General Description

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

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

- A two-piece Style 10 (1/2 in. NPT) or Style 40 (3/4 in. NPT) Recessed Escutcheon with 1/2 in. (12.7 mm) of recessed adjustment or up to 3/4 in. (19.1 mm) of total adjustment from the flush pendent position.

- A two-piece Style 20 (1/2 in. NPT) or Style 30 (3/4 in. NPT) Recessed Escutcheon with 1/4 in. (6.4 mm) of recessed adjustment or up to 1/2 in. (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 what would 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 version of the Series TY-FRB Pendent Sprinklers is detailed in Technical Data Sheet TFP356. Sprinkler Guards are detailed in Technical Data Sheet TFP780.

NOTICE

The Series TY-FRB 2.8, 4.2, 5.6, and 8.0 K-factor Upright, Pendent, and Recessed 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 (NFPA), in addition to the standards of any authorities having jurisdiction. Failure to do so may impair the performance of these devices.

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

NFPA 13 prohibits installation of 1/2 in. NPT sprinklers with K-factors greater than 5.6 in new construction. They are intended for retrofit in existing sprinkler systems only.

Sprinkler Identification Number (SIN)

TY1131 . . . Upright 2.8K, 1/2 in. NPT
TY1231 . . . Pendent 2.8K, 1/2 in. NPT
TY2131 . . . Upright 4.2K, 1/2 in. NPT
TY2231 . . . Pendent 4.2K, 1/2 in. NPT
TY3131 . . . Upright 5.6K, 1/2 in. NPT
TY3231 . . . Pendent 5.6K, 1/2 in. NPT
TY4131 . . . Upright 8.0K, 1/2 in. NPT
TY4231 . . . Pendent 8.0K, 1/2 in. NPT
TY4831 . . . Upright 8.0K, 1/2 in. NPT
TY4931 . . . Pendent 8.0K, 1/2 in. NPT

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 (40.3 LPM/bar)
K=4.2 GPM/psi (60.5 LPM/bar)
K=5.6 GPM/psi (80.6 LPM/bar)
K=8.0 GPM/psi (113.2 LPM/bar)

Temperature Rating
Refer to Table A and B

Finishes
Sprinkler: Refer to Table D
Recessed Escutcheon: Signal or Pure White, Grey Aluminum, Jet Black, Chrome Plated, or Natural Brass

Physical Characteristics
Frame: Bronze
Button: Brass/Copper
Sealing Assembly: Beryllium Nickel w/TEFLON
Bulb: Glass
Compression Screw: L316 Stainless Steel*
Deflector: Copper/Brass
Sealing Assembly: Gold Plated Beryllium Nickel w/TEFLON

Poly-Stainless Physical Characteristics
Frame: Bronze
Button: L316 Stainless Steel*
Bulb: Glass
Compression Screw: L316 Stainless Steel*
Deflector: Copper/Brass
Sealing Assembly: Gold Plated Beryllium Nickel w/TEFLON

*Type L316 stainless steel (UNS 31603) per ASTM A479/479M or BS EN 1008 WN1.4404.

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 2.8, 4.2, 5.6, and 8.0 K-factor Upright, Pendant, and Recessed Pendant 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 based on the requirements of NFPA 13 and FM Approval based on the requirements of the FM Global Loss Prevention Data Sheets. Use only the style 10, 20, 30, or 40 Recessed Escutcheon, as applicable, for recessed pendant installations.
Installation

The TYCO Series TY-FRB 2.8, 4.2, 5.6, and 8.0 K-factor Upright, Pendent, and Recessed Pendent 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 2/3/16 in. (3.1 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). A leak tight 3/4 in. NPT sprinkler joint should be obtained with a torque of 10 to 20 lb-ft (13.4 to 26.8 N-m). Higher levels of torque can distort the sprinkler inlet and cause leakage or impairment of the sprinkler. Do not attempt to compensate for insufficient adjustment in the escutcheon plate by under- or overtightening the sprinkler. Re-adjust the position of the sprinkler fitting to suit.

Series TY-FRB 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 (Ref. Figure 14). With reference to Figure 1 to Figure 5, apply the W-Type 6 Sprinkler Wrench to the sprinkler wrench flats.

