

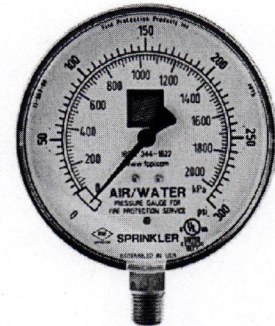
# Sprinkler Gauge

# INSIST ON FPPI®

## Model FPPI-PG

### Description

Model FPPI-PG pressure gauges feature an impact and corrosion resistant case made from ABS (plastic) or powder coated steel. Features phosphor bronze bourdon tube movement with white enameled brass dial face with large numbers for easy reading. Dual scale to 300 PSI/2000Kpa. UL/ULc Listed (EX26630) and FM Approved.



### Applications

- Fire sprinkler systems
- Suitable for all media that will not obstruct the pressure system or attack copper alloy parts

### Special Features

- UL-listed (UL-393), EX26630
- Factory Mutual (FM) approved
- Reliable and economical

### Standard Features

#### Design

EN 837-1 & ASME B40.100

#### Sizes

4" (100 mm)

#### Accuracy class

± 3% of span  
(ASME B40.100 Grade B)

The tolerance is reflected in the box associated with the zero mark on the face of the gauge. The value is considered zero when the pointer falls anywhere within this box.

#### Ranges

0/80 psi, retard to 250 psi (air)  
0/300 psi (air/water, air/water)

#### Working Pressure

Steady: ¾ of full scale value  
Fluctuating: ½ of full scale value  
Short time: full scale value

#### Operating Temperature

Ambient: -40°F to 140°F  
(-40°C to 60°C)  
Media: 140°F (+60°C) maximum

#### Temperature Error

Additional error when temperature of 68°F (20°C) +0.4% for every 18°F (10°C) rising or falling. Percentage of span.

### Specifications

#### Bourdon Tube

Material: copper alloy C-type

#### Pressure Connection

Material: copper alloy  
¼" NPT lower mount (LM)

#### Movement

Copper alloy

#### Dial

White aluminum with stop pin; black and red lettering

#### Pointer

Black aluminum

#### Case

Black polycarbonate  
Powder coated steel (Air/Water Gauge only)

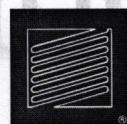
#### Window

Snap-in clear polycarbonate

#### Item Numbers/Descriptions

- 11-550-00 Water Gauge
- 11-551-00 Air Gauge
- 11-552-00 Air Gauge w/Retard
- 11-553-00 Air/Water Gauge
- 11-553-10 Air/Water Gauge w/ Steel Case
- 11-558-00 Water Gauge, Personalized
- 11-559-00 Air/Water Gauge, Personalized
- 11-561-00 Air Gauge w/Retard, Personalized

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WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

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## Fig. 23 - Hanger for CPVC Plastic Pipe Double Fastener Strap Type



**Size Range** — 3/4" thru 3" CPVC pipe

**Material** — Pre-Galvanized Steel

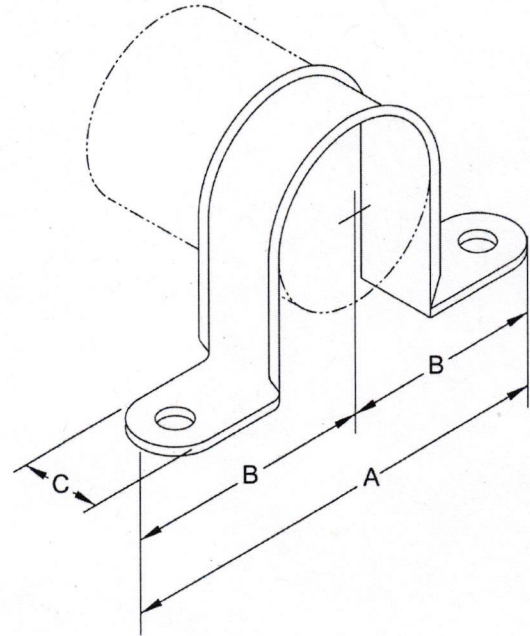
**Function** — Intended to perform as a hanger/restrainer to support CPVC piping used in automatic fire sprinkler systems. Fig. 23 can be installed on the top, bottom or side of a beam. The Fig. 23 also functions as a restrainer to prevent the upward movement of the sprinkler head during activation.

**Approvals** — Underwriters' Laboratories Listed in the USA (UL) and Canada (cUL) sizes 3/4" thru 2" to support fire sprinkler piping. May be installed in wood using fasteners supplied with product, or into minimum 20 gauge steel using (2) 1/4" x 1" tek type screw. Meets and exceeds the requirements of NFPA 13, 13R and 13D.

**Features** — Fig. 23 incorporates features which protect the pipe and ease installation. The flared edge design protects the CPVC pipe from any rough surface. It also incorporates snap restrainers allowing easier and faster installation. Easily attaches to the building structure using the two UL Listed hex head self threading screws\* furnished with the product. It is recommended that rechargeable electric drills fitted with a hex socket attachment be used as installation tools. No impact tools (such as a hammer) are allowed. Damage has been known to result from installations using impact type tools. No pre-drilling of a pilot hole in wood is required.

**Finish** — Pre-Galvanized

**Order By** — Figure number and pipe size



\* Hardened hex head self threading screw is furnished with the product and is the minimum fastener size acceptable.

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### Dimensions • Weights

CPVC Pipe Size	A	B	C	Max. Hanger Spacing (Ft.)	Fastener Hex Head Size	Approx. Wt./100
3/4	3 1/8	1 9/16	1 3/16	5 1/2	5/16	9
1	3 3/8	1 11/16	1 3/16	6	5/16	9
1 1/4	4 3/16	2 3/32	1 3/16	6 1/2	5/16	11
1 1/2	4 7/16	2 7/32	1 3/16	7	5/16	12
2	4 7/8	2 7/16	1 3/16	8	5/16	15
2 1/2	10 9/32	2 11/16	1 3/16	Consult Factory	5/16	22
3	11 7/8	3	1 3/16	Consult Factory	5/16	25

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## Fig. 24 - Hanger for CPVC Plastic Pipe Double Fastener Strap Type - Side Mount



**Size Range** — 3/4" thru 2" CPVC pipe

**Material** — Pre-Galvanized Steel

**Function** — Intended to perform as a hanger/restrainer to support CPVC piping used in automatic fire sprinkler systems. Can be installed on the top or on the bottom of a beam. The Fig. 24 can also function as a restrainer to prevent the upward movement of the sprinkler head during activation.

