

Model ESFR-17 Early Suppression Fast Response Pendent Sprinklers 16.8 K-factor

General Description

The Model ESFR-17 Sprinklers (Ref. Figure 1) are "Early Suppression Fast Response Sprinklers" having a nominal K-factor of 16.8. They are suppression mode sprinklers, and they are especially advantageous as a means of eliminating in-rack sprinklers, when protecting rack storage.

The Model ESFR-17 is primarily designed for use in ceiling only sprinkler systems (i.e. no in-rack sprinklers) for the protection of storage heights of most encapsulated or non-encapsulated common materials including cartoned unexpanded plastics of up to 35 ft. (10,7 m) with ceiling heights to 40 ft. (12,2 m), as well as cartoned expanded plastics up to 25 ft. (7,6 m) with ceiling heights to 30 ft. (9,1 m). In addition, the protection of some storage arrangements of roll paper and rubber tires can be considered.

In some cases, the Model ESFR-17 can be used to protect storage heights up to 40 ft. (12,2 m) with ceiling heights to 45 ft. (13,7 m) in combination with one level of in-rack sprinklers.

The ESFR-17 provides the system designer with hydraulic options not presently available to traditional ESFR sprinklers having a nominal K-Factor of 14.0. In particular, the Model ESFR-17 has been designed to operate at substantially lower end head pressures, as compared to ESFR sprinklers having a nominal K-Factor of 14.0. This feature offers flexibility when sizing the system piping, as well as possibly reducing or eliminating the need for a system fire pump.

WARNINGS

The Model ESFR-17 Sprinklers described herein must be installed and maintained in compliance with this document, as well as with the applicable standards of the National Fire Pro-

tection Association, in addition to the standards of any other authorities having jurisdiction (e.g., FM Global). Failure to do so may impair the integrity 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 relative to any questions.

Sprinkler Identification Numbers

SIN TY7226 - (Pendent K=16.8)

Technical Data

Approvals

FM Approved. UL and C-UL Listed.
(Refer to the Design Criteria Section)

Maximum Working Pressure

175 psi (12,1 bar)

Pipe Thread Connection

3/4 inch NPT or ISO 7-R3/4

Discharge Coefficient

$K = 16.8 \text{ GPM/psi}^{1/2}$
(241,9 LPM/bar^{1/2})

Temperature Ratings

165°F/74°C or 214°F/101°C

Finish

Natural Brass

Physical Characteristics

Frame	Brass
Deflector	Bronze
Compression Screw	Stainless Steel
Hook	Monel
Strut	Monel
Link Assembly	Solder, Nickel
Button	Brass



Sealing Assembly
Beryllium Nickel w/Teflon*
Ejection Spring Inconel

Patents

U.S.A. Patent Numbers 4,580,729, 5,829,532, and 6,059,044 may be applicable to the Model ESFR-17. Other patents are pending.

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 allowing water to flow.

