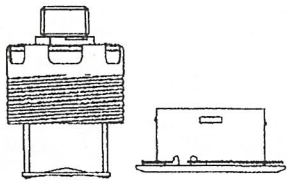
SENJU SPRINKLER CO.,LTD.

Residential Lead Free Flat Concealed Sprinkler, Pendent, Model: RC-RES, K-Factor: 4.9, SIN: SS8464



GENERAL DESCRIPTION

The Model RC-RES Residential Flat Concealed Sprinklers are automatic sprinklers of the compressed fusible solder type. These are decorative and fast response. The Cover Plate Assembly hides the Deflector, Heat Responsive Element etc., which is in turn concealed above the ceiling. The cover plate has a flat profile, and its diameter is extremely small (2-5/8 inch, 68mm). The push-on and/or thread-on, thread-off design of the concealed cover plate assembly allows easy installation of the cover plate. Therefore, the Model RC-RES should be your first choice when aesthetics is the major consideration for ultimate appeal and unbeatable performance is desired. The Model RC-RES is designed for the residential occupancies and it is perfect for use in homes, hotels and other living quarters.

The Model RC-RES is to be used in wet pipe residential sprinkler systems for One- and Two- Family Dwellings and Manufactured Homes per NFPA 13D; wet pipe residential sprinkler systems for Residential Occupancies up to and Including Four Stories in Height per NFPA 13R; or, wet pipe sprinkler systems for the residential portions of any occupancies per NFPA 13.

The Model RC-RES has a 4.9 (70.6 LPM/bar$^{1/2}$) K-factor that meets the required residential flow rates with minimal residual pressure, which allows for smaller pipe sizes and water supply requirements.
For extended installation flexibility, the Model RC-RES provides 1/2 inch (12.8mm) vertical adjustment. This adjustment in installation decreases the need for precise cutting of the pipe that drops to the sprinkler and allows for a perfect fit with a range of pipe lengths.

The heat sensitivity and water distribution design of Model RC-RES allows for an increased chance of residents' escape or evacuation in case of fire. However, residential fire sprinkler systems are not a substitute for fire safety awareness or fire safety construction required by building codes.

"Lead Free" is defined in the Reduction of Lead in Drinking Water Act (S.3874) endorsed by AWWA's Water Utility Council, and California Assembly Bill #1953 as having less than or equal to a weighted average of 0.25% lead in wetted surface of pipes, plumbing fittings and fixtures.

WARNINGS

The Model RC-RES must be installed and maintained in accordance with the rules stated herein as well as in compliance with the applicable standards of the National Fire Protection Association regulations and the standards of any other authorities having jurisdiction.
In the event of this condition, consult the authorities having jurisdiction for guidance and approval.
Failure to do so may impair the integrity of these devices.

It is the responsibility of the installing contractor to provide a copy of this document to the owner or his representative, and in turn, it is the obligation of the owner to provide a copy of this document to a succeeding owner. 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 related questions.

TECHNICAL DATA

Approvals: $_cUL_{us}$ **Listed, NSF-61-G**

Sprinkler Identification Number (SIN): **SS8464**

Maximum Working Pressure: **175psi (12.1bar)**

Discharge Coefficient (Nominal K-Factor):
K=4.9 GPM/psi$^{1/2}$ (70.6 LPM/bar$^{1/2}$)

Temperature Rating:
162℉ (72℃) Sprinkler with 140℉ (60℃) Cover Plate
175℉ (79℃) Sprinkler with 162℉ (72℃) Cover Plate

Color Code (Sprinkler)
162℉ (72℃): Uncolored
175℉ (79℃): White

Color Code (Cover Plate)
140℉ (60℃): No Mark
162℉ (72℃): White-Colored Mark

Vertical Adjustment: **1/2 inch (12.8 mm)**

Cover Plate Finishes:
Standard Finishes-

White, Ivory, Beige, Brown, Black, Nickel, Wood Grain

Custom Finishes-

Custom color and custom pattern cover plates are available on special order. Contact a Senju Sprinkler representative with any custom orders.

Please see chart on Page 8 for more detail.

Physical Characteristics: **Ref. Figure 1**

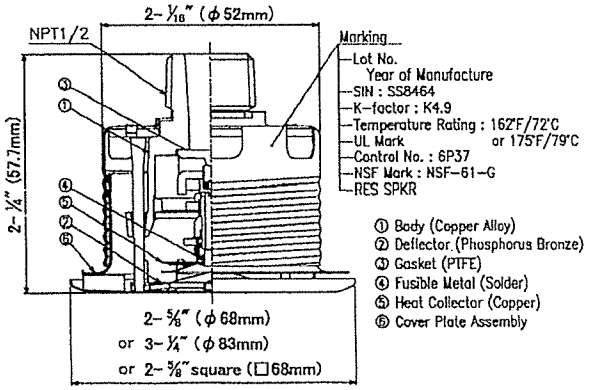


FIGURE 1. Model RC-RES K=4.9

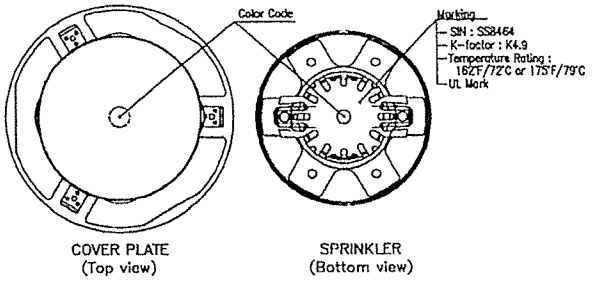


FIGURE 1-1. Marking (Color Code)

OPERATION

In case of fire, the solder component that holds together the Cover Plate and the Retainer melts. Then, the Cover Plate is released at once. As a result, the Deflector drops down to the intended position. Two Heat Collectors are exposed to fire, and when sufficient heat from the fire is recorded, internal components of the sprinkler to fall apart. This leads to allow the water flow to be distributed on the affected by fire area. (Ref. Figure 2)

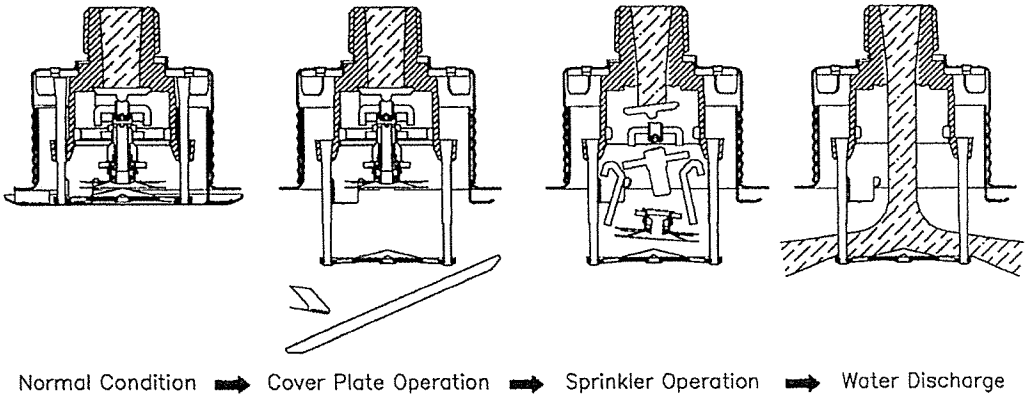


FIGURE 2. OPERATION PROCESS (The figure is for illustrative purpose only)

DESIGN CRITERIA

The herein stated rules for use and installation of Model RC-RES are provided by the manufacturer and must be strictly implemented for safe and full results.

NOTES

Residential Fire Sprinkler Systems should only be designed and installed by individuals who are completely familiar with automatic sprinkler system design, installation procedures, and techniques.

Several criteria may apply to the installation and usage of each sprinkler. Consequently, it is recommended that the sprinkler system designer review and develop a working understanding of the complete list of criteria prior to initiating the design of the sprinkler system.

Questions concerning sprinkler installation and usage criteria, which are not coverage by the following instructions, should be submitted to Contact Company. Include sketches and technical details as appropriate.

In some instances, the requirements of this document may concern specifications which are more stringent and which take precedence over those specified in NFPA 13, 13D, 13R, or by the authority having jurisdiction.

The Model RC-RES must not be used in applications where the air pressure above the ceiling is greater than that below. Inspect all sprinklers after installation to ensure that both the gap between the cover plate, ceiling and the 6 slots in the cup are open and free from any air flow impediment.

The spray from the sprinkler is distributed radically outward and downward from the sprinkler deflector. Consequently, the sprinklers must be located such that there will be no blind spaces shielded from spray by partitions, room dividers, overhangs or other parts of the dwelling structure.

The number of sprinklers within each compartment (as defined by NFPA 13, 13D, or 13R) must be kept as small as possible. Do NOT use more sprinklers than necessary to cover a particular space.

Use only the Cover Plate provided with the Model RC-RES. The sprinkler must be secured in place by firmly fastening the sprinkler system piping to the structure. If the sprinkler is not properly secured in position, reaction forces resulting from sprinkler operation could alter its orientation and its water distribution pattern.

Obstruction to Water Distribution

Locations of sprinklers must follow the obstruction rules of NFPA 13 for Residential Sprinklers.

General Service Conditions

The Model RC-RES must only be utilized in WET PIPE sprinkler systems.

Heat Source Criteria

Refer to NFPA 13D or 13R for the requirements relating to the prevention of possible activation of the Heat Responsive Element of Model RC-RES, due to exposure to a heat sources other than an actual fire.

Precautionary Warnings for Corrosive Environments

The Model RC-RES should not be installed where they may be subjected to a corrosive environment including the following:

(1) Chlorine ion and Chloride environment.

Stress corrosion cracking may be caused by exposure to environments with Chlorine ion and Chloride. Exposure to this environment may result in sprinklers operating under Non-Fire conditions or Not Operating when exposed to an actual fire.

(2) Sprinkler system piping with Copper.

Sprinkler systems should be constructed in compliance with the applicable standards and the requirements for the copper piping when copper piping is used in the sprinkler system. (Reference standards NFPA 13, ASTM B813, B828, and CDA (Copper Development Association) – Solder Joint)

All residual flux must be removed from the interior and exterior of copper piping by thoroughly flushing before installation of the Sprinkler Heads. Otherwise, residues of flux may cause corrosion and leakage in the sprinkler system.

Hydraulic Design Criteria

The minimum required sprinkler flow rates for system designed to NFPA 13D or 13R are given in Table A as a function of temperature rating and the maximum allowable coverage areas. The sprinkler flow rate is the minimum required discharge from the most hydraulically demanding sprinkler from each of the total number of "design sprinklers" as specified in NFPA 13D or 13R.

For systems designed to NFPA 13, the number of designed 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 followings;

- The flow rates given in Table A for NFPA 13D and 13R as a function of temperature rating and maximum allowable coverage area.

- A minimum discharge 0.1GPM/sq.ft. [4.07LPM/sq.m] over the "design area" comprised of the four most hydraulically demanding sprinklers for the actual coverage areas being protected by the four sprinklers.

TABLE A. NFPA 13D & 13R WET PIPE HYDRAULIC DESIGN CRITERIA for Model SS8464

Maximum Coverage Area[a] Ft. × Ft. (m ×m)	Maximum Spacing Ft. (m)	Ordinary Temperature Rating 162℉ (72℃)		Intermediate Temperature Rating 175℉ (79℃)		Deflector to Ceiling	Installation Type	Minimum Spacing Ft. (m)
		Flow[b] GPM (LPM)	Pressure[b] PSI (bar)	Flow[b] GPM (LPM)	Pressure[b] PSI (bar)			
12×12 (3.7×3.7)	12 (3.7)	13 (49.2)	7.0 (0.48)	13 (49.2)	7.0 (0.48)	Smooth Ceilings 3/8 to 7/8 Inches. Beamed Ceilings per NFPA 13D,13R or 13 Installed in beam 3/8 to 7/8 inches below bottom of beam.	Concealed	8 (2.4)
14×14 (4.3×4.3)	14 (4.3)	13 (49.2)	7.0 (0.48)	13 (53.0)	7.0 (0.48)			
16×16 (4.9×4.9)	16 (4.9)	13 (49.2)	7.0 (0.48)	14 (53.0)	8.2 (0.57)			
18×18 (5.5×5.5)	18 (5.5)	17 (64.3)	12.0 (0.83)	18 (68.1)	13.5 (0.93)			
20×20 (6.1×6.1)	20 (6.1)	21 (79.5)	18.4 (1.27)	—	—			

(a) For coverage area dimensions less than the above mentioned, it needs to use the minimum required flow for the Next Higher Coverage Area listed.

(b) Requirement is based on minimum flow in GPM/LPM from each sprinkler. The associated residual pressures are calculated using the nominal K-Factor. Refer to Hydraulic Design Criteria Section for details.

(c) For systems with ceiling types smooth flat horizontal, or beamed, or sloped, in accordance with the 2013 Edition of NFPA 13D, 13R or 13 as applicable.

Sprinkler Spacing Criteria

The minimum spacing between sprinklers is 8 feet (2.4m). The maximum spacing between sprinklers cannot go beyond the coverage area calculated by using the specific hydraulic factors. (Ref. Table A)

INSTALLATION

The Model RC-RES must be installed in accordance with the following instructions.

NOTES

Do not use any sprinklers which have been subjected to potential mechanical damage. Do not use any sprinklers which show deformation or cracking in either the Sprinkler or the Protective Cap.

Prior to installation, sprinklers should be maintained in the original cartons and packaging until used to minimize the potential for damage to sprinklers that would cause improper operation or non-operation.

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

Use a torque of 7 to 14 ft.lbs (9.5 to 19.0Nm) to achieve a 1/2 inch NPT sprinkler joint. If you exceed the recommended maximum torque, this could result in damage to the sprinkler inlet, which may lead to leakage from the sprinkler.

In case of insufficient adjustment in Cover Plate installation, do not try to overly tighten, screw the sprinkler too loosely or make any modification to the cover plate assembly. Readjust the sprinkler fitting for a better fit.

Installing Procedure

Step 1

The installation requirements for the sprinkler are as follows: to be installed only in the pendent position with the waterway perpendicular to the ceiling. Install the sprinkler fitting so that the distance from the face of the fitting to the mounting surface will be nominally 2 inch (50.8mm) as shown in Figure 3.

Step 2

With pipe thread sealant applied to the threads, hand tighten the sprinkler into the sprinkler fitting. Then tighten it with the Sprinkler Socket or Wrench & Socket Combination (Ref. Figure 4). The grooves of the Socket must fit perfectly with the grooves on the Sprinkler for proper installation (Ref. Figure 4).

Step 3

If desired the Protective Cap may also be used to locate the center of the clearance hole by gently pushing the ceiling material against the center point of the Protective Cap. Before the installation of the ceiling, the sprinkler installation can be started with the 2-3/8 inch (60mm) diameter clearance hole (Ref. Figure 3). Use the "Tolerance Limit of Ceiling Level" indicator on the Protective Cap to check for proper installation height (Ref. Figure 3).