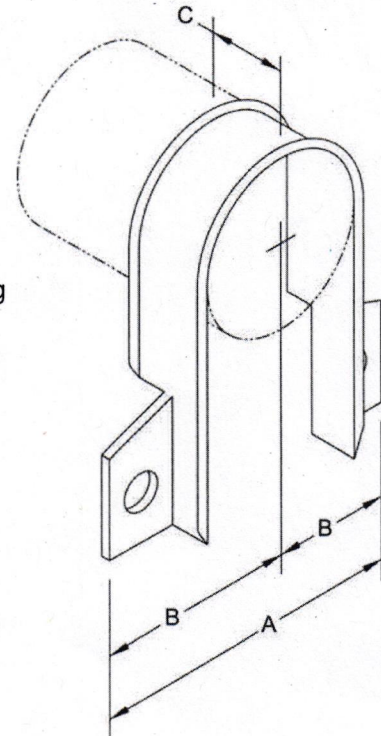
**Approvals** — Underwriters' Laboratories Listed in the USA (UL) and Canada (cUL) to support fire sprinkler piping. May be installed in wood using fasteners supplied with product, or into minimum 20 gauge steel using (2) 1/4" x 1" tek type screws. Meets and exceeds the requirements of NFPA 13, 13R and 13D.

**Features** — Fig. 24 incorporates features which protect the pipe and ease installation. The flared edge design protects the CPVC pipe from any rough surface. Easily attaches to the building structure using the two UL Listed hex head self threading screws\* furnished with the product. It is recommended that rechargeable electric drills fitted with a hex socket attachment be used as installation tools. No impact tools (such as a hammer) are allowed. Damage has been known to result from installations using impact type tools. No pre-drilling of a pilot hole in wood is required.

**Finish** — Pre-Galvanized

**Order By** — Figure number and pipe size

\* Hardened hex head self threading screw is furnished with the product and is the minimum fastener size acceptable.



### Dimensions • Weights

CPVC Pipe Size	A	B	C	Max. Hanger Spacing (Ft.)	Fastener Hex Head Size	Approx. Wt./100
3/4	2 <sup>5</sup> / <sub>16</sub>	1 <sup>9</sup> / <sub>32</sub>	1 <sup>3</sup> / <sub>16</sub>	5 <sup>1</sup> / <sub>2</sub>	5/16	9
1	2 <sup>5</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>16</sub>	6	5/16	9
1 <sup>1</sup> / <sub>4</sub>	3	1 <sup>1</sup> / <sub>2</sub>	1 <sup>3</sup> / <sub>16</sub>	6 <sup>1</sup> / <sub>2</sub>	5/16	11
1 <sup>1</sup> / <sub>2</sub>	3 <sup>1</sup> / <sub>4</sub>	1 <sup>5</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>16</sub>	7	5/16	12
2	3 <sup>11</sup> / <sub>16</sub>	1 <sup>27</sup> / <sub>32</sub>	1 <sup>3</sup> / <sub>16</sub>	8	5/16	15

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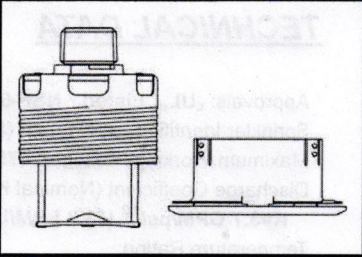
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**SENJU SPRINKLER CO., LTD.**

**Residential Lead Free Flat Concealed Sprinkler,  
Pendent,**

**Model: RC-RES, K-Factor: 3.7, SIN: SS8261**



**GENERAL DESCRIPTION**

The Model RC-RES Residential Flat Concealed Sprinklers are automatic sprinklers of the compressed fusible solder type. They are decorative and fast responding. The Cover Plate Assembly hides the Deflector, Heat Responsive Element etc., which is 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 for 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 residential occupancies and 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 3.7 (53.3 LPM/bar<sup>1/2</sup>) 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 to escape or evacuate in case of a 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.*

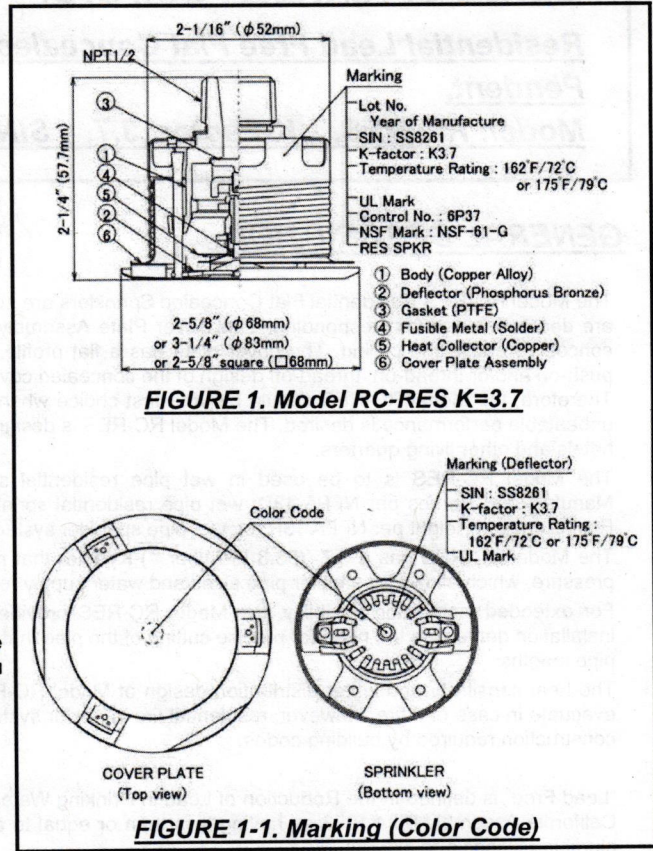
*Failure to do so may impair the integrity of these devices.*

*It is the responsibility of the installing contractor to provide a copy of this document to the owner or their 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.*

