4	.89

REDUCER COUPLING

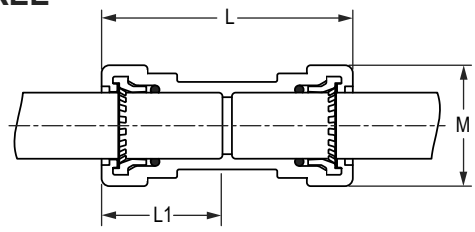
Socket x Socket



Part Number	Size	L	M	M1	N	Approx. Wt. (Lbs.)
4229-131	1x3/4	2-3/8	1-23/32	1-13/32	7/32	.10
4229-167	1-1/4x3/4	2-19/32	2-3/32	1-5/8	11/32	.17
4229-168	1-1/4x1	2-11/16	2-3/32	1-23/32	5/16	.18
4229-210	1-1/2x3/4	2-13/16	2-11/32	1-13/32	15/32	.19
4229-211	1-1/2x1	2-7/8	2-11/32	1-15/16	3/8	.24
4229-212	1-1/2x1-1/4	2-13/16	2-13/32	2-1/8	5/32	.23
4229-248	2x3/4	3-3/16	2-7/8	1-7/16	23/32	.32
4229-249	2x1	3-1/8	2-7/8	1-23/32	1/2	.31
4229-250	2x1-1/4	3-3/16	2-7/8	2-1/8	17/32	.33
4229-251	2x1-1/2	3-3/16	2-27/32	2-11/32	9/32	.31
4229-291	2-1/2x1-1/2	3-23/32	3-15/32	2-11/32	21/32	.51
4229-292	2-1/2x2	3-21/32	3-1/2	2-7/8	13/32	.52
4229-337	3x1-1/2	3-1/2	4-3/16	2-3/8	7/32	.71
4229-339	3x2-1/2	3-27/32	4-3/16	3-1/2	3/16	.80

GripLoc™ COUPLING - LEAD FREE

w/EPDM O-Ring Seals



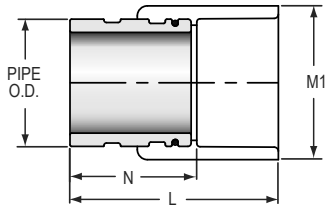
175 psi Maximum Internal Pressure @ 150°F

WARNING: DO NOT INSERT FINGERS.

Part Number	Size	L	M1	N	Approx. Wt. (Lbs.)
GL4229-007	3/4	4	1-15/16	1-29/32	.25
GL4229-010	1	4-5/32	2	2-1/4	.34

GROOVED COUPLING ADAPTER

Groove x Socket



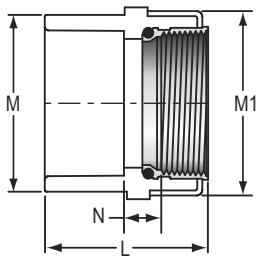
Part Number	Size	L	M1	N	Approx. Wt. (Lbs.)
4233-012	1-1/4	3-5/8	2-3/32	2-11/32	.72
4233-015	1-1/2	3-3/4	2-11/32	2-11/32	.83
4233-020	2	3-27/32	2-27/32	2-11/32	1.27
4233-025	2-1/2	4-3/16	3-15/32	2-7/16	2.02
4233-030	3	4-5/16	4-1/8	2-7/16	2.76

Not intended to convey or dispense water for human consumption through drinking or cooking

FEMALE ADAPTER

Brass Thread Insert Style

Socket x Fipt



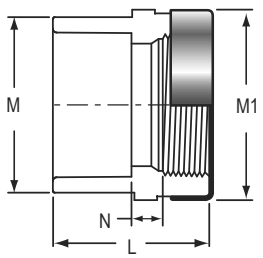
Part Number	Size	L	M	M1	N	Approx. Wt. (Lbs.)
4235-007	3/4	2	1-13/32	1-3/8	5/16	.23
4235-010	1	2-3/16	1-3/4	1-11/16	11/32	.25
4235-012	1-1/4	2-3/8	2-3/32	2-1/16	3/8	.36
4235-015	1-1/2	2-17/32	2-3/8	2-7/16	3/8	.47
4235-020	2	2-25/32	2-27/32	3-3/16	7/16	1.05

Not intended to convey or dispense water for human consumption through drinking or cooking

FEMALE ADAPTER

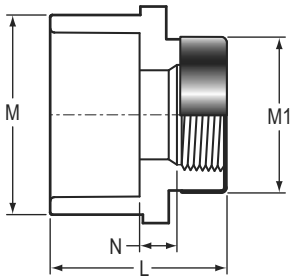
Special Reinforced Plastic Thread Style

Socket x SR Fipt



Part Number	Size	L	M	M1	N	Approx. Wt. (Lbs.)
4235-007SR	3/4	1-7/8	1-13/32	1-3/8	3/32	.08
4235-010SR	1	2-5/32	1-23/32	1-7/8	3/32	.22
4235-012SR	1-1/4	2-5/16	2-1/8	2-1/16	3/16	.20

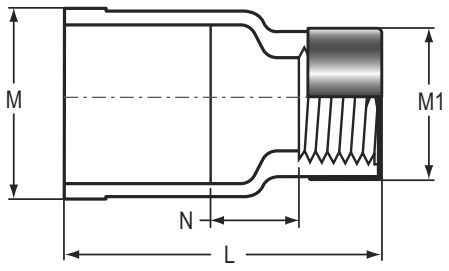
FEMALE SPRINKLER HEAD ADAPTER
Special Reinforced Plastic Thread Style
Socket x SR Fipt



Part Number	Size	L	M	M1	N	Approx. Wt. (Lbs.)
4235-101SR	3/4x1/2	1-29/32	1-13/32	1-3/16	1/8	.08
4235-130SR	1x1/2	1-31/32	1-23/32	1-3/8	3/32	.16
4235-131SR	1x3/4	2-3/32	1-3/4	1-3/8	1/4	.13

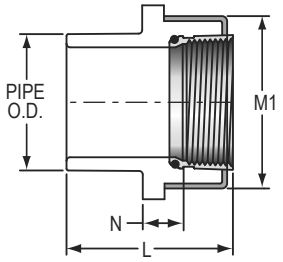
FEMALE SPRINKLER HEAD ADAPTER
Special Reinforced Plastic Thread Style with Socket Wrench Flats
Socket x SR Fipt

M = Flat-to-Flat Dimension



Part Number	Size	L	M	M1	N	Approx. Wt. (Lbs.)
W4235-101SR	3/4x1/2	2-9/32	1-13/32	1-3/16	17/32	.09
W4235-130SR	1x1/2	2-9/32	1-3/4	1-3/16	13/32	.12

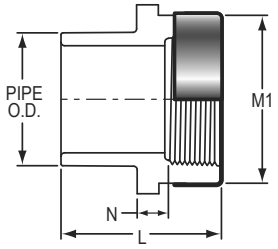
SPIGOT FEMALE ADAPTER
Brass Thread Insert Style
Spigot x Fipt



Part Number	Size	L	M1	N	Approx. Wt. (Lbs.)
4278-007	3/4	2-5/32	1-3/8	17/32	.15
4278-010	1	2-9/32	1-11/16	7/16	.22

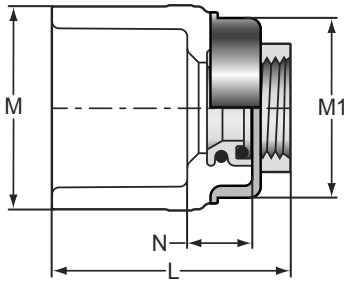
Not intended to convey or dispense water for human consumption through drinking or cooking

SPIGOT FEMALE ADAPTER
Special Reinforced Plastic Thread Style
Spigot x SR Fipt



Part Number	Size	L	M1	N	Approx. Wt. (Lbs.)
4278-007SR	3/4	1-15/16	1-3/8	11/32	.08
4278-010SR	1	2-1/4	1-23/32	13/32	.13

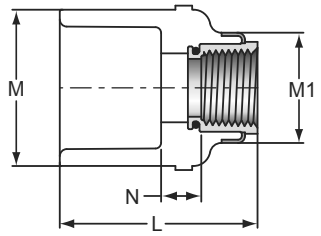
TorqueSafe™ FEMALE SPRINKLER HEAD ADAPTER
Gasket Sealed Brass Thread Insert Style
Socket x Gasket Fipt
With Elastomer Seal - Use NO Thread Sealant



Part Number	Size	L	M	M1	N	Approx. Wt. (Lbs.)
4235-101 G	3/4x1/2	1-7/8	1-13/32	1-3/8	9/16	.15
4235-130GS	1x1/2	2-1/32	1-11/16	1-3/8	17/32	.17
4235-131 G	1x3/4	2	1-11/16	1-9/16	9/16	.18

Not intended to convey or dispense water for human consumption through drinking or cooking

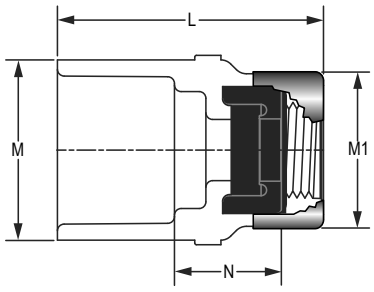
FEMALE SPRINKLER HEAD ADAPTER
Brass Thread Insert Style
Socket x Fipt



Part Number	Size	L	M	M1	N	Approx. Wt. (Lbs.)
4235-101	3/4x1/2	1-7/8	1-13/32	1-17/32	15/32	.19
4235-130	1x1/2	2-11/32	1-11/16	1-3/16	5/8	.16
4235-131	1x3/4	2-5/16	1-11/16	1-3/8	17/32	.18

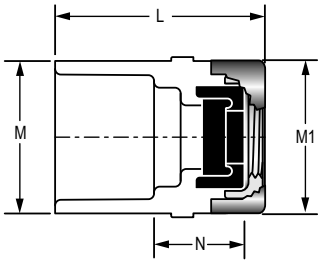
Not intended to convey or dispense water for human consumption through drinking or cooking

SofTorque™ SR FEMALE SPRINKLER HEAD ADAPTER
Gasket Sealed Special Reinforced Plastic Thread Style
Socket x SR Fipt
With Elastomer Seal - Use NO Thread Sealant



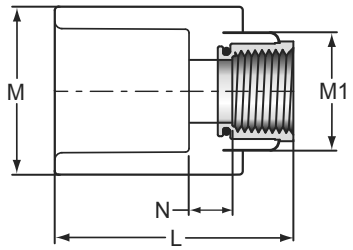
Part Number	Size	L	M	M1	N	Approx. Wt. (Lbs.)
4235-101GSR	3/4x1/2	2-5/16	1-5/16	1-3/8	31/32	.11
4235-130GSR	1x1/2	2-13/32	1-19/32	1-3/8	31/32	.13
4235-131GSR	1x3/4	2-13/32	1-5/8	1-23/32	1	.16

QuickTorque™ SR FEMALE SPRINKLER HEAD ADAPTER
Gasket Sealed Special Reinforced Plastic Thread Style
Socket x SR Metal Fipt
With Elastomer Seal - Use NO Thread Sealant



Part Number	Size	L	M	M1	N	Approx. Wt. (Lbs.)
4235-101GMR	3/4x1/2	1-15/16	1-5/16	1-9/16	13/16	.17
4235-130GMR	1x1/2	2-3/16	1-19/32	1-9/16	15/16	.19

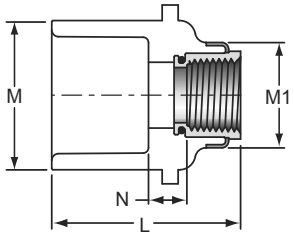
FEMALE SPRINKLER HEAD ADAPTER
Brass Thread Insert Style with Long Body
Socket x Fipt



Part Number	Size	L	M	M1	N	Approx. Wt. (Lbs.)
L4235-130	1x1/2	2-3/16	1-23/32	1-7/32	1/2	.19

Not intended to convey or dispense water for human consumption through drinking or cooking

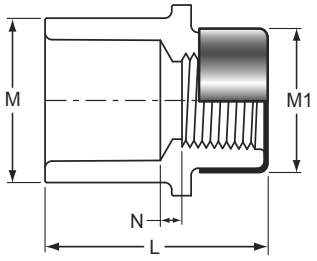
FEMALE SPRINKLER HEAD ADAPTER
Brass Thread Insert Style with Positioning Ring
Socket x Fipt



Part Number	Size	L	M	M1	N	Approx. Wt. (Lbs.)
R4235-101	3/4x1/2	2-1/32	1-7/16	1-3/16	15/32	.15

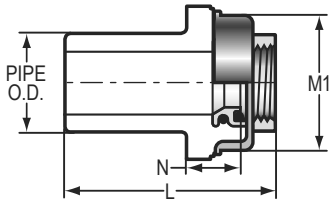
Not intended to convey or dispense water for human consumption through drinking or cooking

FEMALE SPRINKLER HEAD ADAPTER
Special Reinforced Plastic Thread Style with Positioning Ring
Socket x SR Fipt



Part Number	Size	L	M	M1	N	Approx. Wt. (Lbs.)
R4235-101SR	3/4x1/2	1-15/16	1-7/16	1-7/32	7/32	.09

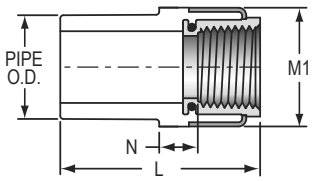
TorqueSafe™ FEMALE SPIGOT SPRINKLER HEAD ADAPTER
Gasket Sealed Brass Thread Insert Style
Spigot x Gasket Fipt
With Elastomer Seal - Use NO Thread Sealant



Part Number	Size	L	M	N	Approx. Wt. (Lbs.)
4238-101 G	3/4x1/2	1-15/16	1-3/8	21/32	.14
4238-130 G	1x1/2	2-1/16	1-3/8	19/32	.15

Not intended to convey or dispense water for human consumption through drinking or cooking

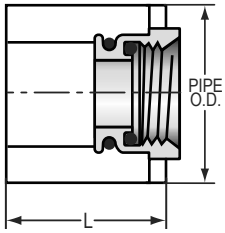
SPIGOT FEMALE SPRINKLER HEAD ADAPTER
Brass Thread Insert Style
Spigot x Fipt



Part Number	Size	L	M1	N	Approx. Wt. (Lbs.)
4238-101	3/4x1/2	1-15/16	1-17/32	17/32	.18
4238-130	1x1/2	2-1/4	1-3/16	11/32	.19

Not intended to convey or dispense water for human consumption through drinking or cooking

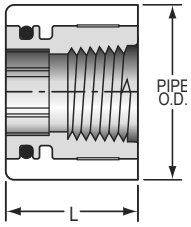
TorqueSafe™ BUSHING - GASKET SEALED
Brass Thread Insert Style
Spigot x Gasket FIPT
With Elastomer Seal - Use NO Thread Sealant



Part Number	Size	L	Approx. Wt. (Lbs.)
4238-130BR G	1x1/2	1-7/32	.10

Not intended to convey or dispense water for human consumption through drinking or cooking

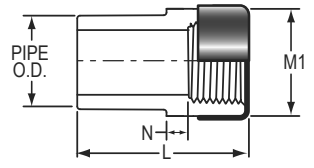
BUSHING with BRASS THREAD INSERT
Spigot x Fipt



Part Number	Size	L	Approx. Wt. (Lbs.)
4238-130BR	1x1/2	1	.13

Not intended to convey or dispense water for human consumption through drinking or cooking

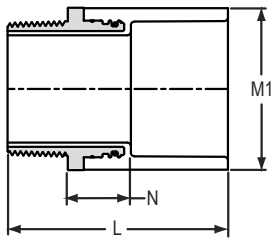
SPIGOT FEMALE SPRINKLER HEAD ADAPTER
Special Reinforced Plastic Thread Style
Spigot x SR Fipt



Part Number	Size	L	M1	N	Approx. Wt. (Lbs.)
4238-101SR	3/4x1/2	1-29/32	1-7/32	1/8	.07
4238-130SR	1x1/2	2-1/32	1-7/32	7/32	.09

MALE ADAPTER

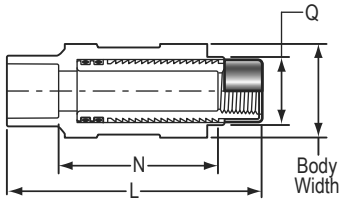
With CPVC Lined Thread Brass Insert
Mipt x Socket



Part Number	Size	L	M1	N	Approx. Wt. (Lbs.)
4236-007	3/4	2-17/32	1-13/32	13/16	.26
4236-010	1	2-15/16	1-23/32	29/32	.43
4236-012	1-1/4	3-1/8	2-3/32	31/32	.66
4236-015	1-1/2	3-9/32	2-11/32	31/32	.80
4236-020	2	3-7/16	2-27/32	31/32	1.00

ADJUSTABLE SPRINKLER HEAD ADAPTER
Special Reinforced Plastic Thread Style

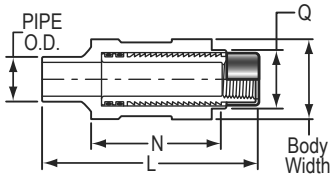
Socket x SR Fipt



Part Number	Size	L		N		Q	Body Width	Approx. Wt. (Lbs.)
		Min	Max	Min	Max			
42001SR	3/4x1/2	6-9/32	8	4-7/16	6-1/4	1-7/16	2-3/16	.66
42011SR	1x1/2	6-13/32	8	4-1/2	6-1/8	1-7/16	2-1/8	.68

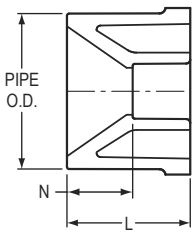
ADJUSTABLE SPRINKLER HEAD ADAPTER
Special Reinforced Plastic Thread Style

Spigot x SR Fipt



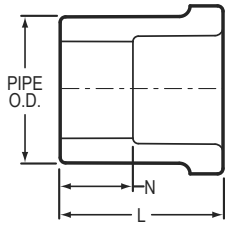
Part Number	Size	L		N		Q	Body Width	Approx. Wt. (Lbs.)
		Min	Max	Min	Max			
42004SR	3/4x1/2	5-1/32	6-5/16	3-3/16	4-15/32	1-5/16	2-1/8	.36
42014SR	1x1/2	6-7/16	8-1/8	4-7/16	6-1/4	1-7/16	2-3/16	.67

REDUCER BUSHING
Flush Style
Spigot x Socket



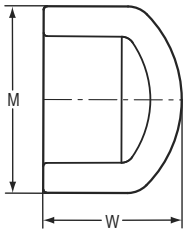
Part Number	Size	L	N	Approx. Wt. (Lbs.)
4237-131	1x3/4	1-1/4	1/4	.04
4237-167	1-1/4x3/4	1-7/16	7/16	.10
4237-168	1-1/4x1	1-13/32	9/32	.06
4237-210	1-1/2x3/4	1-5/8	5/8	.19
4237-211	1-1/2x1	1-17/32	13/32	.13
4237-212	1-1/2x1-1/4	1-9/16	5/16	.07
4237-248	2x3/4	1-29/32	29/32	.28
4237-249	2x1	1-23/32	9/16	.23
4237-250	2x1-1/4	1-11/16	7/16	.21
4237-251	2x1-1/2	1-11/16	5/16	.15
4237-290	2-1/2x1-1/4	2-5/32	7/8	.41
4237-291	2-1/2x1-1/2	2-5/32	3/4	.39
4237-292	2-1/2x2	2-9/32	3/4	.28
4237-338	3x2	2-7/32	11/16	.63
4237-339	3x2-1/2	2-5/16	1/4	.42

TRANSITION BUSHING
IPS Spigot x CTS Socket



Part Number	Size	L	N	Approx. Wt. (Lbs.)
4240-101	3/4x1/2	1-1/8	5/8	.03
4240-130	1x1/2	1-1/4	23/32	.05

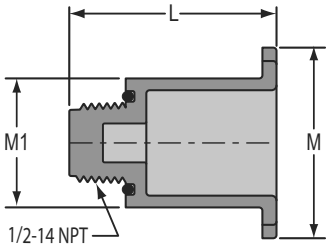
CAP
Socket



Part Number	Size	M	W	Approx. Wt. (Lbs.)
4247-007	3/4	1-5/16	1-5/16	.04
4247-010	1	1-5/8	1-9/16	.06
4247-012	1-1/4	2-3/32	1-27/32	.13
4247-015	1-1/2	2-11/32	2	.17
4247-020	2	2-27/32	2-9/32	.39
4247-025	2-1/2	3-17/32	2-5/8	.50
4247-030	3	4-3/8	3	.92

TEST PLUG - O-ring Sealed

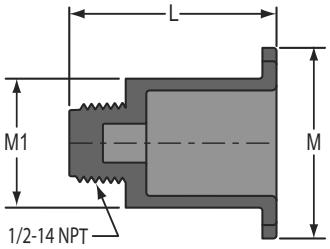
Mipt - For Pressure Testing Only,
Not For use with Z4235 Series Adapters



Part Number	Size	L	M	M1	Approx. Wt. (Lbs.)
FTP-005	1/2	1-27/32	1-15/16	1-7/32	.03

TEST PLUG for TorqueSafe™ Gasket Sealed Head Adapters

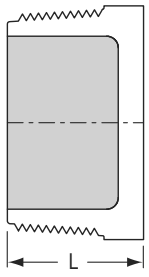
Mipt - For Pressure Testing Only.
Use ONLY with Gasket Sealed Head Adapters



Part Number	Size	L	M	M1	Approx. Wt. (Lbs.)
FTP-005GS	1/2	1-25/32	2-1/32	1-1/4	.05

TEST PLUG

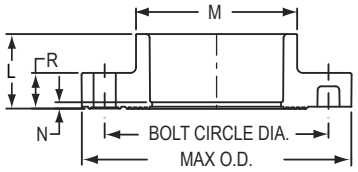
(PVC White) Not UL Listed; For Pressure Testing Only,
Mipt



Part Number	Size	L	Approx. Wt. (Lbs.)
4250-005	1/2	27/32	.02

FLANGE - ONE PIECE

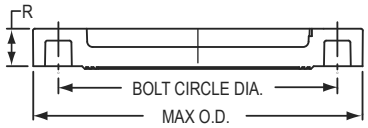
4 Bolt Holes, 175 psi
Socket



Part Number	Size	L	M	N	R	No. of Bolt Holes	Bolt Circle Dia.	Bolt Size	Min. Bolt Length	Max. O.D.	Approx. Wt. (Lbs.)
4251-007	3/4	1-5/32	1-1/2	1/8	17/32	4	2-3/4	1/2	2	3-29/32	.31
4251-010	1	1-5/16	1-13/16	1/8	11/16	4	3-1/8	1/2	2-1/4	4-9/32	.35
4251-012	1-1/4	1-13/32	2-7/32	5/32	11/16	4	3-1/2	1/2	2-1/4	4-5/8	.44
4251-015	1-1/2	1-19/32	2-1/2	3/16	23/32	4	3-27/32	1/2	2-1/2	5-1/16	.61
4251-020	2	1-27/32	3	5/16	27/32	4	4-3/4	5/8	3	5-31/32	.95
4251-025	2-1/2	2-7/32	3-1/2	7/16	1-1/32	4	5-1/2	5/8	3-1/4	7	1.50

BLIND FLANGE

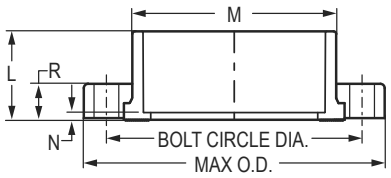
4 Bolt Holes, 175 psi



Part Number	Size	R	Bolt Circle Dia.	No. of Bolt Holes	Bolt Size	Min. Bolt Length	Max. O.D.	Approx. Wt. (Lbs.)
4253-007	3/4	17/32	2-3/4	4	1/2	2	3-27/32	.30
4253-010	1	23/32	3-1/8	4	1/2	2-1/4	4-1/4	.35
4253-012	1-1/4	21/32	3-1/2	4	1/2	2-1/4	4-5/8	.40
4253-015	1-1/2	23/32	3-27/32	4	1/2	2-1/2	5-1/16	.52
4253-020	2	27/32	4-3/4	4	5/8	3	5-31/32	.86
4253-025	2-1/2	1-1/32	5-1/2	4	5/8	3-1/4	6-15/16	1.70
4253-030	3	1-5/16	6	4	5/8	3-1/4	7-5/8	1.72

FLANGE - TWO PIECE

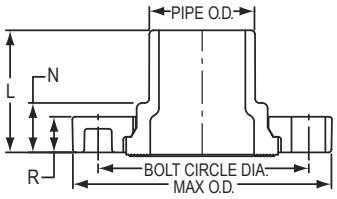
Van Stone Style, 4 Bolt Holes, 175 psi
Socket



Part Number	Size	L	M	N	R	Bolt Circle Dia.	No. of Bolt Holes	Bolt Size	Min. Bolt Length	Max. O.D.	Approx. Wt. (Lbs.)
4254-030	3	2-1/8	4-1/4	9/32	1-1/32	6	4	5/8	3-1/4	7-15/32	1.75

FLANGE - TWO PIECE

Van Stone Style, 4 Bolt Holes, 175 psi
Spigot

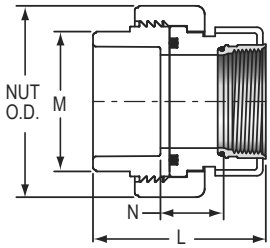


Part Number	Size	L	N	R	Bolt Circle Dia.	No. of Bolt Holes	Bolt Size	Min. Bolt Length	Max. O.D.	Approx. Wt. (Lbs.)
4256-007	3/4	1-15/16	13/16	17/32	2-3/4	4	1/2	2	3-27/32	.30
4256-010	1	2-7/32	1-1/32	11/16	3-1/8	4	1/2	2-1/4	4-1/4	.41
4256-012	1-1/4	2-3/8	1	11/16	3-1/2	4	1/2	2-1/4	4-5/8	.50
4256-015	1-1/2	2-7/16	1-3/32	23/32	3-7/8	4	1/2	2-1/2	4-31/32	.65
4256-020	2	2-3/4	1-5/32	25/32	4-3/4	4	5/8	3	5-15/16	1.00
4256-025	2-1/2	3-1/16	1-9/32	1-1/32	5-1/2	4	5/8	3-1/4	6-15/16	1.62
4256-030	3	3-3/8	1-13/32	1-1/32	6	4	5/8	3-1/4	7-9/16	1.76

TRANSITION UNION

Brass Thread Insert Style

Socket x Fipt



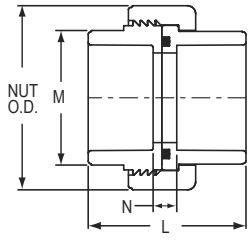
175 psi

Part Number	Size	L	M	N	Nut O.D.	Approx. Wt. (Lbs.)
4259-010BR	1	2-13/16	1-7/8	1-1/32	2-7/8	.52
4259-012BR	1-1/4	3	2-3/16	1-1/8	3-9/32	.98
4259-015BR	1-1/2	3-3/4	2-1/2	1-9/16	3-17/32	.93
4259-020BR	2	3-5/8	2-7/8	1-1/4	4-5/16	1.64

Not intended to convey or dispense water for human consumption through drinking or cooking

UNION

Socket x Socket



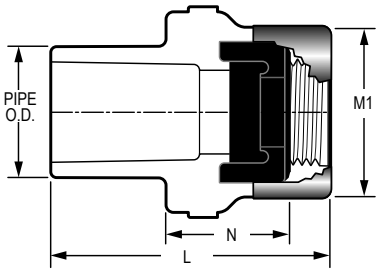
175 psi

Part Number	Size	L	M	N	Nut O.D.	Approx. Wt. (Lbs.)
4257-007	3/4	2-3/8	1-17/32	3/8	2-1/2	.38
4257-010	1	2-9/16	1-27/32	3/8	2-7/8	.41
4257-012	1-1/4	2-27/32	2-7/32	11/32	3-5/16	.52
4257-015	1-1/2	3-1/8	2-1/2	3/8	3-17/32	.63
4257-020	2	3-5/8	3-1/32	9/16	4-3/16	1.09

SofTorque™ SR FEMALE SPIGOT SPRINKLER HEAD ADAPTER

Gasket Sealed Special Reinforced Plastic Thread Style

Spigot x SR Fipt
With Elastomer Seal - Use NO Thread Sealant

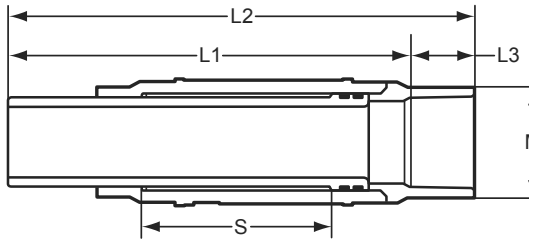


Part Number	Size	L	M1	N	Approx. Wt. (Lbs.)
4278-101GSR	3/4x1/2	2-1/4	1-3/8	1	.11

SHORT REPAIR COUPLING

Spigot x Socket

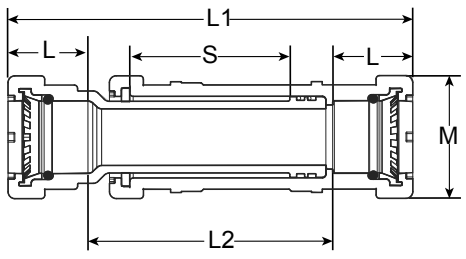
175 psi



Part Number	Size	L1	L2	L3	M	S	Approx. Wt. (Lbs.)
SH118-07CO	3/4	4-13/16	5-17/32	3/4	1-3/4	2-3/16	.31
SH118-10CO	1	4-3/4	5-5/8	31/32	2-1/16	2-5/32	.40

GripLoc™ REPAIR COUPLING – LEAD FREE

w/EPDM O-Ring Seals



175 psi Maximum
Pressure @ 150°F

WARNING: DO NOT INSERT FINGERS.

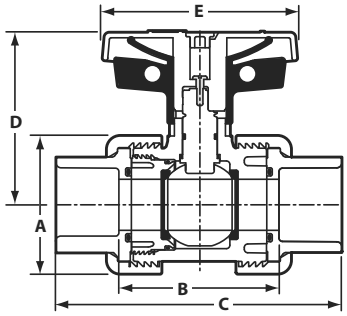
Part Number	Size	L	L1	L2	M	S	Approx. Wt. (Lbs.)
SG118-10CO	1	1-17/32	7-17/32	4-1/4	2-1/4	2-27/32	.73

FlameGuard® CPVC Drain & Swing Check Valves for NFPA 13D Applications Only

Application: FlameGuard® CPVC Orange Swing Check Valves and PVC/CPVC True Union Drain Valves are for use in configuring CPVC Fire Sprinkler System connection to water supply (riser/drain assembly) in NFPA 13D installations only. These valves are not UL Listed and NOT for use in any other locations within the fire sprinkler system.

TRUE UNION INDUSTRIAL DRAIN VALVES
CPVC Gray Valve with CPVC Orange End Connector

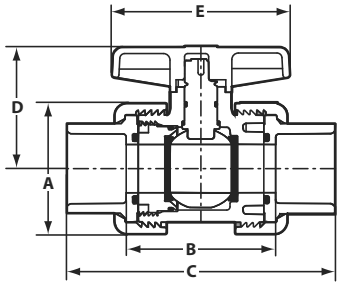
Socket x Socket



Part Number	Size	A	B	C	D	E
1822-007CFG	3/4	2-1/4	2-3/4	4-3/4	2-7/8	3-3/8
1822-010CFG	1	2-1/2	2-7/8	5-1/8	3-1/8	3-7/16
1822-012CFG	1-1/4	3-1/16	3-1/4	5-3/4	3-5/8	3-7/8
1822-015CFG	1-1/2	3-1/2	3-1/2	6-1/4	4	4-3/16
1822-020CFG	2	4-1/4	4-3/4	7-3/4	4-1/2	5-1/8
Not UL Listed						

TRUE UNION DRAIN VALVES
PVC Valve with CPVC End Connector

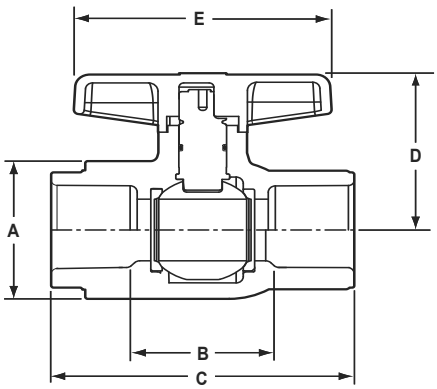
Socket x Socket



Part Number	Size	A	B	C	D	E
3622-007FG	3/4	2-1/4	2-3/4	4-3/4	2	3
3622-010FG	1	2-1/2	2-7/8	5-1/8	2-5/16	3-7/16
Not UL Listed						

COMPACT 2000 DRAIN VALVE

Socket x Socket

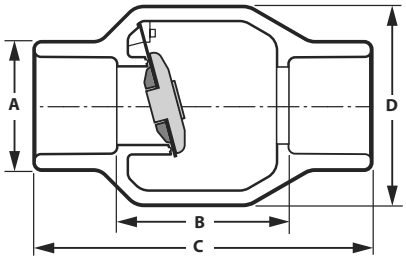


Part Number	Size	A	B	C	D	E
6622-007CO	3/4	1-13/16	1-1/2	3-9/16	2	3
6622-010CO	1	2-1/16	1-3/4	4	2-5/16	3-7/16

Not UL Listed

CPVC SWING CHECK VALVES

Socket x Socket

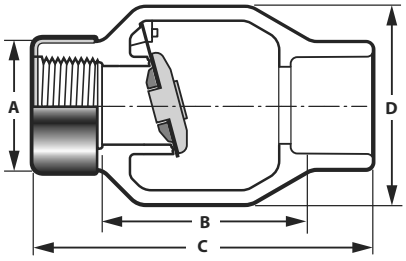


Part Number	Size	A	B	C	D	Approx. Wt. (Lbs)
S1520-10CO	1	1-11/16	2-5/16	4-9/16	2-5/8	.33
S1520-12CO	1-1/4	2-1/16	2-15/16	5-1/2	3-3/8	.42
S1520-15CO	1-1/2	2-7/16	3	5-5/8	3-3/8	.89

Not UL Listed

CPVC SPECIAL REINFORCED THREAD INLET SWING CHECK VALVES

SR Fipt x Socket



Part Number	Size	A	B	C	D	Approx. Wt. (Lbs)
S1520-10FSRSCO	1	1-11/16	2-15/16	4-9/16	2-5/8	.33
S1520-12FSRSCO	1-1/4	2-1/16	3-5/8	5-1/2	3-3/8	.42
S1520-15FSRSCO	1-1/2	2-7/16	3-11/16	5-5/8	3-3/8	.89

Not UL Listed

NOTES

NOTES

PRODUCT LIMITED LIFETIME WARRANTY

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SPEARS® MANUFACTURING COMPANY
Corporate Office
15853 Olden Street • Sylmar, CA 91342
PO Box 9203 • Sylmar, CA 91392
(818) 364-1611 • http://www.spearsmfg.com

FG-4-1115

Model RM-1 Riser Manifold Commercial and Residential

General Description

The TYCO commercial and residential Model RM-1 Riser Manifold provide the necessary waterflow alarm, pressure gauge, alarm test orifice, drain, and sight glass equipment in a single assembly for use in NFPA 13 commercial sprinkler systems and in NFPA 13D/13R residential sprinkler systems as follows:

NFPA 13*
- 1-1/2 in. (DN40) Male Thread x Female Thread
- 2 in.–6 in. (DN50–DN150) Groove x Groove

NFPA 13D
- 1 in. (DN25) Female Thread x Female Thread

NFPA 13R
- 1-1/2 in. (DN40) Male Thread x Female Thread
- 2 in. (DN50) Groove x Groove

* Although the Riser Manifold described in this technical data sheet is intended for NFPA 13 sprinkler systems, it may be used for NFPA 13D or 13R residential sprinkler systems, where a test orifice of 2.8K or 4.2K is acceptable.

