

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

### General Description

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

The recessed version of the Series TY-FRB Pendent Sprinkler, where applicable, is intended for use in areas with a finished ceiling. It uses either a two-piece Style 10 (1/2 inch NPT) or Style 40 (3/4 inch NPT) Recessed Escutcheon with 1/2 inch (12,7 mm) of recessed adjustment or up to 3/4 inch (19,1 mm) of total adjustment from the flush pendent position, or a two-piece Style 20 (1/2 inch NPT) or Style 30 (3/4 inch NPT) Recessed Escutcheon with 1/4 inch (6,4 mm) of recessed adjustment or up to 1/2 inch (12,7 mm) of total adjustment from the flush pendent position. The adjustment provided by the Recessed Escutcheon reduces the accuracy to which the fixed pipe drops to the sprinklers must be cut.

Corrosion resistant coatings, where applicable, are utilized to extend the life of copper alloy sprinklers beyond that which would otherwise be obtained when exposed to corrosive at-

#### 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.

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

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

#### WARNINGS

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

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

### Model/Sprinkler Identification Numbers

TY1131 - Upright 2.8K, 1/2" NPT  
TY1231 - Pendent 2.8K, 1/2" NPT  
TY2131 - Upright 4.2K, 1/2" NPT  
TY2231 - Pendent 4.2K, 1/2" NPT  
TY3131 - Upright 5.6K, 1/2" NPT



TY3231 - Pendent 5.6K, 1/2" NPT  
TY4131 - Upright 8.0K, 3/4" NPT  
TY4231 - Pendent 8.0K, 3/4" NPT