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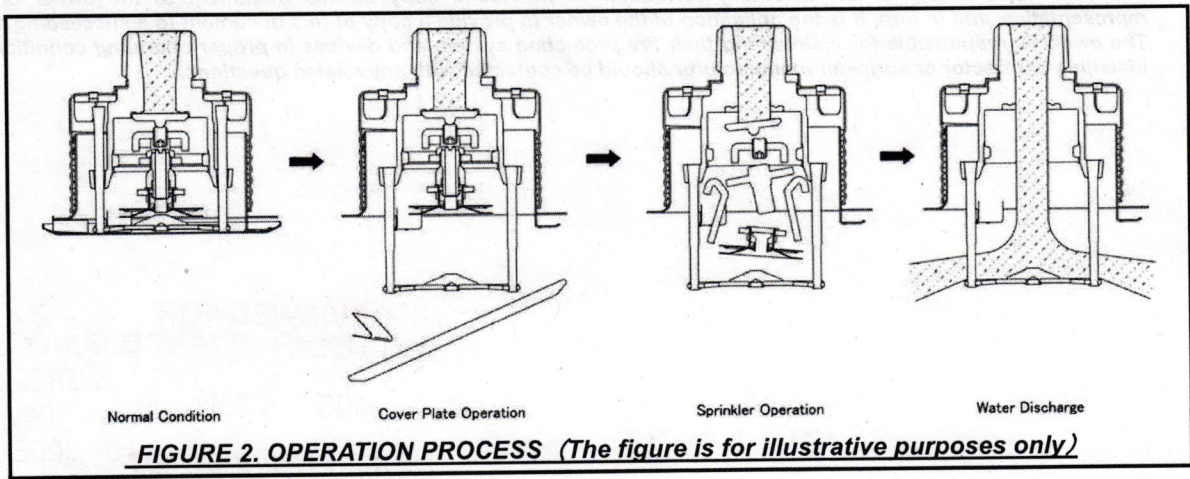
**TECHNICAL DATA**

Approvals: **cUL<sub>us</sub> Listed, NSF-61-G**  
 Sprinkler Identification Number (SIN): **SS8261**  
 Maximum Working Pressure: **175psi (12.1bar)**  
 Discharge Coefficient (Nominal K-Factor):  
**K=3.7 GPM/psi<sup>1/2</sup> (53.3 LPM/bar<sup>1/2</sup>)**  
 Temperature Rating:  
**162°F (72°C) Sprinkler with 140°F (60°C) Cover Plate**  
**175°F (79°C) Sprinkler with 140°F (60°C) Cover Plate**  
**175°F (79°C) Sprinkler with 162°F (72°C) Cover Plate**  
 Color Code (Sprinkler)  
**162°F (72°C): Uncolored**  
**175°F (79°C): White**  
 Color Code (Cover Plate)  
**140°F (60°C): No Mark**  
**162°F (72°C): 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. Figures 1 and 1-1**



**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 reached, internal components of the sprinkler fall apart. This leads to the water flow to be distributed on the affected fire area. (Ref. Figure 2)



## **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 covered by the following instructions, should be submitted to your contracted 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 radially 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 few as possible. Do NOT use more sprinklers than necessary to cover a particular space.*

*Use only the Cover Plate provided for 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, 13D and 13R 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, 13R or 13 for the requirements relating to the prevention of possible activation of the Heat Responsive Element of Model RC-RES, due to the exposure of a heat source other than an actual fire.

Available Sprinkler Temperature Ratings			
Sprinkler Temperature Classification	Sprinkler Nominal Temperature Rating	Maximum Ambient Ceiling Temperature	Temperature Rating of the Cover Plate Assembly
Ordinary	162°F (72°C)	100°F (38°C)	140°F (60°C)
Intermediate	175°F (79°C)	150°F (66°C)	140°F (60°C) <sup>1)</sup>
Intermediate	175°F (79°C)	150°F (66°C)	162°F (72°C)

1) Maximum ambient temperature for the Cover Plate Assembly is 100°F (38°C).

### **Precautionary Warnings for Corrosive Environments**

Model RC-RES sprinklers 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 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 the copper piping by thoroughly flushing before installation of the Sprinkler Heads. Otherwise, residues of flux may cause corrosion and/or leakage in the sprinkler system.

**Hydraulic Design Criteria**

The minimum required sprinkler flow rates for systems designed to NFPA 13D or 13R are given in TABLE A as a function of temperature rating and the maximum allowable coverage area. 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 following:

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

**TABLE A. NFPA 13D & 13R WET PIPE HYDRAULIC DESIGN CRITERIA for Model SS8261**

For systems with ceiling types smooth flat horizontal, or beamed, or sloped, in accordance with NFPA 13D, 13R or 13 as applicable.

Maximum Coverage Area <sup>(a)</sup> Ft. x Ft. (m x m)	Maximum Spacing Ft. (m)	Temperature Classification	Ordinary Temperature Rating	Intermediate Temperature Rating		Deflector to Ceiling	Installation Type	Minimum Spacing Ft. (m)
		Sprinkler	162°F (72°C)	175°F (79°C)	175°F (79°C)			
		Cover Plate	140°F (60°C)	140°F (60°C)	162°F (72°C)			
12x12 (3.7x3.7)	12 (3.7)	Flow <sup>(b)</sup> GPM (LPM)	10 (37.8)	11 (41.6)	11 (41.6)	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)
		Pressure <sup>(b)</sup> PSI (bar)	7.3 (0.50)	8.8 (0.60)	8.8 (0.60)			
14x14 (4.3x4.3)	14 (4.3)	Flow <sup>(b)</sup> GPM (LPM)	10 (37.8)	11 (41.6)	11 (41.6)			
		Pressure <sup>(b)</sup> PSI (bar)	7.3 (0.50)	8.8 (0.60)	8.8 (0.60)			
15x15 (4.6x4.6)	15 (4.6)	Flow <sup>(b)</sup> GPM (LPM)	13 (49.2)	13 (49.2)	—			
		Pressure <sup>(b)</sup> PSI (bar)	12.3 (0.85)	12.3 (0.85)	—			
16x16 (4.9x4.9)	16 (4.9)	Flow <sup>(b)</sup> GPM (LPM)	14 (53.0)	14 (53.0)	—			
		Pressure <sup>(b)</sup> PSI (bar)	14.3 (0.99)	14.3 (0.99)	—			

(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.

