

Model ESFR-1 14.0 K-factor Pendent Sprinkler Early Suppression, Fast Response

IMPORTANT

Refer to Technical Data Sheet TFP2300 for warnings pertaining to regulatory and health information.

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.

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docs.jci.com/tycofire/TFP318

General Description

The TYCO Model ESFR-1 Pendent Sprinklers are Early Suppression, Fast Response (ESFR) sprinklers with a nominal K-factor of 14.0. They are suppression-mode sprinklers that are especially advantageous as a means of eliminating the use of in-rack sprinklers when protecting high-piled storage.

Model ESFR-1 Sprinklers are primarily designed for protection of the following storage arrangements:

- Most encapsulated or non-encapsulated common materials including cartoned, unexpanded plastics
- Some storage arrangements of rubber tires, roll paper, flammable liquids

For more specific criteria, see Table B and the applicable design standard.

NOTICE

The Model ESFR-1 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 (NFPA), in addition to the standards of any other authorities having jurisdiction, such as FM Global. 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. Contact the installing contractor or product manufacturer with any questions.

In all cases, the appropriate NFPA, FM Global installation standard, or other applicable 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.



Sprinkler Identification Number (SIN)

See Table A

Technical Data

Approvals

UL and C-UL Listed
FM Approved
VdS Approved
NYC Approved under MEA 356-01-E
LPCB Approved (Cert. No. 0071)
EAC Approved