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

Step 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.

Step 2. Tighten the sprinkler into the sprinkler fitting using only the W-Type 7 Recessed Sprinkler Wrench (Ref. Figure 15). With reference to Figure 1 to Figure 4, apply the W-Type 7 Recessed Sprinkler Wrench to the sprinkler wrench flats.

Step 3. After the ceiling is installed or the finish coat is applied, slide on the Style 10, 20, 30, or 40 Closure over the Series TY-FRB Recessed Pendent Sprinkler and push the Closure over the Mounting Plate until its flange comes in contact with the ceiling.
Quick Response Series TY-FRB Upright (TY4131) and Pendent (TY4231) Sprinklers

8.0 K-Factor, 3/4 in. NPT

Quick Response Series TY-FRB Upright (TY4831) and Pendent (TY4931) Sprinklers

8.0 K-Factor, 1/2 in. NPT
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 IN. 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 IN. 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 IN. 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 IN. NPT
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 IN. 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 IN. 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 IN. 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 IN. NPT

FIGURE 14
W-TYPE 6 SPRINKLER WRENCH

FIGURE 15
W-TYPE 7 RECESSED SPRINKLER WRENCH
### TABLE A
**LABORATORY LISTINGS AND APPROVALS FOR 2.8 AND 4.2 K-FACTOR SPRINKLERS**

<table>
<thead>
<tr>
<th>K-Factor</th>
<th>Type</th>
<th>Temperature</th>
<th>Bulb Liquid Color</th>
<th>Natural Brass</th>
<th>Chrome Plated</th>
<th>Polyester</th>
<th>Notes</th>
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<td>1/2 in. NPT</td>
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</table>

**NOTES**
- a. Installed with Style 10 (1/2 in. NPT) or Style 40 (3/4 in. NPT) 3/4 in. Total Adjustment Recessed Escutcheon, as applicable.
- b. Installed with Style 20 (1/2 in. NPT) or Style 30 (3/4 in. NPT) 1/2 in. Total Adjustment Recessed Escutcheon, as applicable.
- c. Frame and Deflector only.
- 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.
<table>
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<tr>
<th>K-Factor</th>
<th>Type</th>
<th>Temperature</th>
<th>Bulb Liquid Color</th>
<th>Natural Brass</th>
<th>Chrome Plated</th>
<th>Polyester↑c</th>
<th>Poly-Stainless↑c</th>
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<td><strong>Recessed Pendent (TY4931)</strong>&lt;sup&gt;b&lt;/sup&gt;</td>
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</tbody>
</table>

**NOTES**

- Installed with Style 10 (1/2 in. NPT) or Style 40 (3/4 in. NPT) 3/4 in. Total Adjustment Recessed Escutcheon, as applicable.
- Installed with Style 20 (1/2 in. NPT) or Style 30 (3/4 in. NPT) 1/2 in. Total Adjustment Recessed Escutcheon, as applicable.
- Frame and Deflector only.
- Not Available (N/A)
- 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 Loss Prevention Certification Board (LPCB Ref. No. 007k/04) as Quick Response Sprinklers. However, LPCB does not rate the thermal sensitivity of recessed sprinklers.
- Approved by the City of New York under MEA 354-01-E.
- VdS Approved (For details, contact Johnson Controls, Enschede, Netherlands, Tel. 31-53-428-4444/Fax 31-53-428-3377)
- Approved by the Loss Prevention Certification Board (LPCB Ref. No. 094a/06) as Quick Response Sprinklers.

**TABLE B**

**LABORATORY LISTINGS AND APPROVALS FOR 5.6 AND 8.0 K-FACTOR SPRINKLERS**
Care and Maintenance

The TYCO Series TY-FRB 2.8, 4.2, 5.6, and 8.0 K-factor Upright, Pendent, and Recessed Pendent 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. 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 taken 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. 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.