The variety of sizes and grooved end connections allow cost effective and easy transition to check valves, control valves, and system piping. The Model RM-1 Riser Manifolds may be installed either horizontally (flow switch on top) or vertically (flow going up) orientation, for both single sprinkler rises and floor control in high-rises.

Optional Pressure Relief Kits feature a 175 psi pressure relief valve and trim components for convenient integration into commercial and residential riser manifold assemblies.

The pressure relief valve, installed in manifold assemblies above the normally closed test and drain or drain valve, automatically bleeds system pressure exceeding 175 psi through a flexible hose connected to the manifold drain outlet (Ref. Figure 5), reducing system pressure to 175 psi.

NOTICE

The Model RM-1 Riser Manifolds 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.

Technical Data

Approvals
UL and ULC Listed
FM Approved
Listed by California State Fire Marshall

Maximum Working Pressure
300 psi (20,7 bar)

Test Orifice
1 in.–3 in. (DN25–DN80) Manifolds: 2.8K
4 in.–6 in. (DN100–DN150) Manifolds: 4.2K

Finish
Red Painted

IMPORTANT
Refer to Technical Data Sheet TFP2300 for warnings pertaining to regulatory and health information.

Nominal Riser Size Inches (DN)	End Connections		Nominal Dimensions Inches (mm)							Nominal Drain Size Inches (DN)
	Inlet	Outlet	A	B	C	D	E	F	G	H
1-1/2 (40)	Thread MNPT	Thread FNPT	10 (254)	15-1/2 (394)	2-1/4 (57)	5-5/8 (143)	8-3/8 (213)	15 (381)	4-3/8 (111)	1-1/4 (32)
2 (50)	Groove	Groove	13 (330)	18 (457)	2-1/16 (53)	5-5/8 (143)	8-3/8 (213)	15-1/4 (388)	4-3/8 (111)	1-1/4 (32)
2-1/2 (65)	Groove	Groove	13 (330)	18-1/16 (460)	2-1/16 (53)	5-5/8 (143)	8-3/8 (213)	15-1/4 (388)	4-3/8 (111)	1-1/4 (32)
3 (80)	Groove	Groove	13 (330)	18-1/16 (460)	2-1/16 (53)	5-7/8 (150)	8-5/8 (219)	15-3/4 (400)	4-3/8 (111)	1-1/4 (32)
4 (100)	Groove	Groove	13 (330)	20-1/4 (514)	4-1/4 (108)	6-3/4 (172)	10-3/4 (273)	18-3/8 (467)	5-3/16 (132)	2 (50)
6 (150)	Groove	Groove	13 (330)	20-1/4 (514)	4-1/4 (108)	7-3/4 (197)	11-3/4 (300)	21 (533)	6-3/4 (172)	2 (50)

NO	DESCRIPTION	P/N
1	300 psi/2000 kPa Water Pressure Gauge	90050001
2	Test and Drain Valve, Model TD-1:	
	1-1/2–3 Inch (DN40–DN80) Size Manifolds, 1-1/4", 2.8K Orifice	A61G0420
	4–6 Inch (DN100–DN150) Size Manifolds, 2", 4.2K Orifice	A61G0601
3	Flow Switch, VSR-M:	
	1-1/2" (DN40)	91144815
	2" (DN50)	91144802
	2-1/2" (DN65)	91144825
	3" (DN80)	91144803
	4" (DN100)	91144804
	6" (DN150)	91144806
4	Field Replaceable Retard/Switch	91144800

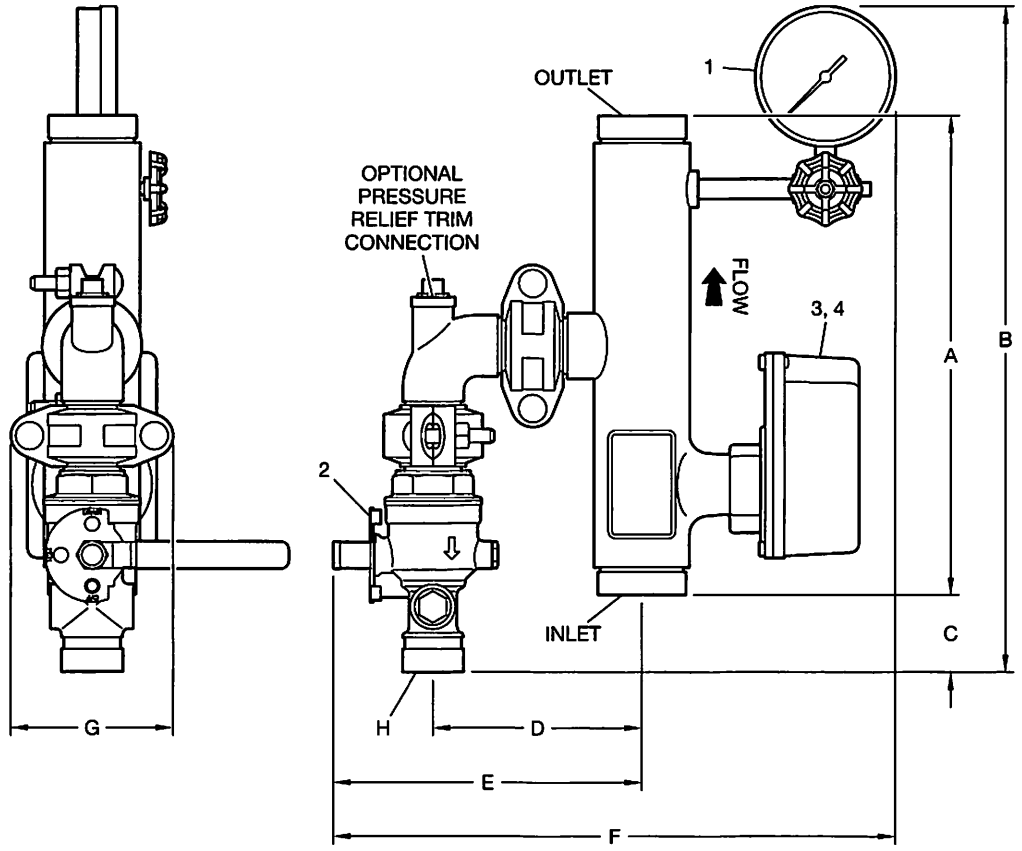
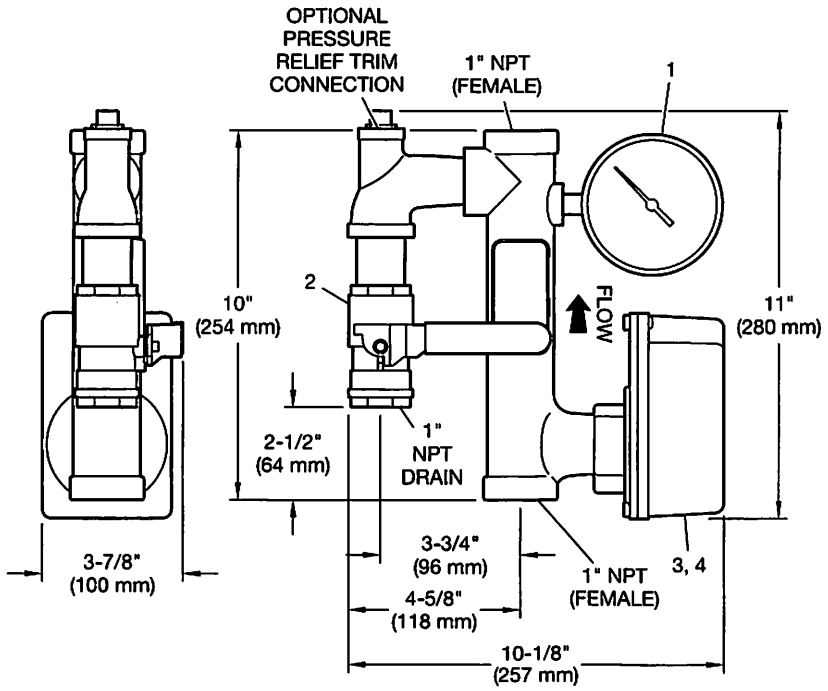
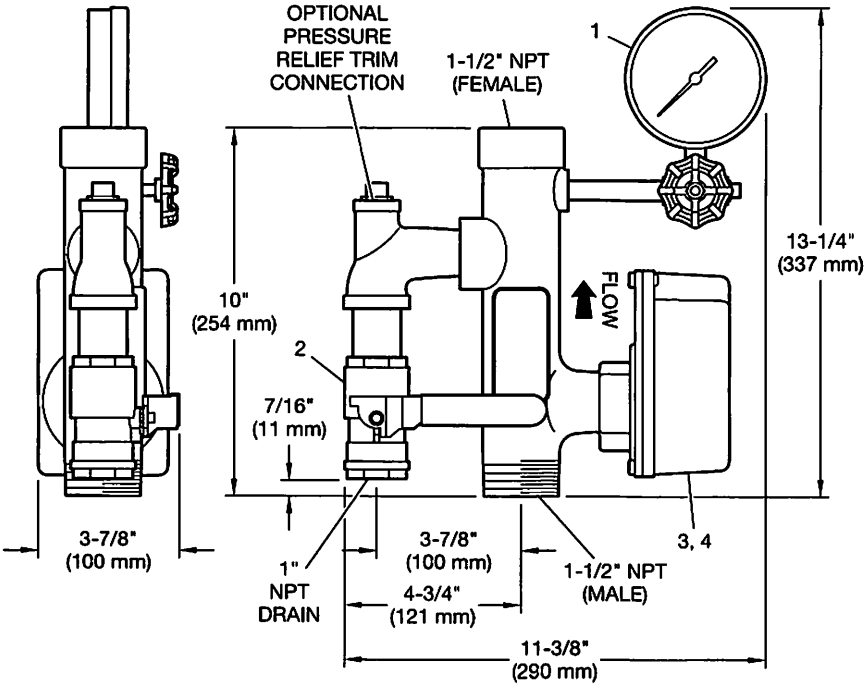


FIGURE 1
MODEL RM-1 COMMERCIAL RISER MANIFOLDS
1-1/2–6 INCH (DN40–DN150)



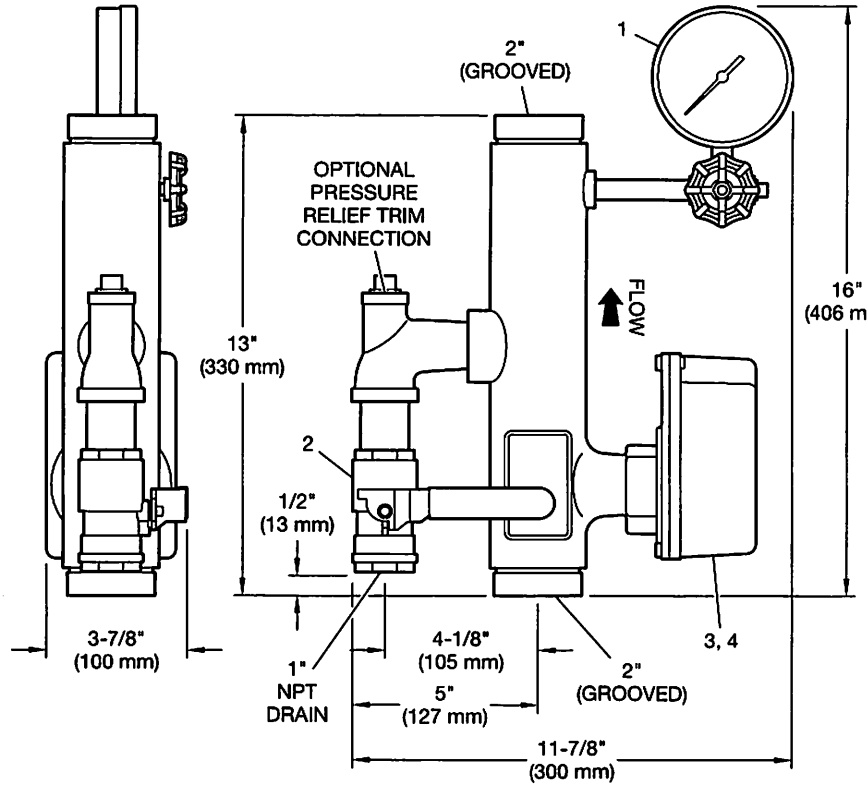
NO	DESCRIPTION	P/N
1	300 psi/2000 kPa Water Pressure Gauge	90050001
2	Ball Valve, 1" (DN25)	97111603
3	Flow Switch, VSR-M, 1" (DN25)	91144801
4	Field Replaceable Retard/Switch	91144800

FIGURE 2
MODEL RM-1 RESIDENTIAL RISER MANIFOLD
1 INCH (DN25)



NO	DESCRIPTION	P/N
1	300 psi/2000 kPa Water Pressure Gauge	90050001
2	Ball Valve, 1" (DN25)	97111603
3	Flow Switch, VSR-M, 1-1/2" (DN40)	91144815
4	Field Replaceable Retard/Switch	91144800

FIGURE 3
MODEL RM-1 RESIDENTIAL RISER MANIFOLD
1-1/2 INCH (DN40)



NO	DESCRIPTION	P/N
1	300 psi/2000 kPa Water Pressure Gauge	90050001
2	Ball Valve, 1" (DN25)	97111603
3	Flow Switch, VSR-M, 2" (DN50)	91144802
4	Field Replaceable Retard/Switch	91144800

FIGURE 4
MODEL RM-1 RESIDENTIAL RISER MANIFOLD
2 INCH (DN50)

Manifold Installation

TYCO Model RM-1 Riser Manifold must be installed in accordance with this section.

The Model RM-1 Riser Manifold may be installed either horizontally (flow switch on top) or vertically (flow going up). The inlet of the Riser Manifold may be connected directly to a shut-off control valve.

Notes:

Where applicable pipe thread sealant is to be applied sparingly. Use of a non-hardening pipe thread sealant is recommended.

Never remove any piping component nor correct or modify any piping deficiencies without first depressurizing and draining the system.

Provisions for an alarm test flow on Residential Models must be made. The alarm test flow is to be through an orifice having a flow capacity equal to or smaller than the smallest orifice sprinkler in the system. One of two options can be considered. The first option is to temporarily install a test orifice in the outlet of the drain line prior to performing the alarm test. The second option is to install an Inspector's Test Connection downstream of the Waterflow Alarm Switch.

Step 1. Install the manifold body with the flow arrow pointing in the downstream position using threaded connections and/or listed mechanical grooved connections, as applicable.

Step 2. Connect the drain line and on commercial manifolds set the Model TD-1 Test and Drain Valve to the OFF position or on residential manifolds close the drain valve.

Step 3. Refer to Figure 6 for wiring guidance. All wiring must be performed in accordance with the authority having jurisdiction and/or the National Electrical Code.

Step 4. Refer to Figure 5 for Optional Pressure Relief Trim installation.

Step 5. Place the system in service by filling the system with water. When filling the system, partially open the control valve to slowly fill the system. Filling the system slowly will help avoid damaging the waterflow alarm switch.

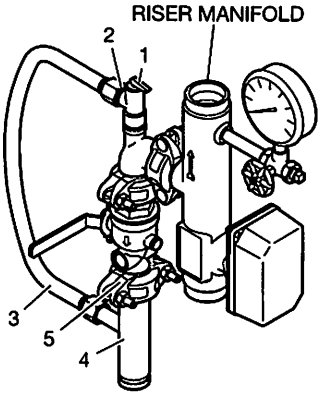
After the system is fully pressurized, completely open the control valve.

Step 6. Secure all supply valves open.

Commercial Riser Manifolds

NO	DESCRIPTION	P/N
1	Pressure Relief Valve, 175 psi, 1/2" NPT	1001184-01
2	1/2" x Close Nipple	1001023-01
3	Flexible Hose: 1-1/2–3 Inch (DN40–DN80) Size Manifolds, 1/2" x 24"	1001266-02
	4–6 Inch (DN100–DN150) Size Manifolds, 1/2" x 30"	1001266-01
4	Figure 323 Reducing Tee, Grooved x NPT Threaded: 1-1/2–3 Inch (DN40–DN80) Size Manifolds, 1-1/4" x 1-1/4" x 1/2"	3231305GS
	4–6 Inch (DN100–DN150) Size Manifolds, 2" x 2" x 1/2"	3232005GS
5	Figure 577 Rigid Grooved Coupling: 1-1/2–3 Inch (DN40–DN80) Size Manifolds, 1-1/4"	57713AGCP
	4–6 Inch (DN100–DN150) Size Manifolds, 2"	57720AGCP

MODEL RM-1
COMMERCIAL
RISER MANIFOLD



Residential Riser Manifolds

NO	DESCRIPTION	P/N
1	Pressure Relief Valve, 175 psi, 1/2" NPT	1001184-01
2	1/2" x Close Nipple, Qty 2	1001023-01
3	Flexible Hose, 1/2" x 16"	1001266-03
4	Figure 815 Threaded Reducing Tee, 1" x 1" x 1/2" NPT	1001259-07
5	1" x Close Nipple	1001025-01

MODEL RM-1
RESIDENTIAL
RISER MANIFOLD

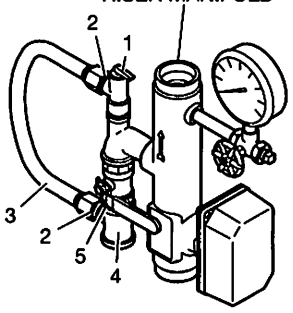


FIGURE 5
MODEL RM-1 COMMERCIAL AND RESIDENTIAL RISER MANIFOLDS
OPTIONAL PRESSURE RELIEF TRIM INSTALLATION

Optional Pressure Relief Trim Installation

Model RM-1 commercial and residential riser manifold assemblies are designed to accommodate an optional pressure relief valve and trim components (Ref. Figure 5).

Optional pressure relief trim must be installed in accordance with the following procedures.

Notes:

For assembly in Riser Manifolds installed and in service, verify the fire protection system is de-pressurized and drained. Close the system supply control valve, set commercial manifold test and drain valve to DRAIN or open residential drain valve to relieve residual pressure and drain system. Make certain that drainage water will not cause any damage or injury.

Refer to Care and Maintenance section for other requirements when closing a fire protection system control valve and placing system in service.

Apply thread sealant or TEFLON tape on all threaded connections, with the exception of internally sealed flexible hose connections.

Commercial Manifolds

Refer to Figure 1 for commercial riser manifold features and Figure 5 for pressure relief trim components described in this procedure.

Step 1. Remove 1/2 in. pipe plug from manifold tee. Inspect exposed female tee threads, remove thread sealant remnants or debris as necessary.

Step 2. Install Pressure Relief Valve (1) in manifold tee, orienting valve outlet port perpendicular to and facing away from manifold body.

Step 3. Install 1/2 in. x Close Nipple (2) in pressure relief valve outlet port.

Step 4. Disconnect drain piping from grooved outlet of manifold TD-1 test and drain valve as applicable and install Figure 323 Grooved Reducing Tee (4) on valve outlet by securing with Figure 577 Grooved Coupling (5), aligning tee threaded branch outlet parallel with pressure relief valve outlet port. Reconnect drain piping to Figure 323 tee drain outlet as necessary.

Note: *Refer to Technical Data Sheet G901 for Figure 577 Grooved Coupling installation and assembly instructions.*

Step 5. Install Flexible Hose (3) by threading female ends onto 1/2 in. x close nipple installed on relief valve outlet port and onto Figure 323 reducing tee branch outlet.

Note: *Assure Flexible Hose is not susceptible to being caught or snagged by other moving equipment.*

Residential Manifolds

Refer to Figures 2, 3 or 4 for residential riser manifold features and Figure 5 for pressure relief trim components described in this procedure.

Step 1. Remove 1/2 in. pipe plug from manifold tee. Inspect exposed female tee threads, remove thread sealant remnants or debris as necessary.

Step 2. Install Pressure Relief Valve (1) in manifold tee, orienting valve outlet port perpendicular to and facing away from manifold body.

Step 3. Disconnect drain piping from threaded outlet of manifold drain valve as applicable and install 1 in. x Close Nipple (5) in valve outlet.

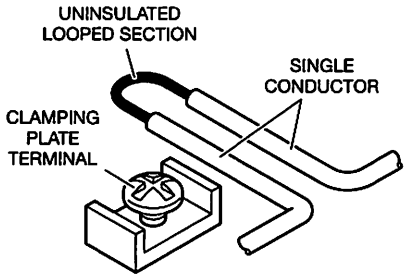
Step 4. Install Figure 815 Reducing Tee (4) onto 1 inch x close nipple, aligning tee branch outlet parallel with pressure relief valve outlet port. Reconnect drain piping to Figure 815 tee drain outlet as necessary.

Step 5. Install 1/2 in. x Close Nipples (2) in pressure relief valve outlet port and in Figure 815 reducing tee branch outlet.

Step 6. Install Flexible Hose (3) by threading female ends onto 1/2 in. x close nipples installed on relief valve outlet port and Figure 815 reducing tee branch outlet.

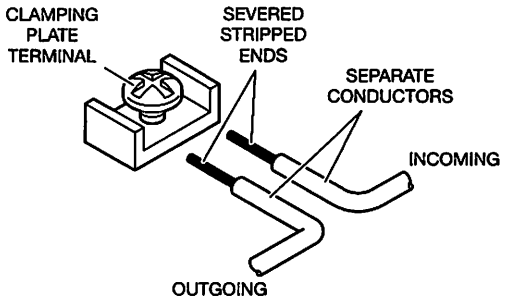
Note: *Assure Flexible Hose is not susceptible to being caught or snagged by other moving equipment.*

SWITCH TERMINAL CONNECTIONS

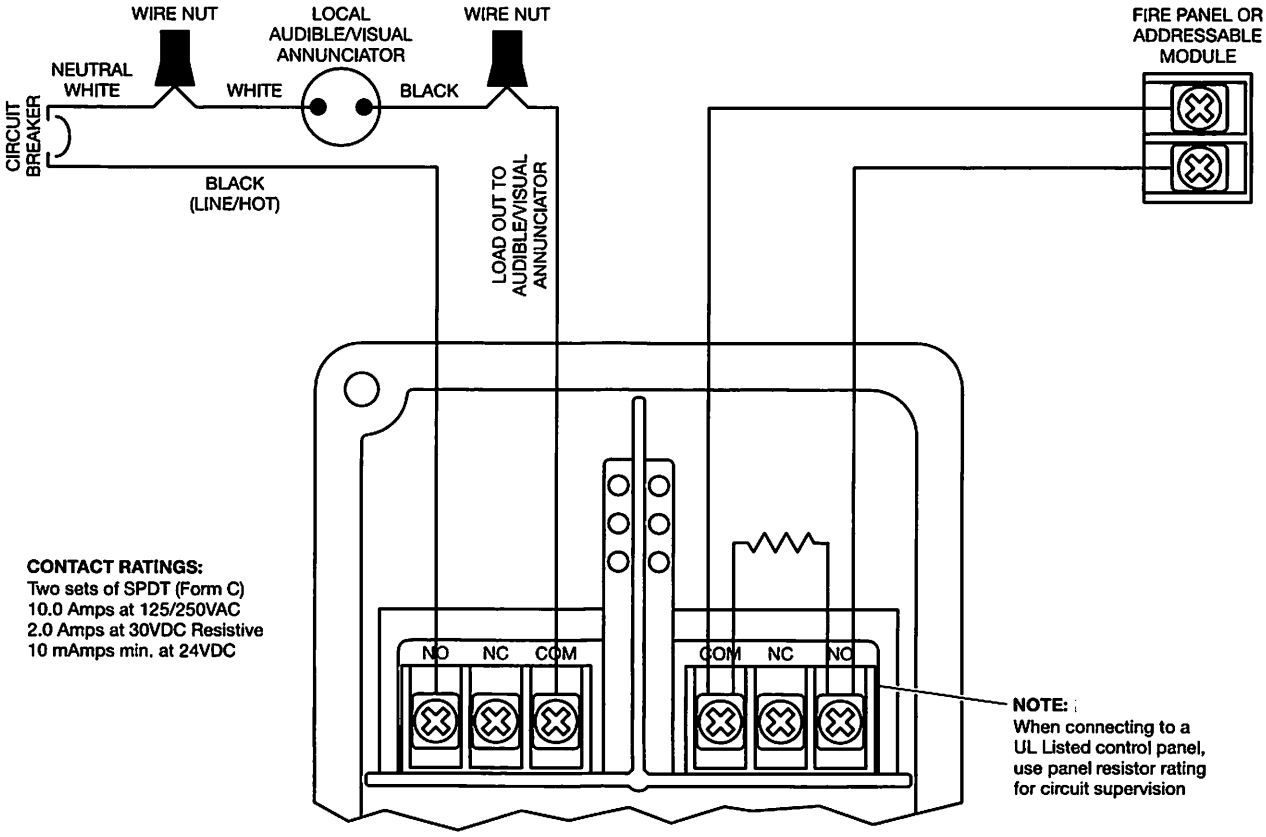


IMPROPER CONNECTION METHOD

CAUTION:
An uninsulated section of a single conductor is not permitted to be looped around the terminal and serve as two separate connections. The wire must be severed to serve as two separate connections, thereby providing supervision of the connection in the event that the wire becomes dislodged from the terminal.



PROPER CONNECTION METHOD



CONTACT RATINGS:
Two sets of SPDT (Form C)
10.0 Amps at 125/250VAC
2.0 Amps at 30VDC Resistive
10 mAmps min. at 24VDC

NOTE:
When connecting to a UL Listed control panel, use panel resistor rating for circuit supervision

NOTE:
For supervised circuits, see "Switch Terminal Connections" above. The Waterflow Alarm Switch has two switches, one can be used to operate a central station, proprietary or remote signaling unit, while the other contact is used to operate a local audible or visual annunciator.

FIGURE 6
MODEL RM-1 COMMERCIAL AND RESIDENTIAL RISER MANIFOLD WIRING GUIDANCE

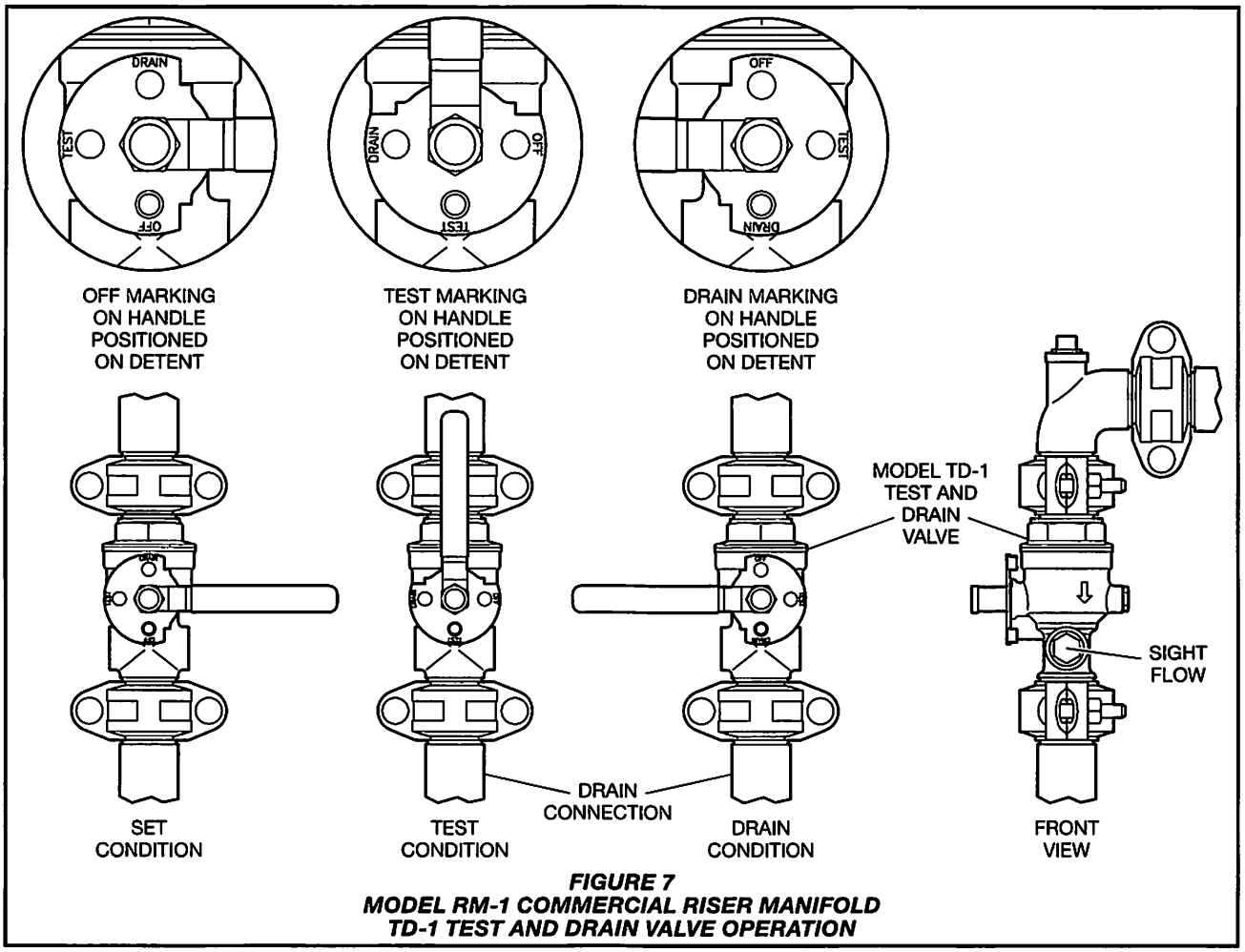


FIGURE 7
MODEL RM-1 COMMERCIAL RISER MANIFOLD
TD-1 TEST AND DRAIN VALVE OPERATION

Care and Maintenance

TYCO Riser Manifolds RM-1 must be serviced and maintained in accordance with this section.

Before closing a fire protection system control valve for inspection or maintenance work on the fire protection system that it controls, permission to shut down the effected fire protection system must first be obtained from the proper authorities and all personnel who may be affected by this action must be notified.

After placing a fire protection system in service, notify the proper authorities and advise those responsible for monitoring proprietary and/or central station alarms.

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 authority having jurisdiction. Contact the installing contractor or product manufacturer with any questions.

It is recommended that automatic sprinkler systems be inspected, tested, and maintained by a qualified Inspection Service in accordance with local requirements and/or national codes.

Note: *No attempt is to be made to repair any Riser Manifold component in the field. Only the pressure gauge, waterflow alarm switch, or relief valve can be replaced. If any other problems are encountered the entire riser manifold must be replaced.*

The alarm/flow test procedure will result in operation of the associated alarms. Consequently, notification must be given to the owner and the fire department, central station, or other signal station to which the alarms are connected, and notification must be given to the building occupants.

The following inspection procedure must be performed as indicated, in addition to any specific requirements of the NFPA, and any impairment must be immediately corrected:

Alarm/Flow Test Procedure

Step 1. Place the Model TD-1 Test and Drain Valve in the TEST position (Ref. Figure 7). On residential assemblies without a test orifice, temporarily install a test orifice in the drain outlet and fully open the Drain Valve. Make certain that drainage water will not cause any damage or injury.

Step 2. Verify operation of associated alarms.

Step 3. Verify that the residual (i.e., flowing) pressure indicated by the pressure gauge is no less that originally recorded for the system when it was first installed.

Step 4. Close the Drain Valve on the Residential models and the Test and Drain valve on commercial models.

Step 5. Verify that the static (i.e., not flowing) pressure indicated by the pressure gauge is no less that originally recorded for the system when it was first installed.

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).

Riser Manifolds
Specify: Size (specify) Connection Type (specify inlet x outlet) Model RM-1 Riser Manifold, P/N (specify):

Commercial
1-1/2 in. (DN40) MT x FT 40551
2 in. (DN50) G x G 40601
2-1/2 in. (DN65) G x G 40611
3 in. (DN80) G x G 40621
4 in. (DN100) G x G 40651
6 in. (DN150) G x G..... 40661

Residential
1 in. (DN25) FT x FT..... 40671
1-1/2 in. (DN40) MT x FT 40571
2 in. (DN50) G x G 40591

Optional 175 psi Pressure Relief Kit
Specify: Pressure Relief Kit, Model RM-1 Riser Manifold, (specify Commercial or Residential application), (specify size range), P/N (specify):

Commercial
1-1/2 in. – 3 in. (DN40–DN80) 40721
4 in. –6 in. (DN100–DN150) 40731

Residential
1 in.–2 in. (DN25–DN50) 40711

Replacement Parts
Specify: Model RM-1 Riser Manifold (specify part description), P/N (specify from Figures 1, 2, 3, 4 or 5)

1400 Pennbrook Parkway, Lansdale, PA 19446 | Telephone +1-215-362-0700

Johnson Controls

Vic-Check® Valves

SERIES 716H/716

The Series 716H/716 check valves are a product of computer-assisted innovative engineering with quality features including a new hydrodynamically efficient profile. The Vic-Check® valve utilizes a spring-assisted, single-disc design that achieves a leak-free seal with as little as 5ft./1.5m of head pressure. The valve can be installed in both horizontal and vertical positions.

Series 716H/716 check valves are engineered for long life and seize-free sealing. For the Series 716H, in 2-3"/50-80mm sizes, the stainless steel disc seats against the o-ring seal which is mounted on the electroless nickel plated end face. The Series 716, in 4-12"/100-300 mm sizes, feature an elastomer encapsulated disc and a welded in nickel seat. 2-3"/50-80 size check valves are rated to 365 psi/2500 kPa and 4-12"/100-300 mm sizes check valves are rated to 300 psi/2065 kPa. All sizes are factory tested to the rated working pressure. Drains can be optionally provided both upstream and downstream of the disc.

Grooved ends allow fast, easy installation with just two Victaulic couplings. The valve may also be connected to flanged (ANSI Class 150) components using Style 741 Vic-Flange adapters on either end.

