

## Series TY-FRB — 5.6 and 8.0 K-factor Upright and Pendent Intermediate Level Sprinklers Quick Response

### General Description

The Series TY-FRB, 5.6 and 8.0 K-factor Upright and Pendent Intermediate Level Sprinklers described in this data sheet are automatic sprinklers of the "quick response" 3 mm frangible bulb type. They are "standard spray" sprinklers intended for use in fire sprinkler systems designed in accordance with the standard installation rules recognized by the applicable Listing or Approval agency (e.g., UL Listing is based on NFPA requirements). Both the Pendent and Upright Sprinklers produce a hemispherical water distribution pattern below the deflector.

Intermediate Level Sprinklers are primarily designed for use in rack storage sprinkler systems where their thermally sensitive elements must be shielded from the water spray of higher elevation sprinklers that could operate earlier during a fire. Intermediate Level Sprinklers are also used in other applications such as beneath open gridded catwalks.

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.

#### 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

TY3133 -	Upright	5.6K, 1/2" NPT
TY3231 -	Pendent	5.6K, 1/2" NPT
TY4133 -	Upright	8.0K, 3/4" NPT
TY4231 -	Pendent	8.0K, 3/4" NPT



### Technical Data

#### Approvals

UL and C-UL Listed.  
FM 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 = 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