### TABLE C

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<th>K-Factor</th>
<th>Type</th>
<th>Sprinkler Finish</th>
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<tbody>
<tr>
<td>Natural Brass</td>
<td>Chrome Plated</td>
<td>Polyester</td>
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<tr>
<td><strong>2.8 1/2 in. NPT</strong></td>
<td>Pendent (TY1231) and Upright (TY1131)</td>
<td>175 psi (12,1 bar)</td>
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<tr>
<td>Recessed Pendent (TY1231)</td>
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<td><strong>4.2 1/2 in. NPT</strong></td>
<td>Pendent (TY2231) and Upright (TY2131)</td>
<td>175 psi (12,1 bar)</td>
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<tr>
<td>Recessed Pendent (TY2231)</td>
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<tr>
<td><strong>5.6 1/2 in. NPT</strong></td>
<td>Pendent (TY3231) and Upright (TY3131)</td>
<td>250 psi (17,2 bar) or 175 psi (12,1 bar)¹</td>
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<tr>
<td>Recessed Pendent (TY3231)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>8.0 3/4 in. NPT</strong></td>
<td>Pendent (TY4231) and Upright (TY4131)</td>
<td>175 psi (12,1 bar)</td>
</tr>
<tr>
<td>Recessed Pendent (TY4231)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>8.0 1/2 in. NPT</strong></td>
<td>Pendent (TY4931) and Upright (TY4831)</td>
<td>175 psi (12,1 bar)</td>
</tr>
</tbody>
</table>

**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.
2. Not applicable (N/A).

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).
**Limited Warranty**

For warranty terms and conditions, visit 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 (Specify SIN), (specify K-factor), (specify Pendant or Upright) Sprinkler (specify) temperature rating, (specify) 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*)

* 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

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**TABLE D**

**SERIES TY-FRB PENDENT AND UPRIGHT SPRINKLERS**

**PART NUMBER SELECTION**

<table>
<thead>
<tr>
<th>P/N 57 – XXX – X – XXX</th>
<th>SIN</th>
<th>SPRINKLER FINISH</th>
<th>TEMPERATURE RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>330 2.8K UPRIGHT (1/2 in. NPT)</td>
<td>TY1131</td>
<td>NATURAL BRASS</td>
<td>135 135°F (57°C)</td>
</tr>
<tr>
<td>331 2.8K PENDENT (1/2 in. NPT)</td>
<td>TY1231</td>
<td>POLY-STAINLESS GREY ALUMINUM (RAL9007)</td>
<td>155 155°F (68°C)</td>
</tr>
<tr>
<td>340 4.2K UPRIGHT (1/2 in. NPT)</td>
<td>TY2131</td>
<td>POLYESTER</td>
<td>175 175°F (79°C)</td>
</tr>
<tr>
<td>341 4.2K PENDENT (1/2 in. NPT)</td>
<td>TY2231</td>
<td>PURE WHITE POLYESTER (RAL9010)</td>
<td>200 200°F (93°C)</td>
</tr>
<tr>
<td>370 5.6K UPRIGHT (1/2 in. NPT)</td>
<td>TY3131</td>
<td>SIGNAL WHITE POLYESTER (RAL9003)</td>
<td>286 286°F (141°C)</td>
</tr>
<tr>
<td>371 5.6K PENDENT (1/2 in. NPT)</td>
<td>TY3231</td>
<td>JET BLACK POLYESTER (RAL9005)</td>
<td></td>
</tr>
<tr>
<td>390 8.0K UPRIGHT (3/4 in. NPT)</td>
<td>TY4131</td>
<td>LEAD COATED</td>
<td></td>
</tr>
<tr>
<td>391 8.0K PENDENT (3/4 in. NPT)</td>
<td>TY4231</td>
<td>CHROME PLATED</td>
<td></td>
</tr>
<tr>
<td>360 8.0K UPRIGHT (1/2 in. NPT)</td>
<td>TY4831</td>
<td></td>
<td></td>
</tr>
<tr>
<td>361 8.0K PENDENT (1/2 in. NPT)</td>
<td>TY4931</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NOTES**

1. Available only on TY3131, TY3231, TY4131, and TY4231
2. Eastern Hemisphere sales only.
3. Available in only 2.8K, 4.2K, and 8.0K, 155°F (68°C) and 200°F (93°C); requires longer lead time to manufacture.