SERIES 716H
SIZES 2 – 3"/50 – 80 MM

SERIES 716
SIZES 4 – 12"/100 – 300 MM

JOB OWNER

System No. _____

Location _____

CONTRACTOR

Submitted By _____

Date _____

ENGINEER

Spec Sect _____ Para _____

Approved _____

Date _____

www.victaulic.com

REV_F

Vic-Check® Valves

SERIES 716H/716

SERIES 716H
SIZES 2 – 3"/50 – 80 MM

SERIES 716
SIZES 4 – 12"/100 – 300 MM

MATERIAL SPECIFICATIONS

Body: Ductile iron conforming to ASTM A-536, grade 65-45-12. Ductile iron conforming to ASTM A-395, grade 65-45-15, is available upon special request.

Body Seat: Sizes 2 – 3"/50 – 80mm machined surfaces electroless nickel plated. 4 – 12"/100 – 300mm integrally welded-on nickel alloy.

Disc Coating O-rings: (Specify Choice)

- **Grade "E" EPDM**
  EPDM (Green color code). Temperature range –30°F to +230°F/–34°C to +110°C. Recommended for hot water service within the specified temperature range plus a variety of dilute acids, oil-free air and many chemical services. UL classified in accordance with ANSI/NSF 61 for for cold +86°F/+30°C and hot +180°F/+82°C potable water service. NOT RECOMMENDED FOR PETROLEUM SERVICES.

- **Grade "T" nitrile**
  Nitrile (Orange color code). Temperature range –20°F to +180°F/–29°C to +82°C. Recommended for petroleum products, air with oil vapors, vegetable and mineral oils within the specified temperature range; except hot, dry air over +140°F/+60°C and water over +150°F/+66°C. NOT RECOMMENDED FOR HOT WATER SERVICES.

- **Grade "O" fluoroelastomer**
  Fluoroelastomer (Blue color code). Temperature range +20°F to +300°F/–7°C to +149°C. Recommended for many oxidizing acids, petroleum oils, halogenated hydrocarbons, lubricants, hydraulic fluids, organic liquids and air with hydrocarbons to +300°F/+149°C.

* Services listed are General Service Recommendations only. It should be noted that there are services for which these disc liners are not recommended. Reference should always be made to the latest Victaulic Gasket Selection Guide for specific liner service recommendations and for a listing of services which are not recommended.

Discs: 2-3"/50-80 mm the stainless steel disc seats against the o-ring seal which is mounted on the electroless nickel plated end face; 4-12"/100-300 mm feature an elastomer encapsulated disc and a welded in nickel seat.

Shaft: 2 - 3"/50 – 80mm Brass. 4 – 12"/100 – 300mm Type 316 stainless steel.

Spring: All sizes Type 302/304 stainless steel.

Shaft Plug: 2 – 3"/50 – 80mm only; Type 416 stainless steel.

Pipe Plug: 4 – 12"/100 – 300mm only; carbon steel zinc plated to ASTM B-633.

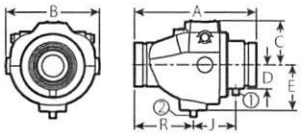
Vic-Check® Valves

SERIES 716H/716

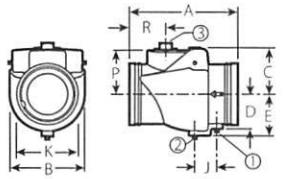
SERIES 716H
SIZES 2 – 3"/50 – 80 MM

SERIES 716
SIZES 4 – 12"/100 – 300 MM

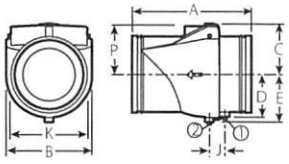
DIMENSIONS



① ½" NPT Upstream Drain (Optional)
② ½" NPT Downstream Drain (Optional)
SERIES 716H
TYPICAL 2 – 3"/50-80 MM



① ½" NPT Upstream Drain (Optional)
② ½" NPT Downstream Drain (Optional)
③ 2" NPT (Drain Optional)
SERIES 716
TYPICAL 4 – 8"/100-200 MM



① ½" NPT Upstream Drain (Optional)
② ½" NPT Downstream Drain (Optional)
SERIES 716
TYPICAL 10 – 12"/250-300 MM

Size		Dimensions – Inches/mm									Approx. Wgt. Each
Nominal Size Inches/ mm	Actual Outside Diameter Inches/ mm	E-E A	Overall Width B	C	D	E	J	K	P	R	Lbs. kg
2 50	2.375 50.8	8.66 220	6.46 164	3.23 82	1.48 38	3.02 77	2.80 71	–	–	4.25 108.0	10.7 4.9
2½ 65	2.875 73.0	9.37 238	6.94 176	3.31 84	1.66 42	3.40 86	3.38 86	–	–	4.38 111.3	3.6 1.6
76.1 mm	3.000 76.1	9.37 238	6.94 176	3.31 84	1.66 42	3.40 86	3.38 86	–	–	4.38 111.3	3.6 1.6
3 80	3.500 88.9	9.62 244	7.44 189	3.53 90	1.91 49	3.65 93	3.38 86	–	–	4.63 117.6	4.5 2.0
4 100	4.500 114.3	9.63 245	6.00 152	3.90 99	2.75 70	3.50 89	2.00 51	4.50 114	3.50 89	3.35 85	16.0 7.3
139.7 mm	5.500 139.7	10.50 267	6.80 173	4.50 114	4.17 106	4.17 106	2.15 55	5.88 149	4.08 104	4.02 102	27.0 12.3
5 125	5.563 141.3	10.50 267	6.80 173	4.50 114	4.17 106	4.17 106	2.15 55	5.88 149	4.08 104	4.02 102	20.0 9.1
6 150	6.625 168.3	11.50 292	8.00 203	5.00 127	4.50 114	4.50 114	2.38 61	6.67 169	4.73 120	3.89 99	28.0 12.7
165.1 mm	6.500 165.1	11.50 292	8.00 203	5.00 127	4.50 114	4.50 114	2.38 61	6.67 169	4.73 120	3.89 99	28.0 12.7
8 200	8.625 219.1	14.00 356	9.88 251	6.10 155	5.05 128	5.65 144	2.15 55	8.75 222	5.70 145	5.75 146	40.0 18.1
10 250	10.750 273.0	17.00 432	12.00 305	7.10 180	5.96 151	6.69 170	2.15 55	10.92 277	6.93 176	–	100.0 45.4
12 300	12.750 323.9	19.50 495	14.00 356	8.10 206	6.91 176	7.64 194	2.51 64	12.81 325	7.93 201	–	140.0 63.5

Vic-Check® Valves

SERIES 716H/716

SERIES 716H
SIZES 2 – 3"/50 – 80 MM

SERIES 716
SIZES 4 – 12"/100 – 300 MM

PERFORMANCE

Vic-Check valves combine high pressure capabilities with low pressure drop performance. The grooved end design permits fast, easy installation. The seat provides leak-free sealing under conditions as low as five feet of head. C_v/K_v values for flow of water at +60°F/+16°C with a fully open valve are shown in the table at right.

Formulas for C_v/K_v values:

$$\Delta P = \frac{Q^2}{C_v^2}$$

$$Q = C_v \times \sqrt{\Delta P}$$

Where:
Q = Flow (GPM)
ΔP = Pressure Drop (psi)
C_v = Flow Coefficient

$$\Delta P = \frac{Q^2}{K_v}$$

$$Q = K_v \times \sqrt{\Delta P}$$

Where:
Q = Flow (m^3/h)
ΔP = Pressure Drop (bar)
K_v = Flow Coefficient

Valve Size		C_v/K_v	Valve Size		C_v/K_v	Valve Size		C_v/K_v
Nominal Size Inches/ mm	Actual Outside Diameter Inches/ mm	(Full Open)	Nominal Size Inches/ mm	Actual Outside Diameter Inches/ mm	(Full Open)	Nominal Size Inches/ mm	Actual Outside Diameter Inches/ mm	(Full Open)
2 50	2.375 50.3	160 138	4 100	4.500 114.3	390 337	6 150	6.625 168.3	1000 865
2½ 65	2.875 73.0	215 186	139.7 mm	5.500 139.7	700 606	8 § 200	8.625 219.1	1800 1557
76.1 mm	3.000 76.1	215 186	5 125	5.563 141.3	700 606	10 § 250	10.750 273.0	3000 2595
3 80	3.500 88.9	315 273	165.1 mm	6.500 165.1	1000 865	12 § 300	12.750 323.9	4200 3633

Vic-Check® Valves

SERIES 716H/716

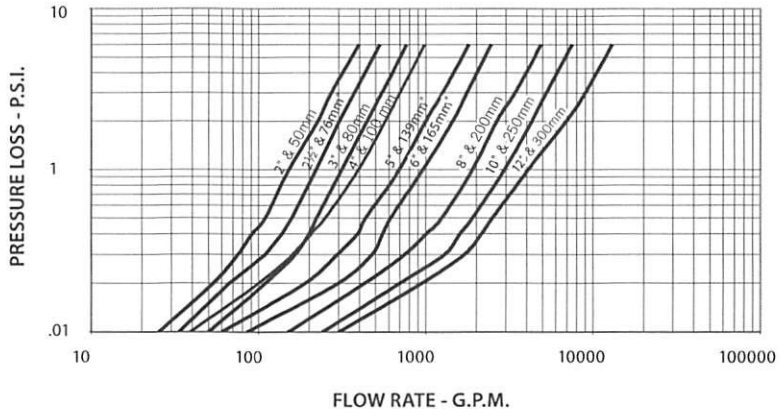
SERIES 716H
SIZES 2 – 3"/50 – 80 MM

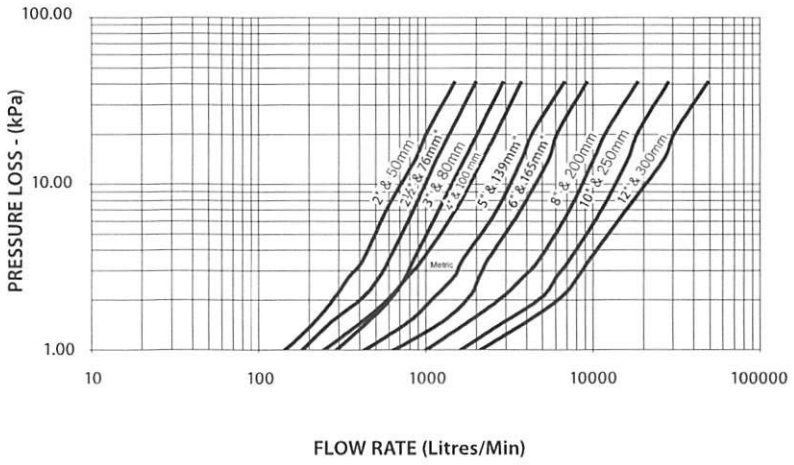
SERIES 716
SIZES 4 – 12"/100 – 300 MM

FLOW CHARACTERISTICS

NOTE: Placement of check valves too close to sources of unstable flow will shorten the life of the valve and potentially may damage the system. To extend valve life, valves should be installed a reasonable distance downstream from pumps, elbows, expanders, reducers or other similar devices. Sound piping practices dictate a minimum of five (5) times the pipe diameter for general use. Distances between three (3) and five (5) diameters are allowable provided the flow velocity is less than eight (8) feet per second (2.4 meters per second). Distances less than three (3) diameters are not recommended and will violate the Victaulic product warranty.

The chart below expresses the flow of water at 60°F/16°C through valve.





Vic-Check® Valves

SERIES 716H/716

SERIES 716H
SIZES 2 – 3"/50 – 80 MM

SERIES 716
SIZES 4 – 12"/100 – 300 MM

WARRANTY

Refer to the Warranty section of the current Price List or contact Victaulic for details.

NOTE

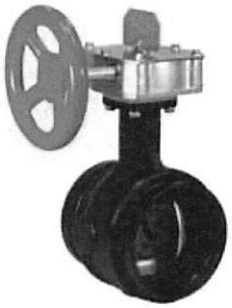
This product shall be manufactured by Victaulic or to Victaulic specifications. All products to be installed in accordance with current Victaulic installation/assembly instructions. Victaulic reserves the right to change product specifications, designs and standard equipment without notice and without incurring obligations.

UPDATED 8/2009
08.08 1473 REV F

FireLock® Butterfly Valve

SERIES 705
WITH WEATHERPROOF ACTUATOR

The Series 705 Butterfly Valve features a weatherproof actuator housing Approved for indoor or outdoor use, a ductile iron body and disc with Nitrile seats. Designed for fire protection services only. Victaulic FireLock Series 705 Butterfly Valve is cULus Listed, LPCB Listed, FM and VdS Approved for 300 psi/2068 kPa service. Contact Victaulic for details of agency approvals.



APPROVALS AND LISTINGS

	Approval/Listing Service Pressures Series 705 Butterfly Valve			
	cULus	FM	VdS	LPCB
2"/50mm	up to 300psi/2068kPa	n/a	up to 300psi/2068kPa	up to 300psi/2068kPa
2 1/2"/65mm	up to 300psi/2068kPa	up to 300psi/2068kPa	n/a	up to 300psi/2068kPa
76.1mm	up to 300psi/2068kPa	up to 300psi/2068kPa	up to 300psi/2068kPa	up to 300psi/2068kPa
3"/80mm	up to 300psi/2068kPa	up to 300psi/2068kPa	up to 300psi/2068kPa	up to 300psi/2068kPa
4"/100mm	up to 300psi/2068kPa	up to 300psi/2068kPa	up to 300psi/2068kPa	up to 300psi/2068kPa
5"/125mm	up to 300psi/2068kPa	up to 300psi/2068kPa	n/a	up to 300psi/2068kPa
139.7mm	up to 300psi/2068kPa	up to 300psi/2068kPa	up to 300psi/2068kPa	up to 300psi/2068kPa
6"/150mm	up to 300psi/2068kPa	up to 300psi/2068kPa	up to 300psi/2068kPa	up to 300psi/2068kPa
165.1mm	up to 300psi/2068kPa	up to 300psi/2068kPa	n/a	up to 300psi/2068kPa
8"/200mm	up to 300psi/2068kPa	up to 300psi/2068kPa	up to 300psi/2068kPa	up to 300psi/2068kPa
10"/250mm	up to 300psi/2068kPa	up to 300psi/2068kPa	n/a	up to 300psi/2068kPa
12"/300mm	up to 300psi/2068kPa	up to 300psi/2068kPa	n/a	up to 300psi/2068kPa

JOB/OWNER
System No. _____
Location _____

CONTRACTOR
Submitted By _____
Date _____

ENGINEER
Spec Sect _____ Para _____
Approved _____
Date _____

www.victaulic.com

FireLock® Butterfly Valve

SERIES 705
WITH WEATHERPROOF ACTUATOR

MATERIAL SPECIFICATIONS

Body: Ductile iron conforming to ASTM A-536, grade 65-45-12

End Face, 2 – 6"/50 – 150 mm: Ductile iron conforming to ASTM A-536, grade 65-45-12

Seal Retainer, 8 – 12"/200 – 300 mm: Ductile iron conforming to ASTM A-536, grade 65-45-12

Coating: Black alkyd enamel

Disc: Ductile iron conforming to ASTM A-536, grade 65-45-12, with electroless nickel coating conforming to ASTM B-733

Seat:

- **Grade "T3" Nitrile**

Stems: 416 stainless steel conforming to ASTM A-582

Stem Seal Cartridge: C36000 brass

Bearings: Stainless Steel with TFE lining

Stem Seals: Nitrile

Stem Retaining Ring: Carbon steel

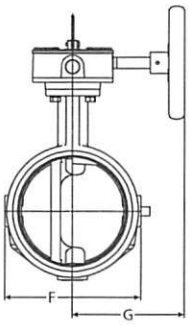
Actuator:

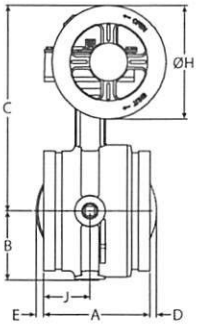
- 2 - 8"/50 - 200mm: Brass or bronze traveling nut on a steel lead screw, in a ductile iron housing
- 10 - 12"/250 - 300mm: Steel worm and cast iron quadrant gear, in a cast iron housing

FireLock® Butterfly Valve

SERIES 705
WITH WEATHERPROOF ACTUATOR

DIMENSIONS –





Note: Optional ½"/15mm tap available.
Contact Victaulic for details.

Size		Dimensions – Inches/millimeters								
Size	Outside Diameter	End to End A	B	C	D	E	F	G	DIA H	J
2" 60.3 mm	2.375 60.3	4.25 108.0	2.28 57.9	6.41 162.8	—	—	4.00 101.6	4.22 107.2	4.50 114.3	2.12 53.8
2½" 73 mm	2.875 73.0	3.77 95.8	2.28 57.9	7.54 191.5	—	—	4.00 101.6	4.22 107.2	4.50 114.3	1.77 45.0
76.1 mm	3.000 76.1	3.77 95.8	2.28 57.9	7.54 191.5	—	—	4.00 101.6	4.22 107.2	4.50 114.3	1.77 45.0
3" 88.9 mm	3.500 88.9	3.77 95.8	2.53 64.3	7.79 197.9	—	—	4.50 114.3	4.22 107.2	4.50 114.3	1.77 45.0
108 mm	4.250 108.0	4.63 117.6	2.88 73.2	8.81 223.8	—	—	5.50 139.7	4.22 107.2	4.50 114.3	2.20 55.9
4" 114.3 mm	4.500 114.3	4.63 117.6	2.88 73.2	8.81 223.8	—	—	5.50 139.7	4.22 107.2	4.50 114.3	2.20 55.9
133 mm	5.250 133.0	5.88 149.4	3.35 85.1	10.88 276.4	—	—	6.56 166.6	6.19 157.2	6.30 160.0	2.58 65.5
139.7 mm	5.500 139.7	5.88 149.4	3.35 85.1	10.88 276.4	—	—	6.56 166.6	6.19 157.2	6.30 160.0	2.58 65.6
5" 141.3 mm	5.563 141.3	5.88 149.4	3.35 85.1	10.88 276.4	—	—	6.56 166.6	6.19 157.2	6.30 160.0	2.58 65.5
159 mm	6.250 159.0	5.88 149.4	3.84 97.5	11.38 289.1	—	0.41 10.4	7.52 191.0	6.19 157.2	6.30 160.0	2.58 65.5
165.1 mm	6.500 165.1	5.88 149.4	3.84 97.5	11.38 289.1	—	0.41 10.4	7.52 191.0	6.19 157.2	6.30 160.0	2.58 65.5
6" 168.3	6.625 168.3	5.88 149.4	3.84 97.5	11.38 289.1	—	0.41 10.4	7.52 191.0	6.19 157.2	6.30 160.0	1.90 48.3
8" 219.1 mm	8.625 219.1	5.33 135.4	5.07 128.8	13.53 343.6	0.80 20.3	1.47 37.3	10.00 254.0	6.19 157.2	8.10 205.7	2.33 59.2
10" 273 mm	10.750 273.0	6.40 162.6	6.37 161.8	15.64 397.3	1.41 35.8	1.81 46.0	12.25 311.2	8.10 205.7	9.00 228.6	—
12" 323.9 mm	12.750 323.9	6.50 165.1	7.36 186.9	16.64 422.7	2.30 58.4	2.80 71.1	14.25 362.0	8.10 205.7	9.00 228.6	—

FireLock® Butterfly Valve

SERIES 705
WITH WEATHERPROOF ACTUATOR

PERFORMANCE

The chart expresses the frictional resistance of Victaulic Series 705 Butterfly Valve in equivalent feet/meters of straight pipe.

Size			Size		
Nominal Size Inches mm	Actual Outside Diameter Inches mm	Equiv. Feet/m of Pipe	Nominal Size Inches mm	Actual Outside Diameter Inches mm	Equiv. Feet/m of Pipe
2 50	2.375 60.3	6 1.8	6 150	6.625 168.3	14 4.2
2½ 65	2.875 73.0	6 1.8	159 mm	159 mm	14 4.3
76.1 mm	3.000 76.1	6 1.8	165.1 mm	6.500 165.1	14 4.2
3 80	3.500 88.9	7 2.1	8 200	8.625 219.1	16 4.9
4 100	4.500 114.3	8 2.4	10 250	10.750 273.0	18 5.5
108 mm	108 mm	8 2.4	12 300	12.750 323.9	19 5.8
5 125	5.563 141.3	12 3.7			
133 mm	133 mm	12 3.7			
139.7 mm	5.500 139.7	12 3.7			

FireLock® Butterfly Valve

SERIES 705
WITH WEATHERPROOF ACTUATOR

PERFORMANCE

C_V values for flow of water at +60°F/+16°C with a fully open valve are shown in the table below. For additional details, contact Victaulic.

Formulas for C_V Values:

$$\Delta P = \frac{Q^2}{C_v^2}$$

$$Q = C_v \times \sqrt{\Delta P}$$

Where:
Q = Flow (GPM)
ΔP = Pressure Drop (psi)
C_v = Flow Coefficient

Size		C_V	Size		C_V	Size		C_V
Nominal Size Inches mm	Actual Outside Diameter Inches mm	(Full Open)	Nominal Size Inches mm	Actual Outside Diameter Inches mm	(Full Open)	Nominal Size Inches mm	Actual Outside Diameter Inches mm	(Full Open)
2	2.375 60.3	170	5 125	5.563 141.3	1200	8 200	8.625 219.1	3400
2½ 65	2.875 73.0	260	133 mm	133 mm	1200	10 250	10.750 273.0	5800
76.1 mm	3.000 76.1	260	139.7 mm	5.500 139.7	1200	12 300	12.750 323.9	9000
3 80	3.500 88.9	440	6 150	6.625 168.3	1800			
4 100	4.500 114.3	820	159 mm	159 mm	1800			
108 mm	108 mm	820	165.1 mm	6.500 165.1	1800			

Formulas for K_V Values:

$$\Delta P = \frac{Q^2}{K_v}$$

$$Q = K_v \times \sqrt{\Delta P}$$

Where:
Q = Flow $\left(\frac{m^3}{hr}\right)$
ΔP = Pressure (bar)
K_v = Flow Factor

Size		K_V	Size		K_V	Size		K_V
Nominal Size Inches mm	Actual Outside Diameter Inches mm	(Full Open)	Nominal Size Inches mm	Actual Outside Diameter Inches mm	(Full Open)	Nominal Size Inches mm	Actual Outside Diameter Inches mm	(Full Open)
2	2.375 60.3	147	5 125	5.563 141.3	1040	8 200	8.625 219.1	2940
2½ 65	2.875 73.0	225	133 mm	133 mm	1040	10 250	10.750 273.0	5020
76.1 mm	3.000 76.1	225	139.7 mm	5.500 139.7	1040	12 300	12.750 323.9	7790
3 80	3.500 88.9	380	6 150	6.625 168.3	1560			
4 100	4.500 114.3	710	159 mm	159 mm	1560			
108 mm	108 mm	710	165.1 mm	6.500 165.1	1560			

FireLock® Butterfly Valve

SERIES 705
WITH WEATHERPROOF ACTUATOR

SWITCH AND WIRING

1. The supervisory switch contains two single pole, double throw, pre-wired switches.
2. Switches are rated:

   10 amps @ 125 or 250 VAC/60 Hz

   0.50 amps @ 125 VDC

   0.25 amps @ 250 VDC

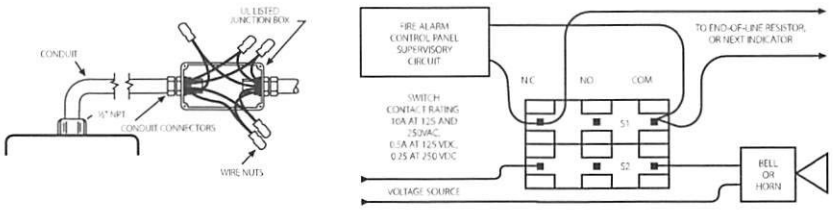
3. **Switches supervise the valve in the "OPEN" position.**
4. One switch has two #18 insulated wires per terminal, which permit complete supervision of leads (refer to diagrams and notes below). The second switch has one #18 insulated wire per terminal. This double circuit provides flexibility to operate two electrical devices at separate locations, such as an indicating light and an audible alarm, in the area that the valve is installed.
5. A #14 insulated ground lead (green) is provided.

   Switch #1 = S1 For connection to the supervisory circuit of a UL Listed alarm control panel

   Switch #2 = S2 Auxiliary switch that may be connected to auxiliary devices, per the authority having jurisdiction

S1
- Normally Closed: (2) Blue
- Common: (2) Yellow

S2
- Normally Closed: Blue with Orange Stripe
- Normally Open: Brown with Orange Stripe
- Common: Yellow with Orange Stripe



Switch 1: 2 leads per terminal
Switch 2: 1 lead per terminal

NOTE: The above diagram shows a connection between the common terminal (yellow – S1 and yellow-with-orange stripe – S2) and the normally closed terminal (blue – S1 and blue-with-orange stripe – S2). In this example, the indicator light and alarm will stay on until the valve is fully open. When the valve is fully open, the indicator light and alarm will go out. Cap off any unused wires (e.g. brown with orange stripe).

Only S1 (two leads per terminal) may be connected to the fire alarm control panel.

The connection of the alarm switch wiring shall be in accordance with NFPA 72 and the auxiliary switch per NFPA 70 (NEC).

FireLock® Butterfly Valve

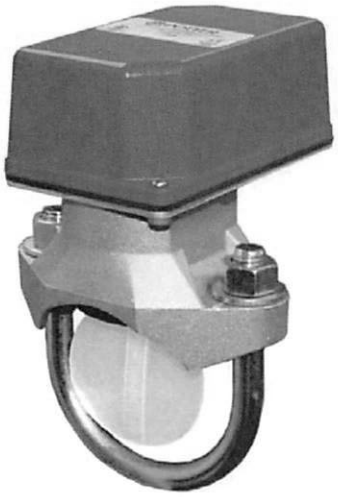
SERIES 705
WITH WEATHERPROOF ACTUATOR

WARRANTY	Refer to the Warranty section of the current Price List or contact Victaulic for details.
NOTE	This product shall be manufactured by Victaulic or to Victaulic specifications. All products to be installed in accordance with current Victaulic installation/assembly instructions. Victaulic reserves the right to change product specifications, designs and standard equipment without notice and without incurring obligations.
INSTALLATION	Reference should always be made to the installation sheet included with the valve. Verify you have the latest revision by visiting our website at www.victaulic.com. Further reference can be found in the I-100 Victaulic Field Installation Handbook.

10.81 5662 REV C UPDATED 12/2010

POTTER
The Symbol of Protection

VSR
VANE TYPE WATERFLOW ALARM SWITCH WITH RETARD



UL, CUL and CSFM Listed, FM Approved, LPCB Approved, For CE Marked (EN12259-5) / VdS Approved model use VSR-EU

Service Pressure: 450 PSI (31 BAR) - UL

Flow Sensitivity Range for Signal:
4-10 GPM (15-38 LPM) - UL

Maximum Surge: 18 FPS (5.5 m/s)

Contact Ratings: Two sets of SPDT (Form C)
10.0 Amps at 125/250VAC
2.0 Amps at 30VDC Resistive
10 mAmps min. at 24VDC

Conduit Entrances: Two knockouts provided for 1/2" conduit. Individual switch compartments suitable for dissimilar voltages.

Environmental Specifications:

- NEMA 4/IP54 Rated Enclosure suitable for indoor or outdoor use with factory installed gasket and die-cast housing when used with appropriate conduit fitting.
- Temperature Range: 40°F - 120°F, (4.5°C - 49°C) - UL
- Non-corrosive sleeve factory installed in saddle.

Service Use:

Automatic Sprinkler	NFPA-13
One or two family dwelling	NFPA-13D
Residential occupancy up to four stories	NFPA-13R
National Fire Alarm Code	NFPA-72

Specifications subject to change without notice.

Ordering Information			
Nominal Pipe Size		Model	Part Number
2"	DN50	VSR-2	1144402
2 1/2"	DN65	VSR-2 1/2	1144425
3"	DN80	VSR-3	1144403
3 1/2"	-	VSR-3 1/2	1144435
4"	DN100	VSR-4	1144404
5"	-	VSR-5	1144405
6"	DN150	VSR-6	1144406
8"	DN200	VSR-8	1144408

Optional: Cover Tamper Switch Kit, stock no. 0090148
Replaceable Components: Retard/Switch Assembly, stock no. 1029030

⚠ WARNING

- Installation must be performed by qualified personnel and in accordance with all national and local codes and ordinances.
- Shock hazard. Disconnect power source before servicing. Serious injury or death could result.
- Risk of explosion. Not for use in hazardous locations. Serious injury or death could result.

CAUTION

Waterflow switches that are monitoring wet pipe sprinkler systems shall not be used as the sole initiating device to discharge AFFF, deluge, or chemical suppression systems. Waterflow switches used for this application may result in unintended discharges caused by surges, trapped air, or short retard times.

General Information

The Model VSR is a vane type waterflow switch for use on wet sprinkler systems. It is UL Listed and FM Approved for use on steel pipe; schedules 10 through 40, sizes 2" thru 8" (50 mm thru 200 mm). LPC approved sizes are 2" thru 8" (50 mm thru 200 mm). See Ordering Information chart.

The VSR may also be used as a sectional waterflow detector on large systems. The VSR contains two single pole, double throw, snap action switches and an adjustable, instantly recycling pneumatic retard. The switches are actuated when a flow of 10 GPM (38 LPM) or more occurs downstream of the device. The flow condition must exist for a period of time necessary to overcome the selected retard period.

Enclosure

The VSR switches and retard device are enclosed in a general purpose, die-cast housing. The cover is held in place with two tamper resistant screws which require a special key for removal. A field installable cover tamper switch is available as an option which may be used to indicate unauthorized removal of the cover. See bulletin number 5401103 for installation instructions of this switch.

POTTER
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VSR
VANE TYPE WATERFLOW ALARM SWITCH WITH RETARD

Installation (see Fig. 1)

These devices may be mounted on horizontal or vertical pipe. On horizontal pipe they shall be installed on the top side of the pipe where they will be accessible. The device should not be installed within 6" (15 cm) of a fitting which changes the direction of the waterflow or within 24" (60 cm) of a valve or drain.

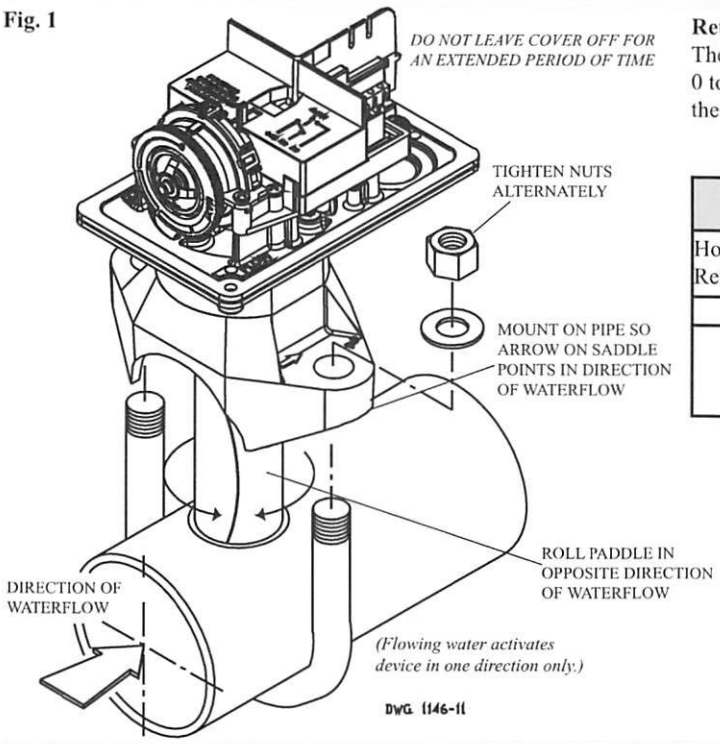
NOTE: Do not leave cover off for an extended period of time.

Drain the system and drill a hole in the pipe using a hole saw in a slow speed drill (see Fig. 1). Clean the inside pipe of all growth or other material for a distance equal to the pipe diameter on either side of the hole. Roll the vane so that it may be inserted into the hole; do not bend or crease it. Insert the vane so that the arrow on the saddle points in the direction of the waterflow. Take care not to damage the non-corrosive bushing in the saddle. The bushing should fit inside the hole in the pipe. Install the saddle strap and tighten nuts alternately to required torque (see the chart in Fig. 1). The vane must not rub the inside of the pipe or bind in any way.

⚠ CAUTION

Do not trim the paddle. Failure to follow these instructions may prevent the device from operating and will void the warranty.

Fig. 1

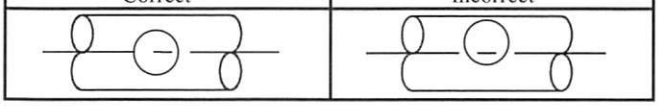


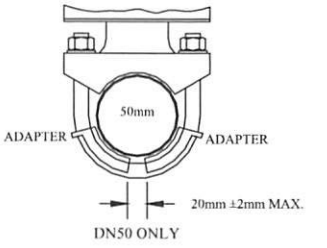
Retard Adjustment

The delay can be adjusted by rotating the retard adjustment knob from 0 to the max setting (60-90 seconds). The time delay should be set at the minimum required to prevent false alarms

CAUTION

Hole must be drilled perpendicular to the pipe and vertically centered. Refer to the Compatible Pipe/Installation Requirements chart for size.





USE (2) 5180162 ADAPTERS AS SHOWN ABOVE

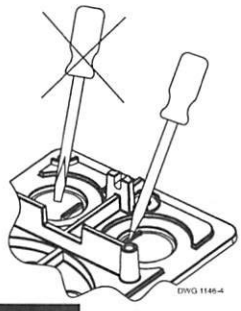
DWG# 1146-1F

Compatible Pipe/ Installation Requirements

Model	Nominal Pipe Size		Nominal Pipe O.D.		Pipe Wall Thickness								Hole Size		U-Bolt Nuts Torque	
					Schedule 10 (UL)		Schedule 40 (UL)		BS-1387 (LPC)		DN (VDS)					
	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	ft-lb	n-m
VSR-2	2	DN50	2.375	60.3	0.109	2.77	0.154	3.91	0.142	3.6	0.091	2.3	1.25 + .125/-.062	33.0 ± 2.0	20	27
VSR-2 1/2	2.5	-	2.875	73.0	0.120	3.05	0.203	5.16	-	-	-	-				
VSR-2 1/2	-	DN65	3.000	76.1	-	-	-	-	0.142	3.6	0.102	2.6				
VSR-3	3	DN80	3.500	88.9	0.120	3.05	0.216	5.49	0.157	4.0	0.114	2.9	2.00 ± .125	50.8 ± 2.0		
VSR-3 1/2	3.5	-	4.000	101.6	0.120	3.05	0.226	5.74	-	-	-	-				
VSR-4	4	DN100	4.500	114.3	0.120	3.05	0.237	6.02	0.177	4.5	0.126	3.2				
VSR-5	5	-	5.563	141.3	0.134	3.40	0.258	6.55	-	-	-	-				
VSR-6	6	DN150	6.625	168.3	0.134	3.40	0.280	7.11	0.197	5.0	0.157	4.0				
VSR-8	8	DN200	8.625	219.1	0.148	3.76	0.322	8.18	0.248	6.3	0.177	4.5				

NOTE: For copper or plastic pipe use Model VSR-CF.