**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 the sprinklers that could cause improper operation or non-operation.*

*The Protective Cap must remain on the sprinkler during installation. After the 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 19.0 N-m) 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.*

*Use only NR-H model wrench socket for installation of RC-RES sprinklers. Use of any other wrench or socket is prohibited and may cause damage to 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.*

*Do not rotate the Cap Remover RC to the left with force when placing the two hook arms into place. The installed sprinkler may become loosened, which may cause water leakage.*

### **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 inches (50.8mm) as shown in Figure 3.

#### **Step 2**

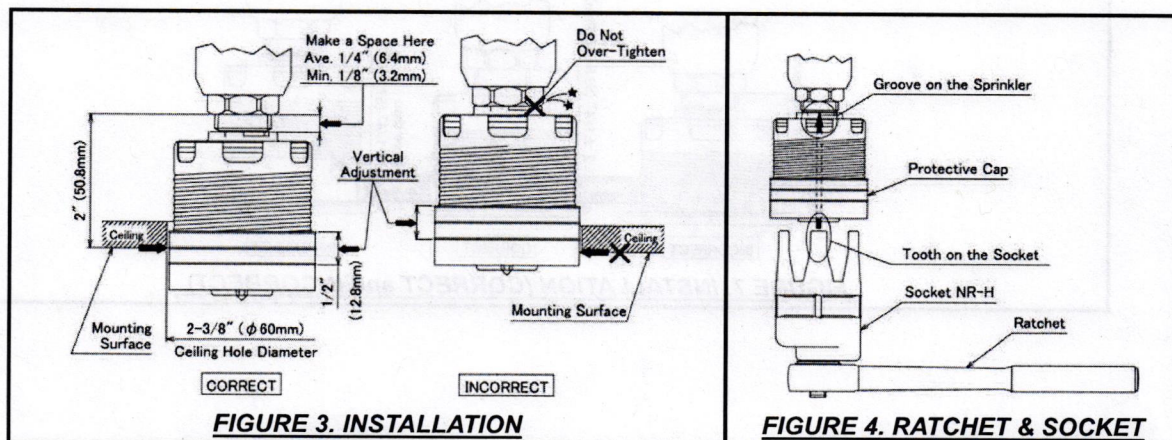
With pipe thread sealant applied to the threads, hand tighten the sprinkler into the sprinkler fitting. Then tighten it with the Socket NR-H or Ratchet (3/8" drive) & Socket NR-H Combination (Ref. Figure 4). The teeth of the Socket must fit perfectly with the grooves on the Sprinkler for proper installation (Ref. Figure 4).

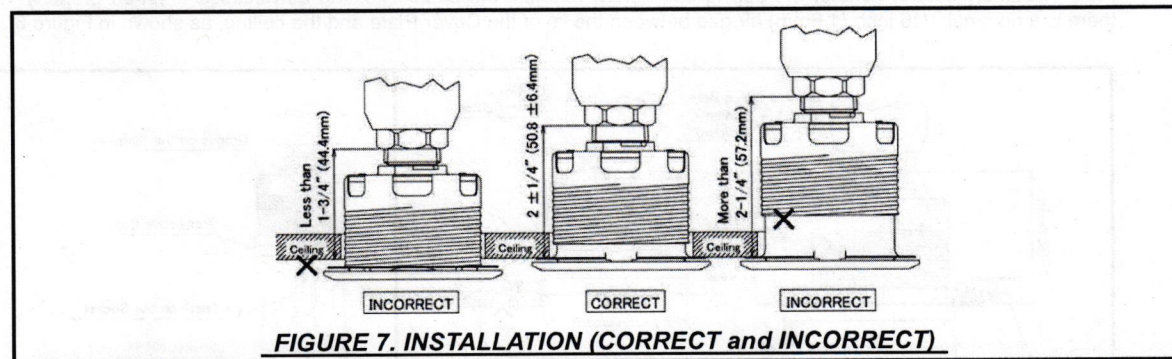
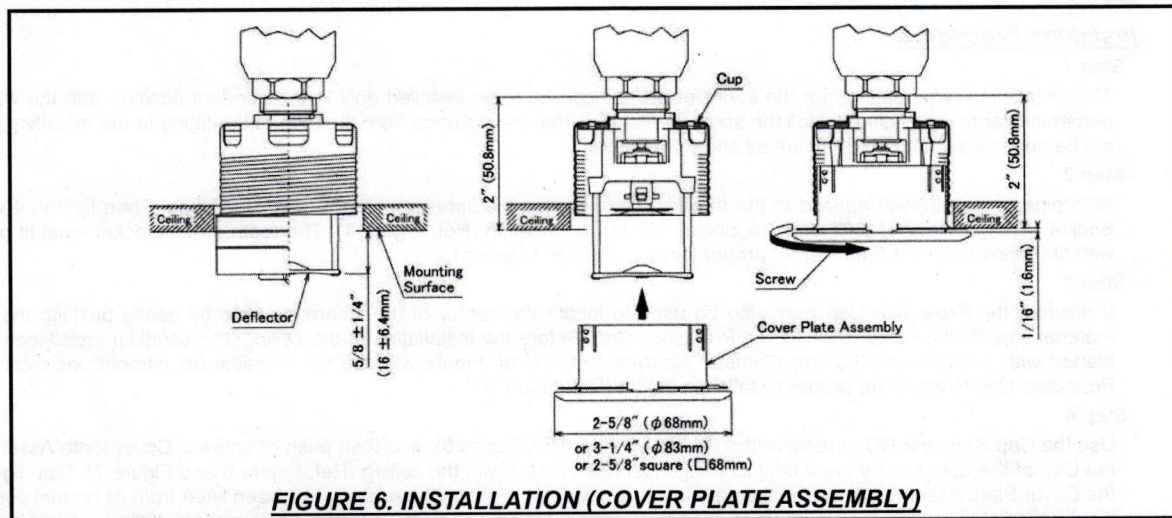
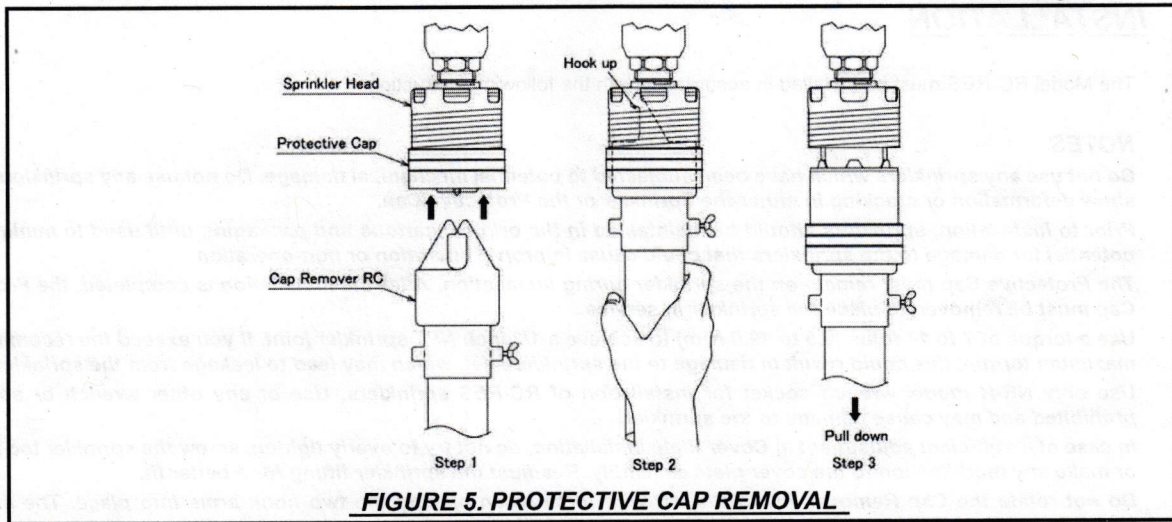
#### **Step 3**

