Model ESFR-17
Early Suppression, Fast Response Upright Sprinklers
16.8 K-Factor

General Description

The TYCO Model ESFR-17 Upright Sprinklers are “Early Suppression, Fast Response Sprinklers” having a nominal K-Factor of 16.8 (Figure 1). They are suppression mode sprinklers that are especially advantageous as a means of eliminating in-rack sprinklers when protecting high-piled storage.

Model ESFR-17 Sprinklers are primarily used for ceiling-only sprinkler protection of (but not limited to) the following storage applications:

- Most encapsulated or non-encapsulated common materials including cartoned, unexpanded plastics.
- Cartoned, expanded plastics.
- Some storage arrangements of rubber tires and roll paper.

For more specific criteria, refer to Table 1 in this data sheet as well as the applicable design standard.

The Model ESFR-17 Upright Sprinklers provide system designers with an upright option to the traditional pendant ESFR Sprinklers. With a K-Factor of 16.8, Model ESFR-17 Sprinklers provide system designers with hydraulic and sprinkler placement options not presently available to traditional ESFR Sprinklers having a K-Factor of 14.0. In particular, the Model ESFR-17 Upright Sprinklers are designed to operate at substantially lower-end head pressures compared to ESFR Sprinklers with 14.0 K-Factors. This feature offers flexibility when sizing system piping and positioning the system piping with respect to the ceiling.

Applications for the TYCO ESFR Sprinklers are expanding beyond currently recognized installation standards. For information on research fire tests that may be acceptable to an Authority Having Jurisdiction, contact the Technical Services department.

NOTICE

The Model ESFR-17 Upright 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 authorities having jurisdiction (for example, FM Global). 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.

In all cases, the appropriate NFPA or FM installation standard must be referenced to ensure applicability and to obtain complete installation guidelines. The general guidelines in this data sheet are not intended to provide complete installation criteria.

Model/Sprinkler Identification Number (SIN)

TY7126 - Upright K=16.8
**Design Criteria**

The following general guidelines provided for the TYCO Model ESFR-17 Upright Sprinklers may be used for quick reference.

**NOTICE**

The National Fire Protection Association (NFPA) and FM Global (FM) provide installation standards that must be used to properly design an automatic sprinkler system utilizing Early Suppression, Fast Response (ESFR) Sprinklers. The guidelines provided by NFPA and FM may differ; consequently, the appropriate standard must be used for a given installation.

* Registered trademark of Dupont

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**Physical Characteristics**

- **Frame**: Brass
- **Deflector**: Copper
- **Compression Screw**: Stainless Steel
- **Hook**: Monel
- **Strut**: Monel
- **Link Assembly**: Solder, Nickel
- **Button**: Brass
- **Sealing Assembly**: Nickel w/Teflon*
- **Ejection Spring**: Inconel
- **Deflector Nut**: Brass

**Patents**

U.S.A. Patent Numbers:
- 5,829,532
- 6,336,509

Additional Patents pending

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**Components:**

1. Frame
2. Deflector
3. Compression Screw
4. Hook
5. Strut
6. Link Assembly
7. Button
8. Sealing Assembly
9. Ejection Spring
10. Deflector Nut

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**System Type**

Wet pipe system

**Roof Construction**

Unobstructed or obstructed construction; for example, smooth ceiling, bar joists, beam and girder, and so forth.

Where the depths of the solid structural members (beams and stem, for example) exceed 12-inches (302 mm), install ESFR Sprinklers in each channel formed by the structural members.

**Ceiling Slope**

Maximum 2-inch rise for 12-inch run (16.7%)**

**Maximum Coverage Area**

100 ft² (9.3 m²)

In some cases, the installation standards permit a greater coverage area.