Finish

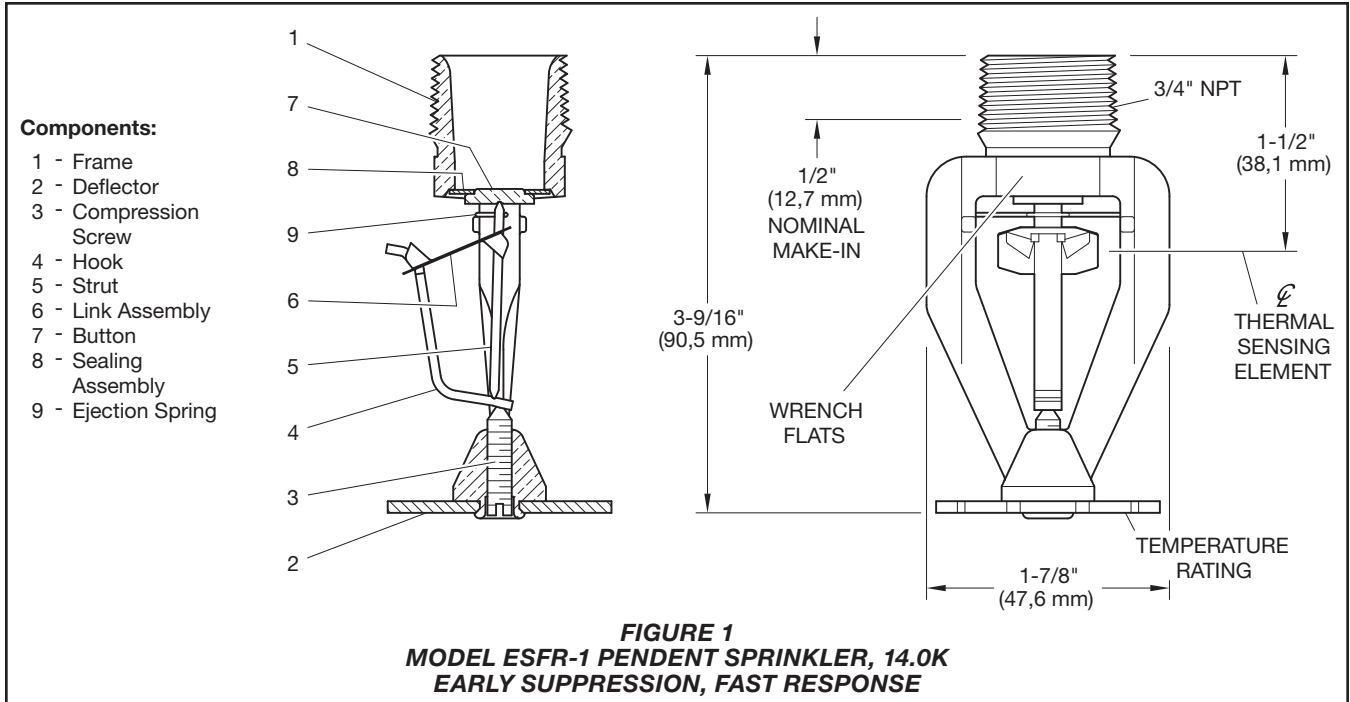
Natural Brass

Physical Characteristics

| | | |
|-------------------|-------|---------------------------|
| Frame | | Brass |
| Deflector | | Bronze |
| Compression Screw | | Stainless Steel |
| Hook | | MONEL |
| Strut | | MONEL |
| Link Assembly | | Solder, Nickel |
| Button | | Brass |
| Ejection Spring | | INCONEL |
| Sealing Assembly | | Beryllium Nickel w/TEFLON |

Additional Technical Data

See Table A



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.

| Item | Description |
|--|--|
| Sprinkler Identification Number (SIN) | TY6226 TY6226 is a re-designation for Central SIN C6226, Gem SIN G8440, and Star SIN S8000. |
| K-factor, gpm/psi ^{1/2} (Lpm/bar ^{1/2}) | 14.0 gpm/psi ^{1/2} (201,6 Lpm/bar ^{1/2}) |
| Temperature Rating °F (°C) | 165°F (74°C) 212°F (100°C) |
| Thread Size | 3/4 in. NPT |
| Sprinkler Orientation | Pendent |
| Maximum Working Pressure, psi (bar) | 175 psi (12,1 bar) |

TABLE A
MODEL ESFR-1 PENDENT SPRINKLER
TECHNICAL DATA

| Storage Type | NFPA | FM Global |
|--|-----------------------------------|-----------------------------------|
| Sprinkler Type | ESFR | Storage |
| Response Type | QR | QR |
| System Type | Wet | Wet |
| Temperature Rating °F (°C) | 165 °F (74 °C) 212 °F (100 °C) | 165 °F (74 °C) 212 °F (100 °C) |
| Open Frame (i.e., no solid shelves) Single, Double, Multiple-Row, or Portable Rack Storage of Class I-IV and Group A or B Plastics | Refer to NFPA 13 | Refer to FM 2-0 and 8-9 |
| Solid Pile or Palletized Storage of Class I-IV and Group A or B Plastics | Refer to NFPA 13 | Refer to FM 2-0 and 8-9 |
| Idle Pallet Storage | Refer to NFPA 13 | Refer to FM 2-0, 8-9, and 8-24 |
| Rubber Tire Storage | Refer to NFPA 13 | Refer to FM 2-0 and 8-3 |
| Roll Paper Storage (Refer to the Standard) | Refer to NFPA 13 | Refer to FM 8-21 |
| Flammable/Ignitable Liquid Storage (Refer to the Standard) | Refer to NFPA 30 | Refer to FM 7-29 |
| Aerosol Storage (Refer to the Standard) | Refer to NFPA 30B | Refer to FM 7-31 |
| Automotive Components in Portable Racks (Control mode only; refer to the Standard) | N/A | N/A |

N/A – Not Applicable

TABLE B
MODEL ESFR-1 PENDENT SPRINKLER
COMMODITY SELECTION AND DESIGN CRITERIA OVERVIEW

Design Criteria

The following general guidelines provided for the TYCO ESFR-1 Sprinklers can be used for quick reference.

NOTICE

The National Fire Protection Association (NFPA) and FM Global (FM Approvals) 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.