Fig. 2
To remove knockouts: Place screwdriver at inside edge of knockouts, not in the center.



NOTICE
Do not drill into the base as this creates metal shavings which can create electrical hazards and damage the device. Drilling voids the warranty.

Fig. 3
Break out thin section of cover when wiring both switches from one conduit entrance.

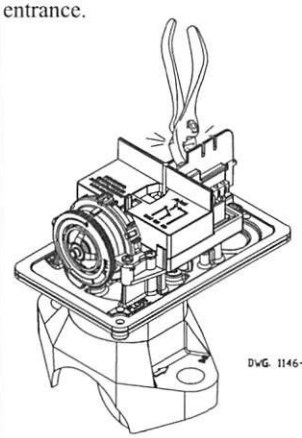
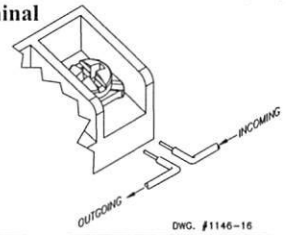


Fig. 4 Switch Terminal Connections Clamping Plate Terminal



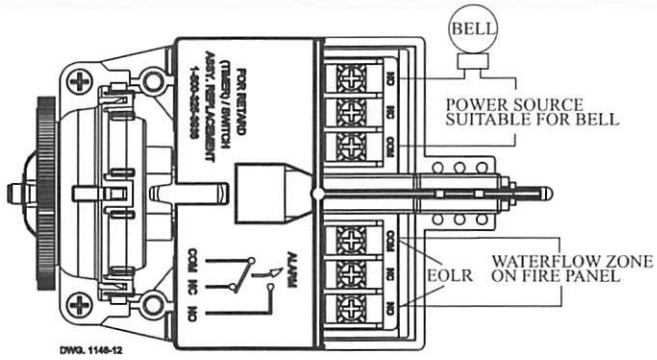
⚠ WARNING

An uninsulated section of a single conductor should not be looped around the terminal and serve as two separate connections. The wire must be severed, thereby providing supervision of the connection in the event that the wire become dislodged from under the terminal. Failure to sever the wire may render the device inoperable risking severe property damage and loss of life.

Do not strip wire beyond 3/8" of length or expose an uninsulated conductor beyond the edge of the terminal block. When using stranded wire, capture all strands under the clamping plate.

Fig. 5 Typical Electrical Connections

Notes:
1. The Model VSR has two switches, one can be used to operate a central station, proprietary or remote signaling unit, while the other contact is used to operate a local audible or visual annunciator.
2. A condition of LPC Approval of this product is that the electrical entry must be sealed to exclude moisture.
3. For supervised circuits, see "Switch Terminal Connections" drawing and warning note (Fig. 4).



Testing

The frequency of inspection and testing for the Model VSR and its associated protective monitoring system shall be in accordance with applicable NFPA Codes and Standards and/or the authority having jurisdiction (manufacturer recommends quarterly or more frequently).

If provided, the inspector's test valve shall always be used for test purposes. If there are no provisions for testing the operation of the flow detection device on the system, application of the VSR is not recommended or advisable.
A minimum flow of 10 GPM (38 LPM) is required to activate this device.

NOTICE Advise the person responsible for testing of the fire protection system that this system must be tested in accordance with the testing instructions.

Fig. 7 Mounting Dimensions

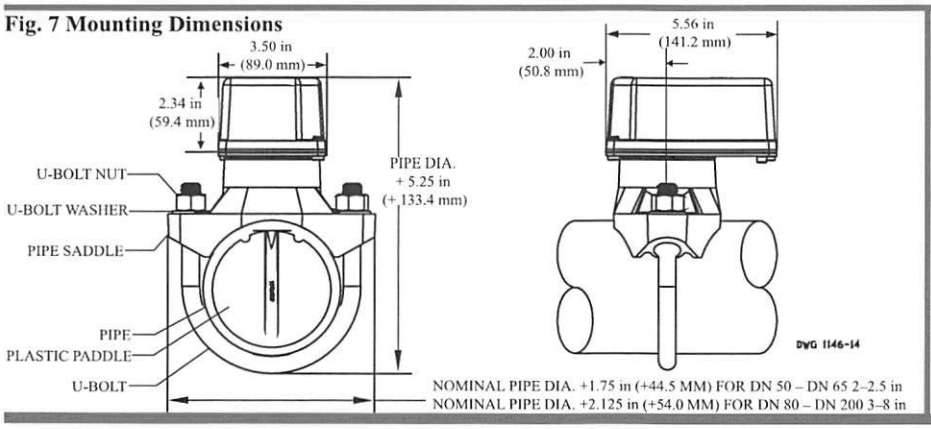
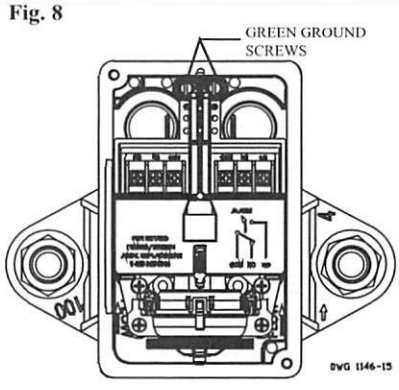


Fig. 8



Maintenance

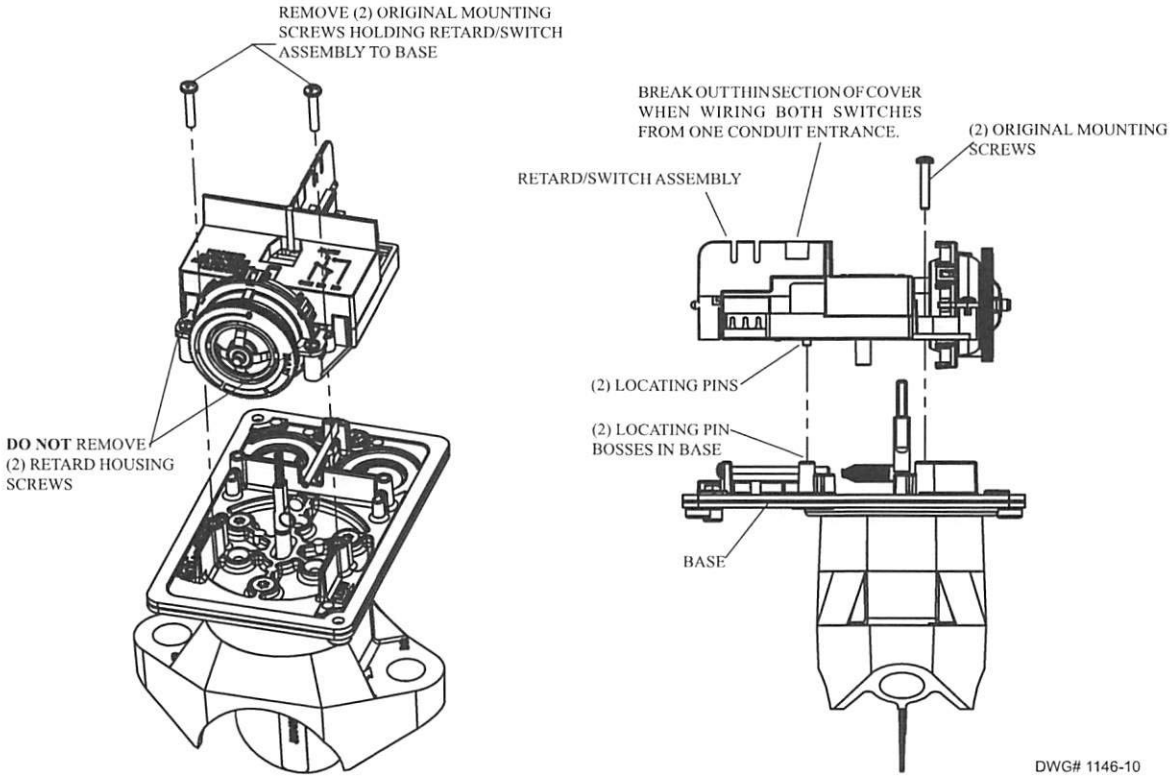
Inspect detectors monthly. If leaks are found, replace the detector. The VSR waterflow switch should provide years of trouble-free service. The retard and switch assembly are easily field replaceable. In the unlikely event that either component does not perform properly, please order replacement retard switch assembly stock #1029030 (see Fig. 6). There is no maintenance required, only periodic testing and inspection.

Retard/Switch Assembly Replacement (See Fig. 6)

NOTICE The Retard/Switch Assembly is field-replaceable without draining the system or removing the waterflow switch from the pipe

1. Make sure the fire alarm zone or circuit connected to the waterflow switch is bypassed or otherwise taken out of service.
2. Disconnect the power source for local bell (if applicable).
3. Identify and remove all wires from the waterflow switch.
4. Remove the (2) mounting screws holding retard/switch assembly to the base. **Do not** remove the (2) retard housing screws.
5. Remove the retard assembly by lifting it straight up over the tripstem.
6. Install the new retard assembly. Make sure the locating pins on the retard/switch assembly fit into the locating pin bosses on the base.
7. Re-install the (2) original mounting screws.
8. Reconnect all wires. Perform a flow test and place the system back in service.

Fig. 6



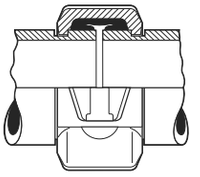
Removal of Waterflow Switch

- To prevent accidental water damage, all control valves should be shut tight and the system completely drained before waterflow detectors are removed or replaced.
- Turn off electrical power to the detector, then disconnect wiring.
- Loosen nuts and remove U-bolts.
- Gently lift the saddle far enough to get your fingers under it. With your fingers, roll the vane so it will fit through the hole while continuing to lift the waterflow detector saddle.
- Lift detector clear of pipe.

Victaulic® Flexible Coupling
Style 75

06.05

1 – 8"/DN25 – DN200



Exaggerated for clarity

1.0 PRODUCT DESCRIPTION

Available Sizes

- 1 – 8"/DN25 – DN200

Pipe Material

- Carbon steel
- Stainless steel

Maximum Working Pressure

- Accommodates pressures ranging from full vacuum (29.9 in Hg/760 mm Hg) up to 500 psi/3447 kPa/34 bar
- Working pressure dependent on material, wall thickness and size of pipe

Application

- Joins standard roll grooved and cut grooved pipe, as well as grooved fittings, valves and accessories
- Provides a flexible pipe joint which allows for expansion, contraction and deflection
- Up to 50% lighter in weight than standard Victaulic Style 77 or Style 177N flexible couplings

2.0 CERTIFICATION/LISTINGS

NOTES

- Download publication 10.01 for Fire Protection Certifications/Listings Reference Guide.
- See publication 02.06: Victaulic Potable Water Approvals ANSI/NSF for potable water approvals if applicable.

ALWAYS REFER TO ANY NOTIFICATIONS AT THE END OF THIS DOCUMENT REGARDING PRODUCT INSTALLATION, MAINTENANCE OR SUPPORT.

System No.		Location	
Submitted By		Date	

Spec Section		Paragraph	
Approved		Date	

3.0 SPECIFICATIONS – MATERIAL

Housing: Ductile iron conforming to ASTM A536, Grade 65-45-12. Ductile iron conforming to ASTM A395, Grade 65-45-15, is available upon special request.

Housing Coating: (specify choice)

☑ Standard: Orange enamel

☐ Optional: Hot dipped galvanized

Optional: Contact Victaulic with your requirements for other coatings.

Gasket: (specify choice[1])

Grade "E" EPDM
EPDM (Green stripe color code). Temperature range –30ºF to +230ºF/–34ºC to +110ºC. May be specified for hot water service within the specified temperature range plus a variety of dilute acids, oil-free air and many chemical services. UL Classified in accordance with ANSI/NSF 61 for cold +73°F/+23°C and hot +180°F/+82°C potable water service and ANSI/NSF 372. **NOT COMPATIBLE FOR USE WITH PETROLEUM SERVICES OR STEAM SERVICES.**

☐ **Grade "T" Nitrile**
Nitrile (Orange stripe color code). Temperature range –20ºF to +180ºF/–29ºC to +82ºC. May be specified for petroleum products, air with oil vapors, vegetable and mineral oils within the specified temperature range; not compatible for hot dry air over +140°F/+60°C and water over +150°F/+66°C. **NOT COMPATIBLE FOR USE WITH HOT WATER.**

Others
For alternate gasket selection, reference publication 05.01: Victaulic Seal Selection Guide - Elastomeric Seal Construction.

[1] Services listed are General Service Guidelines only. It should be noted that there are services for which these gaskets are not compatible. Reference should always be made to the latest Victaulic Seal Selection Guide for specific gasket service guidelines and for a listing of services which are not compatible.

Bolts/Nuts: (specify choice[2])

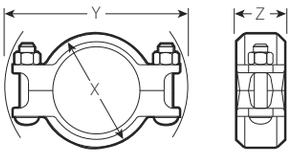
☑ Standard: Carbon steel oval neck track bolts meeting the mechanical property requirements of ASTM A449 (imperial) and ISO 898-1 Class 9.8 (metric). Carbon steel hex nuts meeting the mechanical property requirements of ASTM A563 Grade B (imperial - heavy hex nuts) and ASTM A563M Class 9 (metric - hex nuts). Track bolts and hex nuts are zinc electroplated per ASTM B633 ZN/FE5, finish Type III (imperial) or Type II (metric).

Optional (imperial): Stainless steel oval neck track bolts meeting the mechanical property requirements of ASTM F593, Group 2 (316 stainless steel), condition CW. Stainless steel heavy nuts meeting the mechanical property requirements of ASTM F594, Group 2 (316 stainless steel), condition CW, with galling reducing coating.

[2] Optional bolts/nuts are available in imperial sizes only.

4.0 DIMENSIONS

Style 75



Size		Pipe End Separation[3]	Deflection from Centerline[3]		Bolt/Nut		Dimensions			Weight
Nominal inches DN	Actual Outside Diameter inches mm	Allowable inches mm	Per Cplg. Degrees	Pipe inches/ft. mm/m	Qty.	Size imperial metric	X inches mm	Y inches mm	Z inches mm	Approx. (Each) lb kg
1 DN25	1.315 33.7	0–0.06 0–1.6	2º–43′	0.57 48	2	⅜ x 2 M10 x 51	2.38 61	4.27 108	1.77 45	1.3 0.6
1 ¼ DN32	1.660 42.4	0–0.06 0–1.6	2º–10′	0.45 38	2	⅜ x 2 M10 x 51	2.68 68	4.61 117	1.77 45	1.4 0.6
1 ½ DN40	1.900 48.3	0–0.06 0–1.6	1º–56′	0.40 33	2	⅜ x 2 M10 x 51	2.91 74	4.82 122	1.77 45	1.5 0.6
2 DN50	2.375 60.3	0–0.06 0–1.6	1º–31′	0.32 26	2	⅜ x 2 M10 x 51	3.43 87	5.22 133	1.88 48	1.7 0.8
2 ½	2.875 73.0	0–0.06 0–1.6	1º–15′	0.26 22	2	⅜ x 2 M10 x 51	3.88 98	5.68 144	1.88 48	1.9 0.9
DN65	3.000 76.1	0–0.06 0–1.6	1º–12′	0.26 22	2	⅜ x 2 M10 x 51	4.00 102	5.90 150	1.88 48	1.9 0.9
3 DN80	3.500 88.9	0–0.06 0–1.6	1º–2′	0.22 18	2	½ x 2 ¾ M12 x 70	4.50 114	7.00 178	1.88 48	2.9 1.3
3 ½ DN90	4.000 101.6	0–0.06 0–1.6	0º–54′	0.19 16	2	½ x 2 ¾ M12 x 70	5.00 127	7.50 191	1.88 48	2.9 1.3
4 DN100	4.500 114.3	0–0.13 0–3.2	1º–36′	0.34 28	2	½ x 2 ¾ M12 x 70	5.80 147	8.03 204	2.13 54	4.1 1.9
	4.250 108.0	0–0.13 0–3.2	1º–41′	0.35 29	2	½ x 2 ¾ M12 x 70	5.55 141	7.79 198	2.13 54	3.7 1.7
	5.000 127.0	0–0.13 0–3.2	1º–26′	0.25 21	2	⅝ x 3 ¼ M16 x 83	6.13 156	9.43 240	2.13 54	5.5 2.5
5	5.563 141.3	0–0.13 0–3.2	1º–18′	0.27 23	2	⅝ x 3 ¼ M16 x 83	6.88 175	10.07 256	2.13 54	5.8 2.6
	5.250 133.0	0–0.13 0–3.2	1º–21′	0.28 24	2	⅝ x 3 ¼ M16 x 83	6.55 166	9.37 238	2.13 54	6.0 2.7
DN125	5.500 139.7	0–0.13 0–3.2	1º–18′	0.28 24	2	⅝ x 3 ¼ M16 x 83	6.80 173	9.59 244	2.13 54	6.3 2.9
	6.000 152.4	0–0.13 0–3.2	1º–12′	0.21 18	2	⅝ x 3 ¼ M16 x 83	7.38 187	10.48 266	1.88 48	6.2 2.8
6 DN150	6.625 168.3	0–0.13 0–3.2	1º–5′	0.23 18	2	⅝ x 3 ¼ M16 x 83	8.00 203	11.07 281	2.13 54	7.0 3.2
	6.250 159.0	0–0.13 0–3.2	1º–9′	0.24 20	2	⅝ x 3 ¼ M16 x 83	7.63 194	10.49 266	2.13 54	6.8 3.1
	6.500 165.1	0–0.13 0–3.2	1º–7′	0.23 58	2	⅝ x 3 ¼ M16 x 83	7.84 199	10.66 271	2.08 53	6.6 3.0
	8.515 216.3	0–0.13 0–3.2	0º–51′	0.18 46	2	¾ x 4 ¼ M20 x 108	10.19 259	13.75 350	2.32 59	13.2 6.0
8 DN200	8.625 219.1	0–0.13 0–3.2	0º–50′	0.18 14	2	¾ x 4 ¼ M20 x 108	10.34 263	13.97 355	2.13 59	12.4 5.6

[3] Allowable Pipe End Separation and Deflection figures show the maximum nominal range of movement available at each joint for standard **roll** grooved pipe. Figures for standard **cut** grooved pipe may be doubled. These figures are maximums; for design and installation purposes these figures should be reduced by: 50% for ¾ – 3 ½"/DN20 – DN90; 25% for 4"/DN100 and larger.

NOTE

- Metric thread size bolts are available (color coded gold) for all coupling sizes upon request. Contact Victaulic for details.

5.0 PERFORMANCE

Style 75

Size		Maximum Working Pressure[4]	Maximum End Load[4]
Nominal inches DN	Actual Outside Diameter inches mm	psi kPa	lb N
1 DN25	1.315 33.7	500 3447	680 3,025
1 ¼ DN32	1.660 42.4	500 3447	1080 4,805
1 ½ DN40	1.900 48.3	500 3447	1420 6,320
2 DN50	2.375 60.3	500 3447	2215 9,860
2 ½	2.875 73.0	500 3447	3245 14,440
	3.000 76.1	500 3447	3535 15,730
3 DN80	3.500 88.9	500 3447	4800 21,360
3 ½ DN90	4.000 101.6	500 3447	6300 28,035
4 DN100	4.500 114.3	500 3447	7950 35,380
	4.250 108.0	450 3103	6380 28,395
	5.000 127.0	450 3103	8820 39,250
5	5.563 141.3	450 3103	10935 48,660
	5.250 133.0	450 3103	9735 43,325
DN125	5.500 139.7	450 3103	10665 47,460
	6.000 152.4	450 3103	12735 56,670
6 DN150	6.625 168.3	450 3103	15525 69,085
	6.250 159.0	450 3103	13800 61,405
	6.500 165.1	450 3103	14930 66,412
	8.515 216.3	450 3103	25625 113,986
8 DN200	8.625 219.1	450 3103	26280 116,945

[4] Working Pressure and End Load are total, from all internal and external loads, based on ANSI B36.10 sized carbon steel pipe, grooved in accordance with Victaulic specifications. Contact Victaulic for performance on other pipe.

NOTE

- WARNING: FOR ONE TIME FIELD TEST ONLY, the Maximum Joint Working Pressure may be increased to 1½ times the figures shown.

6.0 NOTIFICATIONS

⚠ WARNING

- **Victaulic RX roll sets must be used when grooving light-wall/thin-wall stainless steel pipe for use with Victaulic Couplings.**

Failure to use Victaulic RX roll sets when grooving light-wall/thin-wall stainless steel pipe may cause joint failure, resulting in serious personal injury and/or property damage.

NOTICE

- **Victaulic RX grooving rolls must be ordered separately. They are identified by a silver color and the designation RX on the front of the roll sets.**

7.0 REFERENCE MATERIALS

02.06: Victaulic® Potable Water Approvals ANSI/NSF

05.01: Victaulic® Seal Selection Guide - Elastomeric Seal Construction

06.15: Victaulic® Pressure Ratings and End Loads for Victaulic Couplings on Steel Pipe

10.01: Victaulic® Products for Fire Protection Pipings Systems - Regulatory Approval Reference Guide

17.01: Victaulic® Pipe Preparation for Use on Stainless Steel Pipe With Victaulic Products

17.09: Victaulic® Ductile Iron Grooved Couplings Performance Data for Stainless Steel Pipe

25.01: Victaulic® Standard Groove Specifications

26.01: Victaulic® Design Data

29.01: Victaulic® Terms and Conditions of Sale

I-100: Victaulic® Field Installation Handbook

06.05 1470 Rev P Updated 10/2017

Victaulic® Firelock™ Rigid Coupling
Style 009N

10.64

Patented

1.0 CERTIFICATION/LISTINGS

C104-1a/36

2.0 PRODUCT DESCRIPTION

- The FireLock EZ™ Style 009N Installation-ReadyTM Rigid Coupling is for use in the fire protection market.
- The coupling's unique design eliminates loose parts, promotes consistent installation and provides substantial gains in productivity.
- **IMPORTANT:** FireLock EZ™ Style 009N couplings are recommended for use ONLY on fire protection systems.

3.0 MATERIAL SPECIFICATIONS

Housing: Ductile iron conforming to ASTM A 536, Grade 65-45-12. Ductile iron conforming to ASTM A 395, Grade 65-45-15, is available upon special request.

Housing Coating: (specify choice)

Orange enamel (North America, Asia Pacific)

Red enamel (Europe)

Hot dipped galvanized

Gasket: (specify choice[1])

Grade "E" EPDM (Type A)
FireLock EZ products have been Listed by Underwriters Laboratories Inc., Underwriters Laboratories of Canada Limited, and Approved by Factory Mutual Research for wet and dry (oil free air) sprinkler services within the rated working pressure.

1 Services listed are General Service Guidelines only. It should be noted that there are services for which these gaskets are not compatible. Reference should always be made to the latest Victaulic Gasket Selection Guide for specific gasket service guidelines and for a listing of services which are not compatible.

Bolts/Nuts: Zinc electroplated carbon steel, trackhead meeting the physical and chemical requirements of ASTM A 449 and physical requirements of ASTM A 183.

System No.		Location	
Submitted By		Date	

Spec Section		Paragraph	
Approved		Date	

4.0 LISTINGS/APPROVAL [2]

The information provided below is based on the latest listing and approval data at the time of publication. Listings/Approvals are subject to change and/or additions by the approvals agencies. Contact Victaulic for performance on other pipe and the latest listings and approvals.

Nominal Size	cULus			FM			Vds	LPCB
inches mm	Sch. 5 psi kPa	Sch. 10 psi kPa	Sch. 40 psi kPa	Sch. 5 psi kPa	Sch. 10 psi kPa	Sch. 40 psi kPa	psi kPa	psi kPa
1 ¼ 32	232 1600	365 2517	365 2517	175 1205	363 2502	363 2502	363 2500	363 2500
1 ½ 40	232 1600	365 2517	365 2517	175 1205	363 2502	363 2502	363 2500	363 2500
2 50	363 2502	365 2517	365 2517	175 1205	363 2502	363 2502	363 2500	363 2500
2 ½ 65	N/A	365 2517	365 2517	175 1205	363 2502	363 2502	363 2500	363 2500
76.1 mm	N/A	365 [3] 2517 [3]	N/A	N/A	363 [4] 2502 [4]	N/A	363 2500	363 2500
3 80	N/A	365 2517	365 2517	175 1205	363 2502	363 2502	363 2500	363 2500
4 100	N/A	365 2517	365 2517	175 1205	363 2502	363 2502	363 2500	363 2500
108.0 mm	N/A	N/A	N/A	175 1205	363 2502	363 2502	N/A	N/A
5 125	N/A	290 2000	365 2517	N/A	363 2502	363 2502	232 1600	N/A
133.0 mm	N/A	N/A	N/A	N/A	363 [4] 2502 [4]	N/A	N/A	N/A
139.7 mm	N/A	290 [5] 2000 [5]	N/A	N/A	363 [4] 2502 [4]	N/A	232 1600	N/A
159.0 mm	N/A	N/A	N/A	N/A	363 [4] 2502 [4]	N/A	N/A	N/A
165.1 mm	N/A	290 [6] 2000 [6]	N/A	N/A	363 [4] 2502 [4]	N/A	N/A	N/A
6 150	N/A	290 2000	365 2517	N/A	363 2502	363 2502	232 1600	N/A
216.0 mm	N/A	N/A	N/A	N/A	363 [4] 2502 [4]	N/A	N/A	N/A
8 200	N/A	290 2000	365 2517	N/A	363 2502	363 2502	232 1600	N/A

2 Listed/Approved for wet and dry pipe systems (> –40°F/–40°C) for continuous use in freezing conditions, use of Style 005H Coupling with Silicone Gasket is recommended.
Please see the Victaulic Installation Manual I-009N/009H for details concerning when supplemental lubrication is required.

3 cULus listed for DIN 2458 2.6 mm pipe wall.

4 FM approved for BS 1387 Medium 3.6 mm pipe wall.

5 cULus listed for EN 10220 4.0 mm pipe wall.

6 cULus listed for EN 10255 4.5 mm pipe wall.

4.1 LISTINGS/APPROVAL

Speciality Pipe

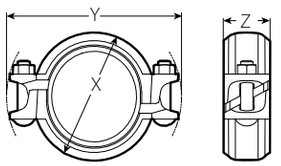
Pipe	Size	Pressure Rating		Pipe	Size	Pressure Rating		Pipe	Size	Pressure Rating	
	inches	**cULus** psi kPa	**FM** psi kPa		inches	**cULus** psi kPa	**FM** psi kPa		inches	**cULus** psi kPa	**FM** psi kPa
BLT	1 ¼ – 2	300 2068	365 2517	EZT	1 ¼ – 2	300 2068	365 2517	MT	1 ¼ – 2	300 2068	365 2517
DF	1 ¼ – 4	300 2068	365 2517	FF	1 ¼ – 4	300 2068	365 2517	MLT	1 ¼ – 2	N/A	365 2517
DT	1 ¼ – 2	300 2068	365 2517	FLF	1 ¼ – 4	N/A	365 2517	ST	1 ¼ – 2	N/A	365 2517
EF	1 ¼ – 4	175 1206	175 1206	FLT	1 ¼ – 2	N/A	365 2517	STF	1 ¼ – 4	N/A	365 2517
EL	1 ¼ – 2	300 2068	365 2517	FLTL	1 ¼ – 2	N/A	365 2517	TF	2 ¼ – 4	N/A	365 2517
ET40	1 ¼ – 2	300 2068	365 2517	GL	1 ¼ – 2	300 2068	365 2517	WLS	1 ¼ – 2	300 2068	365 2517
EZF	3 – 4	300 2068	365 2517	MF	1 ¼ – 4	300 2068	365 2517	WST	1 ¼ – 2	N/A	365 2517
								XL	1 ¼ – 2	300 2068	365 2517

NOTES

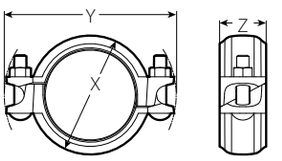
- BLT = BLT steel pipe manufactured by Allied Tube & Conduit Corp.
- DF = DYNA-FLOW steel pipe manufactured by Allied Tube & Conduit Corp.
- DT = DYNA-FLOW steel pipe manufactured by Allied Tube & Conduit Corp.
- EF = EDDY FLOW steel pipe manufactured by Bull Moose Tube Co.
- EL = EDDYLITE steel pipe manufactured by Bull Moose Tube Co.
- ET40 = Eddythread 40 steel pipe manufactured by Bull Moose Tube Co.
- EZF = EZ-Flow steel pipe manufactured by Northwest Pipe Co.
- EZT = EZ-Thread steel pipe manufactured by Youngstown Tube Co.
- FF = Fire-Flo steel pipe manufactured by Youngstown Tube Co.
- FLF = Fire-Line Flow steel pipe manufactured by Western International Forest Products Inc.
- FLT = Fire-Line Threadable steel pipe manufactured by Western International Forest Products Inc.
- FLTL = Fire-Line Threadable Light steel pipe manufactured by Western International Forest Products Inc.
- GL = GL steel pipe manufactured by Wheatland Tube Co.
- MF = Mega-Flow steel pipe manufactured by Wheatland Tube Co.
- MT = Mega-Thread steel pipe manufactured by Wheatland Tube Co.
- MLT = MLT steel pipe manufactured by Wheatland Tube Co
- ST = STD wall pipe in accordance with ASTM A53.
- STF = Steady Flow steel pipe manufactured by AMS Tube Corp.
- TF = Tex-Flow steel pipe manufactured by Tex-Tube Co.
- WLS = WLS steel pipe manufactured by Wheatland Tube Co.
- WST = WST steel pipe manufactured by Wheatland Tube Company.
- XL = XL steel pipe manufactured by Allied Tube & Conduit Corp.

5.0 DIMENSIONS

Style 009N



Style 009N Pre-Assembled
(Push On Condition)



Style 009N Joint Assembled

Nominal Size	Actual Outside Diameter	Maximum Working Pressure [7]	Maximum End Load [7]	Allow. Pipe End Separation [8]	Bolt/Nut [9] Size		Dimensions					Approx. Weight Each
							Pre-assembled (Push On Condition)		Joint Assembled			
							X	Y	X	Y	Z	
inches mm	inches mm	psi kPa	lbs. N	inches mm	No.	inches mm	inches mm	inches mm	inches mm	inches mm	inches mm	lbs. kg
1 ¼ 32	1.660 42.4	365 2517	790 3514	0.10 2.54	2	⅜ × 2 M10 x 2	3.13 79	5.00 127	2.75 70	5.00 127	2.00 51	1.4 0.6
1 ½ 40	1.900 48.3	365 2517	1035 4604	0.10 2.54	2	⅜ × 2 M10 x 2	3.38 86	5.13 130	3.00 76	5.13 130	2.00 51	1.5 0.7
2 50	2.375 60.3	365 2517	1616 7193	0.12 3.05	2	⅜ ×2 ½ M10 x 2 ½	4.00 102	5.63 143	3.50 89	5.63 143	2.00 51	1.9 0.9
2 ½ 65	2.875 73.0	365 2517	2370 10542	0.12 3.05	2	⅜ × 2 ½ M10 x 2 ½	4.50 114	6.13 156	4.00 102	6.13 156	2.00 51	2.1 1.0
76.1 mm	3.000 76.1	365 2517	2580 11476	0.12 3.05	2	⅜ × 2 ½ M10 x 2 ½	4.63 118	6.00 152	4.13 105	6.13 156	2.00 51	2.1 1.0
3 80	3.500 88.9	365 2517	3512 15622	0.12 3.05	2	⅜ × 2 ½ M10 x 2 ½	5.13 130	6.75 171	4.63 117	6.75 171	2.00 51	2.3 1.0
4 100	4.500 114.3	365 2517	5805 25822	0.17 4.32	2	⅜ × 2 ½ M10 x 2 ½	6.00 152	7.88 200	5.63 143	7.50 191	2.13 54	2.9 1.3
108.0 mm	4.250 108.0	365 2517	5175 23020	0.17 4.32	2	⅜ × 2 ½ M10 x 2 ½	5.63 152	7.38 1.87	5.38 137	7.38 187	2.13 54	3.1 1.4
5 125	5.563 141.3	365 2000	8870 39456	0.17 4.32	2	½ × 3 M12 x 3	7.25 184	9.25 235	6.75 171	9.13 232	2.25 57	5.0 2.3
133.0 mm	5.250 133.0	365 2517	7897 35106	0.17 4.32	2	½ × 3 M12 x 3	6.63 168	9.00 229	6.38 162	9.00 229	2.25 57	4.8 2.2
139.7 mm	5.500 139.7	365 2517	8667 38529	0.17 4.32	2	½ × 3 M12 x 3	6.88 175	9.25 235	6.75 171	9.13 232	2.25 57	4.9 2.2
159.0 mm	6.250 159.0	365 2517	11192 49753	0.17 4.32	2	½ × 3 ¼ M12 x 3 ¼	7.88 200	10.00 254	7.38 187	9.88 251	2.25 57	5.6 2.5
165.1 mm	6.500 165.1	365 2517	12105 53813	0.17 4.32	2	½ × 3 ¼ M12 x 3 ¼	8.00 203	10.25 260	7.75 197	10.13 257	2.25 57	6.0 2.7
6 150	6.625 168.3	365 2000	12582 44469	0.17 4.32	2	½ × 3 ¼ M12 x 3 ¼	8.38 213	10.38 264	7.88 200	10.13 257	2.25 57	6.0 2.7
216.0 mm	8.500 216.0	365 2517	20712 55968	0.17 4.32	2	⅝ × 4 M16 x 4	10.63 270	13.25 337	10.25 260	10.13 257	2.63 67	11.4 5.2
8 200	8.625 219.1	365 1620	21326 94863	0.17 4.32	2	⅝ × 4 M16 x 4	10.88 276	13.38 340	10.25 260	13.13 333	2.50 64	11.4 5.2

7 Working Pressure and End Load are total, from all internal and external loads, based on standard weight (ANSI) steel pipe, standard roll or cut grooved in accordance with Victaulic specifications. See the Listings/Approvals section of this publication for ratings on other pipe.

8 The allowable pipe separation dimension shown is for system layout purposes only. FireLock EZ™ couplings are considered rigid connections and will not accommodate expansion or contraction of the piping system.

9 Number of bolts required equals number of housing segments.

NOTES

- When assembling FireLock EZ™ couplings onto end caps, take additional care to make certain the end cap is fully seated against the gasket end stop. For FireLock EZ™ Style 009N couplings, use FireLock No. 006 end caps containing the “EZ” marking on the inside face or No. 60 end caps containing the “QV EZ” marking on the inside face. Non-Victaulic end cap products shall not be used with Style 009N couplings. IMPORTANT: Gaskets intended for the Style 009 or Style 009V couplings cannot be used with the Style 009N coupling. There is no interchanging of gaskets or housings between coupling styles.
- **Use Of Flushseal Gaskets For Dry Pipe Systems** FireLock EZ™ couplings are supplied with FireLock EZ™ Grade “E” Type A gaskets. These gaskets include an integral pipe stop, that once installed provides the similar benefits as a FlushSeal gasket for dry pipe systems. It should be noted that standard Victaulic Flush-Seal™ gaskets are not compatible and cannot be used with the FireLock EZ™ couplings.