**Minimum Coverage Area**

64 ft² (5.8 m²) per NFPA 13/FM 2-0

**Maximum Spacing**

12 feet (3.7 m) for building heights up to 30 feet (9.1 m)
10 feet (3.1 m) for building heights greater than 30 feet (9.1 m)

**Minimum Spacing**

8 feet (2.4 m)

**Minimum Clearance to Commodity**

36 inches (914 mm)

**NFPA 13 — Deflector-to-Ceiling Distance**

3 to 12 inches (76 to 305 mm)

**FM 2-0**

Consult FM and/or FM Guidelines for allowable deflector-to-ceiling distances as well as thermal-sensing element-to-ceiling criteria.

**Obstructions Below Upright ESFR Sprinklers, Including Branch Lines**

Per the requirements of FM, obstructions below upright ESFR Sprinklers can be ignored as follows:

- Open-web bar joists or trusses having chords no more than 4 inches (102 mm) wide.
- Bridging or wind bracing no more than 4 inches (102 mm) wide.
- Individual pipes and conduit 4 inches (102 mm) diameter or less 3-inch (DN80) pipe size or less will not require sprigs.
- Individual groups of smaller pipe or conduit having a total width of 4 inches or less.
### Operation

The fusible link assembly is comprised of two link halves that are joined together by a thin layer of solder. When the rated temperature is reached, the solder melts and the two link halves separate, activating the sprinkler and flowing water.

### Installation

The TYCO Model ESFR-17 Upright Sprinklers must be installed in accordance with the following instructions.

**NOTICE**

Avoid damage to the fusible Link Assembly during installation by using the Frame arms only to handle the sprinkler (that is, do not apply pressure to the fusible Link Assembly) and by using the appropriate sprinkler wrench. Failure to do so can lead to an unstable link assembly and premature activation of the sprinkler. Damaged sprinklers must be replaced.

Obtain a leak-tight 3/4 inch NPT sprinkler joint by applying a minimum-to-maximum torque of 10 to 20 ft.lbs. (13.4 to 26.8 Nm). Higher levels of torque can distort the sprinkler inlet with consequent leakage or impairment of the sprinkler.

1. Install the Model ESFR-17 Upright Sprinkler in the Upright position (Figure 2).
2. With pipe-thread sealant applied, hand-tighten the sprinkler into the sprinkler fitting. Do not apply pressure to the Link Assembly, and handle the Model ESFR-17 Sprinkler only by the Frame arms.
3. Wrench-tighten the Model ESFR-17 Sprinkler using only the W-Type 21 Sprinkler Wrench (Figure 2) and by fully engaging (seating) the wrench on the sprinkler wrench flats (Figure 1).
4. After installation, inspect the Link Assembly of each Model ESFR-17 Sprinkler for damage. In particular, verify that the Link Assembly and Hook are positioned as illustrated in Figure 1, and that the Link Assembly is not bent, creased, or forced out of normal position in any way. Replace damaged 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. Refer to the Price List for a complete listing of Part Numbers (P/Ns).

Sprinkler Assemblies
Specify: (temperature rating), natural brass, TY7126 Upright Sprinkler, P/N (below).
- 165°F (74°C) . . . . . . . . . . . . . . P/N 58-447-1-165
- 214°F (101°C) . . . . . . . . . . . . . . P/N 58-447-1-214

Special-Order Sprinkler Assemblies with ISO 7/1 Thread Connections
Specify: (temperature rating), natural brass, TY7126 Upright Sprinkler with ISO 7/1 thread connection, P/N (below).
- 165°F (74°C) . . . . . . . . . . . . . . P/N 58-448-1-165
- 214°F (101°C) . . . . . . . . . . . . . . P/N 58-448-1-214

Sprinkler Wrench
Specify: W-Type 21 Sprinkler Wrench, P/N 56-001-0-686.

Care and Maintenance

The TYCO Model ESFR-17 Sprinklers 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.

Exercise care to avoid damage 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 slipping, or the like.
- are leaking or exhibiting visible signs of corrosion.

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 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.