

tyco Fire Suppression & Building Products

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www.tyco-fire.com

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

General Description

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

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

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

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

IMPORTANT

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

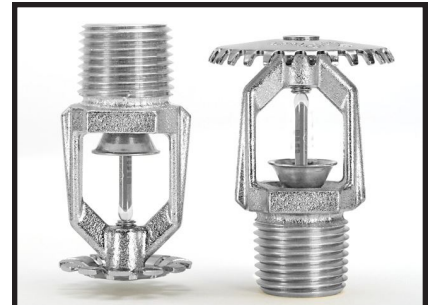
Corrosion-resistant coatings, where applicable, are utilized to extend the life of copper alloy sprinklers beyond that which would otherwise be obtained when exposed to corrosive atmospheres. Although corrosion-resistant coated sprinklers have passed the standard corrosion tests of the applicable approval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

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

NOTICE

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

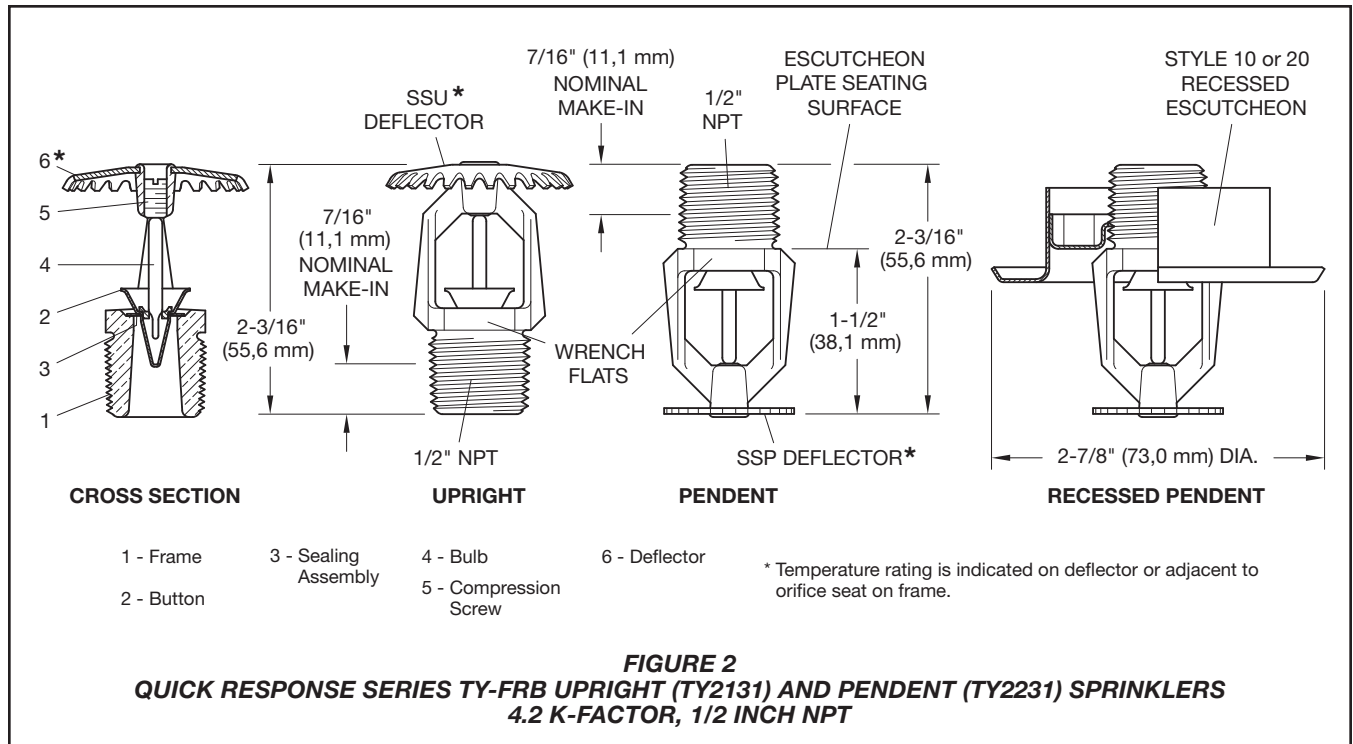
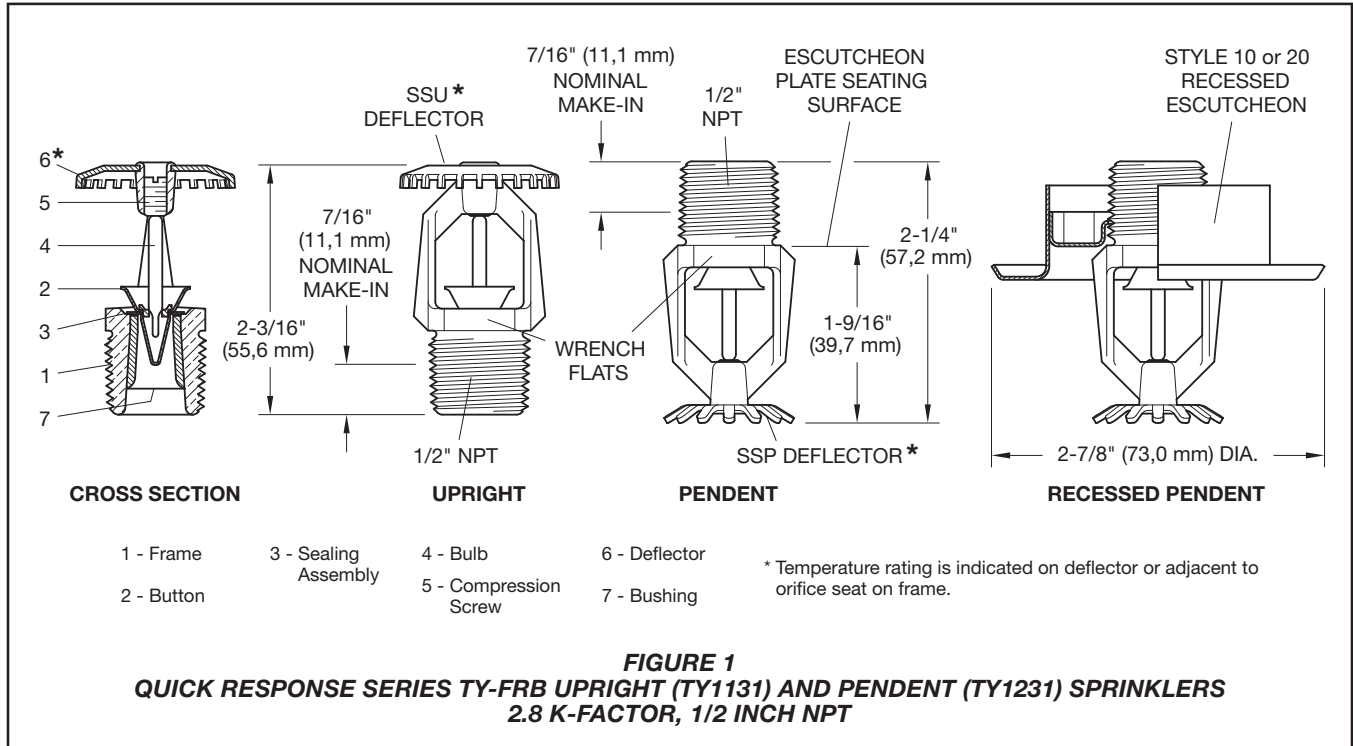
Owners are responsible for maintaining their fire protection system and devices in proper operating condition. The installing contractor or sprinkler manufacturer should be contacted with any questions.