6.0 REFERENCE MATERIALS

Publication 05.01: Seal Selection Guide

I-009N/009H: Installation Instructions FireLock EZ™ Rigid Coupling

FireLock® Fittings

See Victaulic publication 10.01 for details

FireLock® products comprise a unique system specifically designed for fire protection services. FireLock full-flow elbows and tees feature CAD-developed, hydrodynamic design, affording a shorter center-to-end dimension than standard fittings. A noticeable bulge allows the water to make a smoother turn to maintain similar flow characteristics as standard full flow fittings.

FireLock fittings are designed for use exclusively with Victaulic IPS-sized couplings that have been Listed or Approved for Fire Protection Services. Use of other couplings or flange adapters may result in bolt pad interference.

Victaulic FireLock fittings pressure ratings conform to the ratings of Victaulic FireLock EZ® Style 009H couplings.

MATERIAL SPECIFICATIONS

Fitting: Ductile iron conforming to ASTM A-536, grade 65-45-12.

Fitting Coating:

- Orange enamel.
- Red Enamel in EMEA-I.
- **Optional:** Hot dipped galvanized.

JOB/OWNER

System No. _____

Location _____

CONTRACTOR

Submitted By _____

Date _____

ENGINEER

Spec Sect _____ Para _____

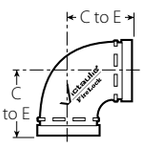
Approved _____

Date _____

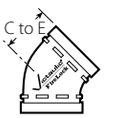
www.victaulic.com

FireLock® Fittings

DIMENSIONS



NO. 001



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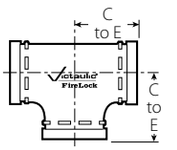


NO. 002

NO. 006

Size		No. 001 90° Elbow		No. 003 45° Elbow		No. 002 Straight Tee		No. 006 Cap	
Nominal Size Inches mm	Actual Outside Diameter Inches mm	C to E Inches mm	Approx. Weight Each Lbs. kg	C to E Inches mm	Approx. Weight Each Lbs. kg	C to E Inches mm	Approx. Weight Each Lbs. kg	Thickness "T" Inches mm	Approx. Weight Each Lbs. kg
1 ¼ 32	1.660 42.4	—	—	—	—	—	—	0.8 21	0.3 0.1
1 ½ 40	1.900 48.3	— —	— —	— —	— —	— —	— —	0.82 21	0.4 0.2
2 50	2.375 60.3	2.75 70	1.7 0.8	2.00 51	1.8 0.8	2.75 70	2.4 1.1	0.88 22	0.6 0.3
2 ½ 65	2.875 73.0	3.00 76	3.1 1.4	2.25 57	2.2 1.0	3.00 76	3.6 1.6	0.88 22	1.0 0.5
76.1 mm	3.000 76.1	3.00 76	3.30 1.5	2.25 57	2.4 1.1	—	—	—	—
3 80	3.500 88.9	3.38 86	4.0 1.8	2.50 64	3.1 1.4	3.38 86	5.3 2.4	0.88 22	1.2 0.5
108 mm	4.250 108.0	4.00 102	5.7 2.6	3.00 76	5.1 2.3	4.00 102	7.5 3.4	—	—
4 100	4.500 114.3	4.00 102	6.7 3.0	3.00 76	5.6 2.5	4.00 102	8.7 3.9	1.00 25	2.4 1.1
5 125	5.563 141.3	4.88 124	12.6 5.7	3.25 83	8.3 3.8	4.88 124	15.7 7.1	1.00 25	4.1 1.9
159 mm	6.250 158.8	5.50 140	12.6 5.7	3.50 89	9.2 4.2	5.50 140	17.9 8.0	—	—
6 150	6.625 168.3	5.50 140	18.3 8.3	3.50 89	11.7 5.3	5.50 140	22.7 10.3	1.00 25	5.9 2.7
8 200	8.625 219.1	6.81 173	25.5 11.6	4.25 108	20.4 9.3	6.94 176	38.7 17.6	1.13 29	12.7 5.8

FireLock® Fittings

FLOW DATA

Size		Frictional Resistance Equivalent Feet/meters of Straight Pipe †			
		Elbows		No. 002 Straight Tee	
Nominal Size Inches mm	Actual Outside Diameter Inches mm	No. 001 90° Elbow	No. 003 45° Elbow	Branch	Run
1 ¼ 32	1.660 42.4	— —	— —	— —	— —
1 ½ 40	1.900 48.3	— —	— —	— —	— —
2 50	2.375 60.3	3.5 1.1	1.8 0.5	8.5 2.6	3.5 1.1
2 ½ 65	2.875 73.0	4.3 1.3	2.2 0.7	10.8 3.3	4.3 1.3
76.1 mm	3.000 76.1	4.5 1.4	2.3 0.7	11.0 3.4	4.5 1.4
3 80	3.500 88.9	5.0 1.5	2.6 0.8	13.0 4.0	5.0 1.5
108 mm	4.250 108.0	6.4 2.0	3.2 0.9	15.3 4.7	6.4 2.0
4 100	4.500 114.3	6.8 2.1	3.4 1.0	16.0 4.9	6.8 2.1
5 125	5.563 141.3	8.5 2.6	4.2 1.3	21.0 6.4	8.5 2.6
159 mm	6.250 158.8	9.4 2.9	4.9 1.5	25.0 7.6	9.6 2.9
6 150	6.625 168.3	10.0 3.0	5.0 1.5	25.0 7.6	10.0 3.0
8 200	8.625 219.1	13.0 4.0	5.0 1.5	33.0 10.1	13.0 4.0

† The flow data listed is based upon the pressure drop of Schedule 40 pipe.

FireLock® Fittings

GENERAL NOTES

NOTE: When assembling FireLock EZ couplings onto end caps, take additional care to make certain the end cap is fully seated against the gasket end stop. For FireLock EZ Style 009/009V/009H couplings, use FireLock No. 006 end caps containing the "EZ" marking on the inside face or No. 60 end caps containing the "QV EZ" marking on the inside face. Non-Victaulic end cap products shall not be used with Style 009/009V/009H couplings.

WARRANTY

Refer to the Warranty section of the current Price List or contact Victaulic for details.

NOTE

This product shall be manufactured by Victaulic or to Victaulic specifications. All products to be installed in accordance with current Victaulic installation/assembly instructions. Victaulic reserves the right to change product specifications, designs and standard equipment without notice and without incurring obligations.

Model F100 / F100G

Fire Hose Valve

Application

Zurn Model F100/F100G Fire Hose Valves are standpipe valves listed for use on a fire hose rack assembly, or as a fire department outlet connection.

212-F100
FNPT x NH

112-F100F
FNPT x FNPT

212-F100G
Grooved x NH

Standards Compliance

- UL® Listed
- C-UL®, ULC® Listed (2-1/2" only)
- FM® Approved

Material

Main valve body	Brass C37700
O-Rings	EPDM (A70)
Handwheel	Aluminum A03600
Handwheel Bolt	Brass C37700
Handwheel Retaining washer	304 Stainless Steel

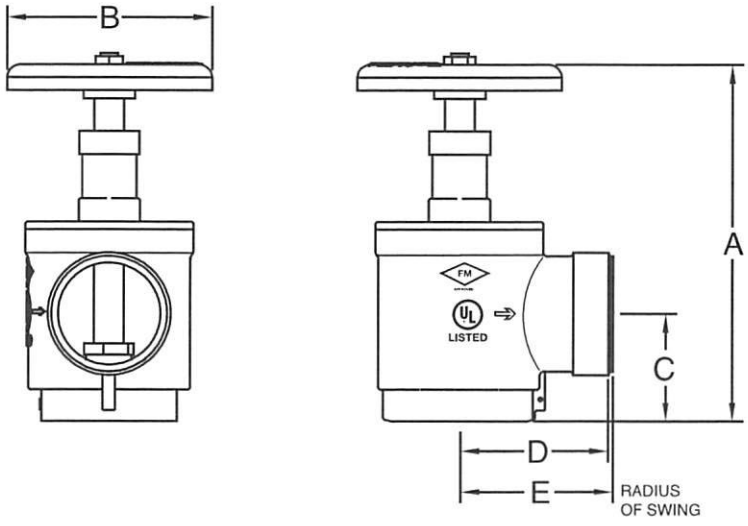
Features

Sizes:	1-1/2", 2-1/2"
Maximum inlet pressure	300 psi
Inlet connection	FNPT or Grooved
Outlet connection	Male hose
Outlet connection	FNPT
Outlet connection	Special Thread (optional)

Options

(Suffixes can be combined)

- ☐ F - Female NPT inlet and outlet angle valve
- ☐ ST - Specified thread outlet
- ☐ CH - Rough Chrome Plated (Request lead time)



Dimensions & Weights (do not include pkg.)

MODEL	DIMENSIONS (approximate)													
	A OPEN		A CLOSED		B		C		D		E		WEIGHT	
	in.	mm			in.	mm	in.	mm	in.	mm	in.	mm	lbs	kg
112-F100	7 3/4	195	6 3/4	169	4	100	2	50	2 1/2	63	2 3/4	68	4	2
112-F100F	7 3/4	195	6 3/4	169	4 1/8	103	2	50	2 5/8	66	2 7/8	72	4	2
212-F100	10 5/8	268	8 7/8	225	5	127	2 3/4	68	3 1/8	79	3 1/2	88	8	4
212-F100F	10 5/8	268	8 7/8	225	5	127	2 3/4	68	3 3/8	84	3 3/4	94	8	4
212-F100G	11 1/2	291	9 7/8	248	5	127	3 5/8	91	3 1/8	79	n/a	n/a	9	4
212-F100GF	11 1/2	291	9 7/8	248	5	127	3 5/8	91	3 3/8	84	n/a	n/a	9	4

Zurn Industries, LLC | Wilkins
1747 Commerce Way, Paso Robles, CA U.S.A. 93446 Ph. 855-663-9876, Fax 805-238-5766
In Canada | **Zurn Industries Limited**
3544 Nashua Drive, Mississauga, Ontario L4V 1L2 Ph. 905-405-8272, Fax 905-405-1292
www.zurn.com

Rev. A
Date: 7/18
Document No. F100
Product No. Model F100

POTTER ROEMER FIRE PRO™
Member of Morris Group International™

CONNECTIONS (FDC)
ROOF FIRE DEPT. OUTLET CONNECTIONS

Model/Series No.
5870-5892 SERIES

SPECIFICATIONS

Cast brass body with female N.P.T. inlet and male N.P.T. outlets. Type and size of inlet and number of outlets as selected by model number.

MODEL 5872 (Shown)

MODEL SELECTION

TWO-WAY BACK INLET
- ❑ 5871
- ❑ 5872
- ❑ 5873
- ❑ 5874

TWO-WAY ANGLE INLET
- ❑ 5876
- ❑ 5877
- ❑ 5878
- ❑ 5879

THREE-WAY BACK INLET
- ❑ 5881
- ❑ 5882
- ❑ 5883
- ❑ 5884

THREE-WAY ANGLE INLET
- ❑ 5886
- ❑ 5887
- ❑ 5888
- ❑ 5889

THREE-WAY FEMALE OUTLETS
- ❑ 5890
- ❑ 5892

PRODUCT OPTIONS

VARIATIONS
- ❑ **-M** with male hose thread, specify thread

MEMBERSHIP

POTTER ROEMER/FIRE PRO
Headquarters:
P.O. Box 3527
City of Industry, CA
91744 U.S.A.
Los Angeles Area
800-366-3473
626-855-4890

Also in:
New York (800) 526-4592
Chicago (800) 547-3473
Atlanta (800) 762-0542
Miami (866) 961-3473
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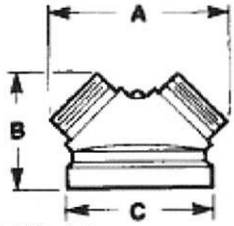
CONNECTIONS (FDC)
ROOF FIRE DEPT. OUTLET CONNECTIONS

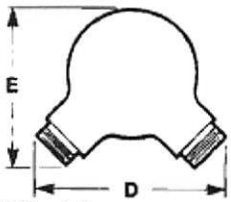
Model/Series No.
5870-5892 SERIES

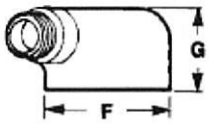
MODEL DIMENSIONS

Inlet Location		Inlet Size	Outlet Size	A	B	C	D	E	F	G
Back Model No.	Angle Model No.									
5871	5876	4	2-1/2	7	5	5	7	6	5	5
5872	5877	6	2-1/2	9	7	7-1/2	10	8	7-1/2	5
5873	5878	4	3	8-1/2	7	5-3/8	9	6-1/2	4-3/4	5-1/4
5874	5879	6	3	9-1/2	8-1/2	7-1/2	10-1/4	8-1/2	7-1/2	5-1/4

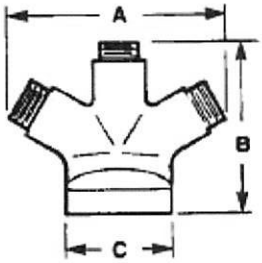
Back Inlet Models

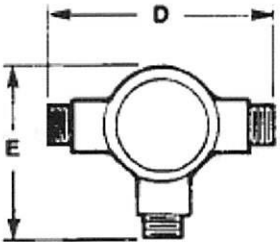


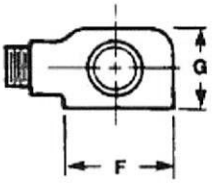
Angle Inlet Models

Inlet Location		Inlet Size	Outlet Size	A	B	C	D	E	F	G
Back Model No.	Angle Model No.									
5881	5886	4	2-1/2	11	9	5-1/4	8-3/4	7-1/2	5-1/4	5
5882	5887	6	2-1/2	11-3/4	9-1/2	7-1/2	11-3/4	9-1/2	7-1/2	5
5883	5888	4	3	12-3/4	8-3/4	5-1/4	12-1/4	9-3/4	7-1/2	5
5884	5889	6	3	14-3/4	9-3/4	7-1/2	11-3/4	9-3/4	7-1/2	5

Back Inlet Models

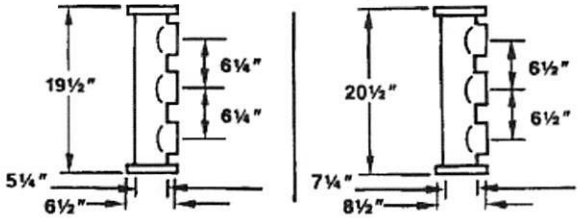





Angle Inlet Models

Model No.	Connection
5890	4" Female N.P.T. Both Ends with 2-1/2" N.P.T. Outlets

Model No.	Connection
5892	6" Female N.P.T. Both Ends with 2-1/2" N.P.T. Outlets

Models 5890-5892

Call Potter Roemer - Fire Pro for current listings and approvals. Dimensions are subject to manufacturer's tolerance and may change without notice. Potter Roemer-Fire Pro assumes no responsibility for use of void or superceded data.

5870-5892 SERIES Date: 9/25/18

MEMBERSHIP

FIRE EQUIPMENT MANUFACTURERS' ASSOCIATION

POTTER ROEMER/FIRE PRO
Headquarters:
P.O. Box 3527
City of Industry, CA
91744 U.S.A.
Los Angeles Area
800-366-3473
626-855-4890

Also in:
New York (800) 526-4592
Chicago (800) 547-3473
Atlanta (800) 762-0542
Miami (866) 961-3473
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POTTER ROEMER FIRE PRO™
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CONNECTIONS (FDC)
FLUSH FIRE DEPT INLET CONNECTIONS - CLAPPER SNOOT TYPE

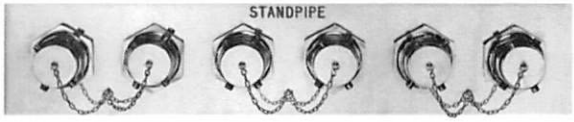
Model/Series No.
5521-5586 SERIES

SPECIFICATIONS

Cast brass or ductile iron (thermally-fused red polyester coated) body. Type and size of outlet and number of inlets as selected by model number. Polished brass plate with lettering as selected. U/L listed polished brass double female clapper snoots with rigid end 3" (76.2cm) NPT x 2 ½" (6.4cm) pin lug hose thread swivels, pin lug plugs and chains.

MODEL SELECTION

- ☐ **5521** Vertical End Brass Two-Way
- ☐ **5522** Vertical End Ductile Iron Two-Way
- ☐ **5523** Vertical Back Ductile Iron Two-Way
- ☐ **5524** Vertical Angle Ductile Iron Two-Way
- ☐ **5525** Horizontal End Brass Two-Way
- ☐ **5526** Horizontal End Ductile Iron Two-Way
- ☐ **5527** Horizontal Back Ductile Iron Two-Way
- ☐ **5528** Horizontal Angle Ductile Iron Two-Way
- ☐ **5532** Vertical, End Ductile Iron Two-Way
- ☐ **5533** Vertical Back Ductile Iron Two-Way
- ☐ **5534** Vertical Angle Ductile Iron Two-Way
- ☐ **5536** Horizontal End Ductile Iron Two-Way
- ☐ **5537** Horizontal Back Ductile Iron Two-Way
- ☐ **5538** Horizontal Angle Ductile Iron Two-Way
- ☑ **5541** Vertical End Brass Four-Way
- ☐ **5542** Vertical End Ductile Iron Four-Way
- ☐ **5543** Vertical Back Ductile Iron Four-Way
- ☐ **5544** Vertical Angle Ductile Iron Four-Way
- ☐ **5545** Horizontal End Brass Four-Way
- ☐ **5546** Horizontal End Ductile Iron Four-Way
- ☐ **5547** Horizontal Back Ductile Iron Four-Way
- ☐ **5548** Horizontal Angle Ductile Iron Four-Way
- ☐ **5561** Vertical End Brass Six-Way
- ☐ **5562** Horizontal Angle Brass Six-Way
- ☐ **5564** Horizontal Back Brass Six-Way
- ☐ **5565** Horizontal End Brass Six-Way
- ☐ **5566** Horizontal Angle Brass Six-Way
- ☐ **5567** Vertical End Brass Six-Way
- ☐ **5568** Horizontal Back Brass Six-Way
- ☐ **5569** Horizontal End Brass Six-Way
- ☐ **5581** Square Angle Brass Four-Way
- ☐ **5582** Square Angle Ductile Iron Four-Way
- ☐ **5585** Square Back Brass Four-Way
- ☐ **5586** Square Back Ductile Iron Four-Way



MODEL 5564 (Shown)

PRODUCT OPTIONS

FINISHES:

- ☐ -D Polished Chrome Plated

THREADS:

- ☐ N.S.T.
- ☐ Other _____

LETTERING AVAILABLE:

- ☐ STANDPIPE
- ☐ DRY STANDPIPE
- ☐ AUTO. SPKR.

5521-5586 SERIES Date: 9/25/18

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POTTER ROEMER/FIRE PRO
Headquarters:
P.O. Box 3527
City of Industry, CA
91744 U.S.A.
Los Angeles Area
800-366-3473
626-855-4890

Also in:
New York (800) 526-4592
Chicago (800) 547-3473
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CONNECTIONS (FDC)
FLUSH FIRE DEPT INLET CONNECTIONS - CLAPPER SNOOT TYPE

Model/Series No.
5521-5586 SERIES

MODEL DIMENSIONS

INSTALLATION		No. Inlets	Outlet Size	Outlet Location	Body Material	Dimensions				
Vertical Model No.	Horizontal Model No.					A	B	C	D	E
Two-Way										
5521	5525	2	4	End	Brass	6	-	15 1/4	-	5 1/2
5522	5526	2	4	End	Ductile Iron	5 1/4	-	15	-	7 1/2
5523	5527	2	4	Back	Ductile Iron	5 1/4	14	-	-	7 1/2
5524	5528	2	4	Angle	Ductile Iron	5 1/4	14	-	-	7 1/2
5532	5536	2	6	End	Ductile Iron	7 3/4	-	15	-	7 1/2
5533	5537	2	6	Back	Ductile Iron	7 3/4	14	-	-	7 1/2
5534	5538	2	6	Angle	Ductile Iron	7 3/4	14	-	-	7 1/2
Four-Way										
5541	5545	4	6	End	Brass	7 5/8	-	28 3/4	-	7 5/8
5542	5546	4	6	End	Ductile Iron	7 3/4	-	30	-	7 3/4
5543	5547	4	6	Back	Ductile Iron	7 3/4	29	-	-	7 3/4
5544	5548	4	6	Angle	Ductile Iron	7 3/4	29	-	-	7 3/4
Six-Way										
5561	5565	6	6	End	Brass	7 5/8	-	43	-	7 5/8
	5562	6	6	Angle	Brass	7 1/2	46 1/4	-	-	7 3/8
	5564	6	6	Back	Brass	7 1/2	46 1/4	-	-	7 3/8
	5566	6	8	Angle	Brass	9 1/8	46 1/4	-	-	7 3/8
5567	5569	6	8	End	Brass	9 1/2	-	43	-	7 5/8
	5568	6	8	Back	Brass	9 1/8	46 1/4	-	-	7 3/8
Four-Way Square										
5581		4	6	Angle	Brass	-	13	-	-	8
5582		4	6	Angle	Ductile Iron	-	12	-	-	8
5585		4	6	Back	Brass	7 1/2	13	-	8 3/4	-
5586		4	6	Back	Ductile Iron	7	13	-	8 3/4	-

ALL DIMENSIONS IN INCHES

5521-5586 SERIES Date: 9/25/18

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POTTER ROEMER/FIRE PRO
Headquarters:
P.O. Box 3527
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91744 U.S.A.
Los Angeles Area
800-366-3473
626-855-4890

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New York (800) 526-4592
Chicago (800) 547-3473
Atlanta (800) 762-0542
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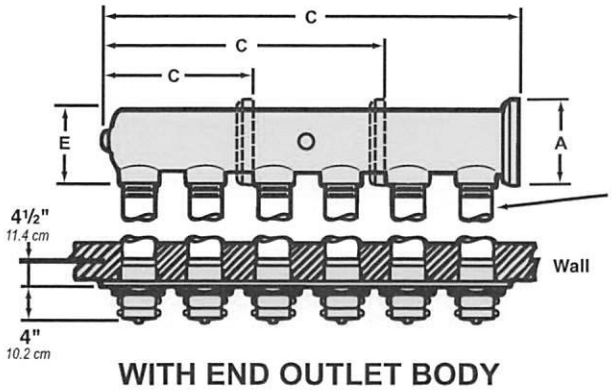
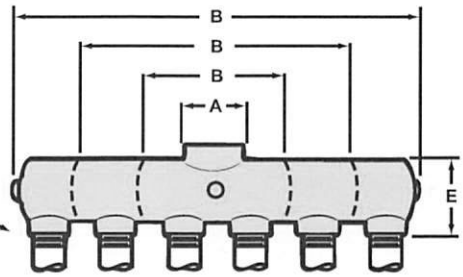
CONNECTIONS (FDC)
FLUSH FIRE DEPT INLET CONNECTIONS - CLAPPER SNOOT TYPE

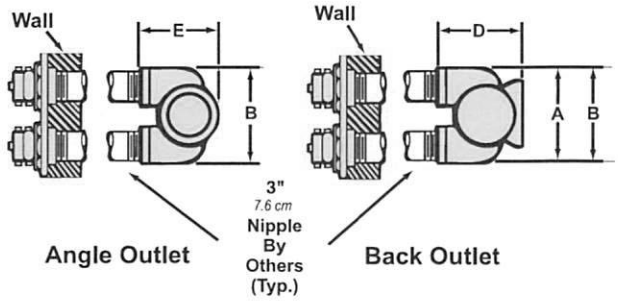
Model/Series No.
5521-5586 SERIES



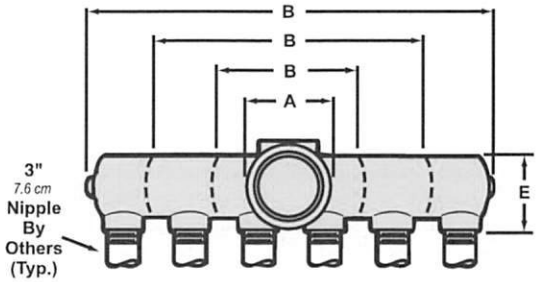
WITH END OUTLET BODY



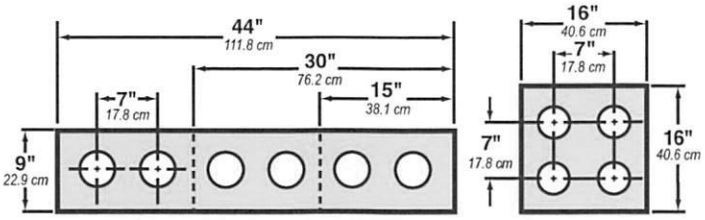
WITH BACK OUTLET BODY



FOUR-WAY SQUARE BODY



WITH ANGLE OUTLET BODY



Horizontal or Vertical

PLATES

5521-5586 SERIES Date: 9/25/18

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91744 U.S.A.
Los Angeles Area
800-366-3473
626-855-4890

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Chicago (800) 547-3473
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KNOX FDC LOCKS™
1.5-INCH AND 2.5-INCH

Knox FDC Locks protect fire department connections (FDCs), keeping pipes clean of debris to ensure the delivery of high-pressure water flow to fire sprinkler systems. The Knox FDC Lock is available in 1.5" and 2.5" configurations and is operated with a Knox Keywrench controlled by the Fire Department.

2.5" Diameter, Male Locking Cap with Swivel-Guard™ Enhanced Protection

WEIGHT: 3.65 lbs

2.5" Diameter,
Male Locking Cap

WEIGHT: 3.05 lbs

1.5" Diameter,
Male Locking Cap

WEIGHT: 1.00 lb

WARNING:

This product must be installed by Authorized Fire Department Representative or Fire Department-Authorized Contractor only. This is a security product that requires a special fire department keywrench to lock the cap in place. Unauthorized installation may result in improper locking of the cap. An improperly locked cap may be subject to removal by unauthorized personnel.

FEATURES

- Locking mechanism secures and protects FDCs
- Stainless steel construction to withstand all weather conditions
- Authorized by 2018 IFC[1] and IBC[2] (Chapter 912.4.1) and 2018 NFPA 1[3] (Chapter 13.1.13)

[1] Also enacted in 2003, 2006, 2009 and 2012 (Chapter 912.3.1) and 2015 (Chapter 912.4.1) of IFC editions

[2] Also enacted in 2006, 2009 and 2012 (Chapter 912.3.1) and 2015 (Chapter 912.4.1) of IBC editions

[3] Also enacted in 2009, 2012 and 2015 (Chapter 13.1.12)

BENEFITS

- Ensures ready and reliable connections to fire sprinkler systems
- FDC Swivel-Guard™ brings added protection against vandalism.
- Protects check valves from freezing in cold climate areas
- Eliminates costly services to back flush the pipes due to debris

OPTIONS

- Swivel-Guard™ (Model #3041) provides enhanced security
- Available in 2.5" and 1.5" NH sizes

ORDERING SPECIFICATIONS

To insure procurement and delivery of the Knox FDC Lock, it is suggested that the following specification paragraph be used:

Knox FDC locking cap made of stainless steel.

Sizes: 1.5-inch and 2.5-inch

Construction and Finish: Stainless steel

Lock: Locks with a proprietary Knox Keywrench

P/N: 1.5-inch - 3050; 2.5-inch with Swivel-Guard- 3041; 2.5-inch - 3043; (mfr's cat. ID)

Mfr's Name: KNOX COMPANY

ABOUT KNOX COMPANY

Over forty years ago, a unique concept in rapid access for emergency response was born. The KnoxBox®, a high-security key lock box, was designed to provide rapid access for emergency responders to reduce response times and protect property from forced entry.

Today, one revolutionary lock box has grown into a complete system providing rapid access for public safety agencies, industries, military, and property owners across the world. The Knox Company is trusted by over 14,000 fire departments, law enforcement agencies, and governmental entities.

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TOLCO™ Fig. 909 - No-Thread Swivel Sway Brace Attachment (UL Listed)

OPM

Size Range: 1" (25mm) bracing pipe. For brace pipe sizes larger than 1" (25mm), use Fig. 980. Available with holes for 1/2", 5/8", or 3/4" fastener attachment.

Material: Steel, hardened cone point set bolt

Function: The structural component of a sway and seismic bracing system.

Features: This product's design incorporates a concentric attachment opening which is critical to the performance of structural seismic connections. NFPA 13 indicates clearly that fastener table load values are based only on concentric loading. No threading of the bracing pipe is required. Open design allows for easy inspection of pipe engagement.

Application Note: Fig. 909 is used in conjunction with the Fig. 1000, Fig. 1001, Fig. 4A or Fig. 4L or other approved TOLCO attachment to pipe, and joined together with bracing pipe. Sway brace assemblies are intended to be installed in accordance with NFPA 13. The required type, number and size of fasteners used for the structure attachment fitting shall be in accordance with NFPA 13.

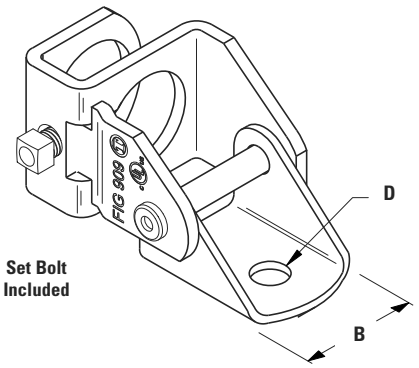
Approvals: Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL)**. Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development **(OSHPD)**. For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13.

Installation Instructions: Fig. 909 is the structural or transitional attachment component of a longitudinal or lateral sway brace assembly. It is intended to be combined with the "bracing pipe" and TOLCO "braced pipe" attachment, Fig. 1000, 1001, 2002, 3000, 4A, 4LA or other approved TOLCO attachment to pipe to form a complete bracing assembly. NFPA 13 guidelines should be followed.

To Install: Place the Fig. 909 onto the bracing pipe. Tighten the set bolt until the head bottoms out on surface. Attachment can pivot for adjustment to proper brace angle.

Finish: Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

Order By: Figure number, fastener attachment size and finish.



Part Number	Mounting Hole D in. (mm)	Brace Pipe Size in. (mm)	B in. (mm)	Max. Design Load lbs. (kN)	Approx. Wt./100 lbs. (kg)
909-1/2 *	17/32" (13.5)	1" (25)	1 5/8" (41.3)	2015 (8.96)	91 (41.3)
909-5/8	11/16" (17.5)	1" (25)	1 5/8" (41.3)	2015 (8.96)	90 (40.8)
909-3/4	13/16" (20.6)	1" (25)	1 5/8" (41.3)	2015 (8.96)	89 (40.4)

* Standard size.

Important! - For load information when using Fig. 909 with pre-installed or post-installed concrete anchors in compliance with NFPA 13 (2016) or ASCE 7-10, including prying factors, see load tables on pages AL-1 thru AL-21.

Eaton's B-Line series seismic bracing components are designed to be compatible only with other B-Line series bracing components, resulting in a listed seismic bracing assembly. Eaton B-Line Division warranty for seismic bracing components will be the warranty provided in Eaton B-Line Division standard terms and conditions of sale made available by Eaton, except that, in addition to the other exclusions from Eaton B-Line Division warranty, Eaton makes no warranty relating to B-Line series seismic bracing components that are combined with products not provided by Eaton.

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

TOLCO™ Fig. 4LA - In-Line Sway Brace Attachment (UL Listed)

OPM

Size Range: 1" (25mm) through 8" (200mm) IPS.

Material: Steel

Function: For bracing pipe against sway and seismic disturbance.

Approvals: For FM Approval information refer to FM Approved page 77. Underwriters Laboratories Listed in the USA and Canada **(cULus)**. Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development **(OSHPD)**. For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13.

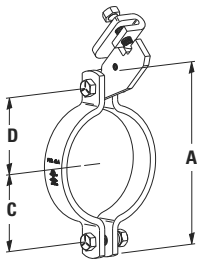
Installation Instructions: Fig. 4LA can be used as the system attachment component of a longitudinal or lateral brace assembly. It is intended to be combined with the "bracing member" and TOLCO transitional attachment and structural attachment to form a complete bracing assembly. For fire sprinkler applications NFPA 13 guidelines should be followed.

To Install: Place the Fig. 4LA pipe clamp component over the pipe to be braced and tighten down the break-off nuts until the hex head portion breaks off to verify correct installation torque. Next engage brace member (pipe or strut) with jaw component and tighten break-off head bolt until the hex head breaks off to verify correct installation torque. Pivot jaw for correct angle and attach to structure using TOLCO brand transitional attachment and structural attachment.

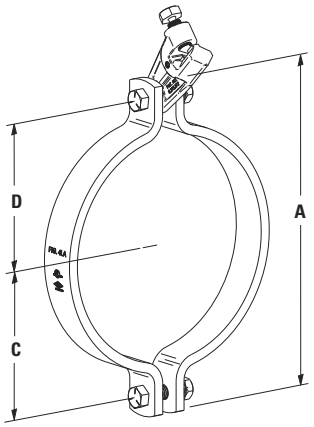
Finish: Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

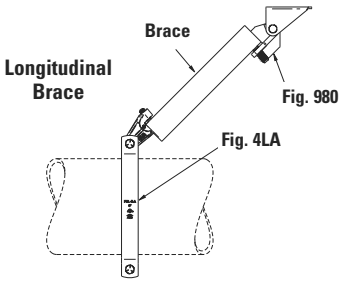
Order By: Figure number, pipe size and finish.