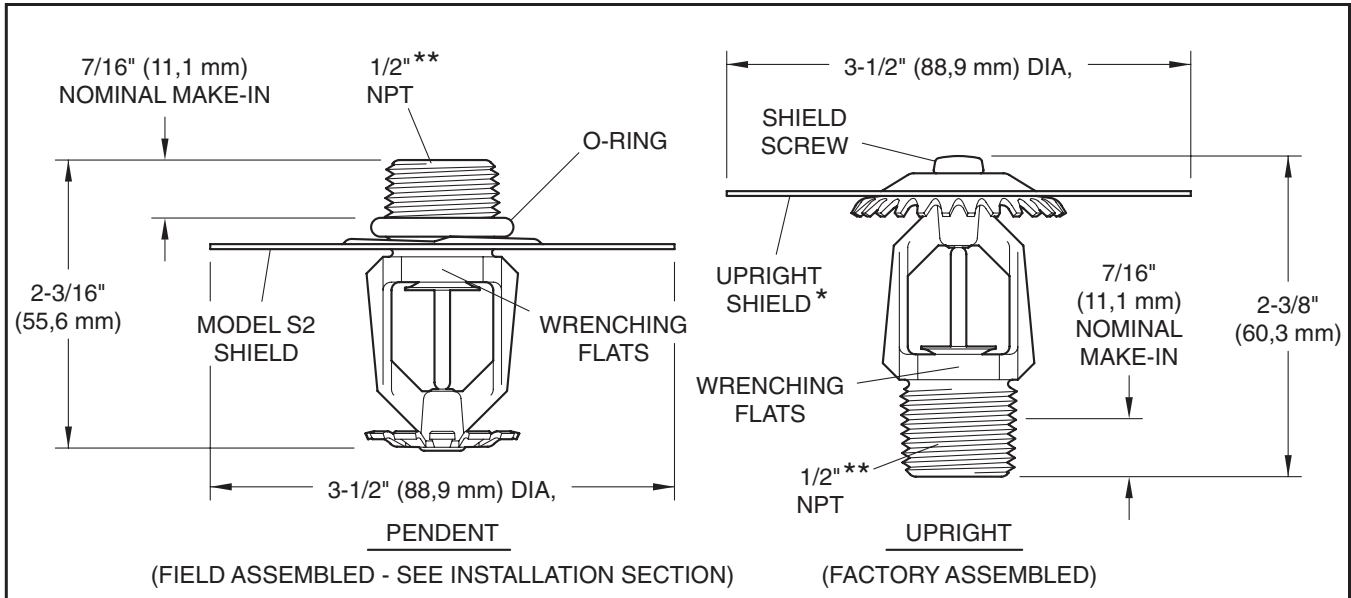
Refer to Table A

#### Finishes

Sprinkler: Refer to Table A

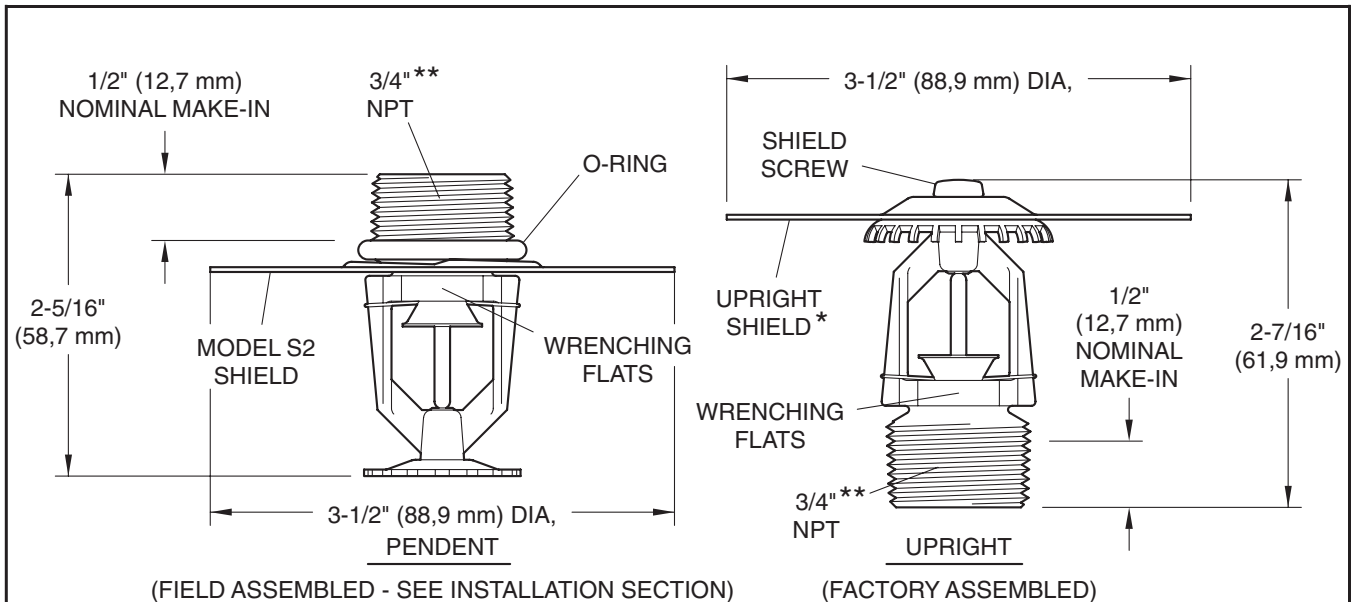
#### IMPORTANT

*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.*



\* Temperature rating is indicated on the deflector, shield, or adjacent to orifice seat on frame.  
 \*\* Pipe thread connections per ISO 7/1 can be provided on special request.

**FIGURE 1**  
**QUICK RESPONSE SERIES TY-FRB UPRIGHT (TY3133) AND PENDENT (TY3231) SPRINKLERS**  
**INTERMEDIATE LEVEL SPRINKLERS, 5.6 K-FACTOR, 1/2 INCH NPT**



\* Temperature rating is indicated on the deflector, shield, or adjacent to orifice seat on frame.  
 \*\* Pipe thread connections per ISO 7/1 can be provided on special request.

**FIGURE 1**  
**QUICK RESPONSE SERIES TY-FRB UPRIGHT (TY4133) AND PENDENT (TY4231) SPRINKLERS**  
**INTERMEDIATE LEVEL SPRINKLERS, 8.0 K-FACTOR, 3/4 INCH NPT**

K	TYPE	TEMP.	BULB LIQUID	SPRINKLER FINISH (See Note 5)	
				NATURAL BRASS***	LEAD COATED
5.6 1/2" NPT	UPRIGHT (TY3133)	135°F/57°C	Orange	1, 2, 3, 4	1, 2, 3, 4
		155°F/68°C	Red		
		175°F/79°C	Yellow		
		200°F/93°C	Green		
		286°F/141°C	Blue		
	PENDENT (TY3231)	135°F/57°C	Orange	1, 2, 3, 4	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	UPRIGHT (TY4133)	135°F/57°C	Orange	1, 2, 3, 4	1, 2, 3, 4
		155°F/68°C	Red		
		175°F/79°C	Yellow		
		200°F/93°C	Green		
		286°F/141°C	Blue		
	PENDENT (TY4231)	135°F/57°C	Orange	1, 2, 3, 4	N/A
		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.
2. Listed by Underwriters Laboratories, Inc. for use in Canada (C-UL) as Quick Response.
3. Approved by Factory Mutual Research Corporation (FM) as Quick Response.
4. Approved by the City of New York under MEA 354-01-E.
5. Where Lead Coated Sprinklers are noted to be UL and C-UL Listed, the sprinklers are UL and C-UL Listed as a Corrosion Resistant Sprinklers. Where Lead Coated Sprinklers are noted to be FM Approved, the sprinklers are FM Approved as a Corrosion Resistant Sprinklers.