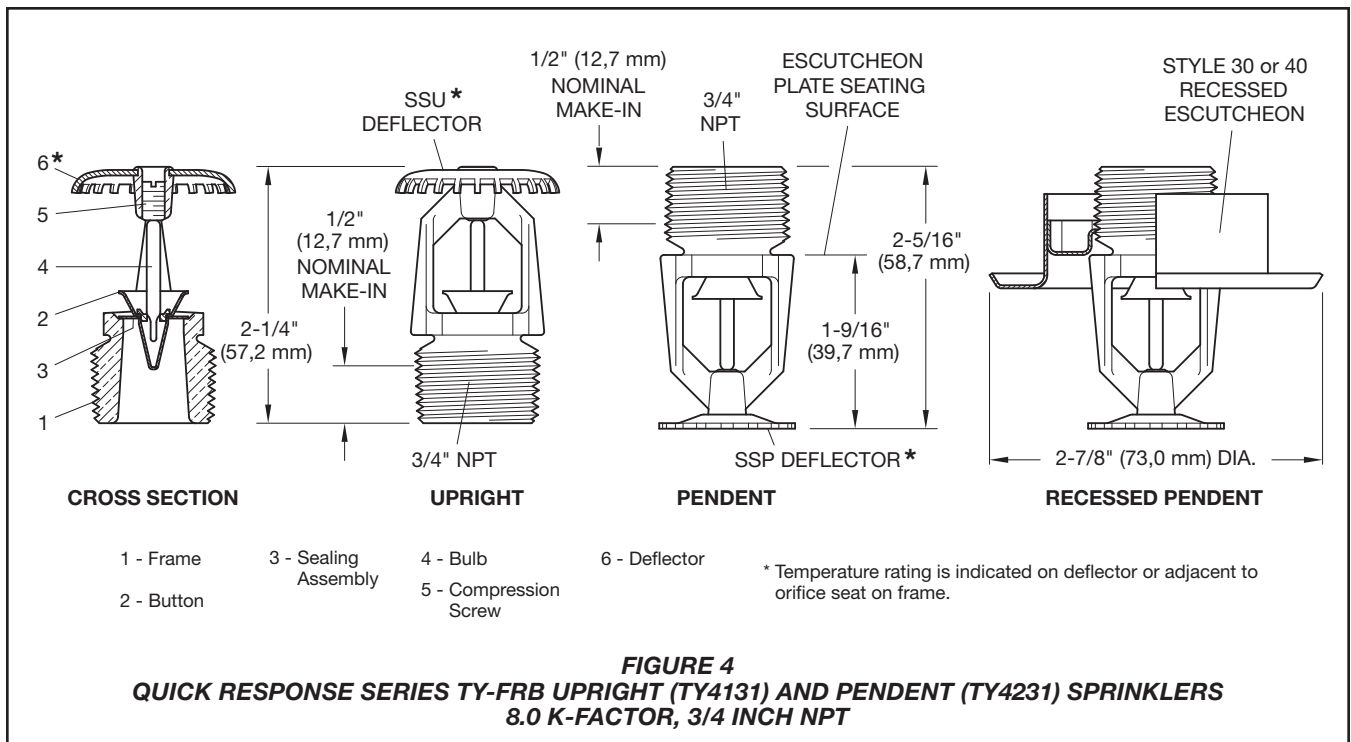
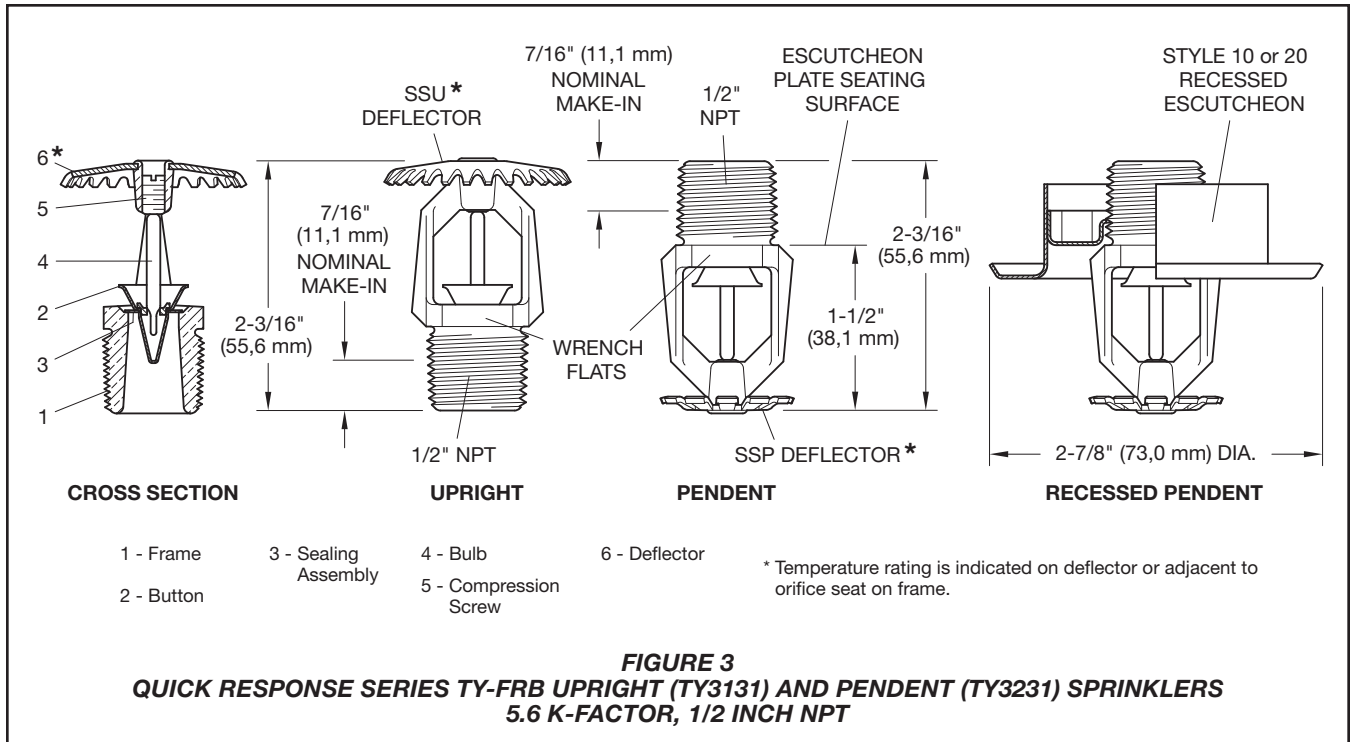