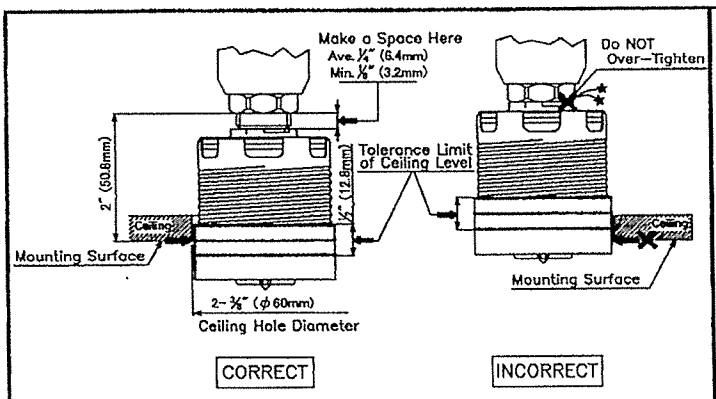


FIGURE 3. INSTALLATION

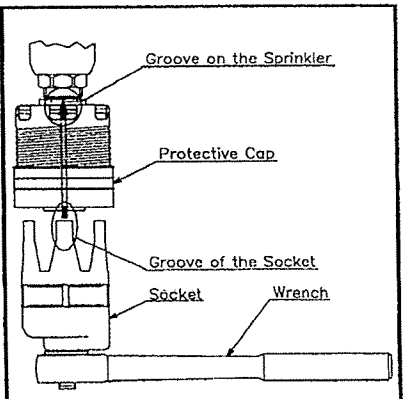


FIGURE 4

Step 4

Use the Cap Remover RC to remove the Protective Cap (Ref. Figure 5), and then push or screw a Cover Plate Assembly on the Cup of the Sprinkler by hand until its flange just comes in contact with the ceiling (Ref. Figure 6 and Figure 7). Stop tightening the Cover Plate Assembly once the flange has come in contact with the ceiling. If the ceiling has been lifted from its normal position in the process of tightening of the Cover Plate Assembly, readjust the cover plate assembly as necessary. If the flange of the Cover Plate Assembly cannot come in contact with the ceiling sufficiently, readjust the sprinkler fitting as necessary. When properly installed, there is a nominal 1/16 inch (1.6mm) air gap between the lip of the Cover Plate and the ceiling, as shown in Figure 6

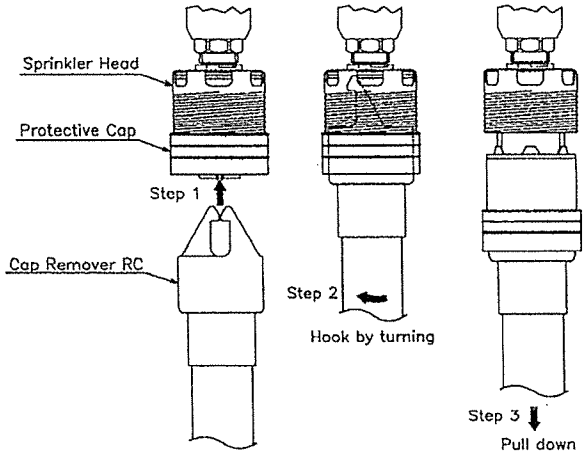


FIGURE 5. PROTECTIVE CAP REMOVAL

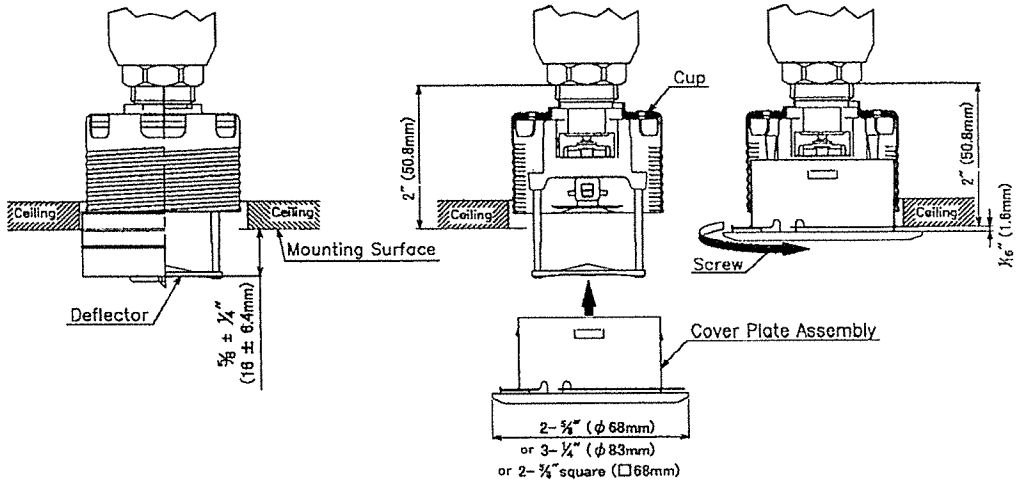


FIGURE 6

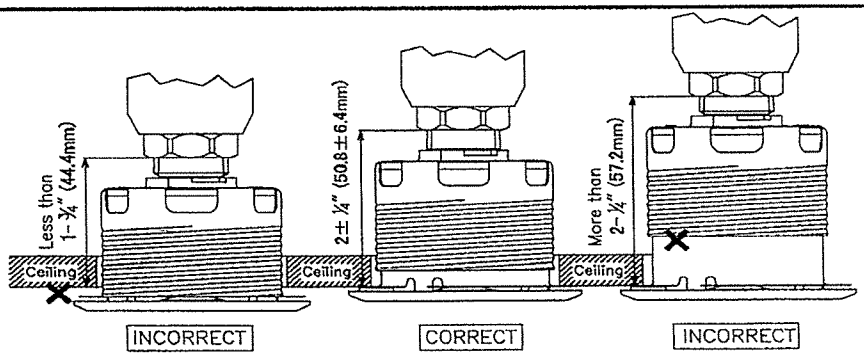


FIGURE 7. INSTALLATION (CORRECT OR INCORRECT)

CARE AND MAINTENANCE

The following instructions must be implemented for the maintenance and service of the Model RC-RES.

NOTES

Wet pipe sprinkler systems must be maintained at a minimum temperature of 40℉/4℃ to prevent freezing and bursting of the pipe and/or sprinklers.

Automatic sprinklers are not to be tested with a heat source. Operation of the heat responsive element can result.

Absence of a Cover Plate Assembly may delay the response time of the sprinkler in case of fire.

Install the cover plate assembly properly, as shown in Figure 6. Improper installation of the cover plate assembly may cause improper operation or non-operation.

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 cover plates. Non-factory applied paint may adversely delay or prevent sprinkler operation in case of a fire.

Do not pull the Cover Plate. Separation may result.

In preparation for maintenance of the fire protection system, permission to close the main control valve must be obtained from the proper authorities and all affected by this action parties must be informed before the maintenance session can commence.

Do NOT enclose any sprinklers within drapes, curtains, or valances.

Do NOT hang anything from the sprinklers.
Do NOT clean the sprinklers with soap and water, detergents, ammonia, cleaning fluids, or other chemicals. Remove dust, lint, cobwebs, cocoons, insects, and larvae by gently brushing with a feather duster or gently vacuuming with a soft bristle (i.e., dusting) brush attachment.

Exercise suitable safety precautions in the use and storage of highly flammable materials. The rapid rate of fire development and spread of these materials can reduce the ability of the sprinkler systems to aid in the control of a fire involving such hazards.

Leaking or corroded sprinklers must be replaced.

Automatic Sprinklers must never be shipped or stored where the temperature exceeds 100℉/38℃.

Automatic sprinkler must never be physically altered, such as painted, plated, or coated, once shipped from the factory. If the sprinklers have been in any way modified, they must be replaced.

Great caution must be applied to prevent damage to the sprinklers at all stages - before, during, and after installation. Damaged units, as a result of dropping, hitting, over-tightening, or wrench slippage, must be replaced.

The Model RC-RES must only be replaced with pendent sprinklers which are listed for residential fire protection service and which have the same nominal K-Factor, the same coverage area, and the same or lower flow ratings (as indicated under Table A "Hydraulic Design Criteria").

When remodeling, such as by adding false beams or light fixtures or changing the location of compartment walls, first verity that the new construction will not violate the installation requirements of the applicable standards of NFPA. Alter the new construction and/or the sprinkler system to suit the requirements of this document and the applicable NFPA regulations.

The owner is responsible for the maintenance of the sprinkler system, including inspection and testing, its compliance with this documents, as well as the standards of the National Fire Protection Association (e.g., NFPA 25), and the regulations of any other authorities having jurisdiction. The owner should direct any questions regarding the above rules and regulations to the installing contractors or the sprinkler manufacturer. It is recommended that automatic sprinkler systems be inspected, tested, and maintained by a qualified Inspection Service in accordance with NFPA 25.

ORDER PROCEDURE

When placing an order, please contact a local distributor with the following information (Model Name, Specify, Temp. and Finish).

Sprinkler:

Model: RC-RES

(SIN: SS8464, Residential Flat Concealed Sprinkler, Pendent, K4.9, Temperature: 162℉ (72℃) or 175℉ (79℃))

Cover Plate Assembly:

2-5/8 inch (ϕ68mm) or 3-1/4 inch (ϕ83mm) or 2-5/8 inch square (□68mm), Order Separately from Sprinkler
Please refer to the chart below for available sizes, temperature, and finishes.

	Standard Finishes							Custom Finishes	
	White	Ivory	Beige	Brown	Black	Nickel	Wood grain	Custom Color	Custom Pattern
2-5/8" Round, 140°F	O	O	–	–	–	O	–	O	O
3-1/4" Round, 140°F	O	O	O	O	O	O	O	O	O
2-5/8" Square, 140°F	O	–	–	–	–	–	–	O	O
2-5/8" Round, 162°F	O	–	–	–	–	–	–	O	O
3-1/4" Round, 162°F	O	–	–	–	–	–	–	O	O

Tools for Installation of Model: RC-RES

- Socket for Model RC-RES
- Wrench & Socket for Model RC-RES
- Cap Remover RC

tyco

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

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

General Description

The TYCO RAPID RESPONSE Series LFII Residential 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 inch (6,4 mm) of recessed adjustment or up to 1/2 inch (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.

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.

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 and as referenced in U.S. Patent 7,712,543, 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.

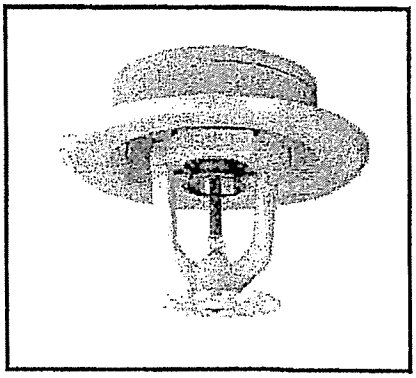
Consequently, the Series LFII Residential Sprinklers offer the features of non-water filled pipe in addition to not having to increase the number of design sprinklers (hydraulic design area) for systems designed to NFPA 13, 13D, or 13R. Non-water filled pipe will permit options for areas sensitive to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

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.

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, in addition to the standards of any authorities having jurisdiction. Failure to do so may impair the performance of these devices.



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

Sprinkler Identification Number (SIN)

TY2234

Components:

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

* Temperature rating is indicated on Deflector.

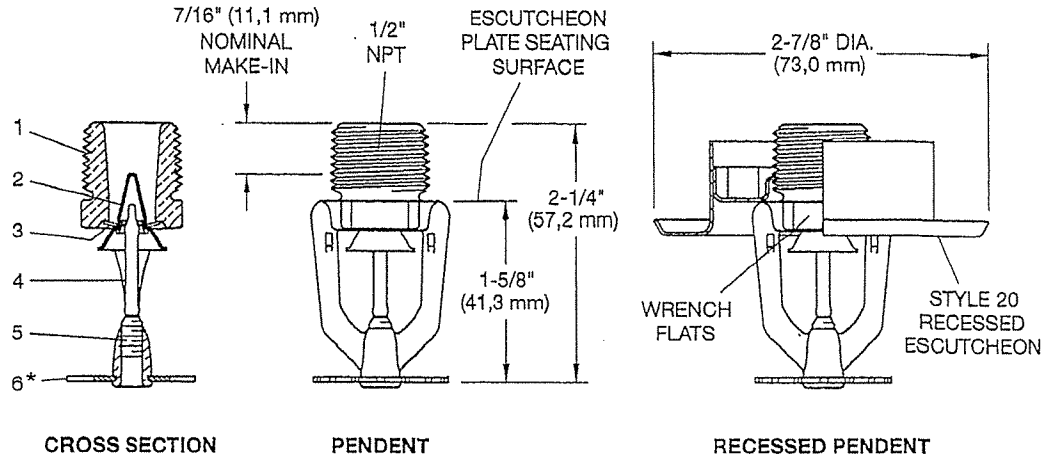


FIGURE 1
RAPID RESPONSE SERIES LFII RESIDENTIAL PENDENT AND RECESSED PENDENT SPRINKLERS (TY2234)

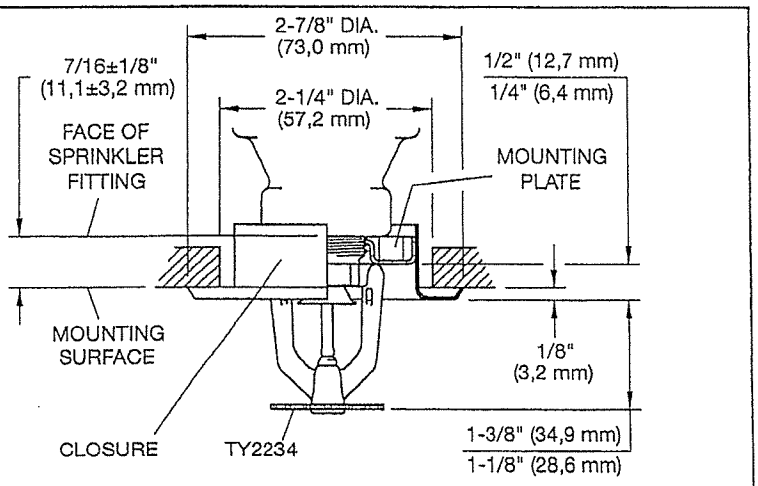


FIGURE 2
STYLE 20 RECESSED ESCUTCHEON FOR USE WITH THE RAPID RESPONSE SERIES LFII RESIDENTIAL PENDENT SPRINKLER (TY2234)

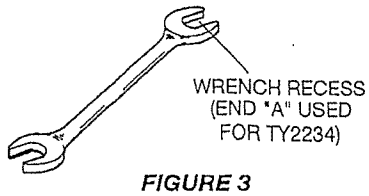


FIGURE 3
W-TYPE 6
SPRINKLER WRENCH

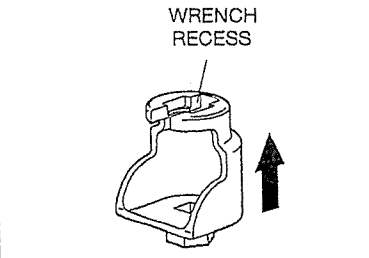


FIGURE 4
W-TYPE 7 RECESSED SPRINKLER WRENCH

Technical Data

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

C-UL Listed for use only with wet pipe systems

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

Maximum Working Pressure
175 psi (12,1 bar)

Discharge Coefficient
K=4.9 GPM/psi$^{1/2}$ (70,6 LPM/bar$^{1/2}$)

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

Finishes
White Polyester Coated
Chrome Plated
Natural Brass

Physical Characteristics

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

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 Pendent and Recessed Pendent Sprinklers (TY2234) 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 about the use of residential sprinklers in residential dry pipe systems.

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 Tables 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
For "Horizontal Ceilings" (maximum 2 inch rise for 12 inch run), the sprinklers are to be installed with a deflector-to-ceiling distance of 1-3/8 to 4 inches or in the recessed position using only the Style 20 Recessed Escutcheon as shown in Figure 2.

The "Beam Ceiling Design Criteria" section permits deflector-to-ceiling distances up to 15-3/4 inches.

For "Sloped Ceilings" (greater than 2 inch rise up to 8 inch rise for 12 inch run), the sprinklers are to be installed with a deflector-to-ceiling distance of 1-3/8 to 4 inches or in the recessed position using only the Style 20 Recessed Escutcheon as shown in Figure 2.

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

Maximum Coverage Area [a] Ft. x Ft. (m x m)	Maximum Spacing Ft. (m)	WET PIPE SYSTEM Minimum Flow and Residual Pressure [b]				
		For Horizontal Ceiling [c, d, e] (Maximum 2 Inch Rise for 12 Inch Run)	For Sloped Ceiling [c, d, e] (Greater than 2 Inch Rise up to Maximum 4 Inch Rise for 12 Inch Run)		For Sloped Ceiling [c, d, e] (Greater than 4 Inch Rise up to Maximum 8 Inch Rise for 12 Inch Run)	
		155°F (68°C) or 175°F (79°C)	155°F (68°C)	175°F (79°C)	155°F (68°C)	175°F (79°C)
12 x 12 (3,7 x 3,7)	12 (3,7)	13 GPM (49,2 LPM) 7.0 psi (0,48 bar)	13 GPM (49,2 LPM) 7.0 psi (0,48 bar)	17 GPM (64,3 LPM) 12.0 psi (0,83 bar)	13 GPM (49,2 LPM) 7.0 psi (0,48 bar)	17 GPM (64,3 LPM) 12.0 psi (0,83 bar)
14 x 14 (4,3 x 4,3)	14 (4,3)	13 GPM (49,2 LPM) 7.0 psi (0,48 bar)	13 GPM (49,2 LPM) 7.0 psi (0,48 bar)	17 GPM (64,3 LPM) 12.0 psi (0,83 bar)	13 GPM (49,2 LPM) 7.0 psi (0,48 bar)	17 GPM (64,3 LPM) 12.0 psi (0,83 bar)
16 x 16 (4,9 x 4,9)	16 (4,9)	13 GPM (49,2 LPM) 7.0 psi (0,48 bar)	13 GPM (49,2 LPM) 7.0 psi (0,48 bar)	17 GPM (64,3 LPM) 12.0 psi (0,83 bar)	13 GPM (49,2 LPM) 7.0 psi (0,48 bar)	17 GPM (64,3 LPM) 12.0 psi (0,83 bar)
18 x 18 (5,5 x 5,5)	18 (5,5)	17 GPM (64,3 LPM) 12.0 psi (0,83 bar)	17 GPM (64,3 LPM) 12.0 psi (0,83 bar)	17 GPM (64,3 LPM) 12.0 psi (0,83 bar)	17 GPM (64,3 LPM) 12.0 psi (0,83 bar)	17 GPM (64,3 LPM) 12.0 psi (0,83 bar)
20 x 20 (6,1 x 6,1)	20 (6,1)	20 GPM (75,7 LPM) 16.7 psi (1,15 bar)	20 GPM (75,7 LPM) 16.7 psi (1,15 bar)	20 GPM (75,7 LPM) 16.7 psi (1,15 bar)	21 GPM (79,5 LPM) 18.4 psi (1,27 bar)	22 GPM (83,3 LPM) 20.2 psi (1,39 bar)

(a) 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.

