

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

General Description

TYCO Model ESFR-1 Pendent Sprinklers are Early Suppression, Fast Response (ESFR) sprinklers having 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, refer to Table A as well as the applicable design standard.

Applications for the TYCO ESFR Sprinklers are expanding beyond currently recognized installation standards. For information on research fire tests (with flammable liquids and aerosols, for example) that may be acceptable to an authority having jurisdiction, contact the Tyco Fire Protection Products (TFPP) Technical Services.

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 (e.g., 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)

TY6226

TY6226 is a re-designation for Central SIN C6226, Gem SIN G8440, and Star SIN S8000.



Technical Data

Approvals

UL and C-UL Listed
FM Approved
VdS Approved
NYC Approved under MEA 356-01-E
LPCB Approved (Cert. Nos. 094b and 007l)

Maximum Working Pressure
175 psi (12,1 bar)

Pipe Thread Connections
3/4 Inch NPT

Discharge Coefficient
K=14.0 gpm/psi^{1/2} (201,6 lpm/bar^{1/2})

Temperature Ratings
165°F (74°C) and 212°F (100°C)

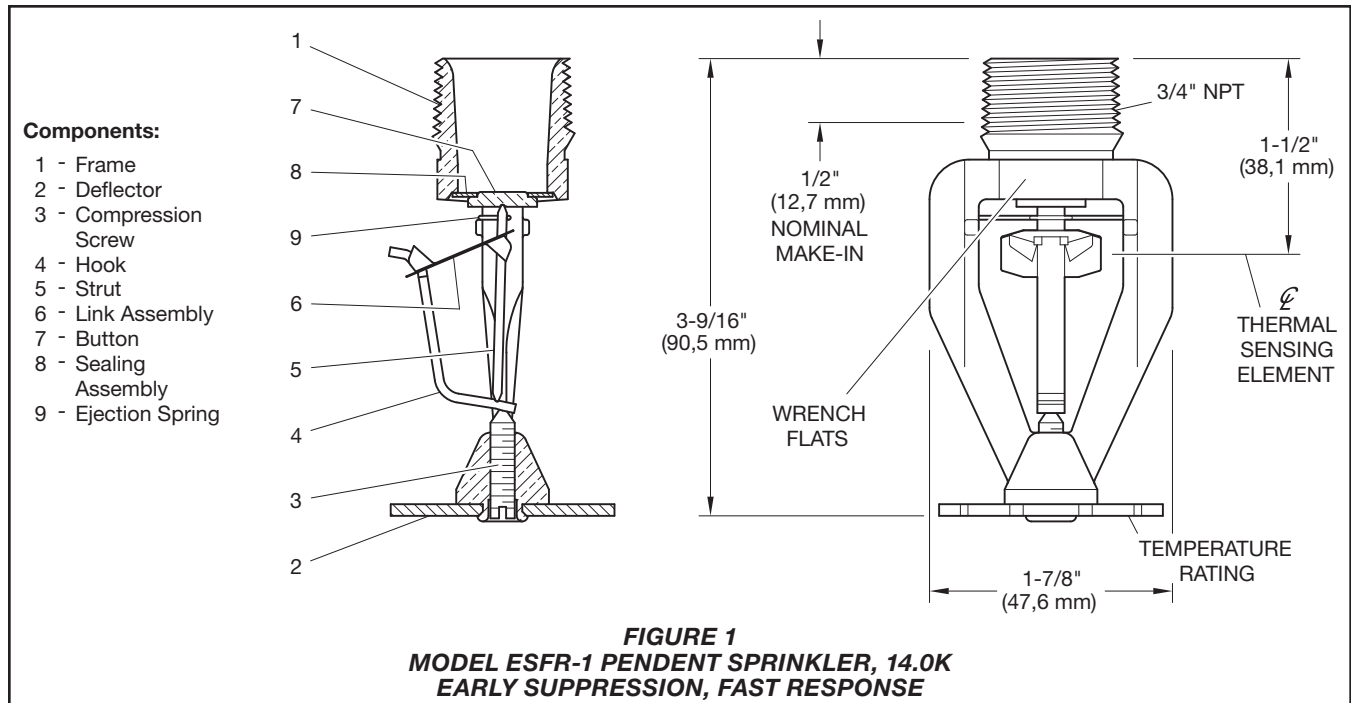
Finish
Natural Brass

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

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.