### Technical Data

#### Approvals

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

#### Maximum Working Pressure

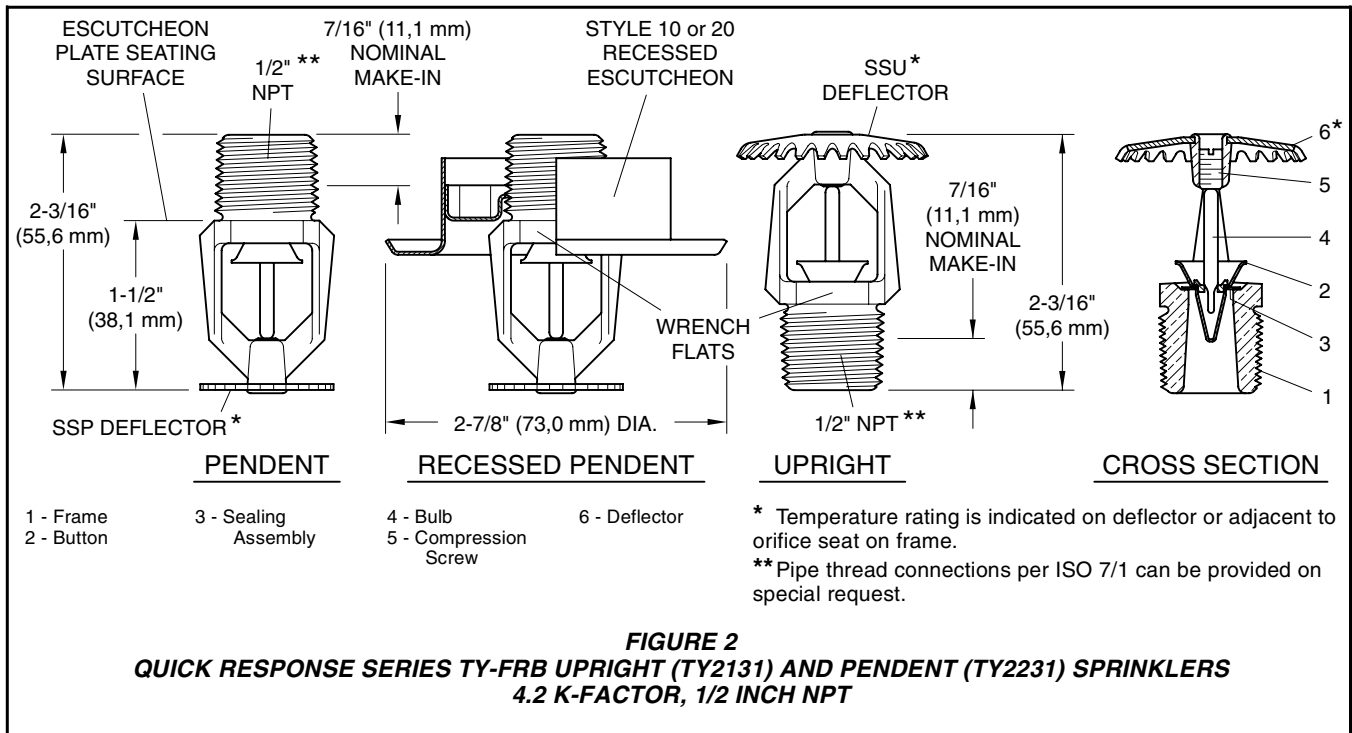
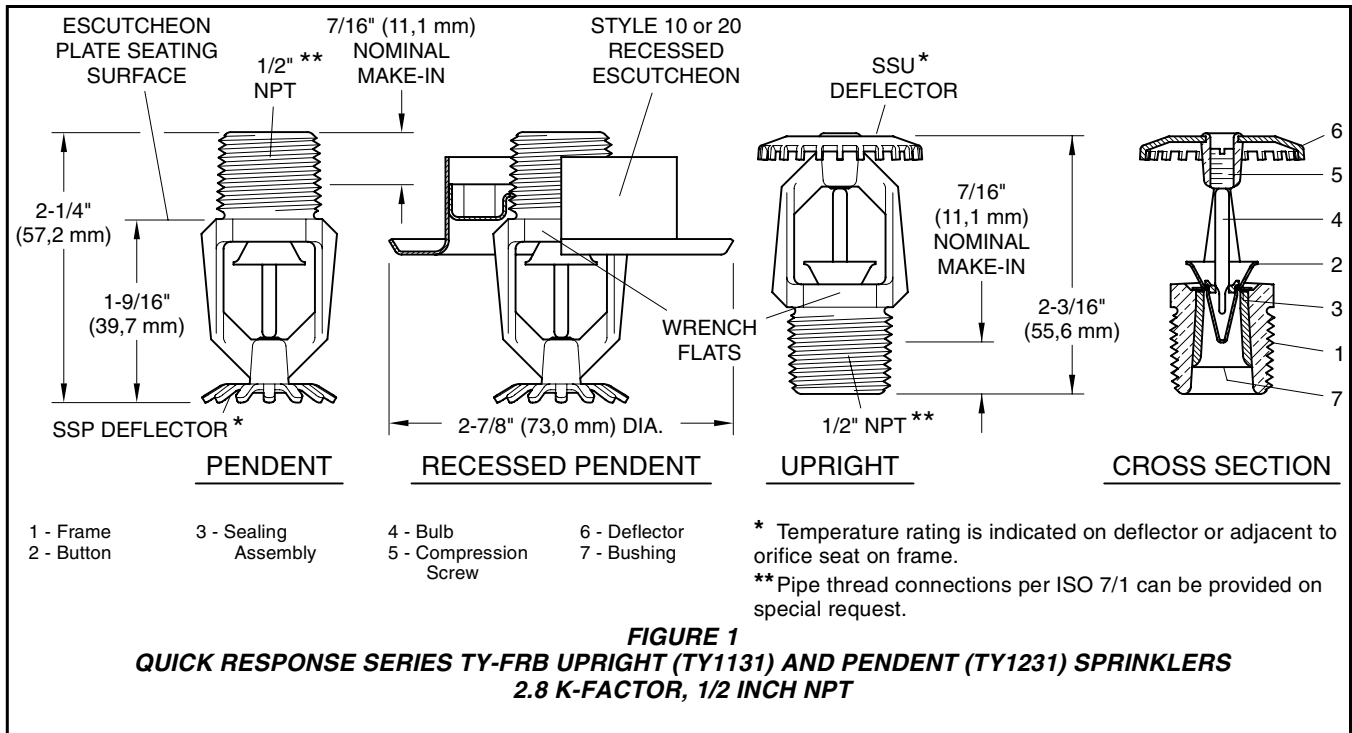
175 psi (12,1 bar)

#### Discharge Coefficient

K = 2.8 GPM/psi<sup>1/2</sup> (40,3 LPM/bar<sup>1/2</sup>)  
K = 4.2 GPM/psi<sup>1/2</sup> (60,5 LPM/bar<sup>1/2</sup>)  
K = 5.6 GPM/psi<sup>1/2</sup> (80,6 LPM/bar<sup>1/2</sup>)  
K = 8.0 GPM/psi<sup>1/2</sup> (115,2 LPM/bar<sup>1/2</sup>)