(b) The Minimum Flow requirement is based on minimum flow in GPM (LPM) from each sprinkler. The associated residual pressures are calculated using the nominal K-factor. Refer to Hydraulic Design under the Design Criteria section.

(c) For NFPA 13D 2010 applications, Horizontal Ceiling criteria shall be used for certain sloped ceiling configurations up to 8:12 pitch. Refer to TIA 1028R for allowed sloped ceiling limitations when using horizontal ceiling criteria.

(d) For NFPA 13R applications, Horizontal Ceiling criteria may be used for sloped ceiling configurations up to 8:12 pitch when acceptable to the local authority having jurisdiction.

(e) 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
SERIES LFII RESIDENTIAL PENDENT AND RECESSED PENDENT SPRINKLERS (TY2234)
NFPA 13D, 13R, AND 13 HYDRAULIC DESIGN CRITERIA
WET PIPE SYSTEMS

Maximum Coverage Area [a] Ft. x Ft. (m x m)	Maximum Spacing Ft. (m)	DRY PIPE SYSTEM Minimum Flow and Residual Pressure [b]	
		For Horizontal Ceiling (Maximum 2 Inch Rise for 12 Inch Run)	
		155°F (68°C)	175°F (79°C)
12 x 12 (3,7 x 3,7)	12 (3,7)	13 GPM (49,2 LPM) 7.0 psi (0,48 bar)	13 GPM (49,2 LPM) 7.0 psi (0,48 bar)
14 x 14 (4,3 x 4,3)	14 (4,3)	14 GPM (53,0 LPM) 8.2 psi (0,57 bar)	14 GPM (53,0 LPM) 8.2 psi (0,57 bar)
16 x 16 (4,9 x 4,9)	16 (4,9)	15 GPM (56,8 LPM) 9.4 psi (0,65 bar)	15 GPM (56,8 LPM) 9.4 psi (0,65 bar)
18 x 18 (5,5 x 5,5)	18 (5,5)	18 GPM (68,1 LPM) 13.5 psi (0,93 bar)	18 GPM (68,1 LPM) 13.5 psi (0,93 bar)
20 x 20 (6,1 x 6,1)	20 (6,1)	21 GPM (79,5 LPM) 18.4 psi (1,27 bar)	21 GPM (79,5 LPM) 18.4 psi (1,27 bar)

(a) 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.

(b) The Minimum Flow requirement is based on minimum flow in GPM (LPM) from each sprinkler. The associated residual pressures are calculated using the nominal K-factor. Refer to Hydraulic Design under the Design Criteria section.

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

Beam Ceiling Design Criteria

The TYCO RAPID RESPONSE Series LFII Residential Pendent and Recessed Pendent Sprinklers (TY2234) are UL and C-UL Listed for installation in wet pipe systems only for residential occupancies with horizontal ceilings (that is, slopes up to a 2 inch rise over a 12 inch run) with beams when installed in accordance with this section:

General Information
The basic concept of this protection scheme is to locate the sprinklers on the underside of the beams, refer Figure 5, (not in the beam pockets); to identify the main beams that principally run in one direction as "primary beams"; and, to identify the beams that run principally perpendicular to the main beams, as may be present (or in some cases may be necessary for proper sprinkler protection), as "secondary beams".

Primary and Secondary Beam Types
Solid surface, solid or hollow core, combustible or non-combustible.

Primary and Secondary Beam Positioning
Directly attached to the underside of a combustible or non-combustible smooth ceiling at any elevation.

Primary Beam Cross-Section
Maximum depth of 14 inches and the maximum width is unlimited. The cross-sectional shape of the primary beam may be rectangular to circular.

Secondary Beam Cross-Section
Maximum depth to be no greater than the primary beam and the maximum width is unlimited. The cross-sectional shape of the secondary beam may be rectangular to circular.

Primary Beam Spacing
The primary beams (Figure 6A) are to be 3 ft.-4 in. to 6 ft. from the compartment wall to center of the nearest beam and from center to center between beams.

Secondary Beam Spacing
The secondary beams principally run perpendicular to the primary beams. Secondary beams of a depth equal to the primary beam must be placed so that the beam pockets created by the primary beams do not exceed 20 feet in length (Figure 6B).

When the beam pockets created by the primary beams exceed 20 feet in length, the installation will require the use of secondary beams as described above. Otherwise, secondary beams need not be present.

Secondary beams of a cross-sectional depth greater than one-quarter the depth of the primary beams are to be a minimum of 3 ft - 4 in from the compartment wall to center of the nearest beam and from center to center between beams (Figure 6C).

Secondary beams of a cross-sectional depth no greater than one-quarter the depth of the primary beams may be placed at any compartment wall to center of the nearest beam distance and from any center to center distance between beams (Figure 6C).

Lintels
Lintels over doorways exiting the compartment must be present. The minimum height for the lintels is 8 inches or no less than the depth of the Primary Beams, whichever is greater.

Sprinkler Types
Series LFII Pendent and Recessed Pendent Residential Sprinklers (TY2234), 155°F (68°C) and 175°F (79°C).

Sprinkler Coverage Area and Hydraulic Design
The sprinkler coverage areas and hydraulic design criteria as presented in the Table A for "Horizontal Ceilings" are to be applied.

Sprinkler Position
The deflector to bottom of primary beams for the Series LFII Pendent and Recessed Pendent Sprinklers (TY2234) is to be 1-1/4 to 1-3/4 inches (Figure 5A). The vertical centerline of the Series LFII Pendent Sprinklers is to be no greater than half the primary beam cross-sectional width plus 2 inches from the centerline of the primary beam (Figure 5B).

NOTICE

Core drilling of beams to allow the installation of sprinkler drops requires consulting with a structural engineer.

Where core drilling is not permitted, the previously stated sprinkler position criteria for the Series LFII Residential Pendent and Recessed Pendent Sprinklers (TY2234) allows placement of the sprinkler drop adjacent to the primary beam.

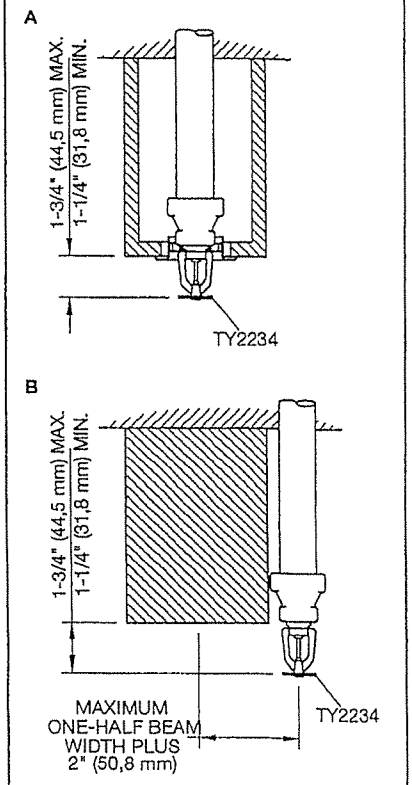


FIGURE 5
SPRINKLER POSITIONING UNDER PRIMARY BEAMS WET PIPE SYSTEMS ONLY
(Refer to the "Beam Ceiling Design Criteria" section.)

Beam and Soffit Arrangements
A soffit is permitted to be placed around the perimeter of a compartment with the beam arrangement within the soffit area (Figure 7).

The cross-section of the soffit may be any size as long as it does not create an obstruction to water distribution per the obstruction rules of NFPA 13 for residential sprinklers.

When soffits are present, the previously provided 3 ft.-4 in. to 6 ft. "compartment wall to adjacent beam" distance for the primary and secondary beams is to be measured from the face of the soffit as opposed to the compartment wall.

Although the distance to the beams is measured from the face of the soffit, the sprinkler coverage area is to be measured from the compartment wall.

ALL FIGURES: DISTANCES ARE MEASURED TO COMPARTMENT WALL FACES AND TO CENTERLINES OF BEAMS

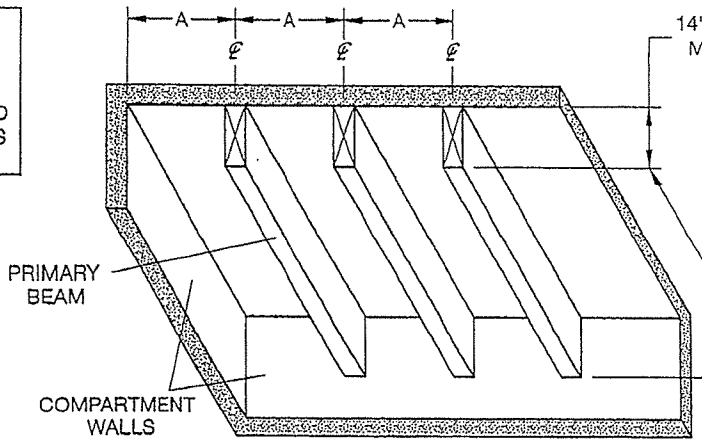
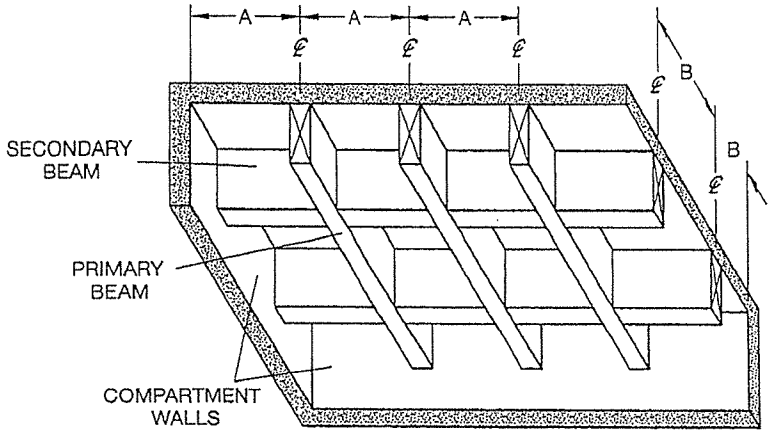


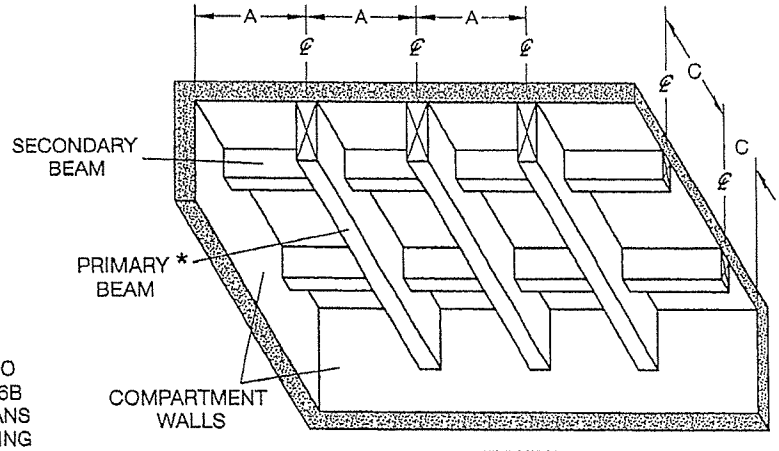
FIGURE 6A
PRIMARY BEAM SPANS UP TO 20'-0" (6,1 m)



A = 3'-4" to 6'-0" (1,0 to 1,8 m) FOR PRIMARY BEAMS HAVING A 14" (356 mm) MAXIMUM DEPTH

B = 20'-0" (6,1 m) MAXIMUM FOR SECONDARY BEAMS THAT ARE TO BE EQUAL IN DEPTH TO PRIMARY BEAMS AND THAT MUST BE IN PLACE SO THAT PRIMARY BEAM POCKETS DO NOT EXCEED 20'-0" (6,1 m)

FIGURE 6B
PRIMARY BEAM SPANS GREATER THAN 20'-0" (6,1 m)



A = 3'-4" to 6'-0" (1,0 to 1,8 m) FOR PRIMARY BEAMS HAVING A 14" (356 mm) MAXIMUM DEPTH

C = 3'-4" (1,0 m) MINIMUM FOR SECONDARY BEAMS HAVING DEPTHS GREATER THAN 25% OF PRIMARY BEAMS

—or—

C = ANY DISTANCE FOR SECONDARY BEAMS HAVING DEPTHS UP TO 25% OF PRIMARY BEAMS

*REFER TO FIGURE 6B FOR SPANS EXCEEDING 20'-0" (6,1 m)

FIGURE 6C
COMBINATIONS OF PRIMARY AND SECONDARY BEAMS

FIGURE 6
BEAM ARRANGEMENTS
WET PIPE SYSTEMS ONLY
(Refer to the "Beam Ceiling Design Criteria" section.)

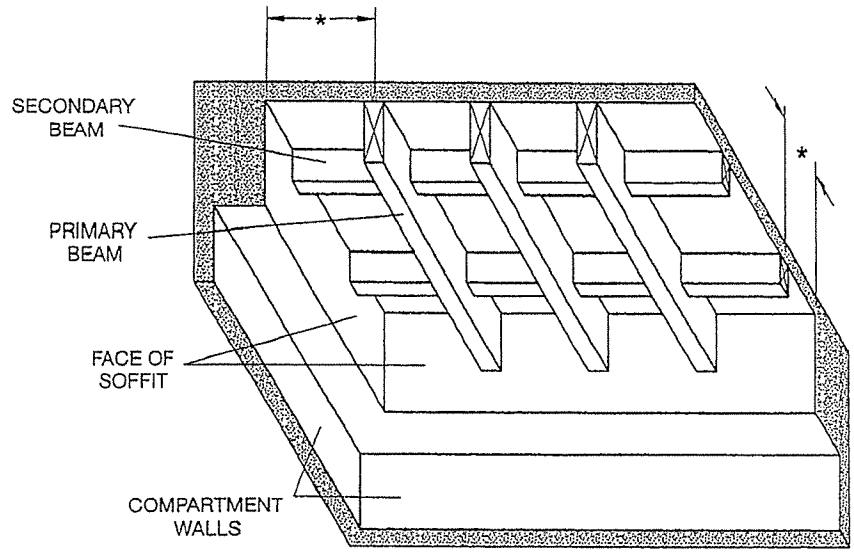


FIGURE 7
BEAM AND SOFFIT ARRANGEMENTS
WET PIPE SYSTEMS ONLY
(Refer to the "Beam Ceiling Design Criteria" section.)

Installation

The TYCO RAPID RESPONSE Series LFII Residential Pendent and Recessed Pendent Sprinklers (TY2234) 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 inch (1,6 mm).

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

Do not attempt to compensate for insufficient adjustment in an Escutcheon Plate by under- or over-tightening the sprinkler. Re-adjust the position of the sprinkler fitting to suit.

Series LFII Residential 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.

Series LFII Residential 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.

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.

Care and Maintenance

The TYCO RAPID RESPONSE Series LFII Residential Pendent and Recessed Pendent Sprinklers (TY2234) 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. (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 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.

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 and Part Number (P/N).

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

155°F (68°C) or
Chrome Plated ..... P/N 51-201-9-155
155°F (68°C)
White Polyester ..... P/N 51-201-4-155
155°F (68°C)
White
(RAL9010)* ..... P/N 51-201-3-155
155°F (68°C)
Natural Brass ..... P/N 51-201-1-155
175°F (79°C) or
Chrome Plated ..... P/N 51-201-9-175
175°F (79°C)
White Polyester ..... P/N 51-201-4-175
175°F (79°C)
White
(RAL9010)* ..... P/N 51-201-3-175
175°F (79°C)
Natural Brass ..... P/N 51-201-1-175

*Eastern Hemisphere sales only.

Recessed Escutcheon
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.

tyco

tyco

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

RAPID RESPONSE Series LFII Residential Sprinklers 4.2 K-factor Horizontal Sidewall Wet Pipe and Dry Pipe Systems

General Description

The TYCO RAPID RESPONSE Series LFII Residential Horizontal Sidewall Sprinklers (TY1334) 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 Sidewall Sprinklers (TY1334) 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 walls. It employs a two-piece Style 20 Recessed Escutcheon. The Recessed Escutcheon provides 1/4 inch (6,4 mm) of recessed adjustment or up to 1/2 inch (12,7 mm) of total adjustment from the flush mounting surface position. The adjustment provided by the Recessed Escutcheon reduces the accuracy to which the pipe nipples to the sprinklers must be cut.