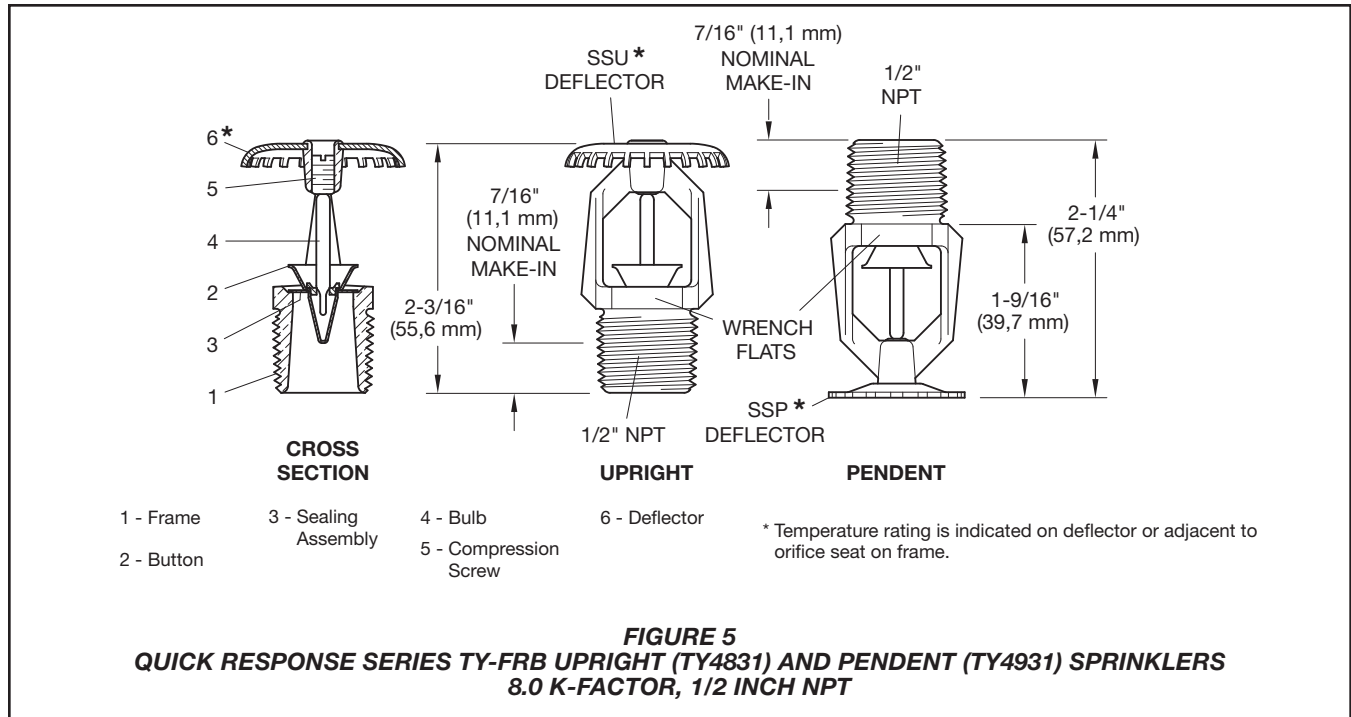
Model/Sprinkler Identification Number (SIN)