#### Temperature Ratings

Refer to Table A and B



**Finishes**

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

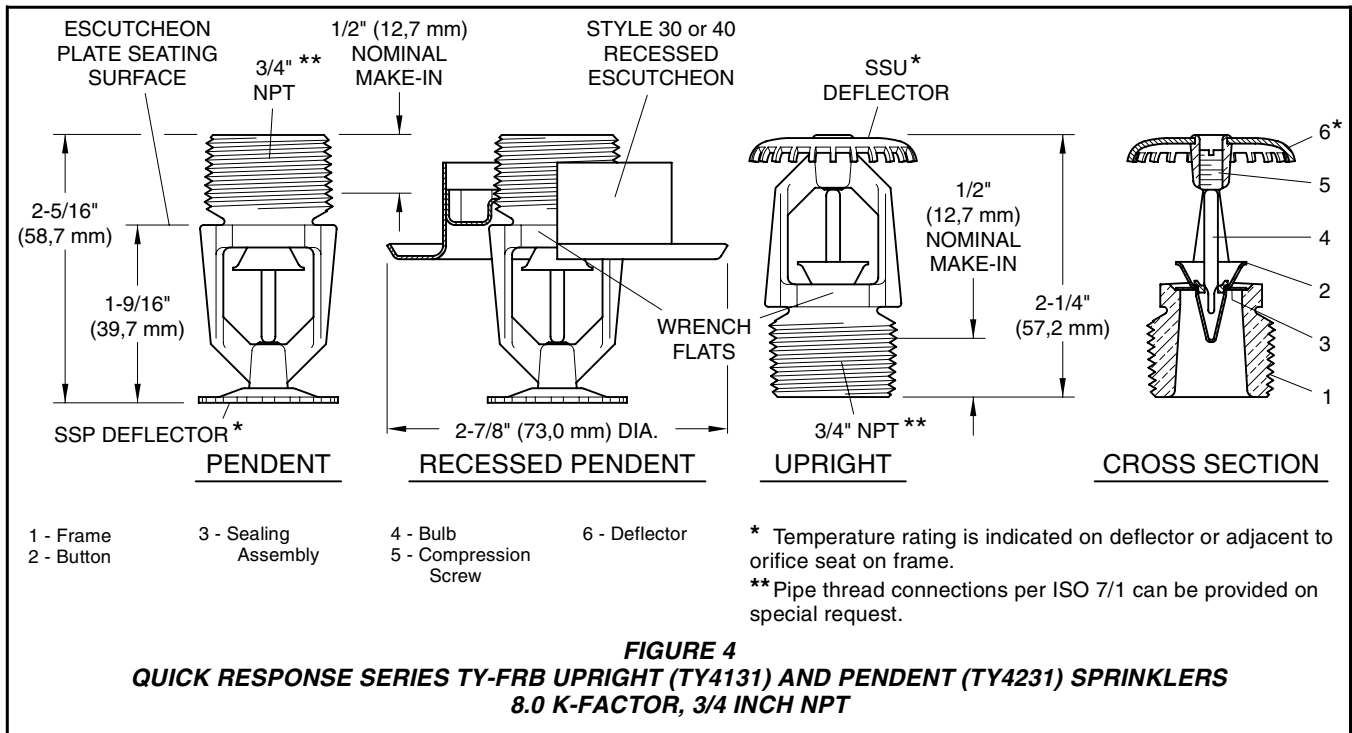
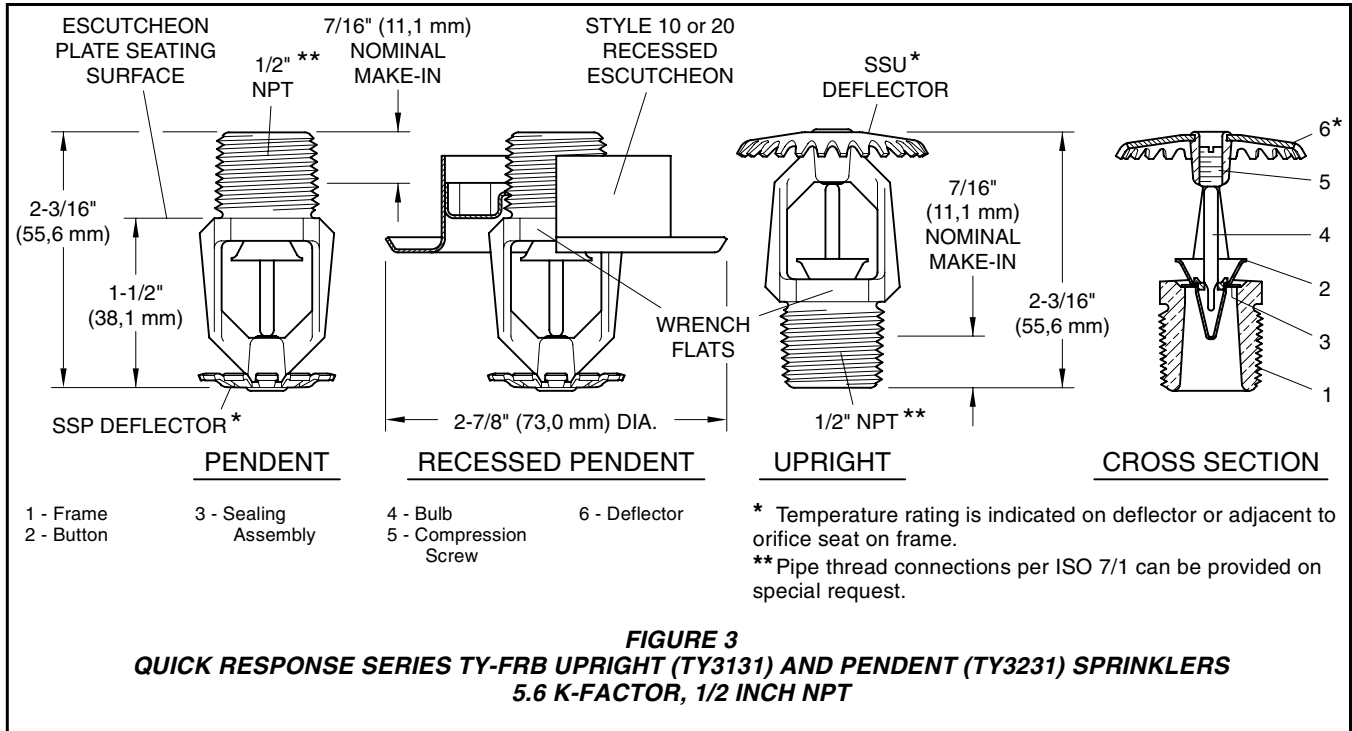
Bulb . . . . . Glass  
 Compression Screw . . . . . Bronze  
 Deflector . . . . . Copper/Bronze  
 Bushing (K=2.8) . . . . . Bronze