\*\*\* With Zinc Plated Shield.

N/A: Not Available

**TABLE A  
LABORATORY LISTINGS AND APPROVALS**

### Physical Characteristics

Frame . . . . .	Bronze
Button . . . . .	Brass/Copper
Sealing Assembly . . . . .	
. . . . .	Beryllium Nickel w/Teflon†
Bulb . . . . .	Glass
Compression Screw . . . . .	Bronze
Deflector . . . . .	Copper
Shield . . . . .	Plated Steel

## 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 Pendent and Upright Intermediate Level 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).

## 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 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 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.*

### — Upright Sprinklers —

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

**Step 1.** With pipe thread sealant applied to the pipe threads, hand tighten the sprinkler into the sprinkler fitting.

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

### — Pendent Sprinklers —

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

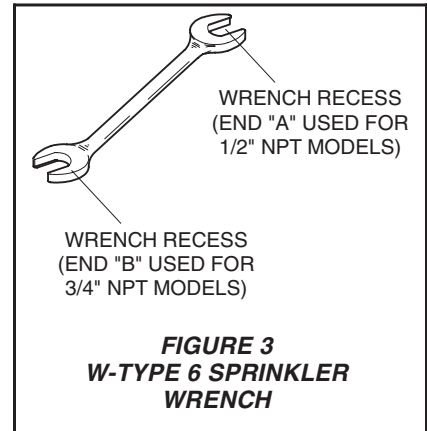
**Step 1.** Thread the S2 Shield onto the sprinkler threads with the stamped markings toward the deflector and just to the end of the threads. The final assembly step is easier to accomplish if the Shield is not disengaged by continuing to turn the Shield past the threads.

**Step 2.** Roll the O-Ring over the sprinkler threads until it seats against the Shield.

**Step 3.** With pipe thread sealant applied to the pipe threads, hand tighten the sprinkler into the sprinkler fitting.

**Step 4.** Tighten the sprinkler into the sprinkler fitting using only the W-Type 6 Sprinkler Wrench (Ref. Figure 3). With reference to Figure 1 or 2, the W-Type 6 Sprinkler Wrench is to be applied to the wrench flats.

**Step 5.** Rotate the S2 Shield clockwise (looking up) so that it slightly compresses the O-Ring between the Shield and sprinkler fitting.



## 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.*

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 in-

specting from the floor level, a random sampling of close-up visual inspections should be made, so as to better determine the exact sprinkler condition and the long term integrity of the corrosion resistant coating, as it may be affected by the corrosive conditions present.

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

### Limited Warranty

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

IN NO EVENT SHALL TYCO FIRE PRODUCTS BE LIABLE, IN CONTRACT, TORT, STRICT LIABILITY OR UNDER ANY OTHER LEGAL THEORY, FOR INCIDENTAL, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES, INCLUDING BUT NOT LIMITED TO LABOR CHARGES, REGARDLESS OF WHETHER TYCO FIRE PRODUCTS WAS INFORMED ABOUT THE POSSIBILITY OF SUCH DAMAGES, AND IN NO EVENT SHALL TYCO FIRE PRODUCTS' LIABILITY EXCEED AN AMOUNT EQUAL TO THE SALES PRICE.

**THE FOREGOING WARRANTY IS MADE IN LIEU OF ANY AND ALL OTHER WARRANTIES EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**

### Ordering Procedure

When placing an order, indicate the full product name. Refer to the Price List for complete listing of Part Numbers.

Contact your local distributor for availability.