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 a 2-3/8 inch (60mm) diameter clearance hole (Ref. Figure 3). Use the "Vertical Adjustment" indicator on the Protective Cap to check for proper installation height (Ref. Figure 3).

#### **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 has contact with the ceiling (Ref. Figure 6 and Figure 7). Stop tightening the Cover Plate Assembly once the flange has contact with the ceiling. If the ceiling has been lifted from its normal position in the process of tightening the Cover Plate Assembly, readjust the cover plate assembly as necessary. If the flange of the Cover Plate Assembly cannot contact 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.





## **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°F/4°C 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 a 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 parties by this action, and 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/or 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 system to aid in the control of a fire involving such hazards.*

*Leaking or corroded sprinklers must be replaced.*

*Automatic Sprinklers must be kept in a cool and dry place.*

*Automatic sprinklers 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 because 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 verify 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 of its compliance with this document, 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.*

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**ORDER PROCEDURE**

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

**Sprinkler**

Model: RC-RES

(SIN: SS8261, Residential Flat Concealed Sprinkler, Pendent, K3.7, Temperature: 162°F (72°C) or 175°F (79°C) )

**Cover Plate Assembly**

2-5/8 inch (ϕ 68mm) or 3-1/4 inch (ϕ 83mm) 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	Copper	Wood Grain	Custom Color	Custom Pattern
2-5/8" Round, 140°F	○	○	-	-	-	-	-	-	○	○
3-1/4" Round, 140°F	○	○	○	○	○	○	○	○	○	○
2-5/8" Square, 140°F	○	-	-	-	-	-	-	-	○	○
2-5/8" Round, 162°F	○	-	-	-	-	-	-	-	○	○
3-1/4" Round, 162°F	○	-	-	-	-	-	-	-	○	○

**Tools for Installation of Model RC-RES**

- Socket NR-H  
For use with a 3/8" drive ratchet (not included)
- Socket NR-H Plastic  
For use with a 1/2" drive ratchet (not included)
- Cap Remover RC

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Contacts

www.tyco-fire.com

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

## General Description

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

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

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

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

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

**IMPORTANT**  
Refer to Technical Data Sheet TFP2300 for warnings pertaining to regulatory and health information.  
Always refer to Technical Data Sheet TFP700 for the "INSTALLER WARNING" that provides cautions with respect to handling and installation of sprinkler systems and components. Improper handling and installation can permanently damage a sprinkler system or its components and cause the sprinkler to fail to operate in a fire situation or cause it to operate prematurely.

### NOTICE

The TYCO Series TY-FRB Sprinklers described herein must be installed and maintained in compliance with this document, as well as with the applicable standards of the National Fire Protection Association, in addition to the standards of any other authorities having jurisdiction. Failure to do so may impair the performance of these devices.

The owner is responsible for maintaining their fire protection system and devices in proper operating condition. Contact the installing contractor or product manufacturer with any questions.

## Sprinkler Identification Number (SIN)

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

## Technical Data

**Approvals**  
Refer to Table A

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

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

**Discharge Coefficient**  
K=5.6 GPM/psi<sup>1/2</sup> (80,6 LPM/bar<sup>1/2</sup>)

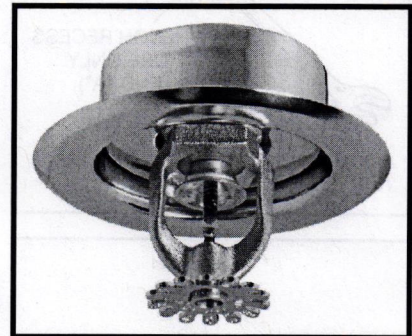
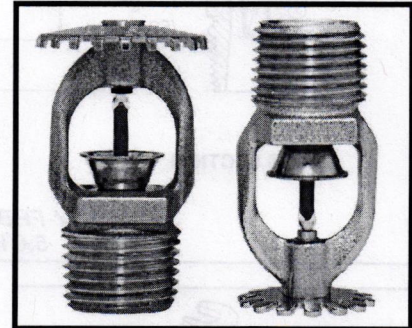
**Temperature Rating**  
Refer to Table A