**Physical Characteristics**

Frame . . . . . Bronze  
 Button . . . . . Brass/Copper  
 Sealing Assembly . . . . .  
 . . . . . Beryllium Nickel w/Teflon†

**Operation**

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



## Design Criteria

The Series TY-FRB Pendant and Upright Sprinklers are intended for fire protection systems designed in accordance with the standard installation rules recognized by the applicable Listing or Approval agency (e.g., UL

Listing is based on the requirements of NFPA 13, and FM Approval is based on the requirements of FM's Loss Prevention Data Sheets). Only the Style 10, 20, 30, or 40 Recessed Escutcheon, as applicable, is to be used for recessed pendent installations.

## Installation

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

### NOTES

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

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

**NOTES:**

- Listed by Underwriters Laboratories, Inc. (UL) as Quick Response Sprinklers.
  - Listed by Underwriters Laboratories, Inc. for use in Canada (C-UL) as Quick Response Sprinklers.
  - Approved by Factory Mutual Research Corporation (FM) as Quick Response Sprinklers.
  - Approved by the City of New York under MEA 354-01-E.
  - Where Polyester Coated Sprinklers are noted to be UL and C-UL Listed, the sprinklers are UL and C-UL Listed as Corrosion Resistant Sprinklers.
  - \* Installed with Style 10 (1/2" NPT) or Style 40 (3/4" NPT) 3/4" Total Adjustment Recessed Escutcheon, as applicable.
  - \*\* Installed with Style 20 (1/2" NPT) or Style 30 (3/4" NPT) 1/2" Total Adjustment Recessed Escutcheon, as applicable.
  - \*\*\* Frame and Deflector only. Listings and approvals apply to color (Special Order).
- N/A: Not Available

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

inch NPT sprinkler joint should be obtained with a torque of 10 to 20 ft.lbs. (13,4 to 26,8 Nm). A maximum of 30 ft.lbs. (40,7 Nm) of torque is to be used to install sprinklers with 3/4 NPT connections. Higher levels of torque may distort the sprinkler inlet and cause leakage or impairment of the sprinkler.