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

*Eastern Hemisphere Sales Only







Technical Data

Approvals

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

Maximum Working Pressure

Refer to Table C.

Discharge Coefficient

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

Temperature Rating

Refer to Table A and B.

Finishes

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

Physical Characteristics

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

Operation

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

Design Criteria

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

Installation

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

NOTICE

Do not install any bulb-type sprinkler if the bulb is cracked or there is a loss of liquid from the bulb. With the sprinkler held horizontally, a small air bubble should be present. The diameter of the air bubble is approximately 1/16

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

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

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

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

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

† Registered Trademark of Dupont

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

NOTES:

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

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

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

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

N/A: Not Available

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

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

NOTES:

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

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

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

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

N/A: Not Available

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

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

NOTES:

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

TABLE C
MAXIMUM WORKING PRESSURE

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

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

Care and Maintenance

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

NOTICE

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

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

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

Replace sprinklers that:

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

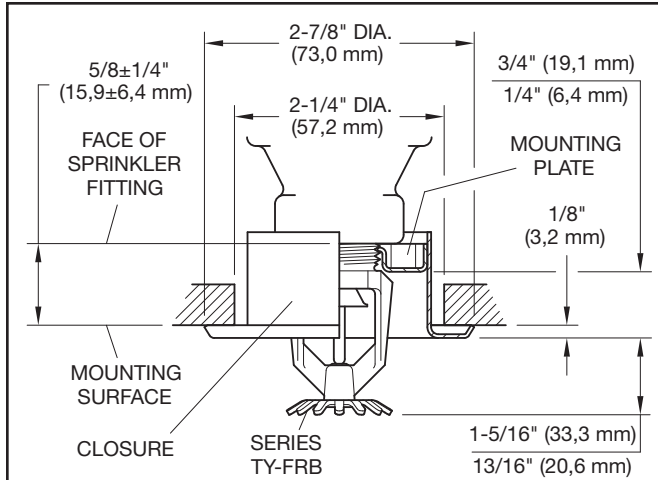


FIGURE 6
SERIES TY-FRB RECESSED PENDENT
WITH TWO-PIECE 3/4 INCH TOTAL ADJUSTMENT
STYLE 10 RECESSED ESCUTCHEON
2.8 K-FACTOR, 1/2 INCH NPT