**Finishes**  
Sprinkler: Refer to Table B

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

### Physical Characteristics

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



## Operation

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

## Design Criteria

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

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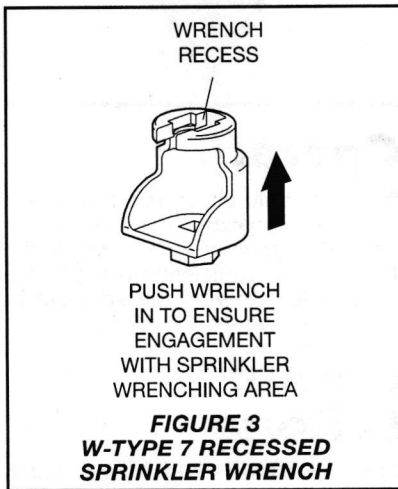
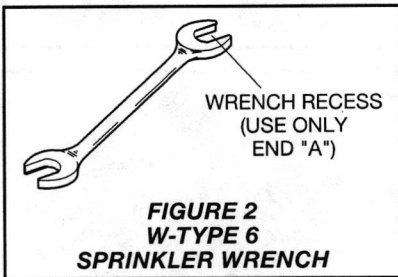
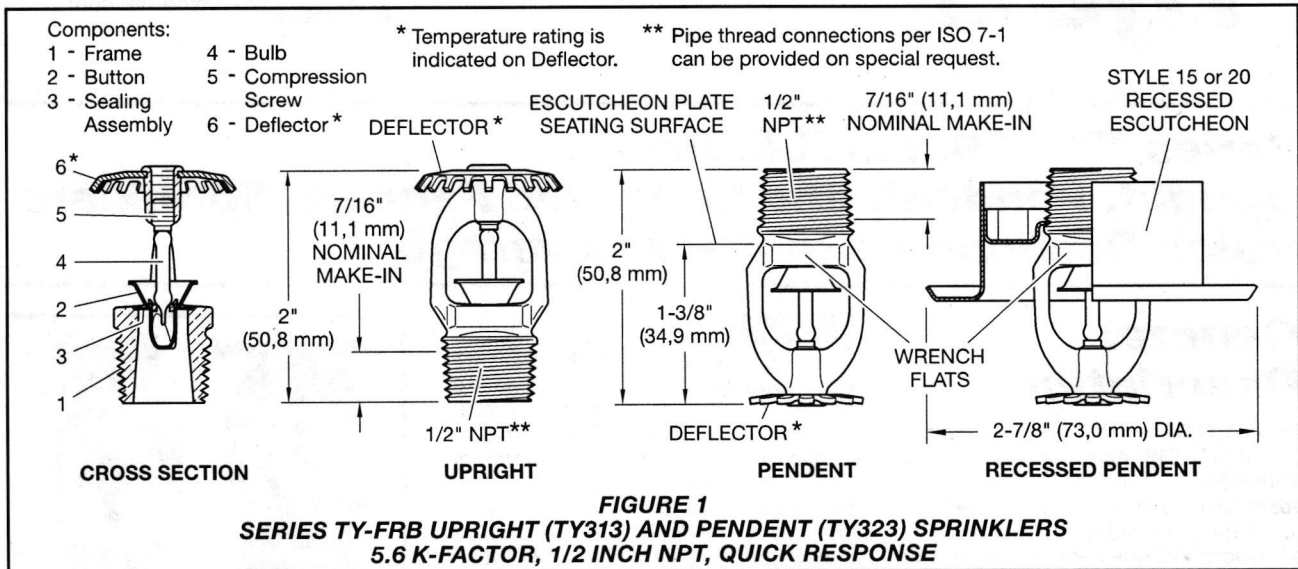
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## Installation

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

### General Instructions

Do not install any bulb-type sprinkler if the bulb is cracked or there is a loss of liquid from the bulb. With the sprinkler held horizontally, a small air bubble should be present. The diameter of the air bubble is approximately 1/16 in. (1,6 mm) for the 135°F (57°C) and 3/32 in. (2,4 mm) for the 286°F (141°C) temperature ratings.

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

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

### Upright and Pendent Sprinklers

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

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

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

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

### Recessed Pendent Sprinklers

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

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

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

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

## Care and Maintenance

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

Before closing a fire protection system main control valve for maintenance work on the fire protection system that it controls, obtain permission to shut down the affected fire protection systems from the proper authorities and notify all personnel who may be affected by this action.

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

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

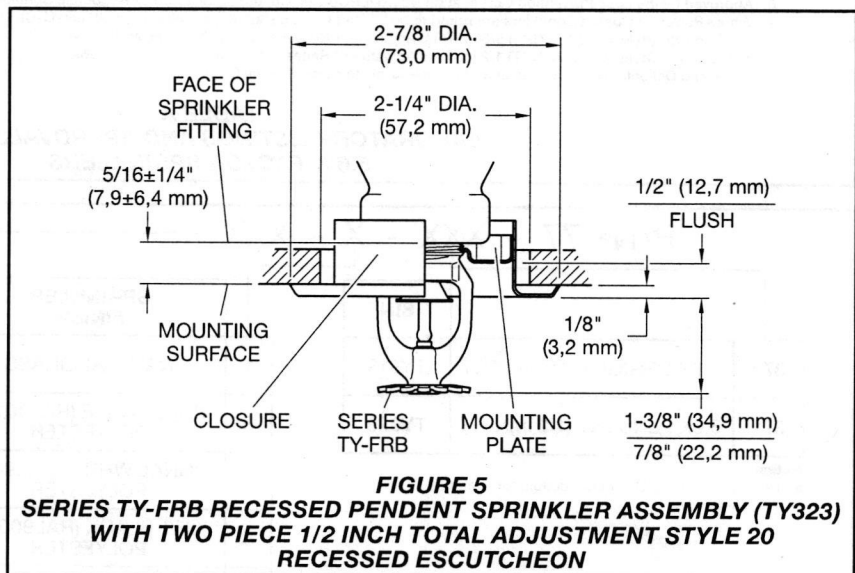
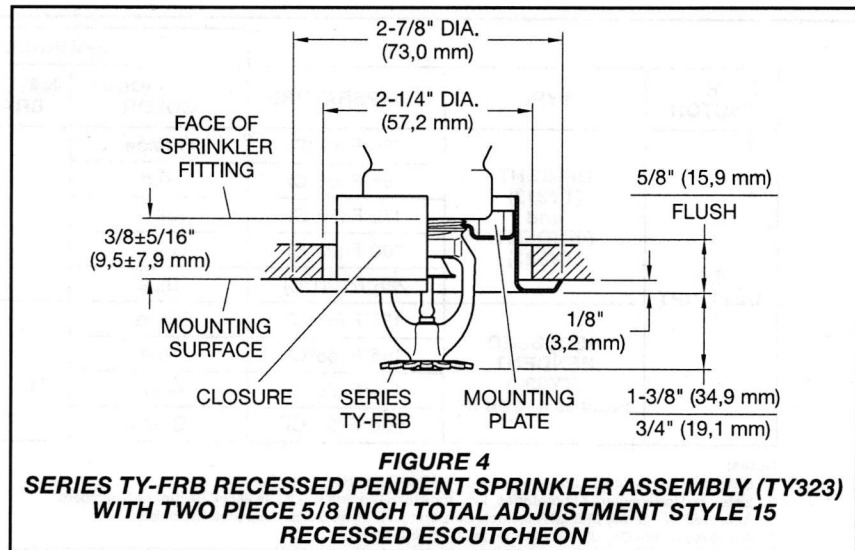
Sprinklers which are found to be leaking or exhibiting visible signs of corrosion must be replaced.