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

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

**Step 1.** Pendent sprinklers are to be installed in the pendent position, and upright sprinklers are to be installed 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 (Ref. Figure 13). With reference to Figures 1, 2, 3, and 4, the W-Type 6 Sprinkler Wrench is to be applied to the sprinkler wrench flats.

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

**Step A.** After installing the Style 10, 20, 30, or 40 Mounting Plate, as applicable, over the sprinkler threads and with pipe thread sealant applied to the pipe threads, hand tighten the sprinkler into the sprinkler fitting.

**Step B.** Tighten the sprinkler into the sprinkler fitting using only the W-Type 7 Recessed Sprinkler Wrench (Ref. Figure 14). With reference to Figure 1, 2, 3, and 4, the W-Type 7 Recessed Sprinkler Wrench is to be applied to the sprinkler wrench flats.

**Step C.** After the ceiling has been installed or the finish coat has been applied, slide on the Style 10, 20, 30, or 40 Closure over the Series TY-FRB Sprinkler and push the Closure over the Mounting Plate until its flange comes in contact with the ceiling.

held horizontally, a small air bubble should be present. The diameter of the air bubble is approximately 1/16 inch (1,6 mm) for the 135°F/57°C to 3/32 inch (2,4 mm) for the 286°F/141°C temperature ratings.

A leak tight 1/2 inch NPT sprinkler joint should be obtained with a torque of 7 to 14 ft.lbs. (9,5 to 19,0 Nm). A maximum of 21 ft. lbs. (28,5 Nm) of torque may be used to install sprinklers with 1/2 NPT connections. A leak tight 3/4

K	TYPE	TEMP.	BULB LIQUID	SPRINKLER FINISH (See Note 8)			
				NATURAL BRASS	CHROME PLATED	WHITE***	LEAD COATED
5.6 1/2" NPT	PENDENT (TY3231) and UPRIGHT (TY3131)	135°F/57°C	Orange	1, 2, 3, 4, 5, 6, 7			1, 2, 3, 5
		155°F/68°C	Red				
		175°F/79°C	Yellow				
		200°F/93°C	Green				
		286°F/141°C	Blue				
	RECESSED PENDENT (TY3231)* Figure 9	135°F/57°C	Orange	1, 2, 4, 5			N/A
		155°F/68°C	Red				
		175°F/79°C	Yellow				
		200°F/93°C	Green				
	RECESSED PENDENT (TY3231)** Figure 10	135°F/57°C	Orange	1, 2, 3, 4, 5		1, 2, 4, 5	N/A
		155°F/68°C	Red				
		175°F/79°C	Yellow				
200°F/93°C		Green					
8.0 3/4" NPT	PENDENT (TY4231) and UPRIGHT (TY4131)	135°F/57°C	Orange	1, 2, 3, 4, 5, 6, 7			1, 2, 5
		155°F/68°C	Red				
		175°F/79°C	Yellow				
		200°F/93°C	Green				
		286°F/141°C	Blue				
	RECESSED PENDENT (TY4231)* Figure 11	135°F/57°C	Green	1, 2, 4, 5			N/A
		155°F/68°C	Orange				
		175°F/79°C	Red				
		200°F/93°C	Yellow				
	RECESSED PENDENT (TY4231)** Figure 12	135°F/57°C	Orange	1, 2, 3, 4, 5			N/A
		155°F/68°C	Red				
		175°F/79°C	Yellow				
200°F/93°C		Green					