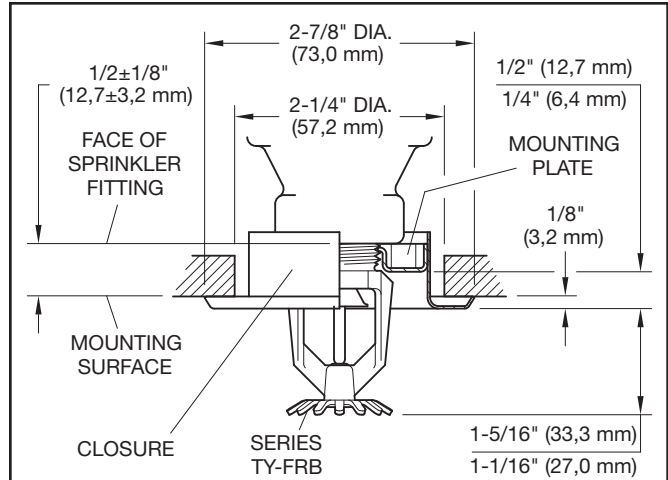


FIGURE 7
SERIES TY-FRB RECESSED PENDENT
WITH TWO-PIECE 1/2 INCH TOTAL ADJUSTMENT
STYLE 20 RECESSED ESCUTCHEON
2.8 K-FACTOR, 1/2 INCH NPT

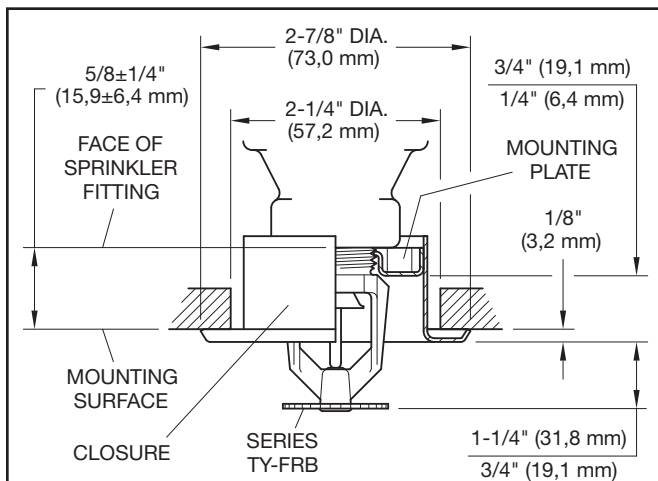


FIGURE 8
SERIES TY-FRB RECESSED PENDENT
WITH TWO-PIECE 3/4 INCH TOTAL ADJUSTMENT
STYLE 10 RECESSED ESCUTCHEON
4.2 K-FACTOR, 1/2 INCH NPT

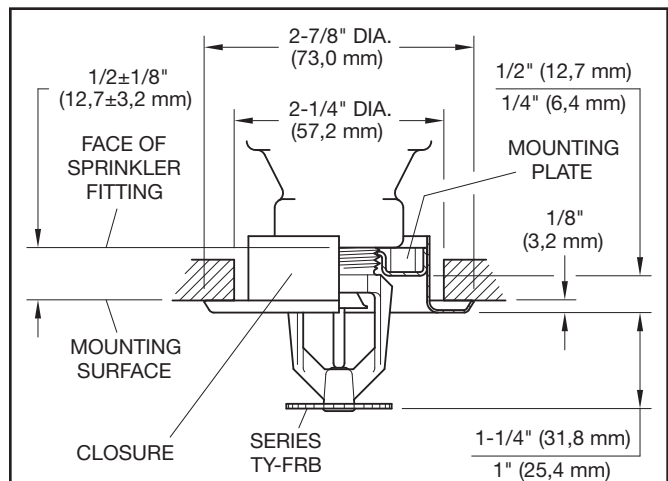


FIGURE 9
SERIES TY-FRB RECESSED PENDENT
WITH TWO-PIECE 1/2 INCH TOTAL ADJUSTMENT
STYLE 20 RECESSED ESCUTCHEON
4.2 K-FACTOR, 1/2 INCH NPT