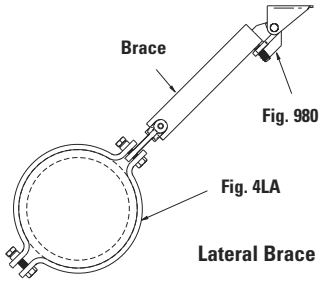
4LA-1 thru 4LA-4



4LA-6 thru 4LA-12







Part No.	Pipe Size in.	(mm)	A in.	(mm)	C in.	(mm)	D in.	(mm)	Bolt Size	UL Max. Rec. Load Longitudinal lbs.	(kN)	Lateral lbs.	(kN)	Approx. Wt./100 lbs.	(kg)
4LA-1	1"	(25)	3 19/32"	(91.2)	1 5/16"	(33.5)	1 5/16"	(33.5)	3/8"-16	1000	(4.45)	NA	(NA)	119	(54.0)
4LA-1 1/4	1 1/4"	(32)	3 29/32"	(99.3)	1 3/8"	(35.3)	1 3/8"	(35.3)	3/8"-16	1000	(4.45)	NA	(NA)	123	(55.8)
4LA-1 1/2	1 1/2"	(40)	4 5/32"	(105.7)	1 1/2"	(38.5)	1 1/2"	(38.5)	3/8"-16	1000	(4.45)	NA	(NA)	127	(57.6)
4LA-2	2"	(50)	5 11/32"	(135.6)	2 1/32"	(51.9)	2 1/16"	(51.9)	3/8"-16	1000	(4.45)	NA	(NA)	142	(64.4)
4LA-2 1/2	2 1/2"	(65)	5 27/32"	(148.7)	2 5/16"	(58.5)	2 5/16"	(58.5)	3/8"-16	1000	(4.45)	NA	(NA)	173	(78.5)
4LA-3	3"	(80)	6 1/2"	(164.9)	2 5/8"	(66.6)	2 5/8"	(66.6)	3/8"-16	1000	(4.45)	1000	(4.45)	187	(84.8)
4LA-3 1/2	3 1/2"	(90)	7.407"	(188.1)	2 7/8"	(73.1)	2 7/8"	(73.1)	3/8"-16	1000	(4.45)	1000	(4.45)	198	(89.8)
4LA-4	4"	(100)	7 13/32"	(190.8)	3 1/8"	(79.5)	3 1/8"	(79.5)	3/8"-16	1000	(4.45)	1000	(4.45)	209	(94.8)
4LA-6	6"	(150)	10 5/8"	(269.9)	4 9/16"	(115.9)	4 9/16"	(115.9)	1/2"-13	1600	(7.12)	1600	(7.12)	521	(236.3)
4LA-8	8"	(200)	12 13/16"	(325.5)	5 9/16"	(143.7)	5 21/32"	(143.7)	1/2"-13	2015	(7.12)	2015	(7.12)	629	(285.3)
4LA-10*	10"	(250)	16 1/2"	(419.1)	7 1/4"	(184.2)	7 1/4"	(184.2)	1/2"-13	NA	(NA)	NA	(NA)	1320	(598.7)
4LA-12*	12"	(300)	18 1/2"	(469.9)	8 1/4"	(209.6)	8 1/4"	(209.6)	1/2"-13	NA	(NA)	NA	(NA)	1496	(678.6)

* FM Approved but not UL Listed.

Eaton's B-Line series seismic bracing components are designed to be compatible only with other B-Line series bracing components, resulting in a listed seismic bracing assembly. Eaton B-Line Division warranty for seismic bracing components will be the warranty provided in Eaton B-Line Division standard terms and conditions of sale made available by Eaton, except that, in addition to the other exclusions from Eaton B-Line Division warranty, Eaton makes no warranty relating to B-Line series seismic bracing components that are combined with products not provided by Eaton.

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

TOLCO™ Fig. 4LA - In-Line Sway Brace Attachment (FM Approved)

OPM

FM APPROVED

Size Range: 1" (25mm) through 12" (300mm) IPS.
Material: Steel
Function: For bracing pipe against sway and seismic disturbance.
Approvals: Approved by Factory Mutual Engineering **(FM)**, 1" (25mm) through 12" (300mm) pipe.
For UL Listed information refer to UL Listed page 76.
Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development **(OSHPD)**. For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13.

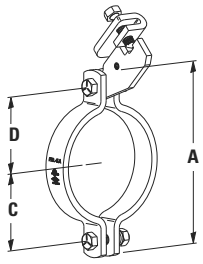
Installation Instructions: Fig. 4LA can be used as the system attachment component of a longitudinal or lateral brace assembly. It is intended to be combined with the "bracing member" and TOLCO transitional attachment and structural attachment to form a complete bracing assembly. For fire sprinkler applications NFPA 13 guidelines should be followed.

To Install: Place the Fig. 4LA pipe clamp component over the pipe to be braced and tighten down the break-off nuts until the hex head portion breaks off to verify correct installation torque. Next engage brace member (pipe or strut) with jaw component and tighten break-off head bolt until the hex head breaks off to verify correct installation torque. Pivot jaw for correct angle and attach to structure using TOLCO brand transitional attachment and structural attachment.

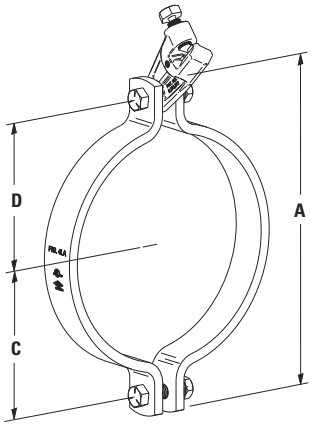
Finish: Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

Order By: Figure number, pipe size and finish.

4LA-1 thru 4LA-4

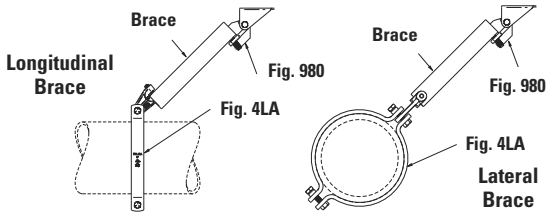


4LA-6 thru 4LA-12



Part No.	Pipe Size in.	(mm)	A in.	(mm)	C in.	(mm)	D in.	(mm)	Bolt Size	FM Max. Rec. Load Longitudinal & Lateral** 30°-44° lbs.	(kN)	45°-59° lbs.	(kN)	60°-74° lbs.	(kN)	75°-90° lbs.	(kN)	Approx. Wt./100 lbs.	(kg)
4LA-1	1"	(25)	3 19/32"	(91.2)	1 5/16"	(33.5)	1 5/16"	(33.5)	3/8"-16	680	(3.02)	970	(4.31)	1190	(5.29)	1320	(5.87)	119	(54.0)
4LA-1 1/4	1 1/4"	(32)	3 29/32"	(99.3)	1 3/8"	(35.3)	1 3/8"	(35.3)	3/8"-16	680	(3.02)	970	(4.31)	1190	(5.29)	1320	(5.87)	123	(55.8)
4LA-1 1/2	1 1/2"	(40)	4 5/32"	(105.7)	1 1/2"	(38.5)	1 1/2"	(38.5)	3/8"-16	680	(3.02)	970	(4.31)	1190	(5.29)	1320	(5.87)	127	(57.6)
4LA-2	2"	(50)	5 11/32"	(135.6)	2 1/32"	(51.9)	2 1/16"	(51.9)	3/8"-16	680	(3.02)	970	(4.31)	1190	(5.29)	1320	(5.87)	142	(64.4)
4LA-2 1/2	2 1/2"	(65)	5 27/32"	(148.7)	2 5/16"	(58.5)	2 5/16"	(58.5)	3/8"-16	680	(3.02)	970	(4.31)	1190	(5.29)	1320	(5.87)	173	(78.5)
4LA-3	3"	(80)	6 1/2"	(164.9)	2 5/8"	(66.6)	2 5/8"	(66.6)	3/8"-16	680	(3.02)	970	(4.31)	1190	(5.29)	1320	(5.87)	187	(84.8)
4LA-3 1/2	3 1/2"	(90)	7.407"	(188.1)	2 7/8"	(73.1)	2 7/8"	(73.1)	3/8"-16	680	(3.02)	970	(4.31)	1190	(5.29)	1320	(5.87)	198	(89.8)
4LA-4	4"	(100)	7 13/32"	(190.8)	3 1/8"	(79.5)	3 1/8"	(79.5)	3/8"-16	680	(3.02)	970	(4.31)	1190	(5.29)	1320	(5.87)	209	(94.8)
4LA-6	6"	(150)	10 5/8"	(269.9)	4 9/16"	(115.9)	4 9/16"	(115.9)	1/2"-13	1620	(7.20)	*Note 1*		*Note 3*		*Note 5*		521	(236.3)
4LA-8	8"	(200)	12 13/16"	(325.5)	5 9/16"	(143.7)	5 21/32"	(143.7)	1/2"-13	1620	(7.20)	*Note 2*		*Note 4*		*Note 6*		629	(285.3)
4LA-10	10"	(250)	16 1/2"	(419.1)	7 1/4"	(184.2)	7 1/4"	(184.2)	1/2"-13	1620	(7.20)	*Note 2*		*Note 4*		*Note 6*		1320	(598.7)
4LA-12	12"	(300)	18 1/2"	(469.9)	8 1/4"	(209.6)	8 1/4"	(209.6)	1/2"-13	1620	(7.20)	*Note 2*		*Note 4*		*Note 6*		1496	(678.6)

** Longitudinal and Lateral Loads are the same except where noted in chart.
Note 1: Longitudinal Load 2260 lbs. (10.05kN) - Lateral Load 2300 lbs. (10.23kN)
Note 2: Longitudinal Load 1660 lbs. (7.38kN) - Lateral Load 2300 lbs. (10.23kN)
Note 3: Longitudinal Load 2010 lbs. (8.94kN) - Lateral Load 2820 lbs. (12.54kN)
Note 4: Longitudinal Load 1570 lbs. (6.98kN) - Lateral Load 2820 lbs. (12.54kN)
Note 5: Longitudinal Load 2220 lbs. (9.87kN) - Lateral Load 3140 lbs. (13.96kN)
Note 6: Longitudinal Load 1740 lbs. (7.74kN) - Lateral Load 3140 lbs. (13.96kN)



Eaton's B-Line series seismic bracing components are designed to be compatible only with other B-Line series bracing components, resulting in a listed seismic bracing assembly. Eaton B-Line Division warranty for seismic bracing components will be the warranty provided in Eaton B-Line Division standard terms and conditions of sale made available by Eaton, except that, in addition to the other exclusions from Eaton B-Line Division warranty, Eaton makes no warranty relating to B-Line series seismic bracing components that are combined with products not provided by Eaton.

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

TOLCO™ Fig. 1001 - Sway Brace Attachment (UL Listed)

OPM

Size Range: Pipe size to be braced: 1" (25mm) thru 8" (200mm) IPS. Pipe size used for bracing: 1" (25mm) and 1¼" (32mm) Schedule 40 IPS.

Material: Steel

Function: For bracing pipe against sway and seismic disturbance. The pipe attachment component of a sway brace system: Fig. 1001 is used in conjunction with a Fig. 900 Series fitting and joined together with bracing pipe per NFPA 13, forming a complete sway brace assembly.

Features: Can be used to brace schedule 7 through schedule 40 IPS. Field adjustable, making critical pre-engineering of bracing pipe length unnecessary. Unique design requires no threading of bracing pipe. Comes assembled and ready for installation. Fig. 1001 has built-in visual verification of correct installation. See installation note below.

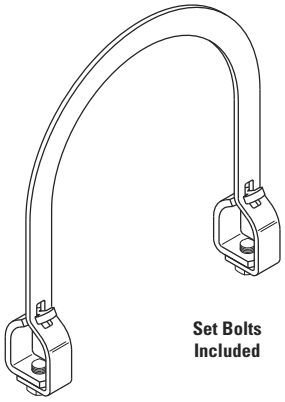
Installation Note: Position Fig. 1001 over the pipe to be braced and tighten two hex head cone point set bolts until heads bottom out. A minimum of 1" (25mm) pipe extension is recommended. Brace pipe can be installed on top or bottom of pipe to be braced.

Approvals: Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL)**. Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development **(OSHPD)**. For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13.
For FM Approval information refer to FM Approved page 67.

Finish: Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

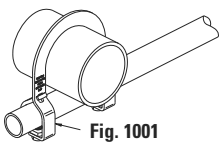
Order By: Order by figure number, pipe size to be braced, followed by pipe size used for bracing (1" (25mm) or 1¼" (32mm)), and finish.

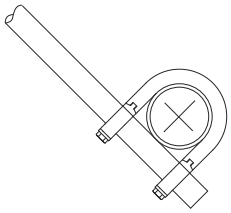
Important Note: Fig. 1001 is precision manufactured to perform its function as a critical component of a complete bracing assembly. To ensure performance, the UL Listing requires that Fig. 1001 must be used only with other TOLCO bracing products.

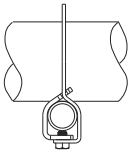


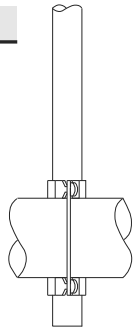
Pipe Size	Part Number & Approx. Wt./100 1" (24mm) Brace Pipe			Part Number & Approx. Wt./100 1¼" (32mm) Brace Pipe			Design Load - Lbs. For Brace Pipe Size 1" / 1¼" Sch. 7 1" / 1¼"	Sch. 10 1" / 1¼"	Sch. 40 1" / 1¼"
in. (mm)		Lbs.	(kg)		Lbs.	(kg)			
1" (25)	**1001-1 X 1**	100.0	(45.3)	**1001-1 X 1¼**	118.0	(53.5)	-- / --	1000 / 1000	1000 / 1000
1¼" (32)	**1001-1¼ X 1**	100.0	(45.3)	**1001-1¼ X 1¼**	114.0	(51.7)	1000 / 1000	1000 / 1000	1000 / 1000
1½" (40)	**1001-1½ X 1**	100.0	(45.3)	**1001-1½ X 1¼**	115.0	(52.1)	1000 / 1000	1500 / 1500	1500 / 1500
2" (50)	**1001-2 X 1**	108.0	(49.0)	**1001-2 X 1¼**	121.0	(54.8)	1000 / 1000	2015 / 2015	2015 / 2015
2½" (65)	**1001-2½ X 1**	138.6	(62.8)	**1001-2½ X 1¼**	160.4	(72.7)	1600 / 1600	2015 / 2765	2015 / 2765
3" (80)	**1001-3 X 1**	147.2	(66.7)	**1001-3 X 1¼**	168.7	(76,5)	1600 / 1600	2015 / 2765	2015 / 2765
4" (100)	**1001-4 X 1**	160.9	(73.0)	**1001-4 X 1¼**	182.4	(82.7)	1600 / 1600	2015 / 2765	2015 / 2765
6" (150)	**1001-6 X 1**	190.0	(86.2)	**1001-6 X 1¼**	211.4	(95.9)	1600 / 1600	2015 / 2765	2015 / 2765
8" (200)	**1001-8 X 1**	217.4	(98.6)	**1001-8 X 1¼**	238.8	(108.3)	1600 / 1600	2015 / 2765	2015 / 2765

Note: Metric sizes are available, contact factory.







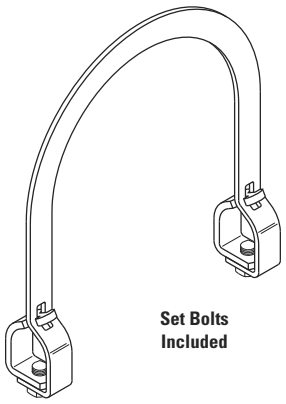


All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

TOLCO™ Fig. 1001 - Sway Brace Attachment (FM Approved)

OPM

FM APPROVED



Size Range: Pipe size to be braced: 1" (25mm) thru 8" (200mm) IPS. Pipe size used for bracing: 1" (25mm) and 1¼" (32mm) Schedule 40 IPS.

Material: Steel

Function: For bracing pipe against sway and seismic disturbance. The pipe attachment component of a sway brace system: Fig. 1001 is used in conjunction with a Fig. 900 Series fitting and joined together with bracing pipe per NFPA 13, forming a complete sway brace assembly.

Features: Can be used to brace schedule 7 through schedule 40 IPS. Field adjustable, making critical pre-engineering of bracing pipe length unnecessary. Unique design requires no threading of bracing pipe. Can be used as a component of a four-way riser brace. Comes assembled and ready for installation. Fig. 1001 has built-in visual verification of correct installation. See installation note below.

Installation Note: Position Fig. 1001 over the pipe to be braced and tighten two hex head cone point set bolts until heads bottom out. A minimum of 1" (25mm) pipe extension is recommended. Brace pipe can be installed on top or bottom of pipe to be braced.

Approvals: Approved by Factory Mutual Engineering **(FM)**. Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development **(OSHPD)**. For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13. For **UL** Listed information refer to **UL** Listed page 66.

Finish: Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

Order By: Order by figure number, pipe size to be braced, followed by pipe size used for bracing (1" (25mm) or 1¼" (32mm)) , and finish.

Important Note: Fig. 1001 is precision manufactured to perform its function as a critical component of a complete bracing assembly. To ensure performance, the FM Approval requires that Fig. 1001 must be used only with other TOLCO bracing products.

Designed to meet or exceed requirements of FM DS 2-8.

Pipe Size in. (mm)	Part Number & Approx. Wt./100						Design Load - For Sch. 7, Sch. 10, & Sch. 40 Pipe Allowable Horizontal Capacity (lbf) Per Installation [1,2,3]							
	1" (24mm) Brace Pipe	Lbs.	(kg)	1¼" (32mm) Brace Pipe	Lbs.	(kg)	30°-44° Lbs.	(kN)	45°-59° Lbs.	(kN)	60°-74° Lbs.	(kN)	75°-90° Lbs.	(kN)
1" (25)	**1001-1 X 1**	100.0	(45.3)	**1001-1 X 1¼**	118.0	(53.5)	1800	(8.00)	2550	(11.34)	3120	(13.88)	3490	(25.52)
1¼" (32)	**1001-1¼ X 1**	100.0	(45.3)	**1001-1¼ X 1¼**	114.0	(51.7)	1230	(5.47)	1740	(7.74)	2140	(9.52)	2380	(10.58)
1½" (40)	**1001-1½ X 1**	100.0	(45.3)	**1001-1½ X 1¼**	115.0	(52.1)	1230	(5.47)	1740	(7.74)	2140	(9.52)	2380	(10.58)
2" (50)	**1001-2 X 1**	108.0	(49.0)	**1001-2 X 1¼**	121.0	(54.9)	1230	(5.47)	1740	(7.74)	2140	(9.52)	2380	(10.58)
2½" (65)	**1001-2½ X 1**	138.6	(62.8)	**1001-2½ X 1¼**	160.4	(72.7)	800	(3.56)	1130	(5.02)	1380	(6.14)	1540	(6.85)
3" (80)	**1001-3 X 1**	147.2	(66.7)	**1001-3 X 1¼**	168.7	(76,5)	850	(3.78)	1200	(5.34)	1470	(6.54)	1640	(7.29)
4" (100)	**1001-4 X 1**	160.9	(73.0)	**1001-4 X 1¼**	182.4	(82.7)	850	(3.78)	1200	(5.34)	1470	(6.54)	1640	(7.29)
6" (150)	**1001-6 X 1**	190.0	(86.2)	**1001-6 X 1¼**	211.4	(95.9)	510	(2.27)	730	(3.25)	890	(3.96)	990	(4.40)
8" (200)	**1001-8 X 1**	217.4	(98.6)	**1001-8 X 1¼**	238.8	(108.3)	510	(2.27)	730	(3.25)	890	(3.96)	990	(4.40)

[1] FM Approved when used with 1 or 1¼ inch NPS Schedule 40 GB/T 3091,EN 10255H, or JIS G3451 steel pipe as the brace member.

[2] Load rating for LW above refers to FM Approved Lightwall Pipe commonly referred to as "Schedule 7". These ratings may also be applied when EN 10220 and GB/T 8163 steel pipe.

[3] Load rating for Schedule 10 above may be applied to GB/T 3092,EN 10255M and H, or JIS G3454, FM Approved Thinwall, or Schedule 40 steel pipes.

Note: See UL load ratings in UL Listed Design Load chart shown under drawing.

Note: Metric sizes are available, contact factory.

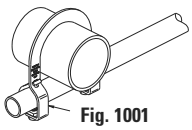
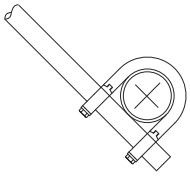
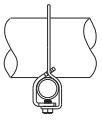
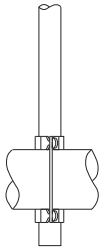


Fig. 1001







All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

TOLCO™ Fig. 1000 - "Fast Clamp" Branch Line Restraint Attachment (UL Listed)

OPM

Size Range: Pipe size to be braced: 1" (25mm) thru 4" (100mm) 40 IPS.
Pipe size used for bracing: 1" (25mm) and 1¼" (32mm) Schedule 40 IPS.
For pipe sizes larger than 2" (500mm) please refer to TOLCO Fig. 1001.

Material: Steel

Function: A restraint device intended for lateral bracing.

Features: Field adjustable, making critical pre-engineering of bracing pipe unnecessary. Unique design requires no threading of bracing pipe. Steel leaf spring insert provided to assure installer and inspector necessary minimum torque has been achieved.

Installation: Fig. 1000 is the "braced pipe" attachment component of a lateral sway brace assembly. It is intended to be combined with the "bracing pipe" and TOLCO structural attachment component, Fig. 980, 910, 909 or other approved TOLCO component to form a complete bracing assembly. Follow NFPA 13 guidelines.

To Install: Place the Fig. 1000 over the pipe to be braced, insert bracing pipe through opening leaving a minimum of 1" extension. Brace pipe can be installed on top or bottom of pipe to be braced. Tighten hex nuts until leaf spring is flat. It is recommended that the brace angle be adjusted before hex nuts are fully tightened.

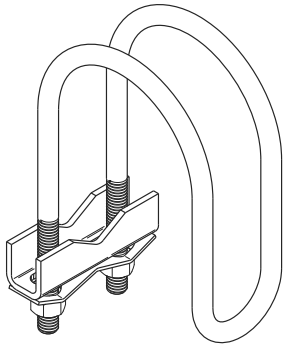
Approvals: Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL)**. Approved for use with engineered light wall sprinkler pipe up to 2" as a restraint device. Torque requirement is 6-8 ft./lbs. (8-10Nm). Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development **(OSHPD)**. For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13.

For FM Approval information refer to FM Approved page 69.

Application Note: Position Fast Clamp and tighten two hex nuts until leaf spring flattens. A minimum of 1" pipe extension beyond the Fig. 1000 is recommended.

Finish: Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

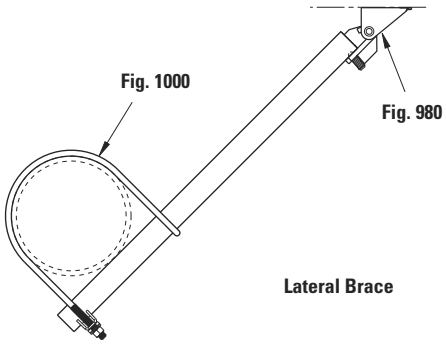
Order By: Order by figure number, pipe size to be braced, followed by pipe size used for bracing (1" (25mm) or 1¼" (32mm)) , and finish.



Hardware Included

*** UL Listed**
1" (25mm) thru 2" (50mm) pipe size

Pipe Size in. (mm)	Part Number & Approx. Wt./100 1" (24mm) Brace Pipe	Lbs.	(kg)	1 1/4" (32mm) Brace Pipe	Lbs.	(kg)
1" (25)	**1000-1 X 1**	71.6	(32.5)	**1000-1 X 1 1/4**	75.8	(34.4)
1 1/4" (32)	**1000-1 1/4 X 1**	74.8	(33.9)	**1000-1 1/4 X 1 1/4**	79.1	(35.9)
1 1/2" (40)	**1000-1 1/2 X 1**	77.8	(35.3)	**1000-1 1/2 X 1 1/4**	82.1	(37.2)
2" (50)	**1000-2 X 1**	84.1	(38.1)	**1000-2 X 1 1/4**	88.4	(40.1)



Eaton's B-Line series seismic bracing components are designed to be compatible only with other B-Line series bracing components, resulting in a listed seismic bracing assembly. Eaton B-Line Division warranty for seismic bracing components will be the warranty provided in Eaton B-Line Division standard terms and conditions of sale made available by Eaton, except that, in addition to the other exclusions from Eaton B-Line Division warranty, Eaton makes no warranty relating to B-Line series seismic bracing components that are combined with products not provided by Eaton.

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

TOLCO™ Fig. 1000 - "Fast Clamp" Sway Brace Attachment (FM Approved)

Size Range: Pipe size to be braced: 1" (25mm) thru 4" (100mm) 40 IPS.
Pipe size used for bracing: 1" (25mm) and 1¼" (32mm) Schedule 40 IPS.
For pipe sizes larger than 4" (100mm) please refer to TOLCO Fig. 1001.

Material: Steel

Function: For bracing pipe against sway and seismic disturbance.

Features: Field adjustable, making critical pre-engineering of bracing pipe unnecessary. Unique design requires no threading of bracing pipe. Steel leaf spring insert provided to assure installer and inspector necessary minimum torque has been achieved.

Installation: Fig. 1000 is the "braced pipe" attachment component of a lateral sway brace assembly. It is intended to be combined with the "bracing pipe" and TOLCO structural attachment component, Fig. 980 or other approved TOLCO seismic brace to form a complete bracing assembly. Follow NFPA 13 guidelines.

To Install: Place the Fig. 1000 over the pipe to be braced, insert bracing pipe through opening leaving a minimum of 1" extension. Brace pipe can be installed on top or bottom of pipe to be braced. Tighten hex nuts until leaf spring is flat. It is recommended that the brace angle be adjusted before hex nuts are fully tightened.

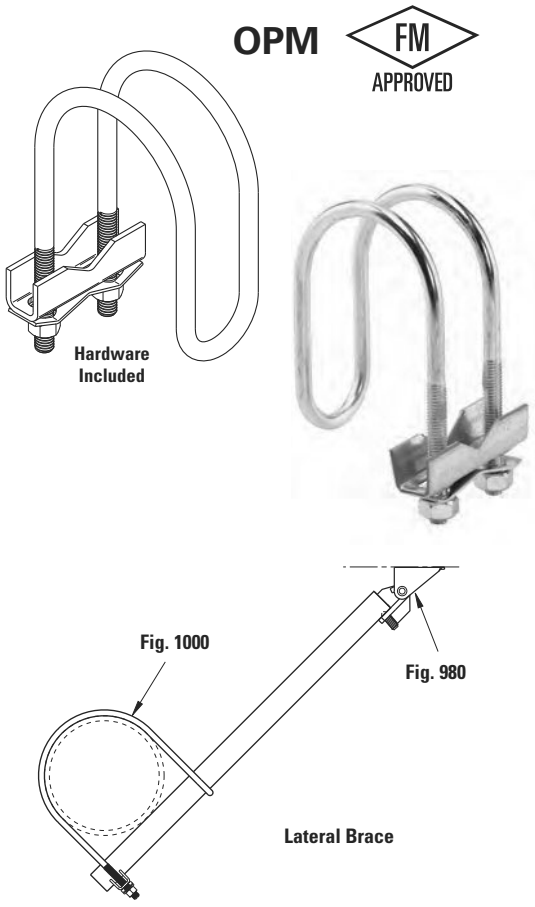
Approvals: Approved by Factory Mutual Engineering **(FM)**.
Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development **(OSHPD)**. For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13.
For UL Listed information refer to UL Listed page 68.

Application Note: Position Fast Clamp and tighten two hex nuts until leaf spring flattens. A minimum of 1" pipe extension beyond the Fig. 1000 is recommended.

Finish: Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

Order By: Order by figure number, pipe size to be braced, followed by pipe size used for bracing (1" (25mm) or 1¼" (32mm)) , and finish.

Designed to meet or exceed requirements of FM DS 2-8.



Pipe Size	Part Number & Approx. Wt./100				Design Load - Allowable Horizontal Capacity (lbf) Per Installation [1,2,3]							
	1" (24mm) Brace Pipe		1¼" (32mm) Brace Pipe		30°-44°		45°-59°		60°-74°		75°-90°	
in. (mm)		Lbs. (kg)		Lbs. (kg)	Lbs.	(kN)	Lbs.	(kN)	Lbs.	(kN)	Lbs.	(kN)
1" (25)	**1000-1 X 1**	71.6 (32.5)	**1000-1 X 1¼**	75.8 (34.4)	200	(0.89)	280	(1.24)	340	(1.51)	380	(1.69)
1¼" (32)	**1000-1¼ X 1**	74.8 (33.9)	**1000-1¼ X 1¼**	79.1 (35.9)	200	(0.89)	280	(1.24)	340	(1.51)	380	(1.69)
1½" (40)	**1000-1½ X 1**	77.8 (35.3)	**1000-1½ X 1¼**	82.1 (37.2)	200	(0.89)	280	(1.24)	340	(1.51)	380	(1.69)
2" (50)	**1000-2 X 1**	84.1 (38.1)	**1000-2 X 1¼**	88.4 (40.1)	200	(0.89)	280	(1.24)	340	(1.51)	380	(1.69)
2½" (65)	**1000-2½ X 1**	90.2 (40.9)	**1000-2½ X 1¼**	94.6 (42.9)	200	(0.89)	280	(1.24)	340	(1.51)	380	(1.69)
3" (80)	**1000-3 X 1**	97.3 (44.1)	**1000-3 X 1¼**	101.7 (46.1)	230	(1.02)	320	(1.42)	400	(1.78)	450	(2.00)
3½" (90)	**1000-3½ X 1**	104.0 (47.2)	**1000-3½ X 1¼**	108.4 (49.2)	230	(1.02)	320	(1.42)	400	(1.78)	450	(2.00)
4" (100)	**1000-4 X 1**	110.3 (50.0)	**1000-4 X 1¼**	114.6 (52.0)	230	(1.02)	320	(1.42)	400	(1.78)	450	(2.00)

[1] FM Approved when used with 1, 1¼, 1½, or 2 inch NPS Schedule 40 GB/T 3091,EN 10255H, or JIS G3451 steel pipe as the brace member.
[2] Load rating for LW above refers to FM Approved Lightwall Pipe commonly referred to as "Schedule 7". These ratings may also be applied when EN 10220 and GB/T 8163 steel pipe.
[3] Load rating for Schedule 10 above may be applied to GB/T 3092,EN 10255M and H, or JIS G3454, FM Approved Thinwall, or Schedule 40 steel pipes.

Eaton's B-Line series seismic bracing components are designed to be compatible only with other B-Line series bracing components, resulting in a listed seismic bracing assembly. Eaton B-Line Division warranty for seismic bracing components will be the warranty provided in Eaton B-Line Division standard terms and conditions of sale made available by Eaton, except that, in addition to the other exclusions from Eaton B-Line Division warranty, Eaton makes no warranty relating to B-Line series seismic bracing components that are combined with products not provided by Eaton.

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

Fig. AF035 (Formerly Afcon Fig. 035) Model K Brace Clamp

Size Range: Carbon Steel Service Pipe: 1" through 12", DN25 through DN200
CPVC Steel Service Pipe: 1" through 3"
Brace Pipe: 1" through 2" and DN25 through DN50

Material: Carbon Steel Strap and Ductile Iron Cast Hoop Ends

Finish: ☑ Plain or ☐ Electro-Galvanized per ASTM B633

Service: Designed to rigidly brace piping systems subjected to lateral seismic loads.

Approvals: cULus Listed (UL 203a) and FM Approved (FM 1950-10 & FM 1950-13). Complies with the hanging and bracing requirements listed in NFPA 13.

Features:

- Unique design provides solutions for carbon steel and CPVC pipe.
- Beveled edge design helps protect the CPVC pipe from any rough surface and eliminates pipe abrasion.
- Large installation hole in the cast hoop ends allows the brace pipe to pass through easily without interference.
- Visual indication of proper assembly when the head of the set screw bottoms out on the cast hoop ends.

Installation Instructions:

- Place the Model K Brace Clamp over the service pipe to be braced and slide the Sch. 40 brace pipe through the cast hoop ends. The end of the brace pipe must extend at least 1" past the cast hoop ends.
- Note: The brace pipe may be installed above or below the service pipe.
- Ensure brace pipe is set to the desired installation brace angle.
- Torque the set screws alternately and equally until the head of the set screw bottoms out on the cast hoop ends.
- For riser/4-way brace installations, two Model K Brace Clamps must be installed within 6" of each other.
- For CPVC installation, ensure the legs of the Model K Brace Clamp strap are parallel to each other and perpendicular to the brace pipe prior to installation.
- Fire Protection applications shall also be installed per the requirements of NFPA 13 and local codes.

Patents: No. 7,516,922, No. 7,523,895

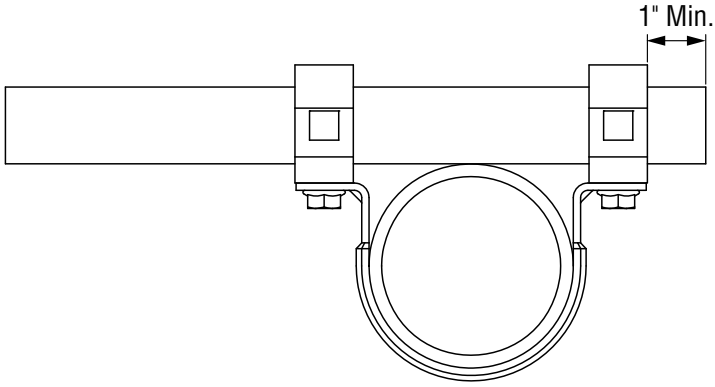
Ordering: Specify service pipe size, brace pipe size, figure number, finish and description.

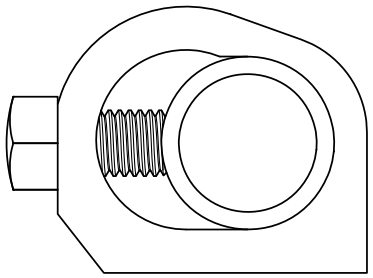
Notes: Anvil International® brand bracing components are designed to be compatible ONLY with other Anvil International® brand bracing components, resulting in a Listed seismic bracing assembly. Updated UL listing information may be viewed at www.ul.com and updated FM approval information may be viewed at www.approvalguide.com.

SeisBrace® Seismic Fire Protection Design Tool may be accessed at www.seisbrace.com

PROJECT INFORMATION	APPROVAL STAMP
Project: Towneplace Suites	☐ Approved
Address:	☐ Approved as noted
Contractor: Discount Fire Protection	☐ Not approved
Engineer: Tim McBride	**Remarks:**
Submittal Date: 08/01/19	
Notes 1:	
Notes 2:	

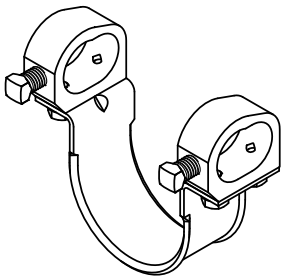
Fig. AF035 (Formerly Afcon Fig. 035) Model K Brace Clamp (cont.)