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.

In addition to this technical data sheet, the following data sheets describe other TYCO ESFR Sprinklers:

- **TFP312**
 Model ESFR-25 (TY9226)
 K=25.2 Pendent Sprinkler
- **TFP315**
 Model ESFR-17 (TY7226)
 K=16.8 Pendent Sprinkler
- **TFP316**
 Model ESFR-17 (TY7126)
 K=16.8 Upright Sprinkler

System Type

Wet Pipe

Roof Construction

Unobstructed or obstructed construction (e.g., smooth ceiling, bar joists, beam and girder, and so forth)

Where the depths of 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 ft.² (9,3 m²)

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

Minimum Coverage Area

64 ft.² (5,8 m²) per
 NFPA 13 / FM Global 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

Deflector-to-Ceiling Distance

6 to 14 inches (152 to 356 mm)

FM Global

Centerline of Thermal Sensing

Element-to-Ceiling Distance

Refer to FM Global 2-0 for Storage Sprinklers.

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.

Storage Type	NFPA	FM Global
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 Chapters 16 and 17	Refer to FM Global 2-0 and 8-9
Solid Pile or Palletized Storage of Class I-IV and Group A or B Plastics	Refer to NFPA 13 Chapters 14 and 15	Refer to FM Global 2-0 and 8-9
Idle Pallet Storage	Refer to NFPA 13 Chapter 12	Refer to FM Global 2-0, 8-9, and 8-24
Rubber Tire Storage	Refer to NFPA 13 Chapter 18	Refer to FM Global 2-0 and 8-9
Roll Paper Storage (Refer to the standard)	Refer to NFPA 13 Chapter 19	Refer to FM Global 8-21
Flammable/Ignitable Liquid Storage (Refer to the standard)	Refer to NFPA 30	Refer to FM Global 7-29
Aerosol Storage (Refer to the standard)	Refer to NFPA 30B	Refer to FM Global 7-31
Automotive Components in Portable Racks (Control mode only; refer to the standard)	N/A	N/A

N/A – Not Applicable

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

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 (i.e., 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.

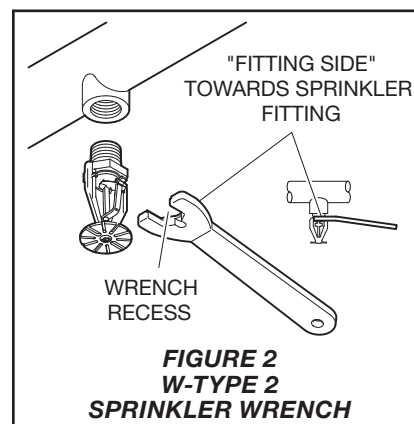
A leak-tight 3/4 inch NPT sprinkler joint should be obtained by applying a minimum-to-maximum torque of 10 to 20 lbs.-ft. (13,4 to 26,8 Nm). Higher levels of torque can distort the sprinkler inlet with consequent leakage or impairment of the sprinkler.

Note: Install the Model ESFR-1 Pendent Sprinkler in the pendent position (Ref. 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 Model ESFR-1 Sprinkler only by the Frame arms.

Step 2. Wrench-tighten the Model ESFR-1 Sprinkler using only the W-Type 2 Sprinkler Wrench (Ref. Figure 2) and by fully engaging (seating) the wrench on the sprinkler wrench flats (Ref. 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 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.



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.

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 slippage, 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 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-14 Early Suppression, Fast Response 14.0K Pendent Sprinklers (TY6226), (specify temperature rating), with Natural Brass finish, P/N (specify):

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

Sprinkler Wrench

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