**NOTES:**

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

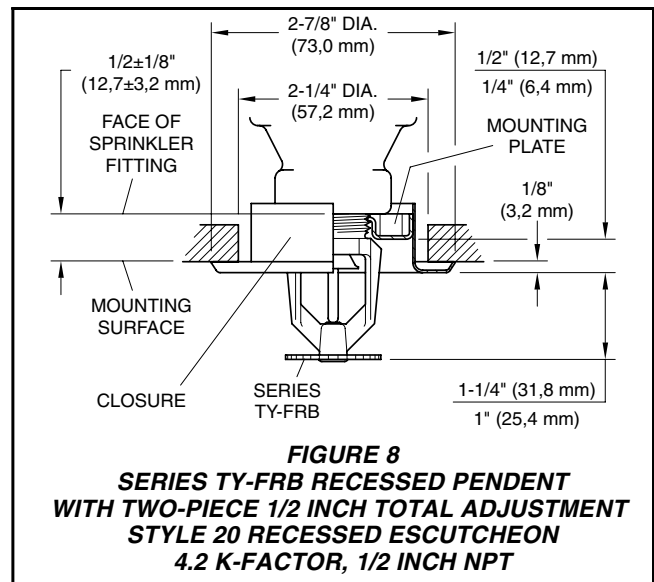
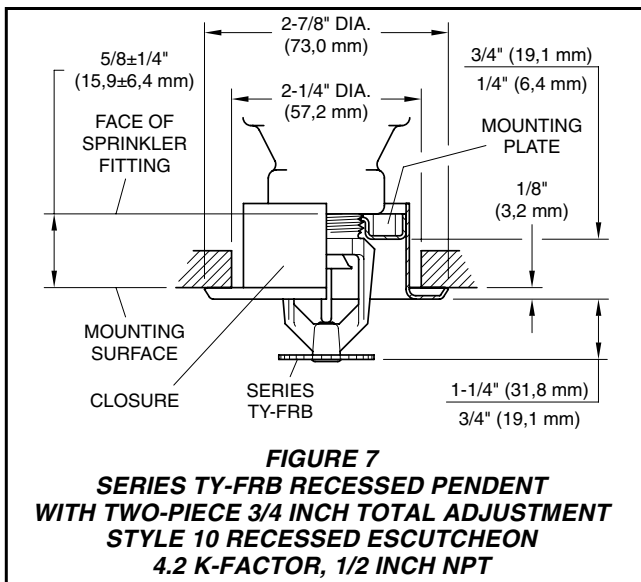
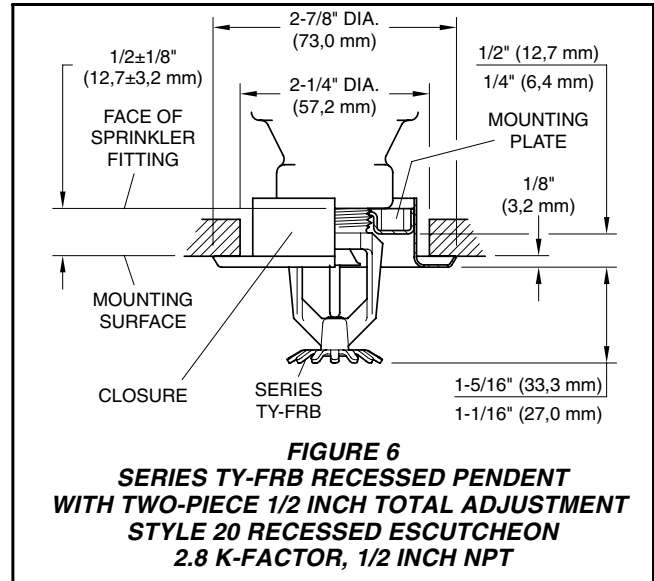
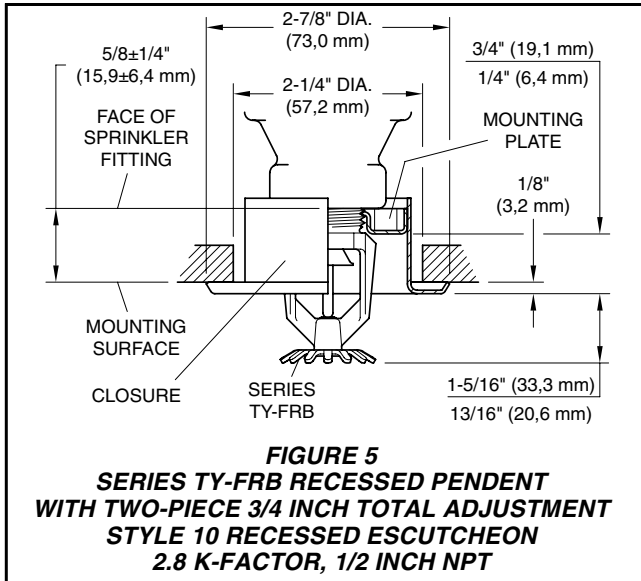
\* Installed with Style 10 (1/2" NPT) or Style 40 (3/4" NPT) 3/4" Total Adjustment Recessed Escutcheon, as applicable.