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.

Dry Pipe System Application

The Series LFII Residential Horizontal and Recessed Horizontal Sidewall 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 and as referenced in U.S. Patent 7,712,543, it has been determined that the number of design sprinklers (hydraulic design area) for the Series LFII Residential 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.

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. Non-water filled pipe will permit options for areas sensitive to freezing

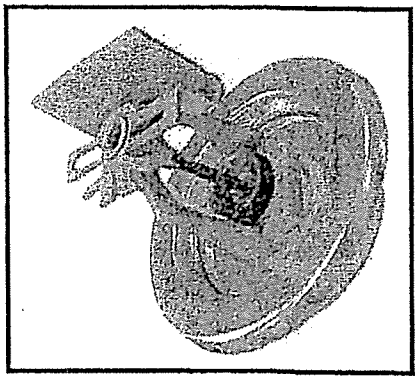
NOTICE

The Series LFII Residential Horizontal Sidewall Sprinklers described herein must be installed and maintained in compliance with this document and 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)

TY1334

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

* Temperature rating is indicated on top of Deflector.

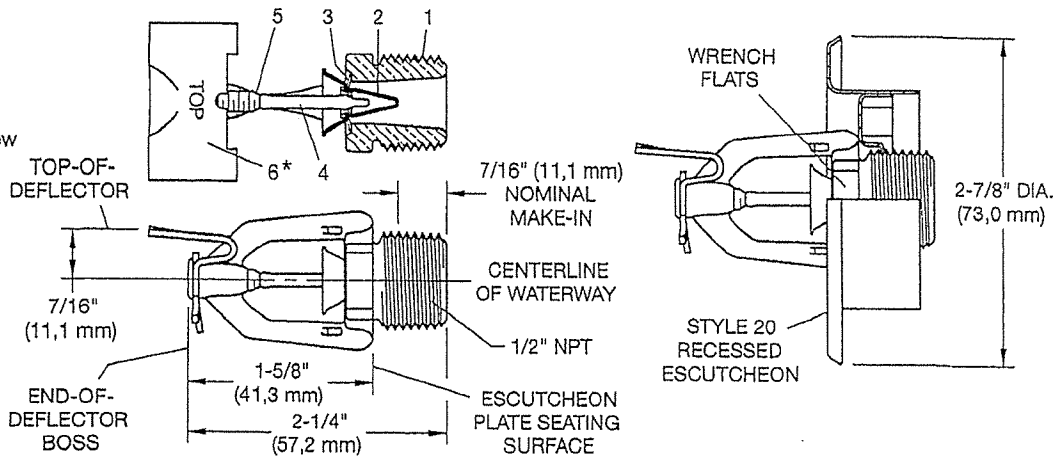


FIGURE 1
RAPID RESPONSE SERIES LFII RESIDENTIAL
HORIZONTAL SIDEWALL AND RECESSED HORIZONTAL SIDEWALL SPRINKLERS (TY1334)

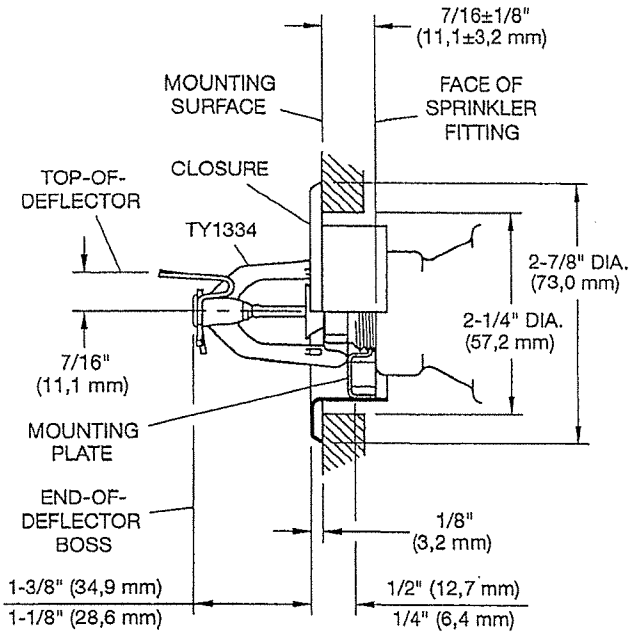


FIGURE 2
STYLE 20 RECESSED ESCUTCHEON
FOR USE WITH THE RAPID RESPONSE SERIES LFII RESIDENTIAL
HORIZONTAL SIDEWALL SPRINKLER (TY1334)

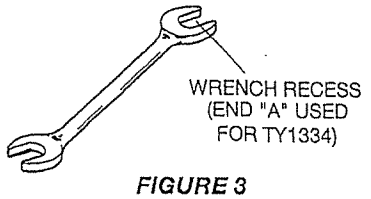


FIGURE 3
W-TYPE 6
SPRINKLER WRENCH

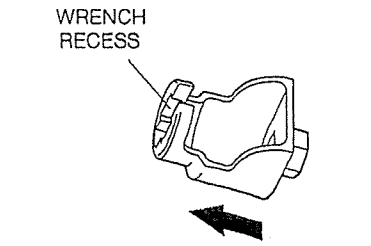


FIGURE 4
W-TYPE 7 RECESSED
SPRINKLER WRENCH

Technical Data

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

C-UL Listed for use only with wet pipe systems

NYC Approved under MEA 44-03-E

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

Maximum Working Pressure
175 psi (12,1 bar)

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

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

Finishes
White Polyester
Chrome Plated
Natural Brass

Physical Characteristics

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

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 Horizontal and Recessed Horizontal Sidewall Sprinklers (TY1334) are 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.

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 about the use of Residential Sprinklers in residential dry pipe systems.

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, B, C, D and E 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 Tables A, B, C, D, or E 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 Horizontal Sidewall Sprinklers (TY1334) 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 TYCO Technical Data Sheet TFP490.

Operational Sensitivity
The sprinklers are to be installed with an end-of-deflector-boss to wall distance of 1-3/8 to 6 inches or in the recessed position using only the Style 20 Recessed Escutcheon as shown in Figure 2.

In addition the top-of-deflector-to-ceiling distance is to be within the range (Tables A, B, C, D or E) being hydraulically calculated.

Sprinkler Spacing
The minimum spacing between sprinklers is 8 feet (2,4 m). The maximum spacing between sprinklers cannot exceed the width of the coverage area (Tables A, B, C, D, or E) being hydraulically calculated (e.g., maximum 12 feet for a 12 ft. x 12 ft. coverage area, or 16 feet for a 16 ft. x 20 ft. coverage area.)

ELEVATION

Maximum Coverage Area [a] Width x Length [b] Ft. x Ft. (m x m)	Maximum Spacing Ft. (m)	WET PIPE SYSTEM Minimum Flow [c, d] and Residual Pressure			
		Top-of-Deflector-to-Ceiling: 4 to 6 Inches (100 to 150 mm)		Top-of-Deflector-to-Ceiling: 6 to 12 Inches (150 to 300 mm)	
		155°F (68°C)	175°F (79°C)	155°F (68°C)	175°F (79°C)
12 x 12 (3,7 x 3,7)	12 (3,7)	12 GPM (45,4 LPM) 8.2 psi (0,57 bar)	12 GPM (45,4 LPM) 8.2 psi (0,57 bar)	13 GPM (49,2 LPM) 9.6 psi (0,66 bar)	13 GPM (49,2 LPM) 9.6 psi (0,66 bar)
14 x 14 (4,3 x 4,3)	14 (4,3)	14 GPM (53,0 LPM) 11.1 psi (0,77 bar)	16 GPM (60,6 LPM) 14.5 psi (1,00 bar)	17 GPM (64,3 LPM) 16.4 psi (1,13 bar)	18 GPM (68,1 LPM) 18.4 psi (1,27 bar)
16 x 16 (4,9 x 4,9)	16 (4,9)	16 GPM (60,6 LPM) 14.5 psi (1,00 bar)	16 GPM (60,6 LPM) 14.5 psi (1,00 bar)	18 GPM (68,1 LPM) 18.4 psi (1,27 bar)	18 GPM (68,1 LPM) 18.4 psi (1,27 bar)
16 x 18 (4,9 x 5,5)	16 (4,9)	19 GPM (71,9 LPM) 20.5 psi (1,41 bar)	19 GPM (71,9 LPM) 20.5 psi (1,41 bar)	21 GPM (79,5 LPM) 25.0 psi (1,72 bar)	21 GPM (79,5 LPM) 25.0 psi (1,72 bar)
16 x 20 (4,9 x 6,1)	16 (4,9)	23 GPM (87,1 LPM) 30.0 psi (2,07 bar)	23 GPM (87,1 LPM) 30.0 psi (2,07 bar)	26 GPM (98,4 LPM) 38.3 psi (2,64 bar)	26 GPM (98,4 LPM) 38.3 psi (2,64 bar)

(a). 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.

(b). The Width x Length dimension refers to Width (backwall where sprinkler is located) times Length (horizontal throw of sprinkler).

(c). The Minimum Flow Requirement is based on minimum flow in GPM (LPM) from each sprinkler. The associated residual pressures are calculated using the nominal K-factor. Refer to Hydraulic Design in the Design Criteria section for details.

(d). 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
SERIES LFII RESIDENTIAL HORIZONTAL AND RECESSED HORIZONTAL SIDEWALL SPRINKLERS (TY1334)
FOR HORIZONTAL CEILINGS
NFPA 13D, 13R, AND 13 HYDRAULIC DESIGN CRITERIA
WET PIPE SYSTEMS
(Maximum 2 Inch Rise for 12 Inch Run)

ELEVATION

Maximum Coverage Area [a] Width x Length [b] Ft. x Ft. (m x m)	Maximum Spacing Ft. (m)	DRY PIPE SYSTEM Minimum Flow [c, d] and Residual Pressure			
		Top-of-Deflector-to-Ceiling: 4 to 6 Inches (100 to 150 mm)		Top-of-Deflector-to-Ceiling: 6 to 12 Inches (100 to 150 mm)	
		155°F (68°C)	175°F (79°C)	155°F (68°C)	175°F (79°C)
12 x 12 (3,7 x 3,7)	12 (3,7)	12 GPM (45,4 LPM) 8.2 psi (0,57 bar)	12 GPM (45,4 LPM) 8.2 psi (0,57 bar)	13 GPM (49,2 LPM) 9.6 psi (0,48 bar)	13 GPM (49,2 LPM) 9.6 psi (0,48 bar)
14 x 14 (4,3 x 4,3)	14 (4,3)	16 GPM (60,6 LPM) 14.5 psi (1,00 bar)	16 GPM (60,6 LPM) 14.5 psi (1,00 bar)	18 GPM (68,1 LPM) 18.4 psi (1,27 bar)	18 GPM (68,1 LPM) 18.4 psi (1,27 bar)
16 x 16 (4,9 x 4,9)	16 (4,9)	16 GPM (60,6 LPM) 14.5 psi (1,00 bar)	16 GPM (60,6 LPM) 14.5 psi (1,00 bar)	18 GPM (68,1 LPM) 18.4 psi (1,27 bar)	21 GPM (79,5 LPM) 25.0 psi (1,72 bar)
16 x 18 (4,9 x 5,5)	16 (4,9)	19 GPM (71,9 LPM) 20.5 psi (1,41 bar)	Not Applicable	21 GPM (79,5 LPM) 25.0 psi (1,72 bar)	21 GPM (79,5 LPM) 25.0 psi (1,72 bar)
16 x 20 (4,9 x 6,1)	16 (4,9)	23 GPM (87,1 LPM) 30.0 psi (2,07 bar)	Not Applicable	Not Applicable	Not Applicable

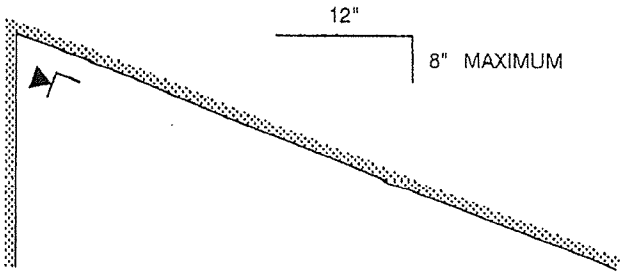
(a). For coverage area dimensions less than or between those indicated, use the minimum required flow for the next highest coverage area for which hydraulic design criteria are stated.

(b). The Width x Length dimension refers to Width (backwall where sprinkler is located) times Length (horizontal throw of sprinkler).

(c). The Minimum Flow Requirement is based on minimum flow in GPM (LPM) from each sprinkler. The associated residual pressures are calculated using the nominal K-factor. Refer to Hydraulic Design in the Design Criteria section for details.

(d). 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
SERIES LFII RESIDENTIAL HORIZONTAL AND RECESSED HORIZONTAL SIDEWALL SPRINKLERS (TY1334)
FOR HORIZONTAL CEILINGS
NFPA 13D, 13R, AND 13 HYDRAULIC DESIGN CRITERIA
DRY PIPE SYSTEMS
(Maximum 2 Inch Rise for 12 Inch Run)



ELEVATION

Maximum Coverage Area [a] Width x Length [b] Ft. x Ft. (m x m)	Maximum Spacing Ft. (m)	WET PIPE SYSTEM Minimum Flow [c, d, e, f] and Residual Pressure							
		Top-of-Deflector-to-Ceiling: 4 to 6 Inches (100 to 150 mm)				Top-of-Deflector-to-Ceiling: 6 to 12 Inches (150 to 300 mm)			
		155°F (68°C)		175°F (79°C)		155°F (68°C)		175°F (79°C)	
12 x 12 (3,7 x 3,7)	12 (3,7)	I	12 GPM (45,4 LPM) 8.2 psi (0,57 bar)	I	12 GPM (45,4 LPM) 8.2 psi (0,57 bar)	I	13 GPM (49,2 LPM) 9.6 psi (0,66 bar)	I	13 GPM (49,2 LPM) 9.6 psi (0,66 bar)
14 x 14 (4,3 x 4,3)	14 (4,3)	I	14 GPM (53,0 LPM) 11.1 psi (0,77 bar)	I	14 GPM (53,0 LPM) 11.1 psi (0,77 bar)	I	17 GPM (64,3 LPM) 16.4 psi (1,13 bar)	I	17 GPM (64,3 LPM) 16.4 psi (1,13 bar)
16 x 16 (4,9 x 4,9)	16 (4,9)	I	16 GPM (60,6 LPM) 14.5 psi (1,00 bar)	I	16 GPM (60,6 LPM) 14.5 psi (1,00 bar)	I	18 GPM (68,1 LPM) 18.4 psi (1,27 bar)	I	18 GPM (68,1 LPM) 18.4 psi (1,27 bar)
16 x 18 (4,9 x 5,5)	16 (4,9)	I	19 GPM (71,9 LPM) 20.5 psi (1,41 bar)	I	19 GPM (71,9 LPM) 20.5 psi (1,41 bar)	I	21 GPM (79,5 LPM) 25.0 psi (1,72 bar)	I	21 GPM (79,5 LPM) 25.0 psi (1,72 bar)
16 x 20 (4,9 x 6,1)	16 (4,9)	I	24 GPM (90,8 LPM) 32.7 psi (2,25 bar)	I	24 GPM (90,8 LPM) 32.7 psi (2,25 bar)	I	26 GPM (98,4 LPM) 38.3 psi (2,64 bar)	I	26 GPM (98,4 LPM) 38.3 psi (2,64 bar)

(a). 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.

(b). The Width x Length dimension refers to Width (backwall where sprinkler is located) times Length (horizontal throw of sprinkler).

(c). The Minimum Flow requirement is based on minimum flow in GPM (LPM) from each sprinkler. The associated residual pressures are calculated using the nominal K-factor. Refer to Hydraulic Design in the Design Criteria section for details.

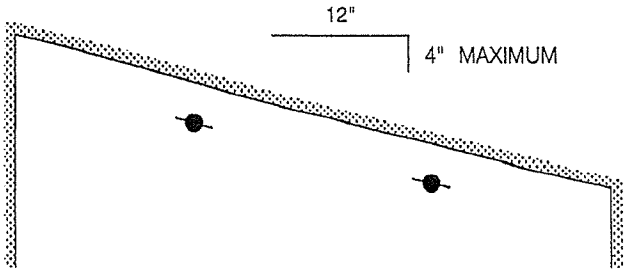
(d). For NFPA 13D 2010 applications, Horizontal Ceiling criteria must be used for certain sloped ceiling configurations up to 8:12 pitch. Refer to TIA 1028R for allowed sloped ceiling limitations when using horizontal ceiling criteria.