#### Upright Sprinkler Assemblies with Shield and NPT Thread Connections:

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

#### Pendent Sprinkler Assemblies with (Shield Ordered Separately) and NPT Thread Connections:

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

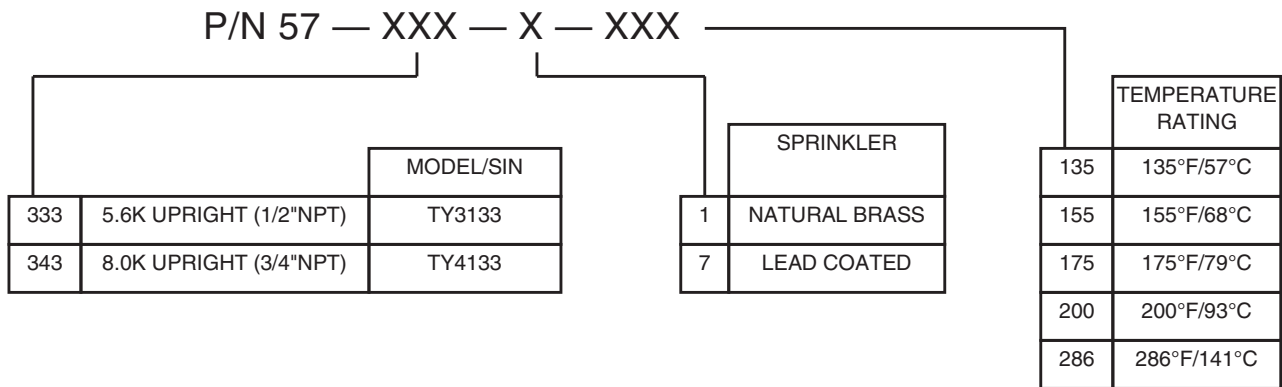
#### Model S2 Pendent Shield & O-Ring:

Specify: S2 Pendent Shield & O-Ring for use with (specify 1/2" NPT or 3/4" NPT) Series TY-B Pendent Sprinklers, P/N (specify).

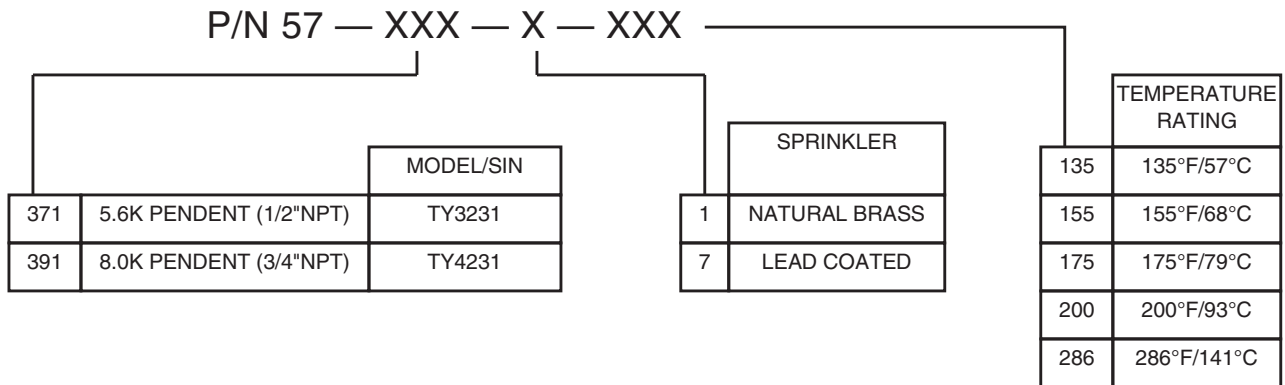
- 1/2" NPT S2  
Pendent Shield  
& O-Ring . . . . . P/N 56-070-9-332
- 3/4" NPT S2  
Pendent Shield  
& O-Ring . . . . . P/N 56-070-9-342

#### Sprinkler Wrench:

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



**TABLE B**  
**PART NUMBER SELECTION**  
**SERIES TY-FRB UPRIGHT INTERMEDIATE LEVEL SPRINKLERS**  
**(UPRIGHT SHIELD INCLUDED WITH SPRINKLER)**



**TABLE C**  
**PART NUMBER SELECTION**  
**SERIES TY-FRB PENDENT SPRINKLERS**  
**(MODEL S2 PENDENT SHIELD & O-RING MUST BE SEPARATELY ORDERED)**