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

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

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

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

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

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

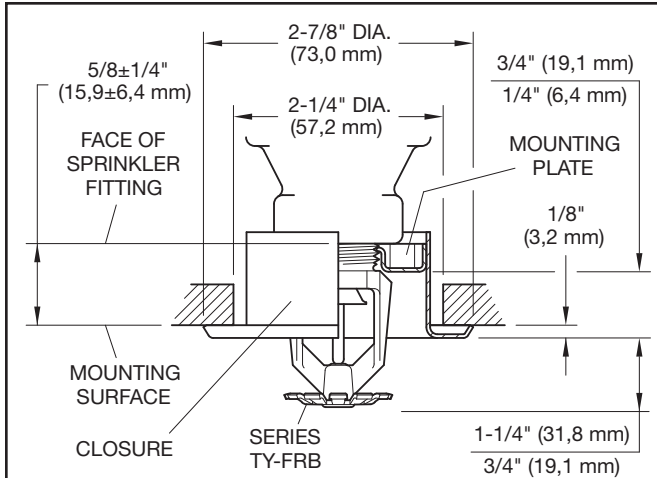


FIGURE 10
SERIES TY-FRB RECESSED PENDENT
WITH TWO-PIECE 3/4 INCH TOTAL ADJUSTMENT
STYLE 10 RECESSED ESCUTCHEON
5.6 K-FACTOR, 1/2 INCH NPT

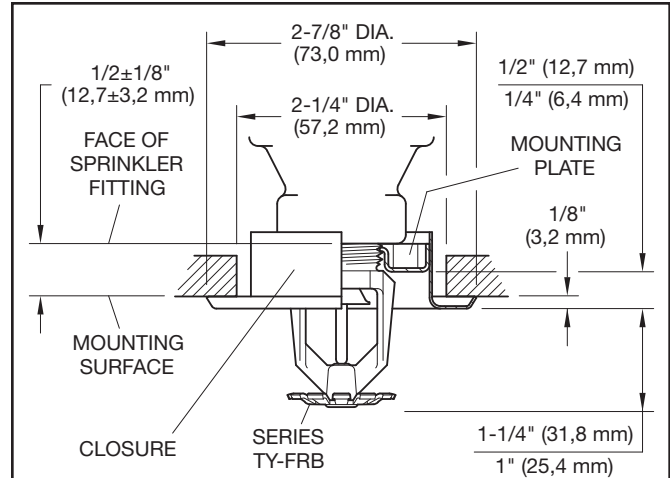


FIGURE 11
SERIES TY-FRB RECESSED PENDENT
WITH TWO-PIECE 1/2 INCH TOTAL ADJUSTMENT
STYLE 20 RECESSED ESCUTCHEON
5.6 K-FACTOR, 1/2 INCH NPT

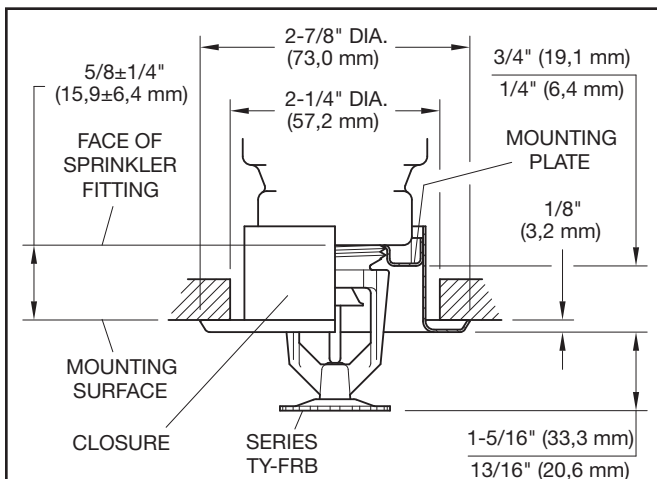


FIGURE 12
SERIES TY-FRB RECESSED PENDENT
WITH TWO-PIECE 3/4 INCH TOTAL ADJUSTMENT
STYLE 40 RECESSED ESCUTCHEON
8.0 K-FACTOR, 3/4 INCH NPT