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

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

N/A: Not Available

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



## Care and Maintenance

The Series TY-FRB Sprinklers must be maintained and serviced in accordance with the following instructions:

### NOTES

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

*Absence of an escutcheon, which is*

*used to cover a clearance hole, may delay the time to sprinkler operation in a fire situation.*

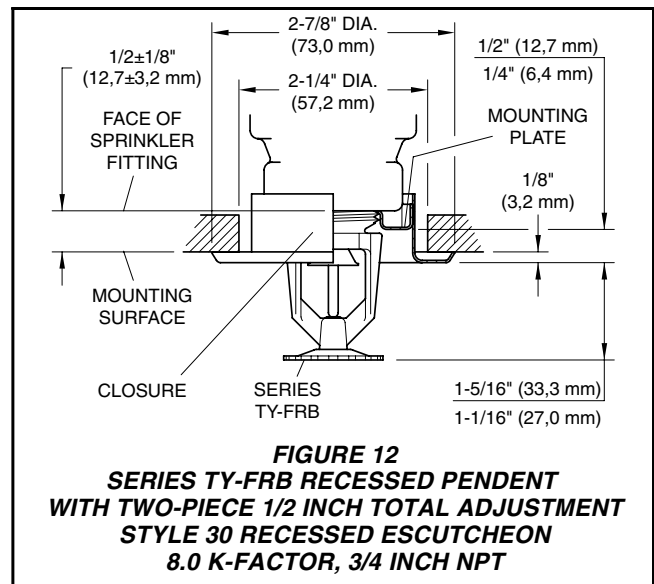
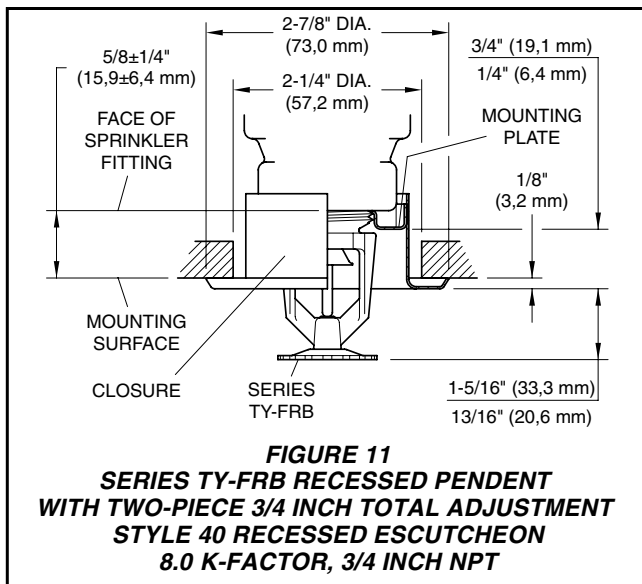
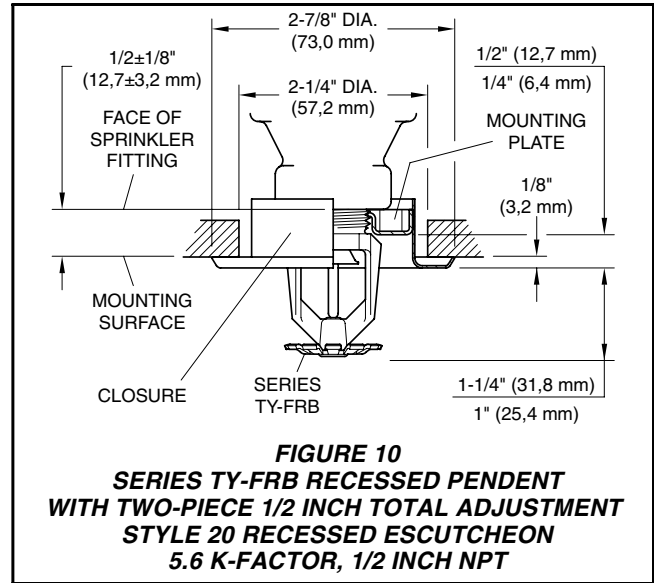
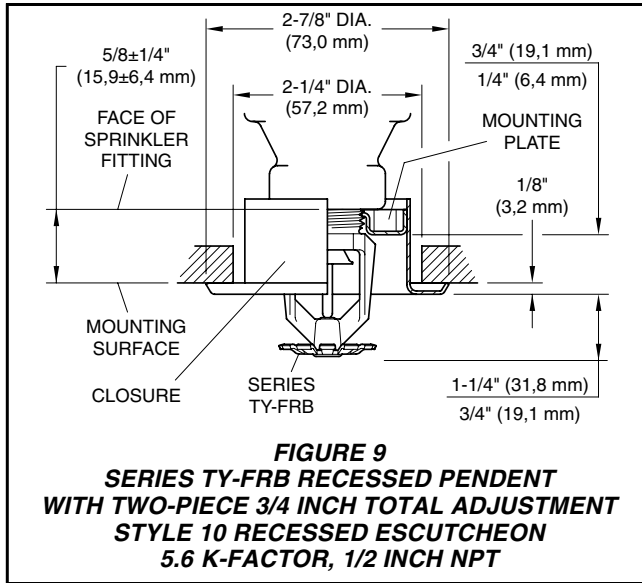
Sprinklers that are found to be leaking or exhibiting visible signs of corrosion must be replaced.