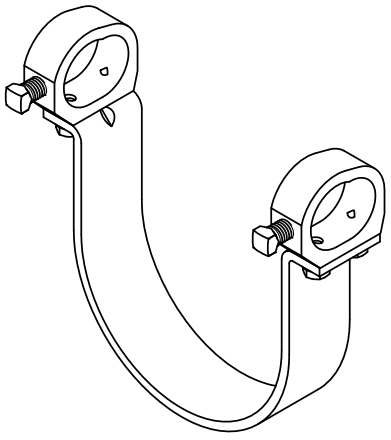


Set Screw Installation

FIG. AF035: DIMENSIONS (IN) • WEIGHT (LBS)				
Service Pipe Size	1"/DN25 Brace Pipe Weight	1 1/4"/DN32 Brace Pipe Weight	1 1/2"/DN40 Brace Pipe Weight	2"/DN50 Brace Pipe Weight
1 (DN25)	1.60	1.80	2.00	2.28
1 1/4 (DN32)	1.68	1.88	2.08	2.36
1 1/2 (DN40)	1.64	1.84	2.04	2.32
2 (DN50)	1.88	2.08	2.28	2.56
2 1/2	1.90	2.10	2.30	2.58
DN65	2.00	2.20	2.40	2.68
3 (DN80)	2.10	2.30	2.50	2.78
4 (DN100)	2.20	2.40	2.60	2.88
5 (DN125)	3.40	3.60	3.80	4.08
DN150	3.80	4.00	4.20	4.48
6	3.90	4.10	4.30	4.58
DN200	4.70	4.90	5.10	5.38
8	4.80	5.00	5.20	5.48
10	5.60	5.80	6.00	6.28
12	–	6.36	6.56	6.84



1" - 4"



5" - 12"

FIG. AF035 cULus MAX SEISMIC LATERAL LOADS: DIMENSIONS (IN) • LOADS (LBS)				
Service Pipe Size	Brace Pipe Size	Max Seismic Brace Load		
		Specialty*	Schedule 10	Schedule 40
1 - 4 (DN25 - DN100)	1 - 2 (DN25 - DN50)	2765	2765	2765
5 - 10 (DN125 - DN200)		–		
12	1 1/4 - 2		3740	3740

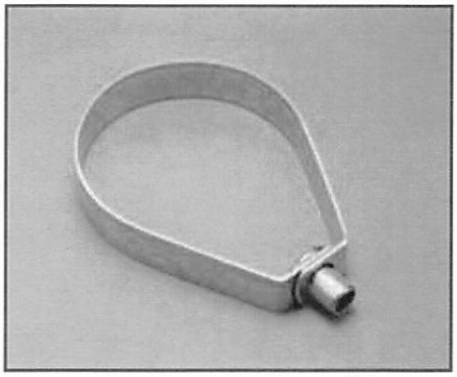
NPS Brace Pipe Dimensions per ASTM A53 Sch. 40, ASTM A106 Sch. 40, or equivalent.
NPS Service Pipe Dimensions per ASTM A53, ASTM A106 or equivalent.
DN Service Pipe Dimensions per KS D 3507/3537 or equivalent listed with Sch. 10 loads.
DN Service Pipe Dimensions per KS D 3562 Sch. 40 or Equivalent listed with Sch. 40 loads.
DN Brace Pipe Dimensions per KS D 3562 Sch. 40 or equivalent.
* Specialty pipes are commonly referred to as Sch. 7 and Flow Pipe. Please visit the UL listing on the UL website for a complete list of listed specialty pipes.

Fig. AF035 (Formerly Afcon Fig. 035) Model K Brace Clamp (cont.)

FIG. AF035 FM MAX SEISMIC LATERAL ASD LOADS***: DIMENSIONS (IN) • LOADS (LBS) • ANGLES (DEGREES)						
Service Pipe Size	Brace Pipe Size	Pipe Schedule	Max Seismic Brace Load at Brace Pipe Angle**			
			30 - 44	45 - 59	60 - 74	75 - 90
1 - 1 1/2 (DN25 - DN40)	1 - 2 (DN25 - DN50)	LW* – Sch. 40	1680	2380	2920	3250
2 - 3 (DN50 - DN80)		LW* – Sch. 40	1800	2550	3120	3490
4 (DN100)		LW* – Sch. 40	1370	1930	2370	2640
5 - 8 (DN125 - DN200)		Sch. 10 – Sch. 40	730	1040	1270	1420

NPS Brace Pipe Dimensions per ASTM A53 Sch. 40, ASTM A106 Sch. 40, or equivalent.
NPS Service Pipe Dimensions per ASTM A53, ASTM A106 or equivalent.
DN Service Pipe Dimensions per EN 10220, GB/T 8163, or equivalent listed with LW loads.
DN Service Pipe Dimensions per GB/T 3091, GB/T 3092, EN10255M, EN10255H, KS D 3507/3537, or equivalent listed with Sch. 10 loads.
DN Service Pipe Dimensions per JIS G3452, KS D 3562 Sch. 40 or equivalent listed with Sch. 40 Loads.
DN Brace Pipe Dimensions per GB/T 3091, EN10255H, JIS G3454 Sch. 40, KS D 3562 Sch. 40, or equivalent.
* Load Rating for LW above refers to FM Approved Lightwall pipe, commonly referred to as Sch. 7 and Flow Pipe. See FM Approval Guide for approved Lightwall pipe.
** Brace Pipe Angles are determined from vertical.
*** The allowable FM approved capacity of brace subassemblies are listed in Allowable Stress Design (ASD). For Load Resistance Factor Design (LRFD) capacities, the above values will need to be mulitplied by 1.5.

SWIVEL LOOP HANGER 115



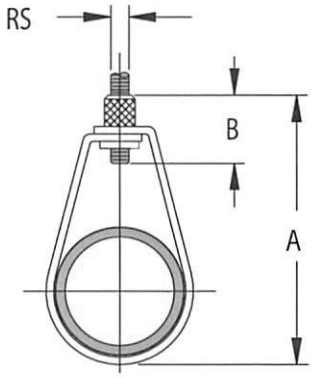
Adjustable Band Hanger with NFPA Rod Sizes

- Size Range: 2-1/2" through 8"
- Surface Finish: Electro-zinc plated
- Recommended for the suspension of stationary non-insulated pipe lines
- Manufactured to use the minimum rod size permitted by NFPA for fire sprinkler piping
- Conforms with Federal Specification WW-H-171 (Type 10), Manufacturers Standardization Society (MSS) SP-58 and SP-69 (Type 10)

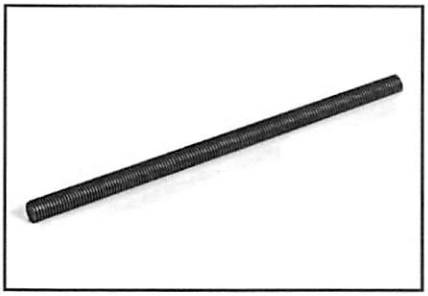
Part Number	Nominal Pipe Size	RS	A	B	Max. Rec. Load (lbs)
1150250EG	2-1/2"	3/8"	5-9/16"	1"	525
1150300EG	3"	3/8"	6-9/16"	1"	525
1150350EG	3-1/2"	3/8"	7-1/16"	1"	585
1150400EG	4"	3/8"	7-9/16"	1"	650
1150500EG	5"	1/2"	9-3/16"	1-1/4"	1000
1150600EG	6"	1/2"	11-5/16"	1-1/4"	1000
1150800EG	8"	1/2"	12-7/8"	1-1/4"	1000

FM APPROVED

c UL us



All Thread Rod



All Thread Rod meets following specifications:

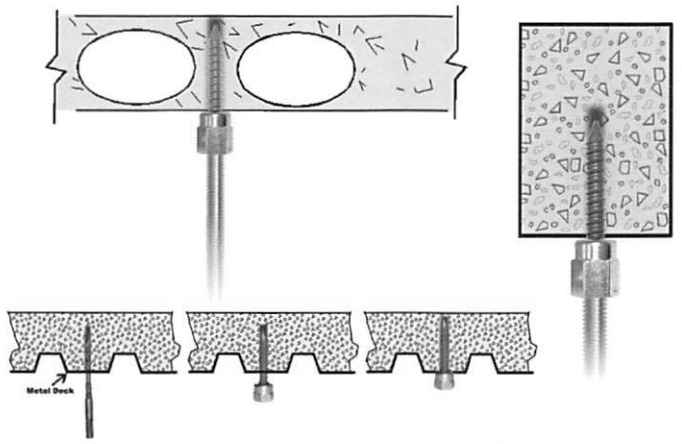
ASTM A307	Domestic and Import All Thread Rod
ASTM A36	Domestic All Thread Rod only
ATSM B 633	Domestic and Import Clear Zinc Plated/Yellow Zinc Plated
ASTM A 153	Domestic and Import Hot Dipped Galvanized
ASTM A193–08B	Import Stainless Steel T-304
ASTM A193-B8	Domestic Stainless Steel T-304
ASTM A193 B8M	Domestic Stainless Steel T-316

Size (in. x ft.)	Ferguson Alt 1			
	Black	Galv	SS 304	SS 316
1/2X10	BATRD10	GATRD10		
1/2X12	BATRD12	GATRD12	SS4ATRD12	SS6ATRD12
1/2X6	BATRDU	GATRDU	SS4ATRDU	SS6ATRDU
1/4X10		GATRB10		
1/4X12	BATRB12			
1/4X6	BATRBU	GATRBU	SS4ATRBU	
1X10		GATRG10		
1X12		GATRG12	SS4ATRG12	
1X6	BATRGU	GATRGU	SS4ATRGU	
3/4X10	BATRF10	GATRF10		
3/4X12	BATRF12	GATRF12	SS4ATRF12	SS6ATRF12
3/4X6	BATRFU	GATRFU	SS4ATRFU	
3/8X10	BATRC10	GATRC10	SS4ATRC10	
3/8X12	BATRC12	GATRC12	SS4ATRC12	
3/8X12				SS6ATRC12
3/8X3		GATRCM		
3/8X6	BATRCU	GATRCU	SS4ATRCU	
3/8X6				SS6ATRCU
5/8X10	BATRE10	GATRE10		
5/8X12	BATRE12	GATRE12	SS4ATRE12	
5/8X3			SS4ATREM	
5/8X6	BATREU	GATREU	SS4ATREU	
7/8X10	BATR7810	GATR7810		
7/8X12	BATR7812	GATR7812	SS4ATR7812	SS6ATR7812
7/8X3			SS4ATR78M	
7/8X6	BATR78U	GATR78U	SS4ATR78U	

Distributed Exclusively by Ferguson and Wolseley Canada

SAMMYS® FOR CONCRETE - Vertical Application

Application



Product Features

- Easy two step process (Drill hole & drive Sammys concrete anchor).
- ¼" pre-drilled pilot hole required.
- Concrete Installation Tool available for a one tool installation process.
- Made in the U.S.A.

Watch a video demonstration at www.itwbuildex.com

Approvals	Rod Size	Part Number	Model	Screw Descriptions	Ultimate Pullout (lbs)*	FM Test Load (lbs)	Box Qty	Case Qty
VERTICAL MOUNT								
	1/4"	8058957	CST 200	5/16 x 1-3/4"	2400		25	125
FM	3/8"	8059957	CST 20	5/16 x 1-3/4"	2400	1475	25	125
	3/8"	8145925	CST 20-SS	5/16 x 1-3/4"	2400		25	125
	1/2"	8060925	CST 2	5/16 x 1-3/4"	2400		25	125

#14 Black Nut Driver Part # 8113910

#14SW Red Nut Driver Part # 8114910

* Tested in 3000 PSI concrete

SIDEWINDER® FOR CONCRETE - Horizontal Application

Application

Product Features

- Easy two step process (Drill hole & drive Sammys concrete anchor).
- ¼" pre-drilled pilot hole required.
- Concrete Installation Tool available for a one tool installation process.
- Made in the U.S.A.

Watch a video demonstration at www.itwbuildex.com

#14SW Red Nut Driver Part # 8114910

Approvals	Rod Size	Part Number	Model	Screw Descriptions	Ultimate Pullout (lbs)*	FM Test Load (lbs)	Box Qty	Case Qty
HORIZONTAL MOUNT								
	1/4"	8062957	SWC 200	5/16 x 1-3/4"	2450		25	125
FM	3/8"	8061957	SWC 20	5/16 x 1-3/4"	2450	1475	25	125

* Tested in 3000 PSI concrete

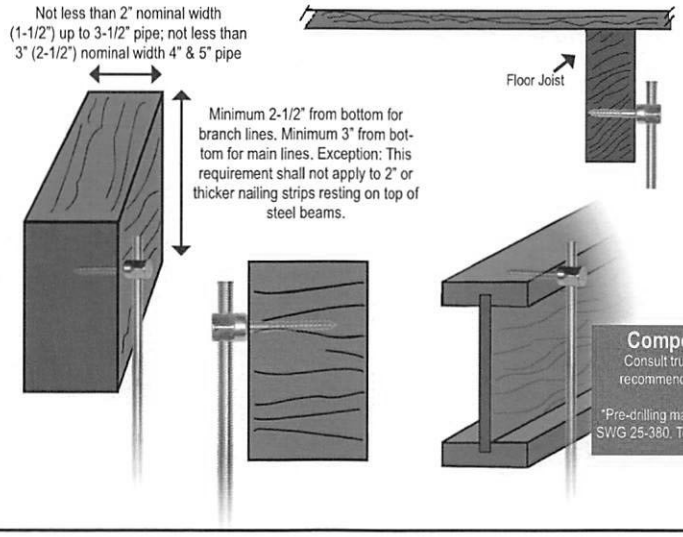
MADE IN U.S.A.

RoHS Compliant

SPECIAL NUT DRIVER SYSTEM: The nut drivers were designed with a unique spin-off feature which provides a fast and safe installation each time. When the face of the driver comes into contact with the material you are installing into, continue drilling until nut driver spins free. Installation is then complete. Warranty requires the use of the appropriate nut driver for installations.

SIDEWINDER® FOR WOOD - Horizontal Application

Application



Composite / Truss
Consult truss manufacturer for recommended installation point.

*Pre-drilling may be required for Model SWG 25-380. Tool available on page 11.

Watch a video demonstration at www.itwbuildex.com

Product Features

- No pre-drilling required.
- Quick to install using the Sammy Nut Driver with an 18V cordless drill/driver.
- Saves time from traditional methods.
- Reduces installation costs.
- Made in the U.S.A.

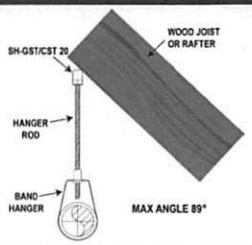
Approvals	Rod Size	Part Number	Model	Screw Descriptions	Ultimate Pullout (lbs)	UL Test Load (lbs)	Box Qty	Case Qty
HORIZONTAL MOUNT								
	1/4"	8019957	SWG 200	1/4 x 2"	1725 (Fir)		25	125
	3/8"	8020957	SWG 10	1/4 x 1"	622 (Fir)	300	25	125
	3/8"	8021957	SWG 20	1/4 x 2"	1725 (Fir)	1050	25	125
	3/8"	8073925	SWG 20-SS	1/4 x 2"	1725 (Fir)	850	25	125
	3/8"*	8022925	SWG 25-380	3/8 x 2-1/2"	2249 (Fir)	1500	25	125
	3/8"	8023925	SWG 30	1/4 x 3"	1884 (Fir)		25	125

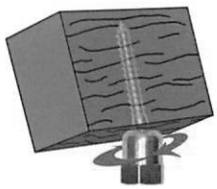
#14 SW Red Nut Driver Part # 8114910

* May require pre-drilling; consult joist manufacturer.

SAMMYS SWIVEL HEAD™ FOR WOOD - Swivel Application

Application





Product Features

- Eliminates distortion of threaded rod.
- Accommodates up to 3 ½" x 12 pitch roof.
- Allows 17° deflection from vertical.
- Saves time from traditional methods.
- Reduces installation costs.
- Made in the U.S.A.

Approvals	Rod Size	Part Number	Model	Screw Descriptions	Ultimate Pullout (lbs)	UL Test Load (lbs)	FM Test Load (lbs)	Min Thickness	Box Qty	Case Qty
SWIVEL MOUNT										
	3/8"	8139957	SH-GST 20	1/4 x 2"	1257 (Fir)	1050	1475		25	125
	3/8"	8141957	SH-GST 30	1/4 x 3"	1720 (Fir)	1500	1475		25	125
	3/8"*	8269957	SH-GST/CST 20	5/16 x 1-3/4"	1903 Dim. Lumber 1406 @ 45°off vertical Dim. Lumber	1500 850 @ 45°			25	125
	1/2"	8303957	SH-GST/CST 2.0	5/16 x 1-3/4"	903 Dim. Lumber 1406 @ 45°off vertical Dim. Lumber				25	125

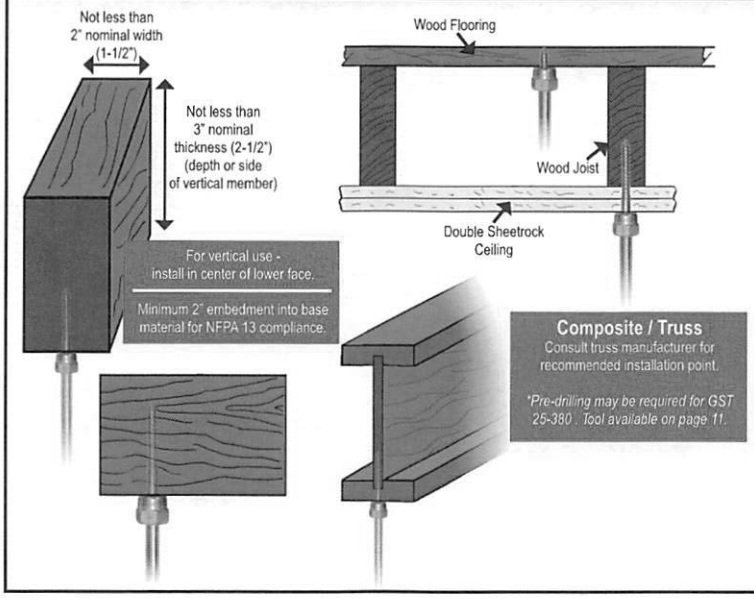
#14 Black Nut Driver Part # 8113910

#14 SH Orange Nut Driver Part # 8273910

* May require pre-drilling; consult joist manufacturer.

SAMMYS® FOR WOOD - Vertical Application

Application



Product Features

- No pre-drilling required.
- Quick to install using the Sammy Nut Driver with an 18V cordless drill/driver.
- Saves time from traditional methods.
- Reduces installation costs.
- Made in the U.S.A.

Watch a video demonstration at www.itwbuildex.com

Approvals	Rod Size	Part Number	Model	Screw Descriptions	Ultimate Pullout (lbs)	UL Test Load (lbs)	FM Test Load (lbs)	Box Qty	Case Qty
VERTICAL MOUNT									
	1/4"	8002957	GST 100	1/4 x 1"	210 (7/16" OSB) 670 (3/4" Ply)			25	125
	1/4"	8003957	GST 200	1/4 x 2"	1760 (Fir)			25	125
	1/4"	8004957	GST 300	1/4 x 3"	2060 (Fir)			25	125
	3/8"	8007957	GST 10	1/4 x 1"	210 (7/16" OSB) 670 (3/4" Ply)	300		25	125
	3/8"	8008957	GST 20	1/4 x 2"	1760 (Fir)	850	1475	25	125
	3/8"	8068925	GST 20-SS	1/4 x 2"	1760 (Fir)	850		25	125
	3/8"	8009925	GST 25-380	3/8 x 2-1/2"	2113 (Fir)	1500		25	125
	3/8"	8010957	GST 30	1/4 x 3"	2060 (Fir)	1500	1475	25	125
	3/8"	8069925	GST 30-SS	1/4 x 3"	2060 (Fir)			25	125
	3/8"	8011925	GST 40	1/4 x 4"	2180 (Fir)			25	125
	1/2"	8013925	GST 2	1/4 x 2"	1760 (Fir)			25	125
	1/2"	8014925	GST 2.5-380	3/8 x 2-1/2"	2113 (Fir)			25	125
	1/2"	8015925	GST 3	1/4 x 3"	2275 (Fir)			25	125

#14 Black Nut Driver Part # 8113910

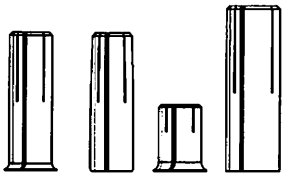
#14 SW Red Nut Driver Part # 8114910

MADE IN U.S.A

RoHS Compliant

SPECIAL NUT DRIVER SYSTEM: The nut drivers were designed with a unique spin-off feature which provides a fast and safe installation each time. When the face of the driver comes into contact with the material you are installing into, continue drilling until nut driver spins free. Installation is then complete. Warranty requires the use of the appropriate nut driver for installations.

Multi-Set II®



SPECIFIED FOR ANCHORAGE INTO CONCRETE

Drop-In, shell-type anchors feature an internally threaded, all-steel shell with expansion cone insert and flush embedment lip. "Anchors are manufactured from zinc-plated carbon steel, 18-8 stainless steel and 316 stainless steel.

Anchors should be installed with carbide tipped hammer drill bits made in accordance to ANSI B212.15-1994 specifications.

Anchors should be tested to ASTM E488 criteria and listed by ICC (formerly ICBO). Anchors should also be listed by the following agencies as required by the local building code: UL, FM, City of Los Angeles, California State Fire Marshal and Cal Trans.

APPROVALS/LISTINGS

Meets or exceeds U.S. Government G.S.A. Specification A-A-55614 Type 1 (Formerly GSA: FF-S-325 Group VIII)

Underwriters Laboratories

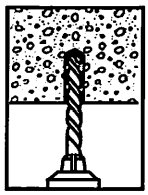
Factory Mutual

California State Fire Marshal

Caltrans

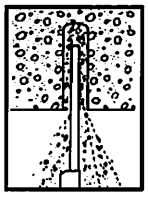
For the most current approvals/listings visit: www.itw-redhead.com

INSTALLATION STEPS

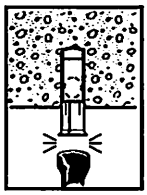


To set anchor flush with surface:

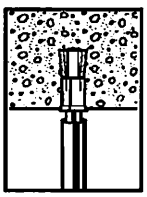
1. Drill hole to required embedment (see Table on page 73).



2. Clean hole with pressurized air.



3. Drive anchor flush with surface of concrete.



4. Expand anchor with setting tool provided (see chart). Anchor is properly expanded when shoulder of setting tool is flush with top of anchor.

To set anchor below surface:

Drill hole deeper than anchor length. Thread bolt into anchor. Hammer anchor into hole until bolt head is at desired depth. Remove bolt and set anchor with setting tool.

PERFORMANCE TABLE

Multi-Set II Drop-In Anchors — Ultimate Tension and Shear Values (Lbs/kN) in Concrete*

BOLT DIA. In. (mm)	ANCHOR DIA. In. (mm)	MIN. EMBEDMENT DEPTH In. (mm)	ANCHOR TYPE	TENSION Lbs. (kN)			SHEAR Lbs. (kN)
				f'c = 2000 PSI (13.8 MPa)	f'c = 4000 PSI (27.6 MPa)	f'c = 6000 PSI (41.4 MPa)	f'c ≥ 2000 PSI (13.8 MPa)
1/4 (6.4)	3/8 (9.5)	1 (25.4)	RM, RL or CL-Carbon or SRM-18-8 S.S. or SSRM-316 S.S.	1,680 (7.5)	2,360 (10.5)	2,980 (13.3)	1,080 (4.8)
3/8 (9.5)	1/2 (12.7)	1-5/8 (41.3)		2,980 (13.3)	3,800 (16.9)	6,240 (27.8)	3,160 (14.1)
1/2 (12.7)	5/8 (15.9)	2 (50.8)		3,300 (14.7)	5,840 (26.0)	8,300 (36.9)	4,580 (20.4)
5/8 (15.9)	7/8 (22.2)	2-1/2 (63.5)		5,500 (24.5)	8,640 (38.4)	11,020 (49.0)	7,440 (33.1)
3/4 (19.1)	1 (25.4)	3-3/16 (81.0)		8,280 (36.8)	9,480 (42.2)	12,260 (54.5)	10,480 (46.6)

*Allowable values are based upon a 4 to 1 safety factor. Divide by 4 for allowable load values.

*For continuous extreme low temperature applications, use stainless steel.

Combined Tension and Shear Loading—for Multi-Set Anchors

Allowable loads for anchors subjected to combined shear and tension forces are determined by the following equation:

$$(Ps/Pt)^{5/3} + (Vs/Vt)^{5/3} \leq 1$$

Ps = Applied tension load **Vs = Applied shear load** **Pt = Allowable tension load** **Vt = Allowable shear load**

PERFORMANCE TABLES

Multi-Set II Drop-In Anchors — Ultimate Tension and Shear Values (Lbs/kN) in Lightweight Concrete*

BOLT DIA. In. (mm)	ANCHOR DIA. In. (mm)	MINIMUM EMBEDMENT DEPTH In. (mm)	ANCHOR TYPE	LIGHTWEIGHT CONCRETE f'c = 3000 PSI (20.7 MPa)		LOWER FLUTE OF STEEL DECK WITH LIGHTWEIGHT CONCRETE FILL f'c = 3000 PSI (20.7 MPa)	
				TENSION Lbs. (kN)	SHEAR Lbs. (kN)	TENSION Lbs. (kN)	SHEAR Lbs. (kN)
3/8 (9.5)	1/2 (12.7)	1-5/8 (39.7)	RM, RL or CL-Carbon or SRM-18-8 S.S. or SSRM-316 S.S.	2,035 (9.1)	1,895 (8.4)	3,340 (14.9)	4,420 (19.6)
1/2 (12.7)	5/8 (15.9)	2 (50.8)		2,740 (12.2)	2,750 (12.2)	3,200 (14.2)	4,940 (22.0)
5/8 (15.9)	7/8 (22.2)	2-1/2 (63.5)		4,240 (18.9)	4,465 (19.9)	5,960 (26.5)	5,840 (26.0)
3/4 (19.1)	1 (25.4)	3-3/16 (81.0)		5,330 (23.7)	6,290 (28.0)	8,180 (36.4)	9,120 (40.6)

*Allowable values are based upon a 4 to 1 safety factor. Divide by 4 for allowable load values.

Multi-Set II Drop-In Anchors — Recommended Edge and Spacing Distance Requirements*

BOLT DIA. In. (mm)	DRILL BIT SIZE In. (mm)	EMBEDMENT DEPTH In. (mm)	ANCHOR TYPE	EDGE DISTANCE REQUIRED TO OBTAIN MAX. WORKING LOAD In. (mm)	MIN. EDGE DISTANCE AT WHICH LOAD FACTOR APPLIED =.80 FOR TENSION =.70 FOR SHEAR In. (mm)	SPACING REQUIRED TO OBTAIN MAX. WORKING LOAD In. (mm)	MIN. ALLOWABLE SPACING BETWEEN ANCHORS LOAD FACTOR APPLIED =.80 FOR TENSION =.55 FOR SHEAR In. (mm)
1/4 (6.4)	3/8 (9.5)	1 (25.4)	RM, RL or CL-Carbon or SRM-18-8 S.S. or SSRM-316 S.S.	1-3/4 (44.5)	7/8 (22.2)	3-1/2 (88.9)	1-3/4 (44.5)
3/8 (9.5)	1/2 (12.7)	1-5/8 (41.3)		2-7/8 (73.0)	1-7/16 (36.5)	5-11/16 (144.5)	2-7/8 (73.0)
1/2(12.7)	5/8 (15.9)	2 (50.8)		3-1/2 (88.9)	1-3/4 (44.5)	7 (177.8)	3-1/2 (88.9)
5/8(15.9)	7/8 (22.2)	2-1/2 (63.5)		4-3/8 (111.1)	2-3/16 (55.6)	8-3/4 (222.3)	4-3/8 (111.1)
3/4(19.1)	1 (25.4)	3-3/16 (81.0)		5-5/8 (142.9)	2-13/16 (71.4)	11-3/16 (284.2)	5-5/8 (142.9)

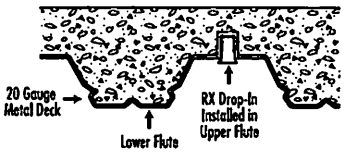
*Spacing and edge distances shall be divided by 0.75 when anchors are placed in structural lightweight concrete. Linear interpolation may be used for intermediate spacing and edge distances.

Multi-Set II Drop-In Anchors — Ultimate Tension and Shear Values (Lbs/kN) for RX-series (3/4" and 1" Embedment)*

BOLT DIA. In. (mm)	DRILL BIT SIZE In. (mm)	EMBEDMENT In. (mm)	2500 PSI (17.2 MPa) CONCRETE		4000 PSI (27.6 MPa) CONCRETE		HOLLOW CORE	
			TENSION Lbs. (kN)	SHEAR Lbs. (kN)	TENSION Lbs. (kN)	SHEAR Lbs. (kN)	TENSION Lbs. (kN)	SHEAR Lbs. (kN)
3/8 (9.5)	1/2 (12.7)	3/4 (19.1)	1,571 (7.0)	2,295 (10.2)	1,987 (8.8)	2,903 (12.9)	1,908 (8.5)	2,401 (10.7)
1/2 (12.7)	5/8 (15.9)	1 (25.4)	2,113 (9.4)	2,585 (11.5)	2,673 (11.9)	3,270 (14.5)	2,462 (11.0)	2,401 (10.7)

* The tabulated values are for RX anchors installed at a minimum of 12 diameters on center and minimum edge distance of 6 diameters for 100 percent anchor efficiency. Spacing and edge distance may be reduced to 6 diameters spacing and 3 diameter edge distance provided the values are reduced 50 percent. Linear interpolation may be used for intermediate spacings and edge margins.

* Allowable values are based upon a 4 to 1 safety factor. Divide by 4 for allowable load values.



Multi-Set II Drop-In Anchors — Anchoring Overhead in 3000 PSI Lightweight Concrete On Metal Deck

ANCHOR In. (mm)	DRILL HOLE DIAMETER	EMBEDMENT In. (mm)	3000PSI (20.7 MPa) CONCRETE			
			ULTIMATE TENSION LOAD Lbs. (kN)		ALLOWABLE WORKING LOAD Lbs. (kN)	
RX-38 Drop-In	1/2 (12.7)	3/4 (19.1)	Upper Flute	1,410 (6.3)	353	(1.6)
			Lower Flute	1,206 (5.4)	301	(1.3)

*Allowable values are based upon a 4 to 1 safety factor. Divide by 4 for allowable load values.

CPVC Straps

FUNCTION: Designed to support CPVC pipe horizontally from the side or bottom of beam, or composite wood joists with a minimum of 3/8" web thickness. Fig. 076 can only be used as a guide on top of beam or on vertical piping. Fig. 076 may be installed onto wood using supplied fasteners or into, minimum 18 gauge, steel using two 1/4" X 1" tek type screws. Features flared edges to protect piping as it slides through the installed fitting.

SIZE: ¾" Through 2" CPVC pipe

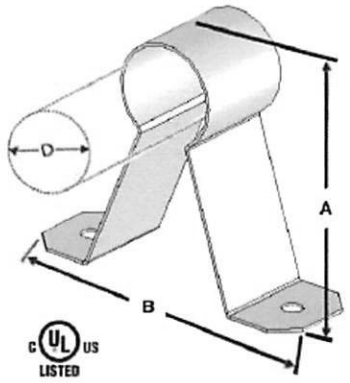
FINISH: Pre-galvanized

MATERIAL: Carbon Steel

APPROVALS: Underwriters Laboratories listed for US and Canada

ORDERING: Specify pipe size and model number.

Fig. 076
CPVC TWO-HOLE STAND OFF STRAP



Pipe Size	A	B	D	Material Size	Box Qty.	Max Spacing	Appx. Wt. Per 100 (lbs.)
3/4	2 9/16	4 1/4	1.050	20 ga. X 1 1/8"	100	5'-6"	12.10
1	2 13/16	4 1/2	1.315	20 ga. X 1 1/8"	100	6'-0"	12.80
1 1/4	3 3/16	4 5/8	1.660	20 ga. X 1 1/8"	100	6'-6"	14.10
1 1/2	3 7/16	5	1.990	20 ga. X 1 1/8"	100	7'-0"	15.20
2	3 7/8	5	2.375	20 ga. X 1 1/8"	100	8'-0"	16.40

Fig. 22 - Hanger for CPVC Plastic Pipe
Single Fastener Strap (Cooper B-Line B3181)

TOLCO c UL us LISTED

Size Range: 3/4" (20mm) thru 2" (50mm) CPVC pipe

Material: Pre-Galvanized Steel

Function: Intended to perform as a hanger to support CPVC piping used in automatic fire sprinkler systems. The product acts as a hanger when tab is upward and the fastener screw is in the horizontal position. Fig. 22 can be installed on the top of a beam, but in this situation acts as a guide to the piping which is supported by the beam itself. It is not intended to support CPVC pipe from under a flat horizontal surface, such as a ceiling.

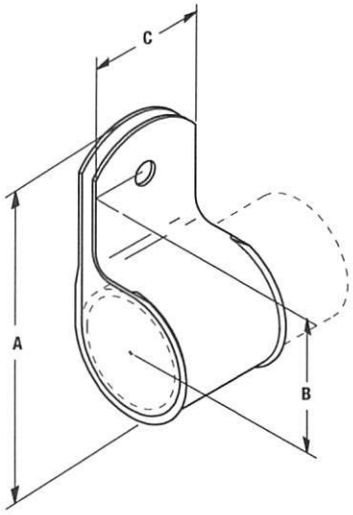
Approvals: Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL)** to support fire sprinkler piping. May be installed in wood using fasteners supplied with product, or into minimum 20 gauge (0.9mm) steel using (1) 1/4" x 1" tek type screw. Meets and exceeds the requirements of NFPA 13, 13R and 13D.

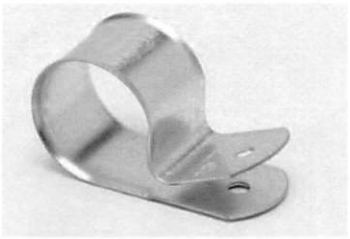
Features: Fig. 22 incorporates features which protect the pipe and ease installation. The flared edge design protects CPVC pipe from any rough surface. It is easily attached to the building structure using the special UL Listed hex head self threading screw* furnished with the product. It is recommended that rechargeable electric drills fitted with a hex socket attachment to be used as installation tools. No impact tools (such as a hammer) are allowed. Damage has been known to result from installations using impact type tools. No pre-drilling of a pilot hole in wood is required.

Finish: Pre-Galvanized

Order By: Part number and CPVC pipe size.

* Hardened hex head self threading screw is furnished with the product and is the minimum fastener size acceptable.





Part No.	CPVC Pipe Size in.	(mm)	A in.	(mm)	B in.	(mm)	C in.	(mm)	Max. Hanger Spacing Ft.	(m)	Fastener Hex Head Size in.	(mm)	Approx. Wt./100 Lbs.	(kg)
22-3/4	3/4"	(20)	2 7/16"	(61.9)	1 5/16"	(33.3)	1 3/16"	(30.2)	5 1/2	(1.67)	5/16"	(7.9)	9	(4.1)
22-1	1"	(25)	2 11/16"	(68.3)	1 7/16"	(36.5)	1 3/16"	(30.2)	6	(1,83)	5/16"	(7.9)	9	(4.1)
22-1 1/4	1 1/4"	(32)	3 1/16"	(77.8)	1 5/8"	(42.3)	1 3/16"	(30.2)	6 1/2	(1.98)	5/16"	(7.9)	11	(5.0)
22-1 1/2	1 1/2"	(40)	3 5/16"	(84.1)	1 3/4"	(44.4)	1 3/16"	(30.2)	7	(2.13)	5/16"	(7.9)	12	(5.4)
22-2	2"	(50)	3 3/4"	(95.2)	2 1/8"	(54.6)	1 3/16"	(30.2)	8	(2.44)	5/16"	(7.9)	15	(6.8)

Fig. 22L2 - One Hole Hanger/Restrainer for CPVC & Steel Pipe

TOLCO c UL us LISTED

Size Range: 3/4" (20mm) thru 2" (50mm) CPVC & steel pipe

Material: Pre-Galvanized Steel

Function: cULus Listed to perform as a hanger and restrainer for CPVC or IPS piping systems. The innovative design also allows for a preferred installation location close to a CPVC fitting without applying damaging compression forces on the pipe which could result in serious Mechanical ESC (Environmental Stress Cracking).