(e). For NFPA 13R applications, Horizontal Ceiling criteria may be used for sloped ceiling configurations up to 8:12 pitch when acceptable to the local authority having jurisdiction.

(f). 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.

(l). For NFPA 13D applications installed per 2007 and earlier editions, two sprinkler hydraulic design with the sprinklers at the high point of the slope and positioned to discharge down the slope.

TABLE C
SERIES LFII RESIDENTIAL HORIZONTAL AND RECESSED HORIZONTAL SIDEWALL SPRINKLERS (TY1334)
AT THE HIGH POINT OF THE SLOPE AND DISCHARGING DOWN THE SLOPE
NFPA 13D, 13R, AND 13 HYDRAULIC DESIGN CRITERIA
WET PIPE SYSTEMS
(Greater Than 2 Inch Rise for 12 Inch Run Up To 8 Inch Rise for 12 Inch Run)



ELEVATION

Maximum Coverage Area [a] Width x Length [b] Ft. x Ft. (m x m)	Maximum Spacing Ft. (m)	WET PIPE SYSTEM Minimum Flow [c, d, e, f] and Residual Pressure							
		Top-of-Deflector-to-Ceiling: 4 to 6 Inches (100 to 150 mm)				Top-of-Deflector-to-Ceiling: 6 to 12 Inches (150 to 300 mm)			
		155°F (68°C)		175°F (79°C)		155°F (68°C)		175°F (79°C)	
12 x 12 (3,7 x 3,7)	12 (3,7)	II	16 GPM (60,6 LPM) 14.5 psi (1,00 bar)	II	16 GPM (60,6 LPM) 14.5 psi (1,00 bar)	II	18 GPM (68,1 LPM) 18.4 psi (1,27 bar)	II	18 GPM (68,1 LPM) 18.4 psi (1,27 bar)
14 x 14 (4,3 x 4,3)	14 (4,3)	II	16 GPM (60,6 LPM) 14.5 psi (1,00 bar)	II	16 GPM (60,6 LPM) 14.5 psi (1,00 bar)	II	18 GPM (68,1 LPM) 18.4 psi (1,27 bar)	II	18 GPM (68,1 LPM) 18.4 psi (1,27 bar)
16 x 16 (4,9 x 4,9)	16 (4,9)	II	16 GPM (60,6 LPM) 14.5 psi (1,00 bar)	II	16 GPM (60,6 LPM) 14.5 psi (1,00 bar)	II	18 GPM (68,1 LPM) 18.4 psi (1,27 bar)	II	18 GPM (68,1 LPM) 18.4 psi (1,27 bar)
16 x 18 (4,9 x 5,5)	16 (4,9)	II	22 GPM (83,3 LPM) 27.4 psi (1,89 bar)	II	22 GPM (83,3 LPM) 27.4 psi (1,89 bar)	II	22 GPM (83,3 LPM) 27.4 psi (1,89 bar)	II	22 GPM (83,3 LPM) 27.4 psi (1,89 bar)
16 x 20 (4,9 x 6,1)	16 (4,9)	III	23 GPM (87,1 LPM) 30.0 psi (2,07 bar)	III	23 GPM (87,1 LPM) 30.0 psi (2,07 bar)	III	26 GPM (98,4 LPM) 38.3 psi (2,64 bar)	III	26 GPM (98,4 LPM) 38.3 psi (2,64 bar)

(a). 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.

(b). The Width x Length dimension refers to Width (backwall where sprinkler is located) times Length (horizontal throw of sprinkler).

(c). The Minimum Flow requirement is based on minimum flow in GPM (LPM) from each sprinkler. The associated residual pressures are calculated using the nominal K-factor. Refer to Hydraulic Design in the Design Criteria section for details.

(d). For NFPA 13D 2010 applications, Horizontal Ceiling criteria must be used for certain sloped ceiling configurations up to 8:12 pitch. Refer to TIA 1028R for allowed sloped ceiling limitations when using horizontal ceiling criteria.

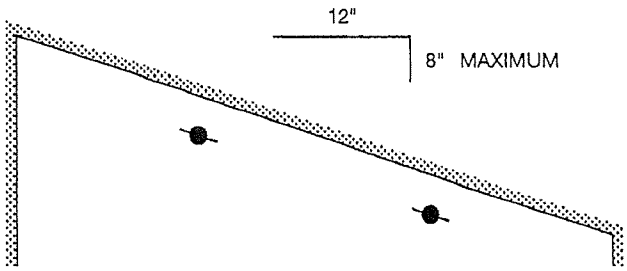
(e). For NFPA 13R applications, Horizontal Ceiling criteria may be used for sloped ceiling configurations up to 8:12 pitch when acceptable to the local authority having jurisdiction.

(f). 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.

(II) For NFPA 13D applications installed per 2007 and earlier editions, two sprinkler hydraulic design with the sprinklers located along the slope and positioned to discharge across the slope.

(III) For NFPA 13D applications installed per 2007 and earlier editions, three sprinkler hydraulic design when there are more than two sprinklers in a compartment and with the sprinklers located along the slope and positioned to discharge across the slope.

TABLE D
SERIES LFII RESIDENTIAL HORIZONTAL AND RECESSED HORIZONTAL SIDEWALL SPRINKLERS (TY1334)
LOCATED ALONG A SLOPE AND DISCHARGING ACROSS THE SLOPE
NFPA 13D, 13R, AND 13 HYDRAULIC DESIGN CRITERIA
WET PIPE SYSTEMS
(Greater Than 2 Inch Rise for 12 Inch Run Up To 4 Inch Rise for 12 Inch Run)



ELEVATION

Maximum Coverage Area [a] Width x Length [b] Ft. x Ft. (m x m)	Maximum Spacing Ft. (m)	WET PIPE SYSTEM Minimum Flow [c, d, e, f] and Residual Pressure			
		Top-of-Deflector-to-Ceiling: 4 to 6 Inches (100 to 150 mm)			
		155°F (68°C)		175°F (79°C)	
12 x 12 (3,7 x 3,7)	12 (3,7)	III	16 GPM (60,6 LPM) 14.5 psi (1,00 bar)	III	16 GPM (60,6 LPM) 14.5 psi (1,00 bar)
14 x 14 (4,3 x 4,3)	14 (4,3)	III	16 GPM (60,6 LPM) 14.5 psi (1,00 bar)	III	16 GPM (60,6 LPM) 14.5 psi (1,00 bar)
16 x 16 (4,9 x 4,9)	16 (4,9)	III	16 GPM (60,6 LPM) 14.5 psi (1,00 bar)	III	16 GPM (60,6 LPM) 14.5 psi (1,00 bar)
16 x 18 (4,9 x 5,5)	16 (4,9)	N/A		N/A	
16 x 20 (4,9 x 6,1)	16 (4,9)	N/A		N/A	

(a). 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.

(b). The Width x Length dimension refers to Width (backwall where sprinkler is located) times Length (horizontal throw of sprinkler).

(c). The Minimum Flow requirement is based on minimum flow in GPM (LPM) from each sprinkler. The associated residual pressures are calculated using the nominal K-factor. Refer to Hydraulic Design in the Design Criteria section for details.

(d). For NFPA 13D 2010 applications, Horizontal Ceiling criteria must be used for certain sloped ceiling configurations up to 8:12 pitch. Refer to TIA 1028R for allowed sloped ceiling limitations when using horizontal ceiling criteria.

(e). For NFPA 13R applications, Horizontal Ceiling criteria may be used for sloped ceiling configurations up to 8:12 pitch when acceptable to the local authority having jurisdiction.

(f). 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.

(III) For NFPA 13D applications installed per 2007 and earlier editions, three sprinkler hydraulic design when there are more than two sprinklers in a compartment and with the sprinklers located along the slope and positioned to discharge across the slope.

TABLE E
SERIES LFII RESIDENTIAL HORIZONTAL AND RECESSED HORIZONTAL SIDEWALL SPRINKLERS (TY1334)
LOCATED ALONG A SLOPE AND DISCHARGING ACROSS THE SLOPE
NFPA 13D, 13R, AND 13 HYDRAULIC DESIGN CRITERIA
WET PIPE SYSTEMS
(Greater Than 4 Inch Rise for 12 Inch Run Up to 8 Inch Rise for 12 Inch Run)

Installation

The TYCO RAPID RESPONSE Series LFII Residential Horizontal and Recessed Horizontal Sidewall Sprinklers (TY1334) 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 inch (1,6 mm).

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

Do not attempt to compensate for insufficient adjustment in an Escutcheon Plate by under- or over-tightening the Sprinkler. Re-adjust the position of the sprinkler fitting to suit.

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

Step 1. Install horizontal sidewall sprinklers in the horizontal position with their centerline of waterway perpendicular to the backwall and parallel to the ceiling. The word "TOP" on the Deflector is to face towards the ceiling with the front edge of 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.

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

Step A. Install recessed horizontal sidewall sprinklers in the horizontal position with their centerline of waterway perpendicular to the backwall and parallel to the ceiling. The word "TOP" on the Deflector is to face towards 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.

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 wall.

Care and Maintenance

The TYCO RAPID RESPONSE Series LFII Residential Horizontal and Recessed Horizontal Sidewall Sprinklers (TY1334) 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 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.

Model 950XLT

Double Check Valve Assembly (3/4", 1", 1 1/4", 1 1/2" & 2")

WILKINS
a ZURN company

❑ Installation ❑ Testing ❑ Maintenance Instructions

INSTALLATION INSTRUCTIONS

CAUTION: Installation of Backflow Preventers must be performed by qualified, licensed personnel. The installer should be sure the proper device has been selected for the particular installation. Faulty installation could result in an improperly functioning device.

WILKINS Model 950XLT Double Check Valve assemblies are for use on potable water lines where a health hazard does not exist in the event of a backflow situation.

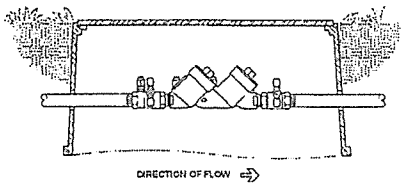
Damage to the device could result wherever water hammer and/or water thermal expansion could create excessive line pressure. Where this could occur, shock arresters, check valves and/or pressure relief valves should be installed downstream of the device.

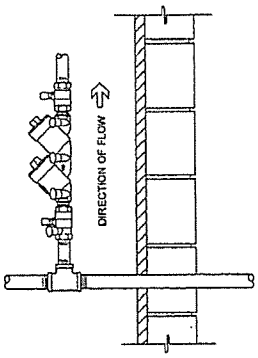
If installation is in a pit or vault, the Backflow Preventer must never be submerged in water because this could cause a cross-connection. Make sure that the pit or vault always remains dry by providing ample drainage.

1. Before installing a Model 950XLT Backflow Preventer, flush the line thoroughly to remove all debris, chips and other foreign matter. If required, a strainer should be placed upstream of the Backflow Preventer. CAUTION: Do not use a strainer in seldom used emergency waterlines such as fire lines.
2. Provide adequate space around the installed unit so that the test cocks will be accessible for testing and servicing.
3. Install valve at least 12 inches above surrounding flood level.
4. Always consult local codes for installation methods, approvals and guidance.

PLACING THE MODEL 950XLT IN SERVICE

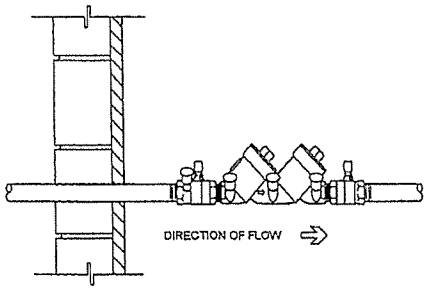
1. Start with both shut-off valves closed. Slowly open the inlet shut-off valve until the backflow preventer is completely pressurized.
2. When the unit has been pressurized, vent any trapped air by slightly opening each of the four test cocks.
3. Slowly open the downstream shut-off valve. The Model 950XLT Double Check Valve assembly is now in service.
4. After the Model 950XLT has been properly installed, test the device (see "TEST PROCEDURES"). If the device fails the test, remove the first and second check valves and thoroughly flush the device. Clean rubber and seats of all debris and place unit back in service.





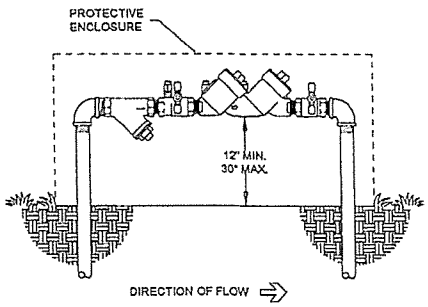
VERTICAL INSTALLATION

Vertical installation is acceptable in applications where inlet and outlet piping are flowing vertically upwards. All the basic installation instructions apply to such installations. Consult factory for approval status.



INDOOR INSTALLATION

Indoor installation is preferred in areas that are subject to freezing conditions. All the basic installation instructions apply to such installations.



OUTDOOR INSTALLATION

The Model 950XLT Backflow Preventer may be installed outdoors only if the device is protected against freezing conditions. Exposure to freezing conditions will result in improper function or damage to the device. The installation location must be kept above 32°F. All the basic installation instructions apply.

Proposition 65 Warning This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

Testing Procedures

MODEL 950XLT DOUBLE CHECK VALVE ASSEMBLY

Equipment Required: Differential pressure gauge test kit.

TEST NO. 1 - TIGHTNESS OF #1 CHECK VALVE

REQUIREMENT:

The static pressure drop across check valve #1 shall be at least 1.0 psid. If test cock #3 is not at the highest point of the check valve body, then a vertical tube must be installed on test cock #3 so that it rises to the top of the check valve body.

PROCEDURE:

1. Slowly open all 4 test cocks to remove any foreign material and attach fittings.
2. Attach hose from the high side of the test kit to the #2 test cock.
3. Open test cock #2 and bleed all air from the hose and gauge by opening the high side bleed needle valve. Close high side bleed needle valve. If a tube is attached to test cock #3, open test cock #3 to fill the tube. Close test cock #3. Close #2 shut-off valve then close the #1 shut-off valve.
4. Hold gauge at same level as test cock #3 or water level in tube. Slowly open test cock #3. Record the static pressure drop across check valve #1 after gauge reading stabilizes and water stops running out of test cock #3.
5. Close all test cocks, open shut-off valve #1 and remove test equipment.

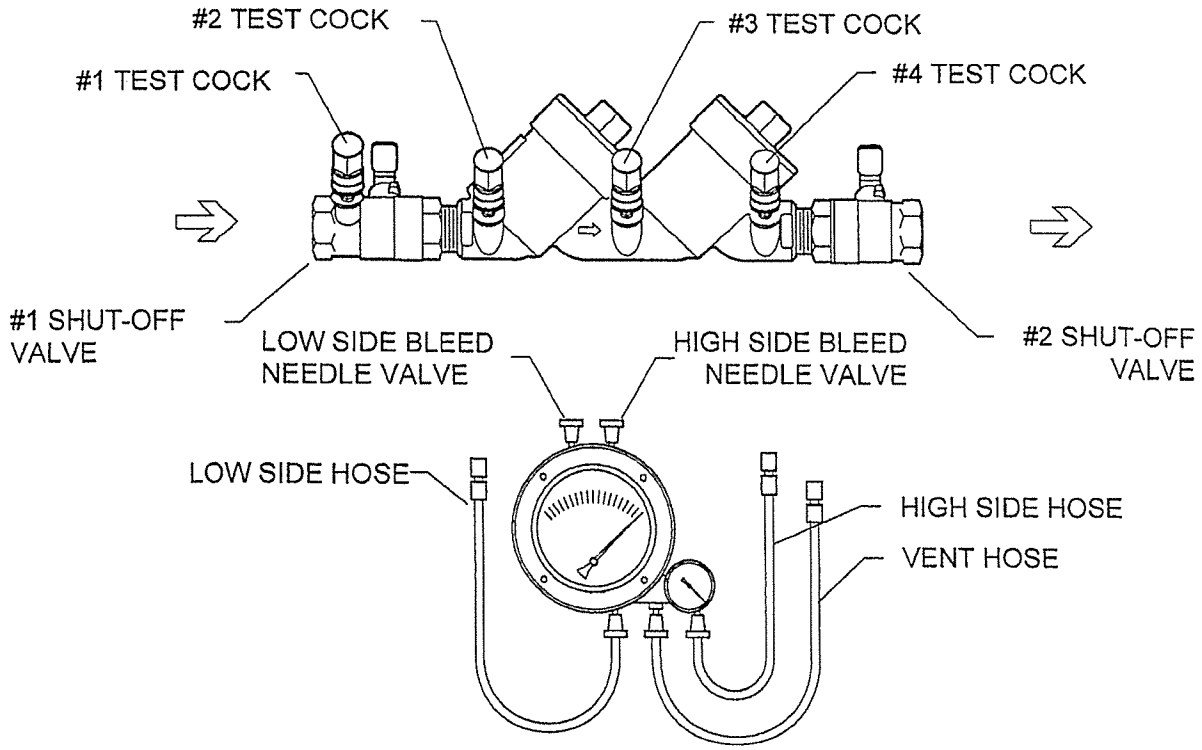
TEST NO. 2 - TIGHTNESS OF #2 CHECK VALVE

REQUIREMENT:

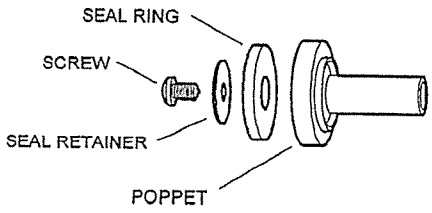
The static pressure drop across check valve #2 shall be at least 1.0 psid. If test cock #4 is not at the highest point of the check valve body, then a vertical tube must be installed on test cock #4 so that it rises to the top of the check valve body.