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

Care must be exercised to avoid damage to the sprinklers - before, during,

and after installation. 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).

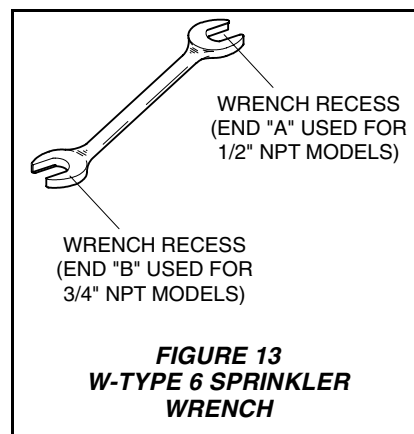
Frequent visual inspections are recommended to be initially performed for corrosion resistant coated sprinklers, after the installation has been completed, to verify the integrity of the corrosion resistant coating. Thereafter, annual inspections per NFPA 25 should suffice; however, instead of inspecting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



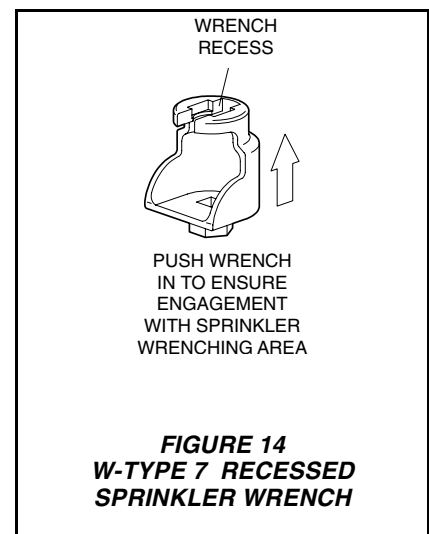
tion and the long term integrity of the corrosion resistant coating, as it may be affected by the corrosive conditions present.

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



P/N 57 — XXX — X — XXX

		MODEL/SIN			TEMPERATURE RATING	
330	2.8K UPRIGHT (1/2"NPT)	TY1131	SPRINKLER		135	135°F/57°C
331	2.8K PENDENT (1/2"NPT)	TY1231			1	NATURAL BRASS
340	4.2K UPRIGHT (1/2"NPT)	TY2131	4	WHITE POLYESTER	175	175°F/79°C
341	4.2K PENDENT (1/2"NPT)	TY2231	3	WHITE (RAL9010)*	200	200°F/93°C
370	5.6K UPRIGHT (1/2"NPT)	TY3131	9	CHROME PLATED	286	286°F/141°C
371	5.6K PENDENT (1/2"NPT)	TY3231	7	LEAD COATED		
390	8.0K UPRIGHT (3/4"NPT)	TY4131				
391	8.0K PENDENT (3/4"NPT)	TY4231				

\* Eastern Hemisphere sales only.

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

## 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 THE-

ORY, 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.**

## Ordering Procedure

Contact your local distributor for availability. Indicate the full product name. Refer to the Price List for complete listing of Part Numbers.

### Sprinkler Assemblies with NPT Thread Connections:

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

### Recessed Escutcheon:

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

1/2" (15 mm) Style 10	
Chrome Plated	P/N 56-701-9-010
White Coated	P/N 56-701-4-010
White RAL9010*	P/N 56-701-3-010
Brass Plated	P/N 56-701-2-010
1/2" (15 mm) Style 20	
Chrome Plated	P/N 56-705-9-010
White Coated	P/N 56-705-4-010
White RAL9010*	P/N 56-705-3-010
Brass Plated	P/N 56-705-2-010
3/4" (20 mm) Style 30	
Chrome Plated	P/N 56-705-9-011
White Coated	P/N 56-705-4-011
White RAL9010*	P/N 56-705-3-011
Brass Plated	P/N 56-705-2-011
3/4" (20 mm) Style 40	
Chrome Plated	P/N 56-700-9-010
White Coated	P/N 56-700-4-010
White RAL9010*	P/N 56-700-3-010
Brass Plated	P/N 56-700-2-010

\* Eastern Hemisphere sales only.

### 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.