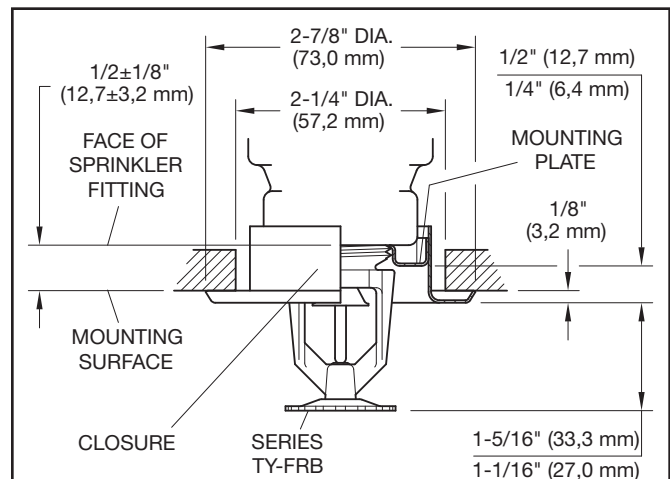


FIGURE 13
SERIES TY-FRB RECESSED PENDENT
WITH TWO-PIECE 1/2 INCH TOTAL ADJUSTMENT
STYLE 30 RECESSED ESCUTCHEON
8.0 K-FACTOR, 3/4 INCH NPT

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

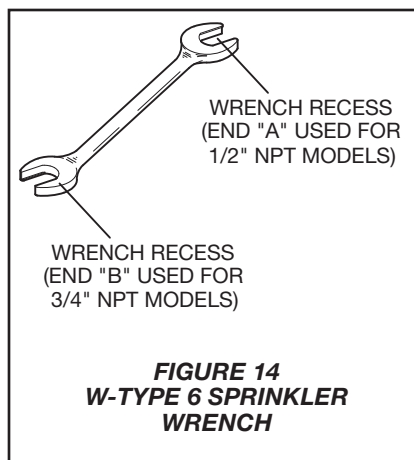


FIGURE 14
W-TYPE 6 SPRINKLER WRENCH

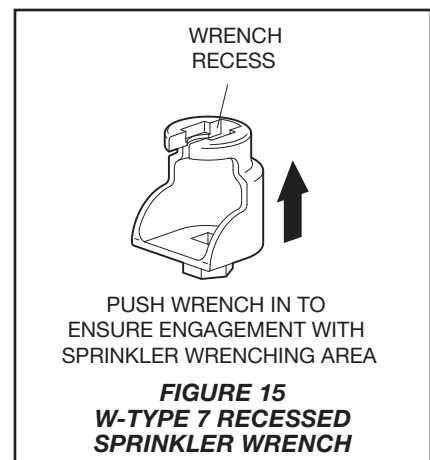


FIGURE 15
W-TYPE 7 RECESSED SPRINKLER WRENCH

P/N 57 - XXX - X - XXX

MODEL/SIN			SPRINKLER FINISH		TEMPERATURE RATINGS	
330	2.8K UPRIGHT (1/2"NPT)	TY1131	1	NATURAL BRASS	135	135°F (57°C)
331	2.8K PENDENT (1/2"NPT)	TY1231	4	WHITE POLYESTER	155	155°F (68°C)
340	4.2K UPRIGHT (1/2"NPT)	TY2131	3	WHITE (RAL9010)*	175	175°F (79°C)
341	4.2K PENDENT (1/2"NPT)	TY2231	9	CHROME PLATED	200	200°F (93°C)
370	5.6K UPRIGHT (1/2"NPT)	TY3131	7	LEAD COATED	286	286°F (141°C)
371	5.6K PENDENT (1/2"NPT)	TY3231	K80快反应下喷头 (镀铬) Part No. : 57-371-9-286			
390	8.0K UPRIGHT (3/4"NPT)	TY4131				
391	8.0K PENDENT (3/4"NPT)	TY4231				
360	8.0K UPRIGHT (1/2"NPT)	TY4831*				
361	8.0K PENDENT (1/2"NPT)	TY4931*				

* Eastern Hemisphere sales only.

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

Limited Warranty

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

responsible for sprinkler system design errors or inaccurate or incomplete information supplied by Buyer or Buyer's representatives.

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

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

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

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

Ordering Procedure

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

Sprinkler Assemblies with NPT Thread Connections

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

Recessed Escutcheon:

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

Sprinkler Wrench

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

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

* Refer to Technical Data Sheet TFP770.