PROCEDURE:

1. Attach hose from the high side of the test kit to the #3 test cock.
2. Open test cock #3 and bleed all air from the hose and gauge by opening the high side bleed needle valve. Close high side bleed needle valve. If a tube is attached to test cock #4, open test cock #4 to fill the tube. Close test cock #4. Close #1 shut-off valve.
3. Hold gauge at same level as test cock #4 or water level in tube. Slowly open test cock #4. Record the static pressure drop across check valve #2 after gauge reading stablizes and water stops running out of test cock #4.
4. Close all test cocks, slowly open shut-off valve #1 & #2 and remove test equipment.



Maintenance Instructions



CHECK ASSEMBLY

All Model 950XLT Double Check Valve Backflow Preventers must be inspected and maintained by licensed personnel at least once a year or more frequently as specified by local codes. Replacement of worn or damaged parts must only be made with genuine "WILKINS" parts.

GENERAL MAINTENANCE

1. Clean all parts thoroughly with water after disassembly.
2. Carefully inspect rubber seal rings and o-rings for damage.
3. Test unit after reassembly for proper operation (refer to "TESTING PROCEDURES").

SERVICING CHECK VALVES

1. Close inlet and outlet shut-off valves.
2. Open No. 2, No. 3 and No. 4 test cocks to release pressure from valve.
3. Unscrew check valve cover using appropriate sized wrench. CAUTION: COVER IS SPRING LOADED. To avoid injury, hold cover down firmly with one hand while unscrewing.
4. Remove cover, spring and poppet assembly.
5. Inspect the rubber seal ring for cuts or embedded debris.
6. To remove seal ring, remove screw and seal retainer.
7. If the reverse side of the seal ring is unused, it is possible to invert the seal ring. This would be considered a temporary solution to fixing a fouled check and should be replaced with a new seal ring as soon as possible.
8. Inspect the valve cavity and seating area. Remove any debris.
9. If necessary, unscrew seat from body and replace with new seat and lightly greased o-ring (For seat removal assistance, contact factory).
10. Reverse the above procedures to reinstall check valve assemblies and access cover, making sure the 3 test cocks remain open.

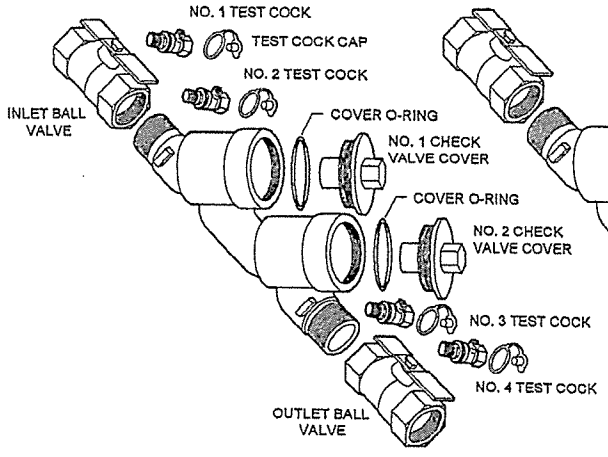


FIGURE 1

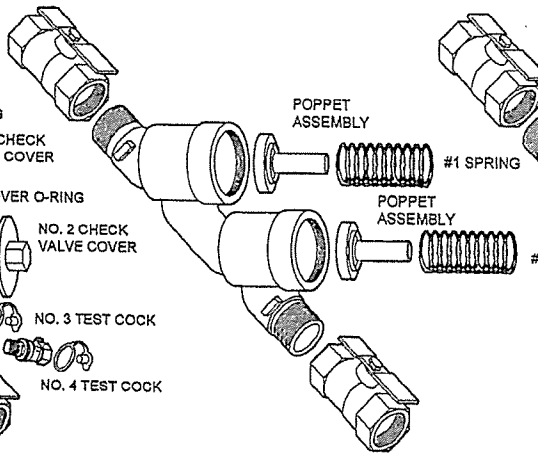


FIGURE 2

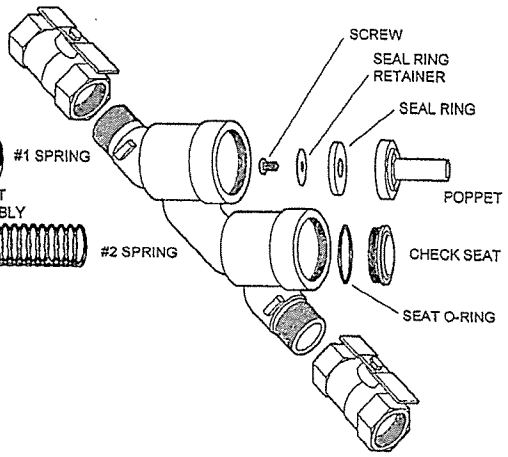


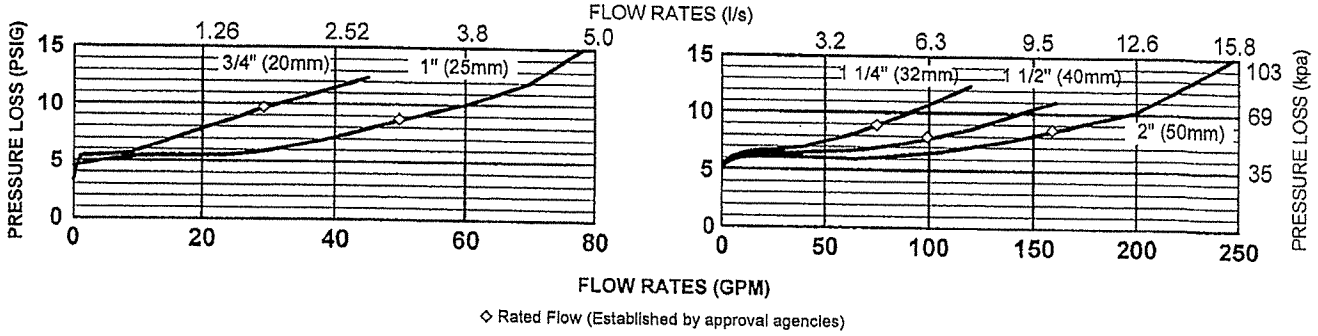
FIGURE 3

Troubleshooting

PROBLEM	POSSIBLE CAUSES	CORRECTIVE ACTION
1. LEAKING CHECK VALVES	1. Debris on seat or seal ring 2. Damaged seat 3. Damaged seat o-ring	1. Clean seat and seal ring area 2. Replace seat 3. Replace seat o-ring
2. LOW OR NO FLOW	1. Device installed backwards 2. Shut-off valves or valve upstream may not be fully open 3. Low supply pressure	

Performance Characteristics

MODEL 950XLT 3/4", 1", 1 1/4", 1 1/2" & 2" (STANDARD & METRIC)



◇ Rated Flow (Established by approval agencies)

Capacity thru Schedule 40 Pipe				
Pipe size	5 ft/sec	7.5 ft/sec	10 ft/sec	15 ft/sec
1/8"	1	1	2	3
1/4"	2	2	3	5
3/8"	3	4	6	9
1/2"	5	7	9	14
3/4"	8	12	17	25
1"	13	20	27	40
1 1/4"	23	35	47	70
1 1/2"	32	48	63	95
2"	52	78	105	167

SPECIFICATIONS

Maximum working water pressure: 175 PSI
Maximum working water temperature: 180°F
Hydrostatic test pressure: 350 PSI
End connections: Threaded ANSI B1.20.1

Proper performance is dependent upon licensed, qualified personnel performing regular, periodic testing according to WILKINS' specifications and prevailing governmental & industry standards and codes and upon following these installation instructions. Failure to do so releases WILKINS of any liability that it might otherwise have with respect to that device. Such failure could also result in an improperly functioning device.

WILKINS a ZURN company
WILKINS OPERATION OF ZURN PLUMBING PRODUCTS
1747 Commerce Way, Paso Robles, CA 93446 Phone:805/238-7100 Fax:805/238-5766

tyco / Fire & Building Products

Technical Services: Tel: (800) 381-9312 / Fax: (800) 791-5500

BlazeMaster®
CPVC Fire Sprinkler Pipe & Fittings
Submittal Sheet

General Description

Tyco Fire and Building (TFBP) BlazeMaster CPVC Pipe and Fittings are designed exclusively for use in wet pipe automatic fire sprinkler systems. They are made from a specially developed thermoplastic compound composed of post chlorinated polyvinyl chloride (CPVC) resin and state of the art additives. TFBP BlazeMaster CPVC products are easier to install than traditional steel pipe systems, and at the same time, provide superior heat resistance and strength as compared to traditional CPVC and PVC piping materials used in the plumbing trade. Various adapters are available to connect CPVC pipe to metallic piping. All female pipe thread adapters have brass inserts for durability. Grooved adapters connect directly to grooved end valves and metallic pipe, with flexible grooved end couplings.

WARNING

Tyco Fire & Building Products (TFBP) BlazeMaster CPVC Pipe and Fittings 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. The installing contractor or sprinkler manufacturer should be contacted with any questions.

Technical Data

Sizes
3/4" to 3"

Maximum Working Pressure
175 psi

Approvals
UL, FM, CUL, NSF, Dade County, LPCB, MEA, and the City of Los Angeles. (Refer to IH-1900, Rev. 0, January 2005 "Installation Instruction & Technical Handbook" for exact listing/approval information.)

Manufacture Source
U.S.A.

Material

- Pipe: ASTM F442, SDR 13.5
- Fittings: ASTM F438 (Sch. 40) and ASTM F439 (Sch. 80), ASTM F1970

Color
Orange

NOMINAL SIZE	AVERAGE O.D.	AVERAGE I.D.	WEIGHT lbs./ft.	FILLED WEIGHT lbs./ft.	FT. OF PIPE PER LIFT	WEIGHT PER LIFT lbs.
3/4"	1.050"	0.874"	0.18	0.44	7875	1418
1"	1.315"	1.101"	0.26	0.67	5040	1320
1-1/4"	1.660"	1.394"	0.42	1.08	2835	1191
1-1/2"	1.900"	1.598"	0.54	1.41	2205	1186
2"	2.375"	2.003"	0.84	2.20	1260	1063
2-1/2"	2.875"	2.425"	1.26	3.26	1215	1531
3"	3.500"	2.952"	1.87	4.83	720	1344

FIGURE 1 — PIPE DIMENSIONS

Installation

Tyco Fire and Building Products (TFBP) BlazeMaster CPVC Pipe and Fittings are to be installed in accordance with IH-1900, Rev. 0, January 2005 "Installation Instruction & Technical Handbook".

Care and Maintenance

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. The installing contractor or product manufacturer should be contacted relative to 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.

NOTES

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 affected 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.

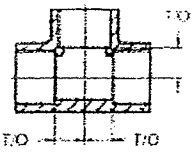
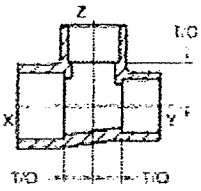
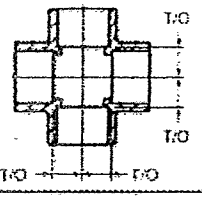
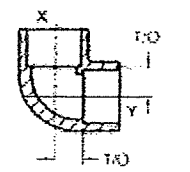
FITTING TYPE	PART NUMBER	NOMINAL SIZE	NOMINAL TAKE-OUT (T/O)			SCHD.	WEIGHT (lb.)
TEE 	80000	3/4"	5/8"			40	0.11
	80001	1"	11/16"			40	0.19
	80002	1-1/4"	7/8"			40	0.28
	80003	1-1/2"	1-1/16"			80	0.51
	80004	2"	1-3/8"			80	0.90
	80005	2-1/2"	1-9/16"			80	1.59
	80006	3"	1-13/16"			80	2.41
REDUCING TEE 		X x Y x Z	X	Y	Z		
	80132	3/4" x 3/4" x 1"	3/4"	3/4"	5/8"	40	0.14
	80133	1" x 3/4" x 3/4"	9/16"	9/16"	3/4"	40	0.14
	80134	1" x 3/4" x 1"	3/4"	11/16"	3/4"	40	0.17
	80259	1" x 1" x 3/4"	5/8"	5/8"	13/16"	40	0.16
	80135	1-1/4" x 1" x 3/4"	5/8"	5/8"	15/16"	40	0.21
	80136	1-1/4" x 1" x 1"	3/4"	3/4"	15/16"	40	0.22
	80137	1-1/4" x 1" x 1-1/4"	15/16"	15/16"	7/8"	40	0.26
	80261	1-1/4" x 1-1/4" x 3/4"	5/8"	5/8"	7/8"	40	0.23
	80262	1-1/4" x 1-1/4" x 1"	3/4"	3/4"	7/8"	40	0.26
	80138	1-1/4" x 1-1/4" x 1-1/2"	1"	1"	1"	80	0.43
	80140	1-1/2" x 1-1/4" x 3/4"	9/16"	9/16"	1"	80	0.36
	80141	1-1/2" x 1-1/4" x 1"	9/16"	9/16"	1-1/16"	80	0.38
	80263	1-1/2" x 1-1/2" x 3/4"	9/16"	9/16"	1"	80	0.36
	80264	1-1/2" x 1-1/2" x 1"	9/16"	9/16"	1-1/16"	80	0.38
	80275	1-1/2" x 1-1/2" x 1-1/4"	7/8"	7/8"	1"	80	0.45
	80265	2" x 2" x 3/4"	3/4"	3/4"	1-3/8"	80	0.61
	80266	2" x 2" x 1"	7/8"	7/8"	1-3/8"	80	0.66
	80274	2" x 2" x 1-1/4"	1-1/16"	1-1/16"	1-3/8"	80	0.74
	80267	2" x 2" x 1-1/2"	1-1/8"	1-1/8"	1-3/8"	80	0.78
	80271	2-1/2" x 2-1/2" x 1"	1-9/16"	1-9/16"	1-9/16"	80	1.43
	80272	2-1/2" x 2-1/2" x 1-1/4"	1-9/16"	1-9/16"	1-9/16"	80	1.46
	80273	2-1/2" x 2-1/2" x 1-1/2"	1-9/16"	1-9/16"	1-9/16"	80	1.48
	80276	2-1/2" x 2-1/2" x 2"	1-9/16"	1-9/16"	1-9/16"	80	1.50
	80270	3" x 3" x 1-1/2"	1-13/16"	1-13/16"	1-13/16"	80	2.28
	80268	3" x 3" x 2"	1-13/16"	1-13/16"	1-3/4"	80	2.25
	80269	3" x 3" x 2-1/2"	1-13/16"	1-13/16"	1-13/16"	80	2.44
CROSS & REDUCING CROSS 	80009	3/4"	9/16"			40	0.13
	80010	1"	11/16"			40	0.23
	80011	1-1/4"	15/16"			40	0.34
	80012	1-1/2"	1-1/16"			80	0.67
	80013	2"	1-5/16"			80	1.00
	80014	2-1/2"	1-9/16"			80	1.91
	80008	3"	1-13/16"			80	2.89
	80015	1" x 1" x 3/4" x 3/4"	7/8"			40	0.28
90° ELBOW & REDUCING ELBOW 	80025	3/4"	5/8"			40	0.09
	80026	1"	3/4"			40	0.14
	80027	1-1/4"	7/8"			40	0.21
	80028	1-1/2"	1-1/16"			80	0.40
	80029	2"	1-5/16"			80	0.79
	80030	2-1/2"	1-9/16"			80	1.14
	80031	3"	1-13/16"			80	1.82
		X x Y	X	Y			
	80032	1" x 3/4"	11/16"	12/16"		40	0.16

FIGURE 2 — FITTING DIMENSIONS (Part 1 of 4)