Automatic sprinklers must never be painted, plated, coated, or otherwise altered after leaving the factory. Modified sprinklers must be replaced. Sprinklers that have been exposed to corrosive products of combustion, but have not operated, should be replaced if they cannot be completely cleaned by wiping the sprinkler with a cloth or by brushing it with a soft bristle brush.

Care must be exercised to avoid damage to the sprinklers before, during, and after installation. Sprinklers damaged by dropping, striking, wrench twist/slippage, or the like, must be replaced. Also, replace any sprinkler that has a cracked bulb or that has lost liquid from its bulb. (Ref. Installation Section.)

The owner is responsible for the inspection, testing, and maintenance of their fire protection system and devices in compliance with this document, as well as with the applicable standards of the National Fire Protection Association (e.g., NFPA 25), in addition to the standards of any other authorities having jurisdiction. Contact the installing contractor or product manufacturer with any questions.

Automatic sprinkler systems are recommended to be inspected, tested, and maintained by a qualified Inspection Service in accordance with local requirements and/or national codes.



## Limited Warranty

For warranty terms and conditions, visit [www.tyco-fire.com](http://www.tyco-fire.com).

## Ordering Procedure

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

### Sprinkler Assemblies with NPT Thread Connections

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

### Recessed Escutcheon

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

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

\* Refer to Technical Data Sheet TFP770

### Sprinkler Wrench

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

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

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

**Notes:**  
 1. Listed by Underwriters Laboratories, Inc., (UL) as Quick Response Sprinklers.  
 2. Listed by Underwriters Laboratories, Inc., for use in Canada (C-UL) as Quick Response Sprinklers.  
 3. Approved by Factory Mutual Research Corporation (FM) as Quick Response Sprinklers.  
 4. Approved by the City of New York under MEA 354-01-E.  
 5. VdS Approved (For details, contact Johnson Controls, Enschede, Netherlands, Tel. 31-53-428-4444/Fax 31-54-428-3377).  
 6. Approved by the Loss Prevention Certification Board (LPCB Ref. No. 094a/06) as Quick Response Sprinklers.  
 7. Where Polyester Coated Sprinklers are noted to be UL and C-UL Listed, the sprinklers are UL and C-UL Listed as Corrosion-Resistant Sprinklers.  
 a. Installed with Style 15 (1/2 in. NPT) 5/8 in. Total Adjustment Recessed Escutcheon, as applicable.  
 b. Installed with Style 20 (1/2 in. NPT) 1/2 in. Total Adjustment Recessed Escutcheon, as applicable.  
 c. Frame and Deflector only. Listings and approvals apply to color (Special Order).

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

P/Na 77 - XXX - X - XXX

		SIN	SPRINKLER FINISH		TEMPERATURE RATINGS	
370	5.6K UPRIGHT (1/2 in.NPT)	TY313	1	NATURAL BRASS	135	135°F (57°C)
371	5.6K PENDENT (1/2 in.NPT)	TY323	3	PURE WHITE (RAL9010) <sup>a</sup> POLYESTER	155	155°F (68°C)
			4	SIGNAL WHITE (RAL9003) POLYESTER	175	175°F (79°C)
			5	JET BLACK (RAL9005) POLYESTER	200	200°F (93°C)
			9	CHROME PLATED	286	286°F (141°C)

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

**Notes:**  
 a. Eastern Hemisphere sales only

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

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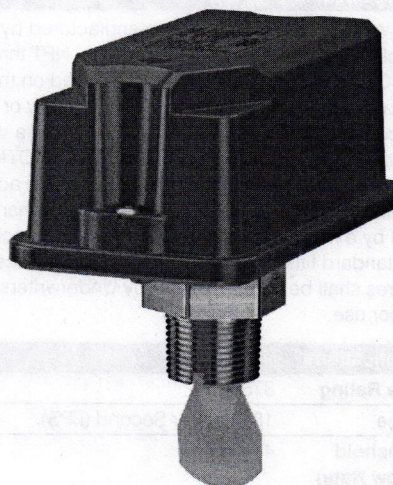
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# WFDTN Series Waterflow Detector



*System Sensor WFDTN T-Tap Waterflow detectors are designed for primary signaling in residential systems and branch line signaling.*

## Features

- New directional cover allows installers and inspectors to easily see the direction of flow
- UL-listed models are NEMA 4 rated
- New cover provides a better seal, is lighter weight, not painted and corrosion resistant
- Sealed retard mechanism immune to dust and other contaminants
- Less exposed metal reduces shock hazard, plastic cover acts as insulator and is resistant to arcing
- Visual switch activation
- Audible switch activation (73 dBA)
- Field-replaceable timer/switch assembly
- Accommodates up to 12 AWG wire
- Switch Synchronization activates both alarm panel and local bell or horn strobe
- Tamper-resistant cover screws
- Improved water sealing
- Reduced product weight
- Wire-ready terminals
- Improved wiring with new terminal block layout
- Snap-in optional cover tamper switch

The new **WFDTN Series** waterflow detectors from **System Sensor** consists of a rugged, NEMA 4-rated enclosure that is more damage resistant than previous metal designs. The waterflow detector is designed for both indoor and outdoor use, with the widest available temperature range, from 32°F to 150°F.

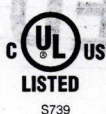
Both the WFDTN with incorporated timer and WFDNTRN with immediate activation fit any tee that has a 1 in. NPT branch, including: 1in., 1¼in., 1½ in. and 2in. NPT threaded ferrous and brass tees; 1in., 1¼in., 1½in. and 2in. copper sweat tees; Tyco, Spears, NIBBCO brand 1 in. CPVC tees. Twelve different clearly marked plastic paddles are available to fit different installation configurations.

UL-listed models are equipped with tamper-resistant cover screws to prevent unauthorized entry. Inside, two sets of SPDT (Form C) synchronized switches are enclosed in a durable terminal block with new layout designed to make wiring easy with wire ready terminals, COM terminals are on a different elevation, large barrier between switches and easy to read raised textured lettering all make wiring easy. An optional cover tamper switch is available, securely snaps into place, no tools required.