In all cases, the appropriate NFPA or FM installation standard must be referenced to assure applicability and to obtain complete installation guidelines, since the following general guidelines are not intended to provide complete installation criteria.

Roof Construction

Unobstructed or obstructed construction, such as smooth ceiling, bar joists, beam and girder.

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

Ceiling Slope

Maximum 2 in. rise for 12 in. run (16.7%)

Maximum Coverage Area
100 ft² (9,3 m²)

Minimum Coverage Area

64 ft² (5,8 m²) per
NFPA 13 and FM Global 2-0

Maximum Spacing

- 12 ft (3,7 m) for building heights up to 30 ft (9,1 m)
- 10 ft (3,1 m) for building heights greater than 30 ft (9,1 m)

Minimum Spacing

8 ft (2,4 m)

Minimum Clearance to Commodity

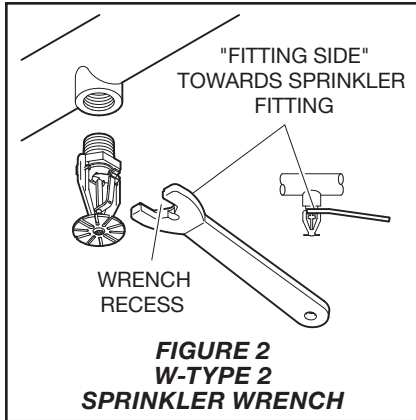
36 in. (914 mm)

NFPA

Deflector-to-Ceiling Distance
6 in. to 14 in. (152 mm to 356 mm)

FM Global

Centerline of Thermal Sensing Element-to-Ceiling Distance
Refer to FM Global 2-0 for Storage Sprinklers.



Installation

TYCO Model ESFR-1 Early Suppression, Fast Response 14.0K Pendent Sprinklers must be installed in accordance with this section.

NOTICE

Damage to the fusible Link Assembly during installation can be avoided by handling the sprinkler by the frame arms only and by using the appropriate sprinkler wrench. Do not apply pressure to the fusible Link Assembly. Failure to do so can lead to an unstable link assembly and premature activation of the sprinkler. Damaged sprinklers must be replaced.

A leak-tight 3/4 in. NPT sprinkler joint should be obtained by applying a minimum-to-maximum torque of 10 ft-lb to 20 ft-lb (13,4 N·m to 26,8 N·m). Higher levels of torque can distort the sprinkler inlet with consequent leakage or impairment of the sprinkler.

Note: Install the Model ESFR-1 Pendent Sprinkler in the pendent position as shown in Figure 2.

Step 1. With pipe thread sealant applied, hand-tighten the sprinkler into the sprinkler fitting. Do not apply pressure to the link assembly, and handle the sprinkler only by the frame arms.

Step 2. Wrench-tighten the sprinkler using only the W-Type 2 Sprinkler Wrench as shown in Figure 2, and by fully engaging (seating) the wrench on the sprinkler wrench flats as shown in Figure 1.

Step 3. After installation, inspect the link assembly of each Model ESFR-1 Sprinkler for damage. In particular, verify that the link assembly and hook are positioned as shown in Figure 1, and that the link assembly is not bent, creased, or forced out of normal position in any way. Replace damaged sprinklers.

Care and Maintenance

TYCO Model ESFR-1 Early Suppression, Fast Response 14.0K 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.

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 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. For more information, see the Installation section.

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 such as NFPA 25, in addition to the standards of any authorities having jurisdiction. Contact the installing contractor or product manufacturer with 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.

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

Specify: Model ESFR-1 Early Suppression, Fast Response 14.0K Pendent Sprinklers (TY6226), (specify temperature rating), with Natural Brass finish, P/N (specify):

165 °F (74 °C) 58-440-1-165
212 °F (100 °C) 58-440-1-214

Sprinkler Wrench

Specify: W-Type 2 Sprinkler Wrench, P/N 56-872-1-001