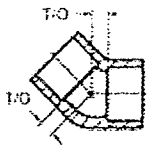
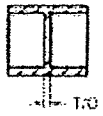
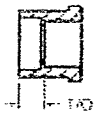
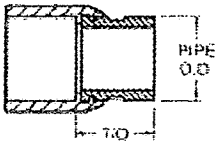
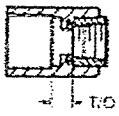
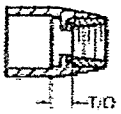
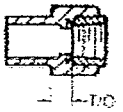
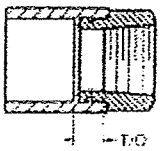
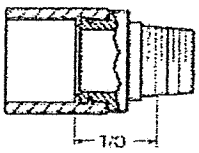
FITTING TYPE	PART NUMBER	NOMINAL SIZE	NOMINAL TAKE-OUT (T/O)	SCHD	WEIGHT (lb.)
45° ELBOW 	80050	3/4"	3/8"	40	0.08
	80051	1"	3/8"	40	0.11
	80052	1-1/4"	3/4"	40	0.20
	80053	1-1/2"	1/2"	80	0.31
	80054	2"	3/4"	80	0.56
	80055	2-1/2"	13/16"	80	0.89
	80056	3"	1"	80	1.19
COUPLING & REDUCING COUPLING 	80075	3/4"	1/8"	40	0.07
	80076	1"	1/8"	40	0.11
	80077	1-1/4"	3/16"	40	0.12
	80078	1-1/2"	3/16"	80	0.25
	80079	2"	3/16"	80	0.39
	80080	2-1/2"	1/4"	80	0.67
	80081	3"	3/16"	80	0.91
	80220	1" x 3/4"	1/8"	40	0.08
REDUCER BUSHING 	80200	1" x 3/4"	7/16"	40	0.04
	80201	1-1/4" x 3/4"	1/2"	40	0.11
	80202	1-1/4" x 1"	5/16"	40	0.12
	80203	1-1/2" x 3/4"	5/8"	80	0.16
	80204	1-1/2" x 1"	1/2"	80	0.14
	80205	1-1/2" x 1-1/4"	3/8"	80	0.12
	80206	2" x 3/4"	13/16"	80	0.27
	80207	2" x 1"	11/16"	80	0.26
	80208	2" x 1-1/4"	9/16"	80	0.24
	80209	2" x 1-1/2"	7/16"	80	0.19
	80215	2-1/2" x 1"	15/16"	80	0.42
	80214	2-1/2" x 1-1/4"	13/16"	80	0.45
	80213	2-1/2" x 1-1/2"	11/16"	80	0.48
	80211	2-1/2" x 2"	5/8"	80	0.29
	80210	3" x 2"	3/4"	80	0.72
	80212	3" x 2-1/2"	1/2"	80	0.47
CAP 	80100	3/4"	5/16"	40	0.04
	80101	1"	3/8"	40	0.06
	80102	1-1/4"	7/16"	40	0.10
	80103	1-1/2"	11/16"	80	0.20
	80104	2"	5/8"	80	0.31
	80105	2-1/2"	7/8"	80	0.58
	80106	3"	1"	80	0.88
GROOVED COUPLING ADAPTER 			T/O / PIPE O.D.		
	80160	1-1/4" x 1-1/4" Groove	2-5/16" / 1-1/4" (1.660")	40	0.78
	80161	1-1/2" x 1-1/2" Groove	2-5/16" / 1-1/2" (1.900")	80	0.95
	80162	2" x 2" Groove	2-5/16" / 2" (2.375")	80	1.42
	80163	2-1/2" x 2-1/2" Groove	2-5/16" / 2-1/2" (2.875")	80	2.28
	80164	3" x 3" Groove	2-1/4" / 3" (3.500")	80	3.00
	80169	2-1/2" x 76,1 mm Groove	2-5/16" / 76.1 mm (3.000")	80	2.28

FIGURE 2 — FITTING DIMENSIONS (Part 2 of 4)

FITTING TYPE	PART NUMBER	NOMINAL SIZE	NOMINAL TAKE-OUT (T/O)	SCHD.	WEIGHT (lb.)
SPRINKLER HEAD ADAPTER 	80175E	3/4" x 1/2" NPT	7/16"	80	0.20
	80176E	1" x 1/2" NPT	7/16"	80	0.22
	80175WL	3/4" x 1/2" NPT	7/16"	40	0.16
	80179	1" x 3/4" NPT	13/16"	40	0.43
SPRINKLER HEAD ADAPTER 	80175W	3/4" x 1/2" NPT	1/2"	40	0.19
	80176W	1" x 1/2" NPT	1/2"	40	0.18
SPRINKLER HEAD ADAPTER (SPIGOT) 	80177L	3/4" x 1/2" NPT	1/2"	40	0.16
	80178	1" x 1/2" NPT	9/16"	40	0.20
	80180	1" x 3/4" NPT	7/8"	40	0.40
FEMALE ADAPTER 	80142	3/4" x 3/4" NPT	13/16"	40	0.41
	80145	1" x 1" NPT	7/8"	40	0.63
	80146	1-1/4" x 1-1/4" NPT	1-1/8"	40	1.03
	80147	1-1/2" x 1-1/2" NPT	1-3/8"	80	1.42
	80148	2" x 2" NPT	1-11/16"	80	2.66
MALE ADAPTER 	80157	3/4" x 3/4" NPT	1-5/16"	40	0.33
	80158	1" x 1" NPT	1-3/8"	40	0.56

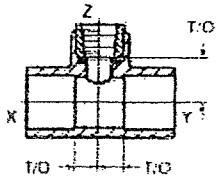
SPRINKLER HEAD ADAPTER TEE 		X x Y x Z	X	Y	Z		
	80250	3/4" x 3/4" x 1/2" NPT	9/16"	9/16"	1"	40	0.22
	80251	1" x 1" x 1/2" NPT	11/16"	11/16"	1-3/16"	40	0.29
	80249	1" x 1" x 1" NPT	15/16"	15/16"	1-9/16"	40	0.73
	80256	1-1/4" x 1" x 1/2" NPT	7/16"	9/16"	1-5/16"	40	0.30
	80252	1-1/4" x 1-1/4" x 1/2" NPT	7/16"	7/16"	1-5/16"	40	0.31
	80257	1-1/2" x 1-1/4" x 1/2" NPT	1/2"	11/16"	1-7/16"	80	0.43
	80254	1-1/2" x 1-1/2" x 1/2" NPT	1/2"	1/2"	1-7/16"	80	0.46
	80258	2" x 1-1/2" x 1/2" NPT	1/2"	5/8"	1-13/16"	80	0.56
	80253	2" x 2" x 1/2" NPT	1/2"	1/2"	1-13/16"	80	0.62

FIGURE 2 — FITTING DIMENSIONS (Part 3 of 4)

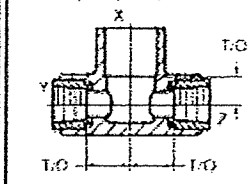
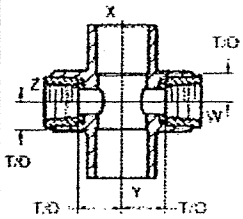
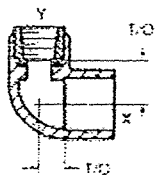
FITTING TYPE	PART NUMBER	NOMINAL SIZE	NOMINAL TAKE-OUT (T/O)		SCHD.	WEIGHT (lb.)
BACK-TO-BACK TEE 		X x Y x Z	X	Y, Z		
	80459	1" x 1/2" NPT x 1/2" NPT	5/8"	1-5/16"	40	0.48
	80460	1" x 1/2" NPT x 1/2" NPT	5/8"	1-3/16"	40	0.46
BACK-TO-BACK CROSS 		X x Y x Z x W	X, Y	Z, W		
	80462	1" x 1" x 1/2" NPT x 1/2" NPT	5/8"	1-3/16"	40	0.46
	80463	1" x 1" x 1/2" NPT x 1/2" NPT	5/8"	1-5/16"	40	0.47
SPRINKLER HEAD ADAPTER 90° ELBOW 		X x Y	X	Y		
	80199	3/4" x 1/2" NPT	9/16"	1"	40	0.20
	80169	1" x 1/2" NPT	3/4"	1-1/4"	40	0.26
	80196	1" x 3/4" NPT	1-1/16"	1-1/16"	40	0.26

FIGURE 2 — FITTING DIMENSIONS (Part 4 of 4)

Limited Warranty

Products manufactured by Tyco Fire Products 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 Tyco Fire Products. No warranty is given for products or components manufactured by companies not affiliated by ownership with Tyco Fire Products 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 Tyco Fire Products to be defective shall be either repaired or replaced, at Tyco Fire Products' sole option. Tyco Fire Products neither assumes, nor authorizes any person to assume for it, any other obligation in connection with the sale of products or parts of products. Tyco Fire Products 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 TYCO FIRE PRODUCTS 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 TYCO FIRE PRODUCTS WAS INFORMED ABOUT THE POSSIBILITY OF SUCH DAMAGES, AND IN NO EVENT SHALL TYCO FIRE PRODUCTS' 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.

POTTER
The Symbol of Protection

BELLS
PBA-AC & MBA-DC

UL, ULC, and FM Approved
Sizes Available: 6" (150mm), 8" (200mm) and 10" (250mm)
Voltages Available: 24VAC
120VAC
12VDC (10.2 to 15.6) Polarized
24VDC (20.4 to 31.2) Polarized
Service Use: Fire Alarm
General Signaling
Burglar Alarm
Environment: Indoor or outdoor use (See Note 1)
-40° to 150°F (-40° to 66°C)
(Outdoor use requires weatherproof backbox.)
Termination: AC Bells - 4 No. 18 AWG stranded wires
DC Bells - Terminal strip
Finish: Red powder coating
Optional: Model BBK-1 weatherproof backbox
Model BBX-1 deep weatherproof backbox

These vibrating type bells are designed for use as fire, burglar or general signaling devices. They have low power consumption and high decibel ratings. The unit mounts on a standard 4" (101mm) square electrical box for indoor use or on a model BBK-1 weatherproof backbox or BBX-1 deep weatherproof backbox for outdoor applications. Weatherproof backbox model BBK-1, Stock No. 1500001.

Notes:
1. Minimum dB ratings are calculated from integrated sound pressure measurements made at Underwriters Laboratories as specified in UL Standard 464. UL temperature range is -30° to 150°F (-34° to 66°C).
2. Typical dB ratings are calculated from measurements made with a conventional sound level meter and are indicative of output levels in an actual installation.
3. ULC only applies to MBA DC bells.

Size inches (mm)	Voltage	Model Number	Stock Number	Current (Max.)	Typical dB at 10 ft. (3m) (2)	Minimum dB at 10 ft. (3m) (1)
6 (150)	12VDC	MBA-6-12	1750070	.12A	85	76
8 (200)	12VDC	MBA-8-12	1750080	.12A	90	77
10 (250)	12VDC	MBA-10-12	1750060	.12A	92	78
6 (150)	24VDC	MBA-6-24	1750100	.06A	87	77
8 (200)	24VDC	MBA-8-24	1750110	.06A	91	79
10 (250)	24VDC	MBA-10-24	1750090	.06A	94	80
6 (150)	24VAC	PBA246	1806024*	.17A	91	78
8 (200)	24VAC	PBA248	1808024*	.17A	94	77
10 (250)	24VAC	PBA2410	1810024*	.17A	94	78
6 (150)	120VAC	PBA1206	1806120*	.05A	92	83
8 (200)	120VAC	PBA1208	1808120*	.05A	99	84
10 (250)	120VAC	PBA12010	1810120*	.05A	99	86

All DC bells are polarized and have built-in transient protection.
* Does not have ULC listing.

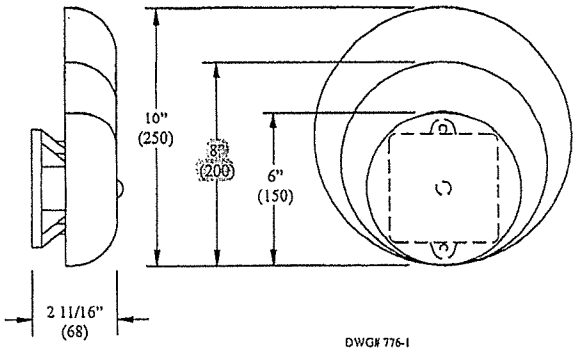
⚠ WARNING

In outdoor or wet installations, bell must be mounted with weatherproof backbox, BBK-1 or BBX-1. Standard electrical boxes will not provide a weatherproof enclosure. If the bell and/or assembly is exposed to moisture, it may fail or create an electrical hazard.

POTTER
The Symbol of Protection

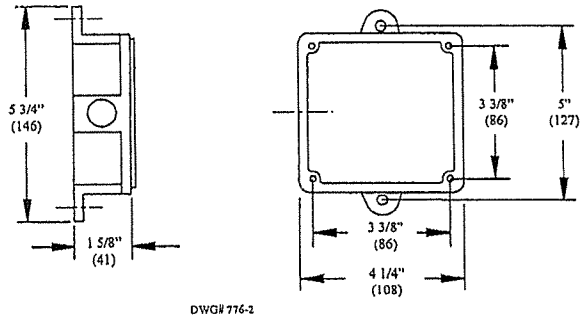
BELLS
PBA-AC & MBA-DC

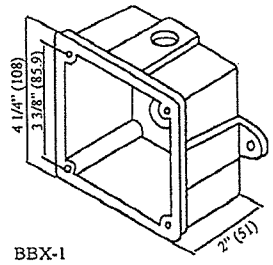
Bells Dimensions Inches (mm)
Fig. 1



Weatherproof Backbox Dimensions Inches (mm)
Fig. 2

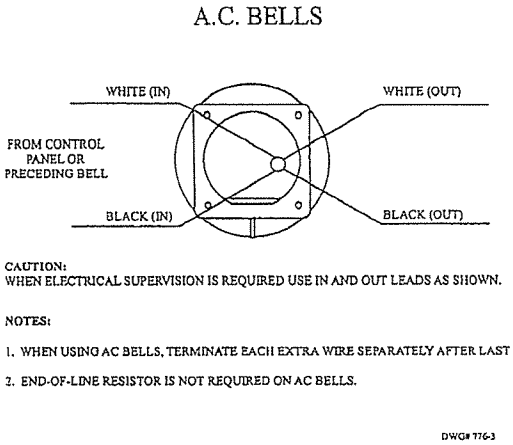
Box has one threaded 1/2" conduit entrance

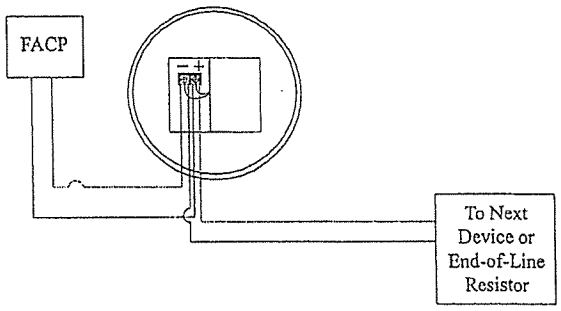




BBX-1

Wiring (rear view)
Fig. 3





Installation

1. The bell shall be installed in accordance with NFPA 13, 72, or local AHJ. The top of the device shall be no less than 90" AFF and not less than 6" below the ceiling.
2. Remove the gong.
3. Connect wiring (see Fig. 3).
4. Mount bell mechanism to backbox (bell mechanism must be mounted with the striker pointing down).
5. Reinstall the gong (be sure that the gong positioning pin, in the mechanism housing, is in the hole in the gong).
6. Test all bells for proper operation and observe that they can be heard where required (bells must be heard in all areas as designated by the authority having jurisdiction).

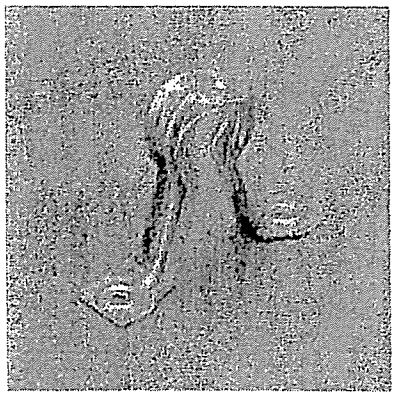
⚠ WARNING

Failure to install striker down will prevent bell from operating.

PVC / CPVC Pipe Fixings

SOSR075

SOSR Standoff Surge Restraint 2-Hole Strap Hanger For CPVC Fire Protection Pipe



Ordering Information

Region	Part / Article #
North America	SOSR075
Latin America	SOSR075
Europe/Middle East/Africa	597805
Asia/Australia	SOSR075

Application Information

- The SOSR Standoff Surge Restraint, part of the CADDY® line of fasteners and supports from ERICO, is ideal for use with CPVC fire protection pipe. The SOSR meets the UL® 203 stringent upward thrust requirement and can be mounted in both vertical and horizontal positions on concrete, steel and wood. Engineered specifically for use with CPVC fire protection pipes from 3/4" to 2", the SOSR features a flared band to help protect the CPVC pipe from damage. It is UL Listed as both a hanger and pipe restrainer.