The WFDTN incorporates a mechanical time delay feature, which minimizes the risk of false alarm due to pressure surges or air trapped in the fire sprinkler system. The larger and easy to turn timer dial makes setting the waterflow detector easy with high contrast pad printed markings. The dial offers three tabs to help with turning, with one larger tab located on the dial position for approximately 60 seconds, a notch is also indicated on the dial to locate approximately 30 seconds making setting the detector in dimly lit locations easy.

The WFDTN series is designed for accuracy and repeatability. The detector also offers improved performance during vibration in riser applications where detectors are exposed to a large in rush of water.

## Agency Listings



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# Waterflow Detector Specifications

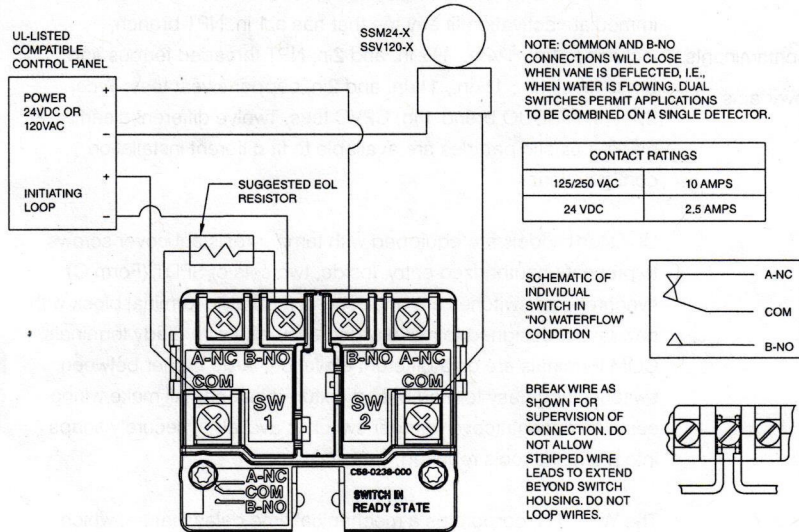
## Engineering Specifications

Model shall be WFDTN or WFDTNRN as manufactured by System Sensor. T-Tap waterflow detectors shall be installed on a tee that has a 1in. NPT branch including: 1in., 1¼in., 1½in. and 2in. NPT threaded ferrous and brass tee; 1in., 1¼in., 1½in. and 2in. copper sweat tees; Tyco, Spears, NIBBCO brand 1in. CPVC tees as designed on the drawing and /or as specified herein. Detectors shall mount on any clear pipe span of the appropriate nominal size, either a vertical upflow or horizontal run at least 6" from any fittings or valves that may change water direction, flow rate, or pipe diameter or no closer than 24in. from a valve or drain. Detectors shall have a sensitivity in the range of 4 to 10 gallons per minute and a static pressure rating of 375 psi. The WFDTN detector with incorporated time delay mechanism shall respond to waterflow in the specified direction after a preset time delay that is field adjustable. The delay mechanism shall be a sealed mechanical pneumatic unit with visual and audible indication of actuation. The actuation mechanism shall include a ethylene vinyl acetate vane inserted through a hole in the pipe and connected by a mechanical linkage to the delay mechanism. Outputs shall consist of dual SPDT switches (Form C contacts). Two conduit entrances for standard fittings of commonly used electrical conduit shall be provided on the detectors. A grounding provision is provided. Unless noted, enclosures shall be NEMA 4 listed by Underwriters Laboratories Inc. All detectors shall be listed by Underwriters Laboratories Inc. for indoor or outdoor use.

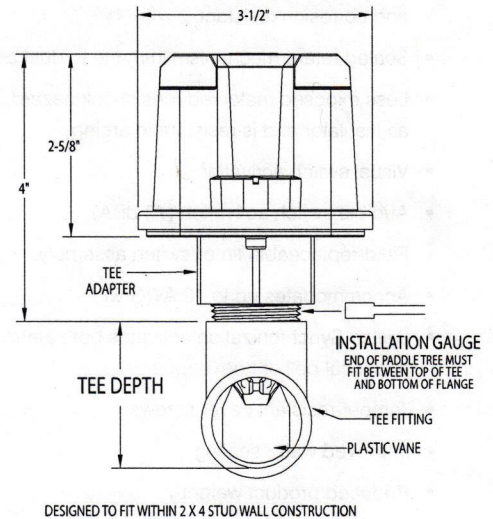
## Standard Specifications

<b>Static Pressure Rating</b>	375 PSI	<b>Operating Temperature Range</b>	32°F to 150°F (0°C to 60°C)
<b>Maximum Surge</b>	18 Feet Per Second (FPS)	<b>Enclosure Rating*</b>	NEMA 4 – suitable for indoor/outdoor use
<b>Triggering Threshold Bandwidth (Flow Rate)</b>	4-10 GPM	<b>Cover Tamper Switch</b>	Standard with ULC models, optional for UL models, part no. CTS
<b>Conduit Entrances</b>	Two openings for ½in. conduit. NEMA 4 rated plugs	<b>Service Use</b>	Automatic Sprinkler: NFPA-13 One or Two Family Dwelling: NFPA 13D Residential Occupancies up to 4 Stories: NFPA 13R National Fire Alarm Code: NFPA-72
<b>Contact Ratings</b>	Two sets of SPDT (Form C) 10.0 A, ½ HP @ 125/250 VAC 2.5 A @ 6/12/24 VDC	<b>U.S. Patent Numbers</b>	5,213,205
<b>Compatible Tee Fittings</b>	Threaded ferrous and brass tees, copper sweat tees, CPVC tees.	<b>Warranty</b>	3 Years

## WFDTN Field Wiring Diagram



## Overall Dimensions, Installed



## Ordering Information

UL Model	ULC Model	Description
WFDTN	WFDTNA	Waterflow Detector, Fits 1in., 1¼in., 1½in., 2in. ferrous and brass threaded tees; 1in., 1¼in., 1½in., 2in. copper sweat tees; 1in. CPVC tees.
WFDTNRN	—	Waterflow Detector without incorporated time delay mechanism, fits same tees as WFDTN

## Accessories

FS-RT	Delay mechanism and switch assembly
CTS	Tamper-proof switch kit
WFDW	Tamper-proof wrench for cover



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Product specifications are subject to change without notice. Visit [www.systemsensor.com](http://www.systemsensor.com) for current product information, including the latest version of this data sheet.  
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