Approvals: Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL)** to support fire sprinkler piping. May be installed in wood using fasteners supplied with product, or into minimum 20 gauge (0.9mm) steel using (1) 1/4" x 1" tek type screw. Meets and exceeds the requirements of NFPA 13, 13R and 13D.

Installation Note: Comes in open position for easier installation. Because of multi – structural installation possibilities, specific fastener not included; see notes below for various applications.

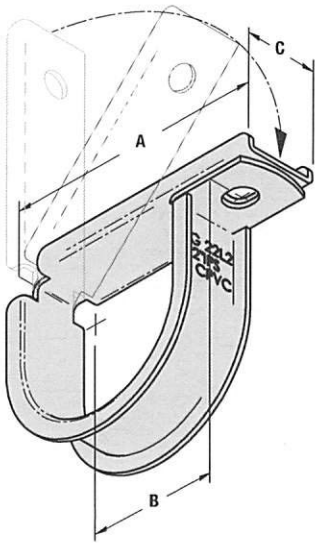
For Concrete Installation — UL requires a minimum test load of 340 lbs for CPVC hangers and 750 lbs for steel pipe hangers; verify anchors meet or exceed these requirements.

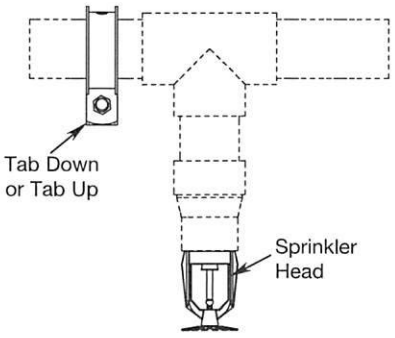
For Wood Installation — Test results have shown that #14 x 1 ½" wood screws will support the required load for c UL us.

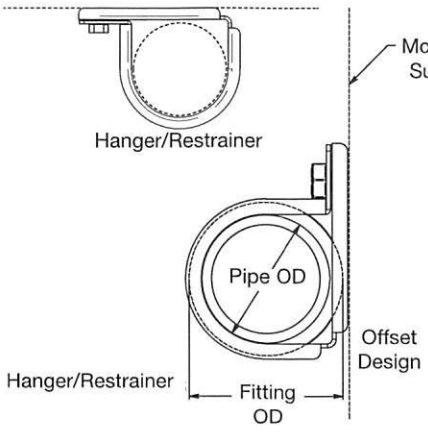
For Steel Installation — Test results have shown that 1/4" x 1" (min. 20ga steel) Tek type screw will support required UL load.

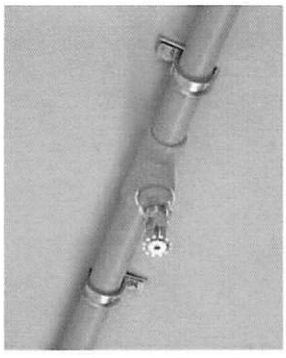
Finish: Pre-Galvanized

Order By: Part number









Part No.	CPVC or Steel Pipe Size in.	(mm)	A in.	(mm)	B in.	(mm)	C in.	(mm)	Max. Hanger Spacing - CPVC Ft.	(m)	Max. Hanger Spacing - Steel Ft.	(m)	Approx. Wt./100 Lbs.	(kg)
22L2-3/4	3/4"	(20)	2 3/16"	(55.6)	15/16"	(23.8)	3/4"	(19.0)	5 1/2	(1.67)	NA	(NA)	9	(4.1)
22L2-1	1"	(25)	2 1/2"	(63.5)	1 1/8"	(28.6)	3/4"	(19.0)	6	(1,83)	12	(3.66)	9	(4.1)
22L2-1 1/4	1 1/4"	(32)	2 13/16"	(71.4)	1 1/4"	(31.7)	3/4"	(19.0)	6 1/2	(1.98)	12	(3.66)	9	(4.1)
22L2-1 1/2	1 1/2"	(40)	3 1/8"	(79.4)	1 7/16"	(36.5)	3/4"	(19.0)	7	(2.13)	15	(4.57)	9	(4.1)
22L2-2	2"	(50)	3 9/16"	(90.5)	1 5/8"	(41.3)	3/4"	(19.0)	8	(2.44)	15	(4.57)	9	(4.1)

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

INTUMESCENT ACRYLIC FIRESTOP SEALANT

BlazeMaster®

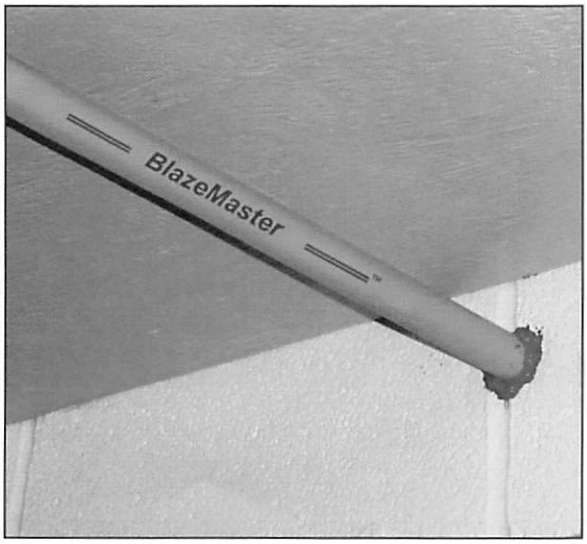
CAULK & WALK®

OVERVIEW

BlazeMaster® Caulk & Walk® is an intumescent, acrylic-based firestopping sealant for use in fire-rated building construction. It is specifically designed to be compatible with BlazeMaster® CPVC fire sprinkler systems. Manufactured by Tremco, Inc., a leading provider of sealants for use in construction, BlazeMaster® Caulk & Walk® is listed for use where CPVC pipe penetrates fire-rated assemblies. BlazeMaster® Caulk & Walk® has been tested for penetrations through 1 and 2 hour rated gypsum wallboard assemblies, 2 hour concrete assemblies and 1 hour wood frame assemblies. BlazeMaster® Caulk & Walk® has also been tested for metallic pipe penetrations which enables the product to be utilized for firestopping when pipe transitions are employed.

ABOUT COMPATIBILITY

BlazeMaster® CPVC fire sprinkler systems have been used successfully for more than 16 years in building construction and renovation. BlazeMaster® systems are ideally suited for use in fire protection primarily due to their ease of installation, outstanding corrosion resistance, low flame spread and low smoke characteristics. These properties can however be compromised if the CPVC pipe comes in contact with incompatible chemicals found in some construction products.



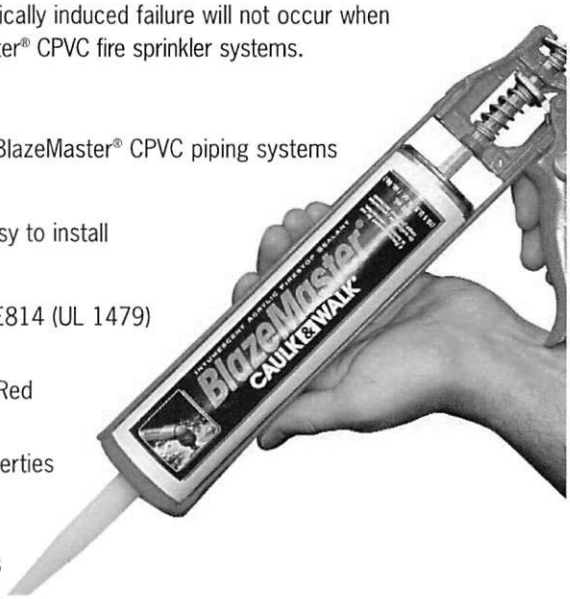
2 Hour Fire Rated Through Penetration Firestop for Single Plastic Pipe through Concrete Floors or Walls using BlazeMaster® Caulk & Walk®

1 or 2 Hour Fire Rated Through Penetration Firestop for Single Plastic Pipe through Gypsum Walls using BlazeMaster® Caulk & Walk®

One area where these incompatibilities can be found is in firestopping sealants. Certain firestopping sealants within the industry contain chemicals that are incompatible with CPVC piping systems. These chemicals can cause the wall of the CPVC pipe to weaken and may even cause environmental stress fractures. BlazeMaster® Caulk & Walk® is a specially formulated firestopping sealant made to ensure that a chemically induced failure will not occur when used with BlazeMaster® CPVC fire sprinkler systems.

FEATURES

- Compatible with BlazeMaster® CPVC piping systems
- UL/cUL Listed
- User friendly - Easy to install
- Paintable
- Tested to ASTM E814 (UL 1479) and CAN4-S115
- Available in Rust Red
- Graphite-based intumescent properties
- Available in 300 ml tubes and 5 gallon pails



UL SYSTEM RATINGS

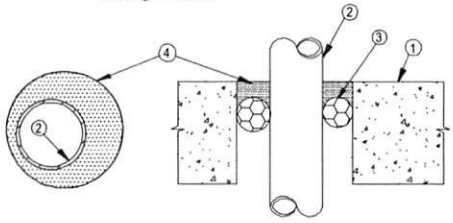
	PENETRATING ITEM	CONCRETE	GYPSUM	WOOD FRAME
PLASTIC PIPE	CPVC	C-AJ-2221	W-L-2151	F-C-2199
PLASTIC PIPE	PVC	C-AJ-2221	W-L-2151	F-C-2199
METALLIC PIPE		C-AJ-1304	W-L-1147	F-C-1083
INSULATED PIPE	Fiberglass	C-AJ-5181	W-L-5155	F-C-5047
INSULATED PIPE	AB/PVC	N/A	W-L-5154	F-C-5047

CONCRETE ASSEMBLIES

2 Hour Fire Rated Through Penetration Firestop for Single Plastic Pipe through Concrete Floors or Walls using BlazeMaster® Caulk & Walk.®

F-Rating = 2 Hr.
T-Rating = 1-1/2 Hr.

Drawing not to scale



① Pre-Rated Concrete Floors or Block Walls = Min. 4-1/2" thickness

② Plastic Pipe - A) Nom. 2" diam. (or smaller) Sch. 40 PVC pipe.
B) Nom. 2" diam. (or smaller) CPVC pipe.
The annular space range shall be min. 1/4" to max. 3/8".
NOTE: For use in closed (process or supply) piping systems.

③ Forming Material - (Optional) Foam backer rod packed into the opening as a permanent form.

④ BlazeMaster® Caulk & Walk® - Min. 1/2" thickness of sealant applied within opening, flush top surface of floor or both surfaces of wall assembly.

UL/cUL System No. CAJ 2221

Project: _____
Location: _____
Installer: _____
Signature: _____

The Tremco products used above have been tested in accordance with the following:
• ASTM E814 (UL1479) Standard Test Method for Through Penetration Firestopping.

Date: 10/29/01 | Drawing: BCW-2221
Approved by: J. Pitcole

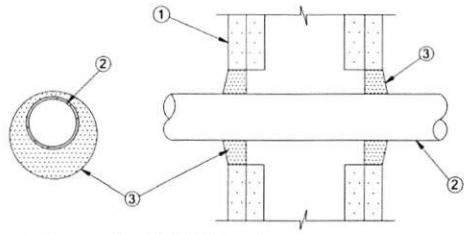
This information is intended for engineering purposes only and is based on internal and third party testing which we believe to be accurate. The user of this information must determine the suitability of the design to the application and the product to local building codes. Tremco shall not be liable for damages, direct or consequential, resulting from use of this material or design. Tremco shall only be responsible for replacing material found to be defective.

GYPSUM WALL ASSEMBLIES

1 or 2 Hour Fire Rated Through Penetration Firestop for Single Plastic Pipe through Gypsum Walls using BlazeMaster® Caulk & Walk.®

F-Rating = 1 & 2 Hr.
T-Rating = 1 & 2 Hr.

Drawing not to scale



① Pre-Rated Gypsum Wallboard/Stud Wall Assembly
A) The F-Rating = 1 hour if there is one layer of gypsum wallboard.
B) The F-Rating = 2 hours if there are two layers of gypsum wallboard.

② Plastic Pipe - A) Nom. 2" diam. (or smaller) Sch. 40 PVC pipe.
B) Nom. 2" diam. (or smaller) CPVC pipe.
The annular space range shall be min. 1/4" to max. 1-3/8".
NOTE: For use in closed (process or supply) piping systems.

③ BlazeMaster® Caulk & Walk® - Min. 1/2" thickness of sealant applied within opening. Additional sealant to be installed such that a min. 1/4" crown is formed around the penetrating item.

NOTE: The F & T ratings of the system is equal to the fire rating of the wall assembly.

UL/cUL System No. WL 2151

Project: _____
Location: _____
Installer: _____
Signature: _____

The Tremco products used above have been tested in accordance with the following:
• ASTM E814 (UL1479) Standard Test Method for Through Penetration Firestopping.

Date: 10/29/01 | Drawing: BCW-2151
Approved by: J. Pitcole

This information is intended for engineering purposes only and is based on internal and third party testing which we believe to be accurate. The user of this information must determine the suitability of the design to the application and the product to local building codes. Tremco shall not be liable for damages, direct or consequential, resulting from use of this material or design. Tremco shall only be responsible for replacing material found to be defective.

Lubrizol

9911 Brecksville Road
Cleveland, Ohio 44141-3201 USA
216-447-5000
888-234-2436
Fax: 216-447-5750

For technical questions about installation and use please contact Tremco, Inc. 800-321-7906

Manufactured by TREMCO.
Information: 216-292-5000 800-321-7906

Printed in USA 07/07 BMCW

Oatey®
4700 W. 160th St.
Cleveland, OH 44135
PH:800-321-9532
FX:800-321-9535
www.oatey.com

TECHNICAL SPECIFICATION

GREAT WHITE® PIPE JOINT COMPOUND WITH PTFE

Quality ISO 9001 System

TECHNICAL SPECIFICATION: Oatey Great White® Pipe Joint Compound with PTFE is a white colored, non-separating thread sealant compound designed to seal threaded connections against leakage due to internal pressure. This compound permits a tighter assembly with lower torque, secure permanent sealing of all threaded connections and allows for easy disassembly without stripping or damaging threads.

PHYSICAL/CHEMICAL PROPERTIES

Pressure Rating	
Liquids	10,000 psi @ -50° F to 500° F
Gases	3,000 psi @ -50° F to 400° F
Required Dry Time	Up to 125 psi, no wait
	Over 125 psi, 4 hours
Appearance	White Paste
Shelf Life	2 years from manufacture date
VOC Level	3 g/L Maximum

DIRECTIONS FOR USE

Clean all pipe threads. Be sure all joints are free from rust, scale, grease or other contamination. Remove any debris with a clean cloth or wire brush. Stir contents thoroughly and apply evenly to male threads.

PRECAUTIONS

Read all cautions and directions carefully before using this product. Contains no lead or other harmful metals and is safe for use on potable water lines. DO NOT USE on lines carrying Oxygen, Liquid Sodium, Ketones or Halogens. Do not store near strong oxidizing agents, acids or extreme heat. Keep container closed when not in use. DO NOT REUSE EMPTY CONTAINER. KEEP OUT OF REACH OF CHILDREN.

Refer to material safety data sheet for more information. For emergency first aid help, call 1-877-740-5015.

COMMON APPLICATIONS

CAN BE USED ON LINES CARRYING:

Acids (dilute)	Hydrogen
Air (compressed)	Inert Gases
Ammonia (gas, liquid)	Nitrogen (gas)
Brine	Soap (liquid)
Carbon Dioxide	Steam
Castor Oils	Vegetable Oils
Glycol	Water (hot & cold)
Helium (gas)	**AND MANY MORE!**

CAN BE USED ON PIPE MADE OF:

ABS	Fiberglass
Aluminum	PVC
Black Iron	Polyethylene
Brass	Polypropylene
Copper	Stainless Steel
CPVC	**AND MANY MORE!**

Consult Oatey Technical Department for applications not specifically referenced above.

INGREDIENTS

Non-Hazardous: Calcium Carbonate, Hydrocarbon Oils, PTFE, Titanium Dioxide and Clays

APPROVALS AND LISTINGS

NSF Standard 61 for potable water.

UPC® IAPMO listed.

FGG=BM=™ **SYSTEM COMPATIBLE**

FGG/BM System Compatible indicates that this product has been tested, and is monitored on an ongoing basis to assure its chemical compatibility with FlowGuard Gold® water distribution and Blazemaster® fire sprinkler systems.

PRODUCT NUMBER	DESCRIPTION	PACK	CARTON WEIGHT
31229	1 fl. oz. Great White Pipe Joint Compound	12	1 lb.
31229D	1 fl. oz. Great White Pipe Joint Compound – Display	54	6 lbs.
312291	1 fl. oz. Great White Pipe Joint Compound – Gravity Feed Pack	120	8 lbs.
31230	4 fl. oz. Great White Pipe Joint Compound	12	7 lbs.
31230D	4 fl. oz. Great White Pipe Joint Compound – Display	48	27 lbs.
31231	8 fl. oz. Great White Pipe Joint Compound	12	12 lbs.
31231D	8 fl. oz. Great White Pipe Joint Compound – Display	30	28 lbs.
31232	16 fl. oz. Great White Pipe Joint Compound	24	29 lbs.
31233	32 fl. oz. Great White Pipe Joint Compound	12	40 lbs.

**FlowGuard Gold® and Blazemaster® are registered trademarks of The Lubrizol Corporation.

SPEARS® MANUFACTURING COMPANY

FS-5 **RED**

SPEARS® FlameGuard® CPVC FIRE SPRINKLER PRODUCTS

TECHNICAL SPECIFICATIONS
Low VOC CPVC Solvent Cement

PRODUCT:
Spears® FlameGuard® FS-5 RED One-Step (no primer required) CPVC cement specifically formulated and approved for use with Spears® FlameGuard® and other approved CPVC Fire Sprinkler Products with interference fit through 3".

INTENDED USE:
Spears® FS-5 is approved for use with Spears® FlameGuard® and other approved CPVC Fire Sprinkler Products. See publication FG-3, FlameGuard® Installation Instructions for additional application details.

GENERAL PRODUCT SPECIFICATIONS:

COLOR:	Red
RESIN:	CPVC
SPECIFIC GRAVITY:	0.985 ± 0.04
BROOKFIELD VISCOSITY	Heavy Body - Minimum 1600 cP@ 73 ± 2°F (23°C +1° C)
RELATIVE SET:	Fast
MAX VOC EMISSIONS:	490 G/L per SCAQMD Rule 1168/316A
SHELF LIFE:	2 years from date stamped on the bottom of container.

Note: Product usability is limited by the evaporation of the solvents when the container is opened and can cause the cement to thicken and reduce its usefulness. Always seal the can tightly between uses to prevent the solvent from becoming thickened, stringy or jelled. Do not add thinners to change viscosity of thickened cement. Significant changes in cement properties can result.

CONFORMANCE STANDARDS AND APPROVALS:

- NSF®/ANSI Standard 14 Listed and Certified for compliance to ASTM F493
- NSF®/ANSI Standards 14/61 Listed and Certified for Potable Water, Drain Waste and Vent, and Sewer service use (NSF®-PW, DWV, SW) NSF® Listed and Certified to requirements of the Uniform Plumbing Code (NSF® U.P. Code); NSF® Certified Lead-Free.
- FM® and UL® approved for use with Spears® FlameGuard® and other approved CPVC Fire Sprinkler Products.
- Meets SCAQMD Rule 1168/316A for Compliance with LEED® (Leadership in Energy and Environmental Design). Low VOC product credit can be claimed for LEED Green Building Rating System - Indoor Environmental Quality.

PACKAGING, SHIPPING & TRANSPORTATION INFORMATION:

Can Size	Standard Case Quantity
Pint	12
Quart	12

The following is general information for ground shipping, see SDS FS5-6 for additional detail.

Proper Shipping Name: Adhesive
Hazard Class: 3
Identification Number: UN 1133
Packing Group: II
Label Required: Class 3 Flammable Liquid

Exceptions for Quantities < 1 liter
Classification: Limited Quantity
49CFR172.315 Marking:

Note: Purchasers who may repackage this product must also conform to all local, state and federal labeling, safety and other regulations.

SAFETY & USE PRECAUTIONS:

WARNING: CAN CAUSE SERIOUS EYE IRRITATION. HARMFUL IF INHALED. MAY CAUSE DROWSINESS OR DIZZINESS. MAY CAUSE RESPIRATORY IRRITATION. REPEATED EXPOSURE MAY CAUSE SKIN DRYNESS OR CRACKING. KEEP OUT OF REACH OF CHILDREN.

Do not take internally. Keep away from heat, spark, open flame, other sources of ignition. Vapors may ignite explosively. Use only in well ventilated area; if not well ventilated, use forced ventilation or NIOSH approved respirator. Avoid breathing vapors. Do not smoke, eat or drink while using. Avoid contact with skin and eyes. Use skin and eye protection. Eye contact may cause injury. Keep container closed when not in use. Contains Tetrahydrofuran (CAS#109-99-9); Methyl Ethyl Ketone (CAS# 78-93-3); Cyclohexanone (CAS# 108-94-1); Acetone (CAS# 67-64-1); CPVC Resin (CAS# 68648-82-8).

FIRST AID

Contact with eyes: Flush eyes immediately with plenty of water for 15 minutes and seek medical advice immediately.
Skin contact: Remove contaminated clothing and shoes. Wash skin thoroughly with soap and water. If irritation develops, seek medical advice.
Inhalation: Remove to fresh air. If breathing is stopped, give artificial respiration. If breathing is difficult, give oxygen. Seek medical advice.
Ingestion: Rinse mouth with water. Give 1 or 2 glasses of water or milk to dilute. Do not induce vomiting. Seek medical advice immediately.

INSTALLATION & INSTALLER TRAINING

FS-5 is specialty cement; see Spears® publication FG-3, FlameGuard® Installation Instructions, for specific details and limitations. Installation instructions are printed on the can label and instructional information is available on Spears® website at www.spearsmfg.com. Certified Installers Training for FlameGuard® CPVC Fire Sprinkler Systems is also available. Contact Spears® for additional instructional information or formal training.

AVOID USE AROUND DRY GRANULATED CALCIUM HYPOCHLORITE

While CPVC Fire Sprinkler Systems typically are not disinfected, a fire or explosion may result if dry granular calcium hypochlorite is used to disinfect plastic piping systems that are exposed to organic vapors found in solvent cements, cleaners or primers when a water solution is not used. Calcium hypochlorite is a strong oxidizer and common in Pool & Spa chemicals such as "pool-shock". If required, it is recommended to purify lines by pumping nonvolatile chlorinated water into the piping system. Do not store or use dry granular calcium hypochlorite near solvent cements, cleaners and primers.

Refer to Safety Data Sheet (SDS), Spears® publication FS5-6, for more information.

LIMITED LIFETIME WARRANTY:

Spears® Manufacturing Company warrants all new Solvent Cement and Primer products shall be free from defects in material and workmanship for the specified product shelf life based on the assigned manufactured date on the original product container. If any such product becomes defective under normal use and storage conditions during this warranty period, Spears® will replace the nonconforming solvent cement or primer product without charge. Spears® liability will be limited, without exception, to product replacement. Spears® further warrants properly made solvent cement joints using this product for the life of the system. See Spears® standard Limited Lifetime Warranty for additional detailed information and exclusions.

Progressive Products From Spears® Innovation & Technology

SPEARS® MANUFACTURING COMPANY • CORPORATE OFFICE
15853 Olden St., Sylmar, CA 91342 • PO Box 9203, Sylmar, CA 91392
(818) 364-1611 • www.spearsmfg.com

Engineering Specification

Job Name **Homewood Suites Puyallup WA**

Job Location _____

Engineer _____

Approval _____

Contractor _____

Approval _____

Contractor's P.O. No. _____

Representative _____

Series 3000SS

Double Check Detector Assemblies

Sizes: 2½" – 12"

Series 3000SS Double Check Detector Assemblies are designed for use in accordance with water utility non-health hazard containment requirements. It is mandatory to prevent the reverse flow of fire protection system substances, such as glycerin wetting agents, stagnant water, and water of non-potable quality from being pumped or siphoned into the potable water supply.

3000SS-OSY-TS FxF

Features

- Cam-Check Assembly valve provides low head loss
- Short lay length is ideally suited for retrofit installations
- Stainless steel body is half the weight of competitive designs reducing installation and shipping cost
- Stainless steel construction provides long term corrosion protection and maximum strength
- Single top access cover with two-bolt grooved style coupling for ease of maintenance
- No special tools required for servicing
- Compact construction allows for smaller vaults and enclosures
- Furnished with ⅝" x ¾" bronze meter (gpm or cfm)
- Detects underground leaks and unauthorized water use
- May be installed horizontal or vertical "flow up" position (ASSE Only)
- Includes an integrated supervisory tamper switch on each gate valve of the OSY model

Specification

A Double Check Detector Assembly shall be installed on fire protection systems when connected to a drinking water supply. Degree of hazard present is determined by the local authority having jurisdiction. The main valve body shall be manufactured from 300 Series stainless steel to provide corrosion resistance, 100% lead free* through the waterway. The double check detector assembly consists of two independently operating, spring loaded check valves, two UL, FM, OSY resilient seated gate valves, and bypass assembly. The bypass assembly consists of a meter (cubic ft. or gallons), a double check including shutoff valves and required test cocks. Each cam-check shall be internally loaded and provide a positive drip tight closure against reverse flow. Cam-check includes a stainless steel cam arm and spring, rubber faced disc and a replaceable seat. There shall be no brass or bronze parts used within the cam-check valve assembly.

The check valve seats shall be of molded thermoplastic construction. The use of seat screws as a retention method is prohibited. All internal parts shall be accessible through a single cover on the valve assembly. The valve cover shall be held in place through the use of a single grooved style two-bolt coupling. The bypass line shall be hydraulically sized to accurately measure low flow. The bypass line shall consist of a meter, a small diameter double check assembly with test cocks and isolation valves. The bypass line double check valve shall have two independently operating modular poppet check valves, and top mounted test cocks.

The integrated supervisory tamper switch on the OSY model shall have continuity with the valve fully open and activate within two (2) turns from open. The device consists of two SPDT switches and is designed to send a tamper signal when the valve is closed and when the switch is removed from the valve. In the neutral position, the switch indicates the valve is fully open. Closing the valve causes the switch rod to come out of the valve stem groove, activating the switch. Removing the tamper switch also activates the switch. The assembly shall be an Ames Fire & Waterworks 3000SS.

NOTICE

The information contained herein is not intended to replace the full product installation and safety information available or the experience of a trained product installer. You are required to thoroughly read all installation instructions and product safety information before beginning the installation of this product.

⚠ WARNING

It is illegal to use this product in any plumbing system providing water for human consumption, such as drinking or dishwashing, in the United States. Before installing standard material product, consult your local water authority, building and plumbing codes.

*The wetted surface of this product contacted by consumable water contains less than 0.25% of lead by weight.

AMES FIRE & WATERWORKS

A WATTS Brand

Materials

All internal metal parts: 300 Series stainless steel, Main valve body: 300 Series stainless steel, Check assembly: Noryl® Flange dimension in accordance with AWWA Class D.

Available Models

Suffix:

LG	– Less shutoff valves
OSY-TS	– UL/FM outside stem and yoke resilient seated gate valves with integrated tamper switch
OSY FxG**	– Flanged inlet gate connection and grooved outlet gate connection
OSY FxF**	– Flanged inlet gate connection and flanged outlet gate connection
OSY GxF**	– Grooved inlet gate connection and flanged outlet gate connection
OSY GxG**	– Grooved inlet gate connection and grooved outlet gate connection
CFM	– Cubic feet per minute
GPM	– Gallons per minute meter

** Consult factory for the following:
- Grooved NRS gate valves
- Post-indicator plate and operating nut
- Dimensions

Pressure — Temperature

Temperature Range: 33°F – 110°F (0.5°C – 43°C)
Maximum Working Pressure: 175psi (12 bar)

Standards

ASSE 1048, AWWA C510-92, CSA B64.5, UL 1469

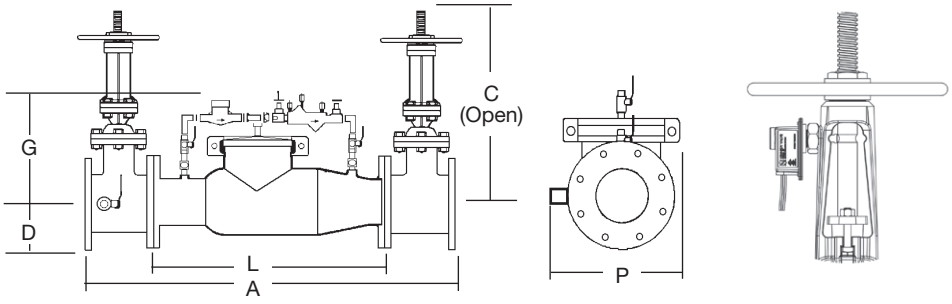
Approvals

UL Classified (OSY only), FM (sizes 2½" – 10", OSY only)

USC Foundation for Cross-Connection Control and Hydraulic Research

For 12" assembly approvals consult factory.

Dimensions – Weights



SIZE	DIMENSIONS												NET WEIGHT		NET WEIGHT	
	A		C (OSY)		D		G		L		P		w/Gates		w/o Gates	
in.	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*lb*	*kg*	*lb*	*kg*
2½	37	965	16⅜	416	3½	89	10	250	22	559	12½	318	160	72	68	31
3	38	965	18⅞	479	3¾	95	10	250	22	559	13	330	235	106	70	32
4	40	1016	22¾	578	4½	114	10	250	22	559	14½	368	245	111	73	33
6	48½	1232	30⅛	765	5½	140	15	381	27½	699	15½	394	395	179	120	54
8	52½	1334	37¾	959	6¾	171	15	381	29½	749	18½	464	577	261	180	82
10	55½	1410	45¾	1162	8	200	15	381	29½	749	19½	495	779	353	190	86
12	57½	1461	53⅛	1349	9½	241	15	381	29½	749	21	533	1049	476	220	100

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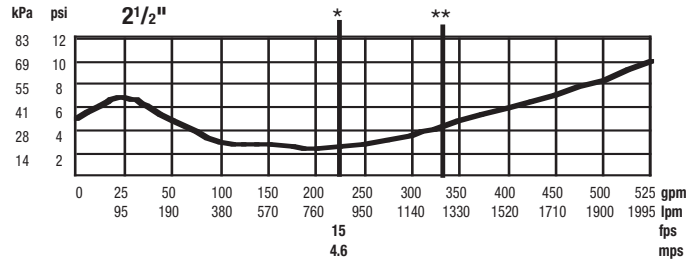
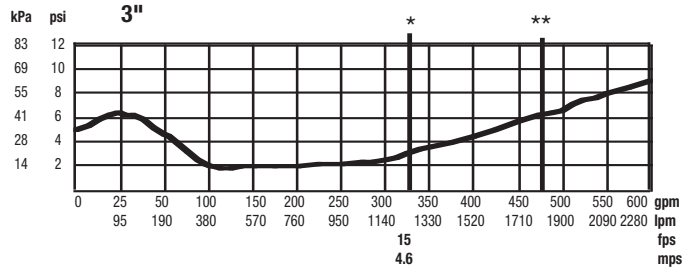
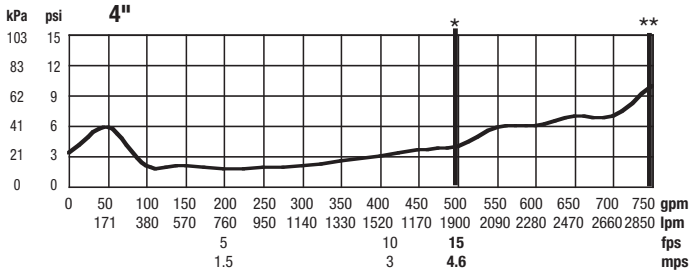
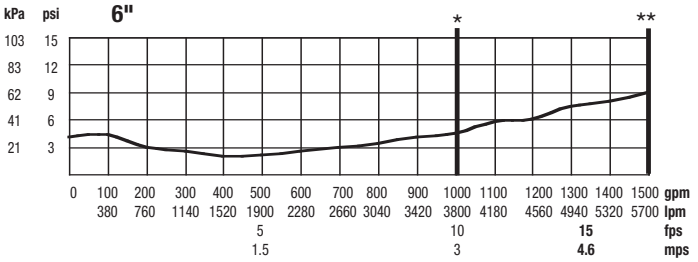
Capacity

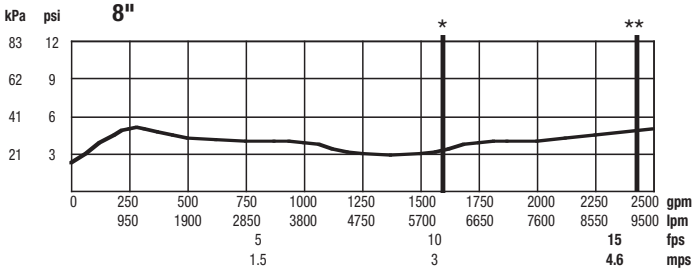
Flow curves as tested by Underwriters Laboratory per UL 1469, 1996. * Rated flow **UL Tested

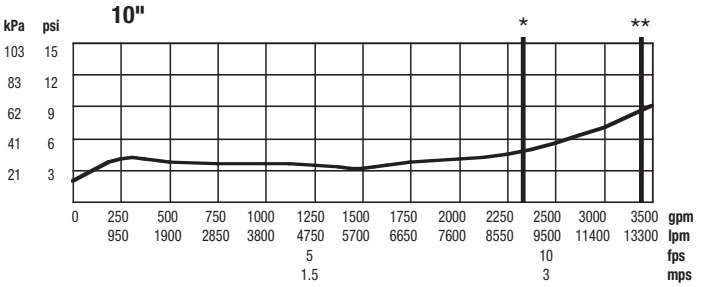


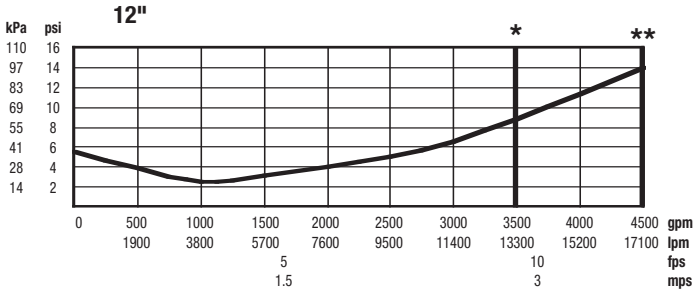












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