Features

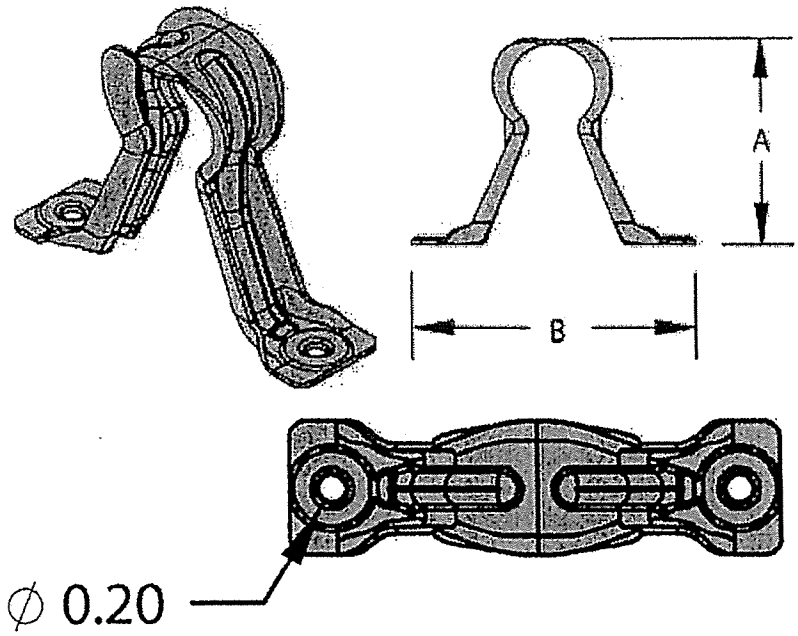
- Meets UL 203 upward thrust requirement
- Available for 3/4" to 2" CPVC pipe
- Engineered for superior performance
- Complies with static load requirements of NFPA® 13
- Automatically spaces CPVC pipe 1-1/2" off of the surface
- For mounting CPVC pipe to structural elements (concrete, steel, wood and composite wood joist)
- #10 hex head cap screws included

Notes

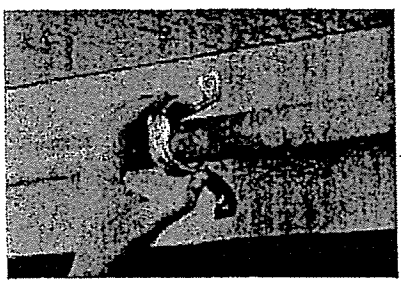
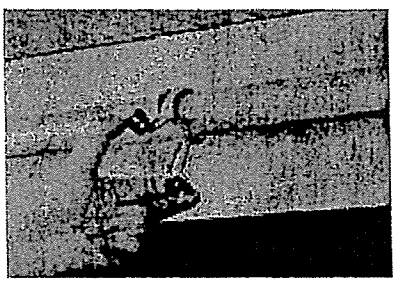
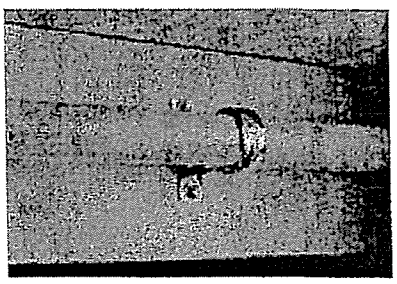
- Use the new 3TW backing nut on composite wood joist installations (sold separately)
- Time-saving SOSR installation depicted beside traditional labor intensive wood block assemblies
- NOTE: For supporting CPVC pipe off of the vertical face of structural or composite wood joists with a minimum web thickness of 3/8".
- NOTE: DO NOT install on the bottom of a structural member or under other horizontal surfaces less than 1-1/4" thick.
- *NOTE: (wt) refers to the weight of the water filled pipe

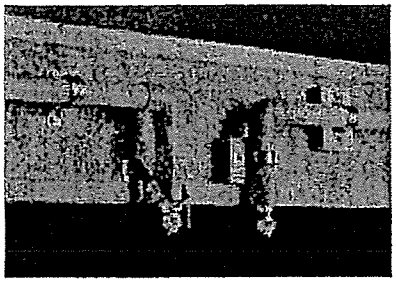
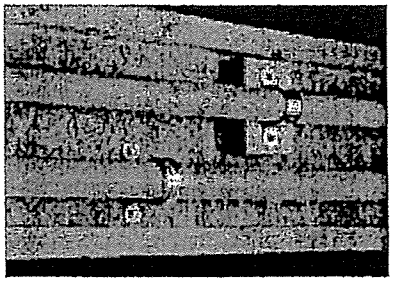
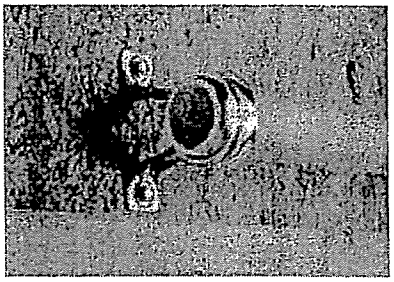
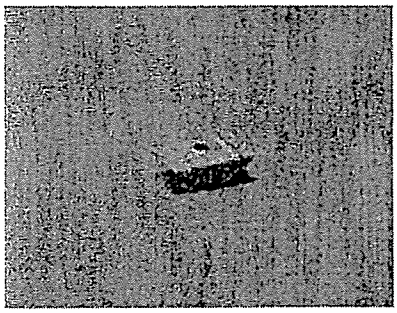
Product Specifications

A (in)	2 11/16"
A (mm)	68.0 mm
B (in)	3 5/8"
B (mm)	92.0 mm
Finish	Pre-galvanized
HS	1.7 m
Max. Hanger Spacing	5 1/2'
Nominal Pipe Size IP	3/4"
Standard Packaging Quantity	100
Third Party Certifications	UL 203 cULus®



Application Photos

WARNING
ERICO products shall be installed and used only as indicated in ERICO's product instruction sheets and training materials. Instruction sheets are available at www.erico.com and from your ERICO customer service representative. Improper installation, misuse, misapplication or other failure to completely follow ERICO's instructions and warnings may cause product malfunction, property damage, serious bodily injury and death.

WARRANTY
ERICO products are warranted to be free from defects in material and workmanship at the time of shipment. NO OTHER WARRANTY, WHETHER EXPRESS OR IMPLIED (INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE), SHALL EXIST IN CONNECTION WITH THE SALE OR USE OF ANY ERICO PRODUCTS. Claims for errors, shortages, defects or nonconformities ascertainable upon inspection must be made in writing within 5 days after Buyer's receipt of products. All other claims must be made in writing to ERICO within 6 months from the date of shipment or transport. Products claimed to be nonconforming or defective must, upon ERICO's prior written approval in accordance with its standard terms and procedures governing returns, promptly be returned to ERICO for inspection. Claims not made as provided above and within the applicable time period will be barred. ERICO shall in no event be responsible if the products have not been stored or used in accordance with its specifications and recommended procedures. ERICO will, at its option, either repair or replace nonconforming or defective products for which it is responsible or return the purchase price to the Buyer. THE FOREGOING STATES BUYER'S EXCLUSIVE REMEDY FOR ANY BREACH OF ERICO WARRANTY AND FOR ANY CLAIM, WHETHER SOUNDING IN CONTRACT, TORT OR NEGLIGENCE, FOR LOSS OR INJURY CAUSED BY THE SALE OR USE OF ANY PRODUCT.

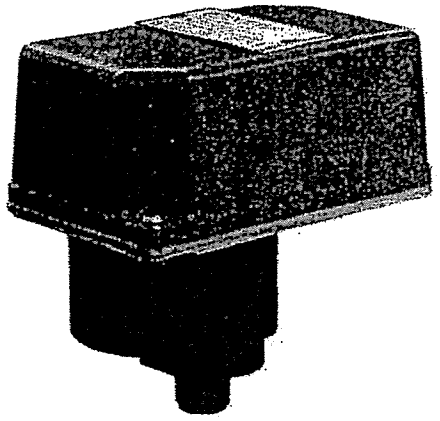
LIMITATION OF LIABILITY
ERICO excludes all liability except such liability that is directly attributable to the willful or gross negligence of ERICO's employees. Should ERICO be held liable its liability shall in no event exceed the total purchase price under the contract. ERICO SHALL IN NO EVENT BE RESPONSIBLE FOR ANY LOSS OF BUSINESS OR PROFITS, DOWNTIME OR DELAY, LABOR, REPAIR OR MATERIAL COSTS OR ANY SIMILAR OR DISSIMILAR CONSEQUENTIAL LOSS OR DAMAGE INCURRED BY BUYER.

Due to a policy of continued product development, specifications are subject to change without notice.

ERICO®

POTTER
The Symbol of Protection

WFSR-F
WATERFLOW ALARM SWITCH WITH RETARD



Stock number - 1010080

⚠ CAUTION

This device is not intended for applications in explosive environments.

UL, cUL and CSFM Listed, FM Approved and NYMEA Accepted, CE Marked, VdS Approved

Dimensions: 5 9/16"H x 3 1/2"W x 5 7/8"D
(14,1cm H x 8,9cm W x 14,9cm D)

Weight: 1.5 lbs. (3,3 kg.)

Enclosure: Cover - Die-cast with textured red powdercoat finish
Base - Die-cast aluminum

Pressure Connection: 1/2" Male NPT

Pressure Adjustments: Factory adjusted to operate between 5 and 8 PSI (0.35 and 0,55 BAR) on rising pressure

Maximum system pressure: 175 PSI (12,1 BAR)

Contact Ratings: Two Sets of SPDT (Form C)
15.0 Amps at 125/250VAC
2.0 Amps at 30VDC Resistive

Conduit Entrances: Two knockouts provided for 1/2" conduit

Environmental Specifications: 40°F to 120°F (4,5°C to 49°C)
NEMA 4 Enclosure - when used with proper conduit fittings

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

Tamper: Cover incorporates tamper resistant fasteners that require a special key for removal. One key is supplied with each device. For optional cover tamper switch kit, order Stock No. 0090018.

Waterflow Alarm Switch With Retard For Supervision Of Wet Alarm Check Valve

The Model WFSR-F is a pressure operated switch with an adjustable, instantly recycling pneumatic retard to prevent false alarms due to water pressure variation. The WFSR-F is connected into the alarm port of a wet sprinkler system alarm check valve (see " WARNING", page 2).

Installation

A male ½" NPT pipe fitting is provided for connection to the alarm port of the alarm check valve. No additional mounting or support is required. Allow 5" (12,7cm) to the front of the unit for removal of the cover. Install with the pressure connection down.

Testing

Operation of the unit is checked by opening the by-pass test valve or inspector's test valve. The frequency of the inspection and testing for the Model WFSR-F and its associated protective monitoring system should be in accordance with applicable NFPA Codes and Standards and/or authority having jurisdiction (manufacturer recommends quarterly or more frequently).

Fig. 1 WFSR-F

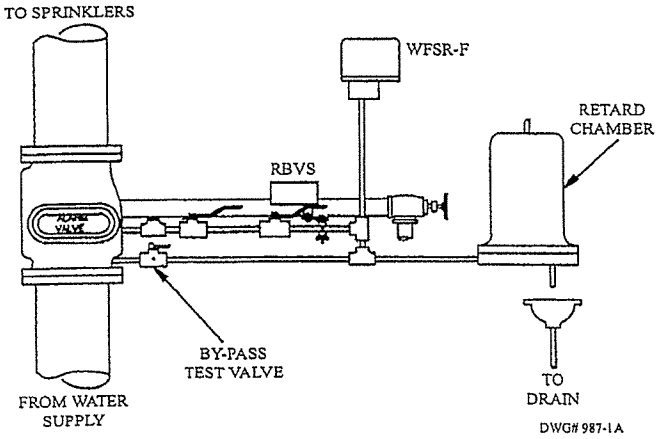
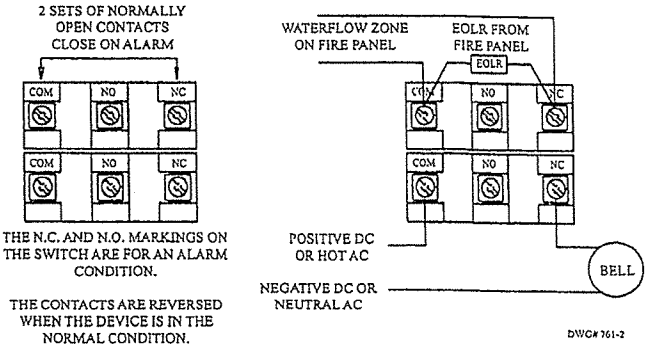


Fig. 2 Typical Electrical Connections

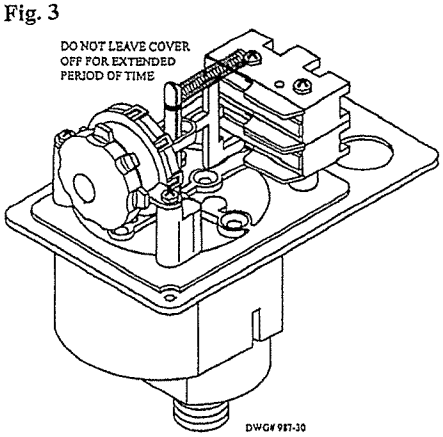


Note: For supervised circuits see "Switch Terminal Connections" drawing and caution note (Fig. 4).

POTTER
The Symbol of Protection

WFSR-F
WATERFLOW ALARM SWITCH WITH RETARD

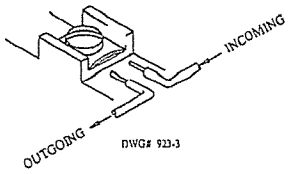
Fig. 3



Retard Adjustment:
To change time turn knob (either direction) for desired time delay. Use the minimum amount of retard necessary to prevent false alarms, a "B" setting is usually adequate for this. Factory set at "B".

APPROX. RETARD SETTINGS (IN SEC.)					
0	A	B	C	D	E
0	10-25	20-40	35-55	50-70	60-90

Fig. 4 Switch Terminal Connections
Clamping Plate Terminal



⚠ CAUTION

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 becomes dislodged from under the terminal.

Fig. 5 Typical Wet System

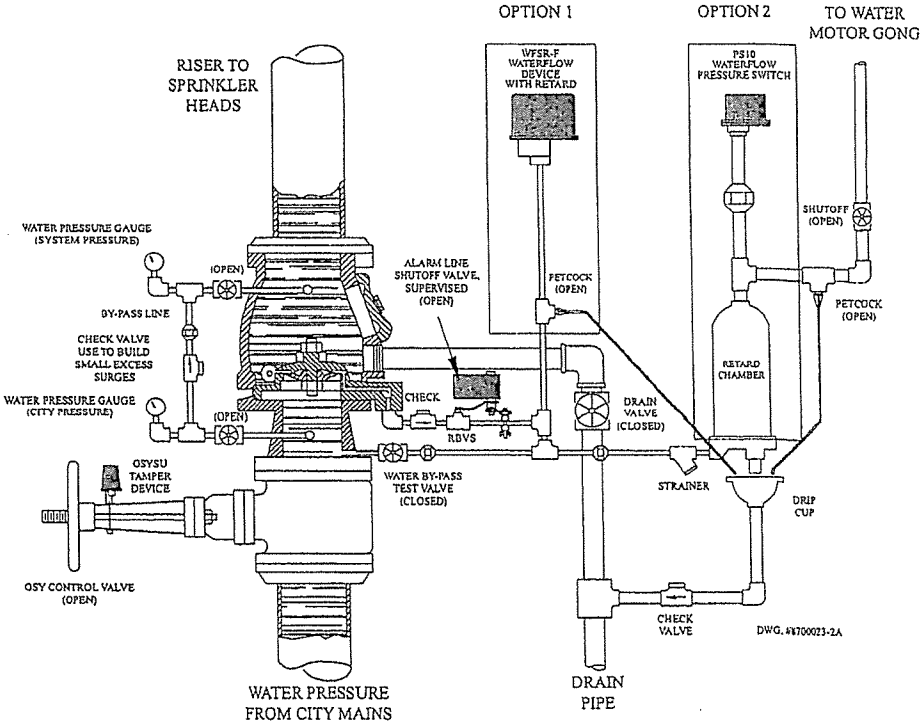
⚠ WARNING

Use teflon tape sealant only. Apply only to male threads of connectors.

Use of pipe cement voids warranty as this material may obstruct pressure aperture resulting in loss of alarm signal.

Device must be installed before any shut off valve on alarm port line unless it is supervised by a supervisory switch such as Potter Model RBVS.

The system should be tested on a quarterly basis or more frequently to insure proper operation.



⚠ CAUTION

Due to the possibility of unintended discharges caused by pressure surges, trapped air, or short retard times, 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.