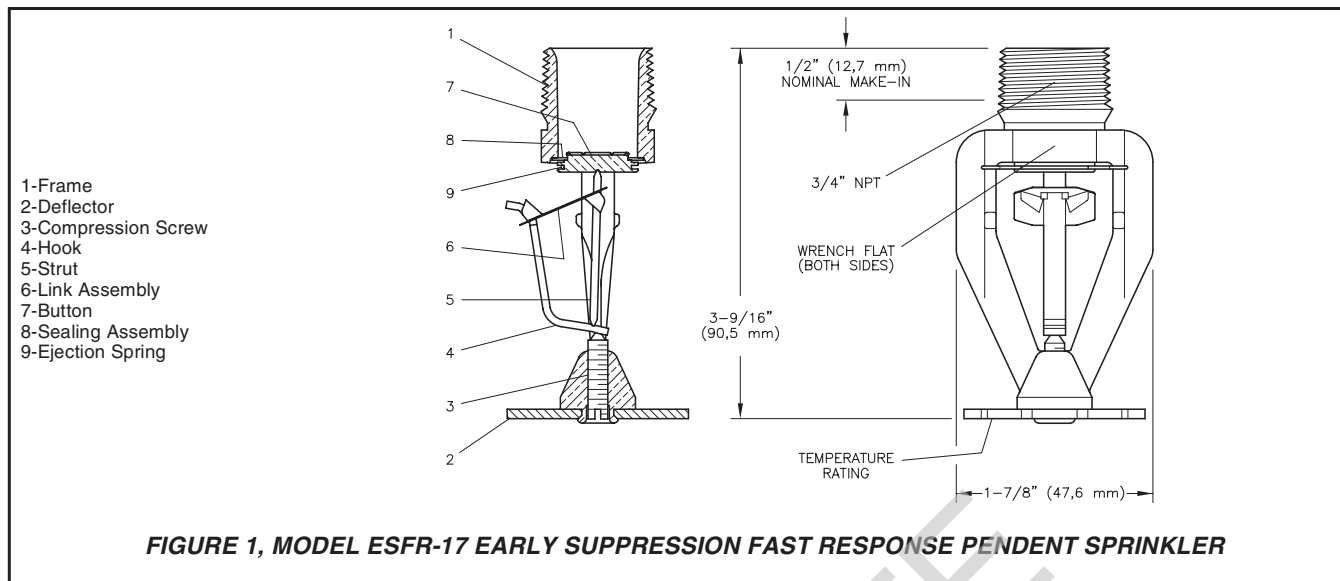


FIGURE 1, MODEL ESFR-17 EARLY SUPPRESSION FAST RESPONSE PENDENT SPRINKLER

Design Criteria

FM APPROVAL CRITERIA

The Model ESFR-17 Sprinklers (SIN TY7226) may be used to protect the same types of storage and building heights (up to 40 ft. (12,2 m) without in-rack sprinklers, or 45 ft. (13,7 m) with one level of in-rack sprinklers) as 14.0 K-Factor ESFR sprinklers, **excluding storage of roll tissue, flammable liquids, aerosols, and exposed expanded plastics**. Refer to the appropriate FM Global Data Sheet and Engineering Bulletin entitled "Tyco Fire Products Model TY7226, K16.8 Suppression-Model Sprinklers" for details of appropriate applications and design specifications.

A. Hydraulic Design: Design should be 12 sprinklers, supplying four sprinklers on three branch lines, at the following pressures based on equivalence to 14.0 K-Factor ESFR sprinkler flows:

K=14.0 ESFR Design Pressure, psi (bar)	K=16.8 ESFR Design Pressure, psi (bar)
50 (3,4)	35 (2,4)
60 (4,1)	42 (2,9)
75 (5,2)	52 (3,6)
90 (6,2)	63 (4,3)

B. System Type: wet-pipe only (no preaction or dry-pipe).

C. Sprinkler Spacing: The maximum area of coverage is 100 ft²

(9,3m²) and the minimum area of coverage is 80 ft² (7,4 m²).

The maximum distance between sprinklers on branch lines or between branch lines is 12 ft. (3,7 m) for buildings up to 30 ft. (9,1 m) high, and 10 ft. (3,1 m) for buildings higher than 30 ft. (9,1 m) to 45 ft. (13,7 m).

The minimum distance between sprinklers on branch lines or between branch lines is 8 ft. (2,4 m).

C. Sprinkler Position: Position sprinklers so that the deflectors are located at a maximum distance of 14 inches (360 mm) and a minimum distance of 4 inches (100 mm) below the ceiling.

D. Hose Stream Demand and Water Supply Duration: 250 GPM (950 LPM) and 60 minutes respectively.

F. Other Details: All other details are the same as for pendent 14.0 K-Factor ESFR sprinklers as recommended in the following FM Global Data Sheets:

- 2-2, "Installation Guidelines for Early Suppression Fast Response Sprinklers"
- 8-3, "Rubber Tire Storage"
- 8-9, "Storage of Commodities"
- 8-21, "Roll Paper Storage"
- 8-24, "Idle Pallet Storage"

G. Mixed Occupancies: 16.8 K-Factor ESFR sprinklers may be used in adjacent non-storage oc-

cupancies which qualify for use with quick response sprinklers as indicated in FM Global Data Sheet 3-26, Table 2, using design guidelines as described above.

UL AND C-UL SPECIFIC APPLICATION LISTING CRITERIA

The Model ESFR-17 Sprinklers (SIN TY7226) are UL and C-UL Listed as "Specific Application Early Suppression Fast Response Sprinklers". They are intended for installation and to protect the same types of storage and building heights as described in NFPA 13 for UL and C-UL Listed K=14.0 ESFR Sprinklers using the following K=16.8 ESFR Design Pressures in lieu of the given K=14.0 ESFR Design Pressures stated in NFPA 13.

K=14.0 ESFR Design Pressure, psi (bar)	K=16.8 ESFR Design Pressure, psi (bar)
50 (3,4)	35 (2,4)
75 (5,2)	52 (3,6)

NOTE

Since UL and C-UL currently limit the listing of K=14.0 ESFR Sprinklers to a maximum ceiling height of 40 feet (12,2 m), the specific application of the Model ESFR-17 is for a maximum ceiling height of 40 feet (12,2 m), even though NFPA 13 may reference protection schemes using K=14.0 ESFR Sprinklers for ceiling heights greater than 40 feet (12,2 m).

Installation

The Model ESFR-17 Pendent Sprinklers are to be installed in accordance with the following instructions:

NOTE

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. Damaged sprinklers must be replaced.

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). Higher levels of torque may distort the sprinkler inlet with consequent leakage or impairment of the sprinkler.

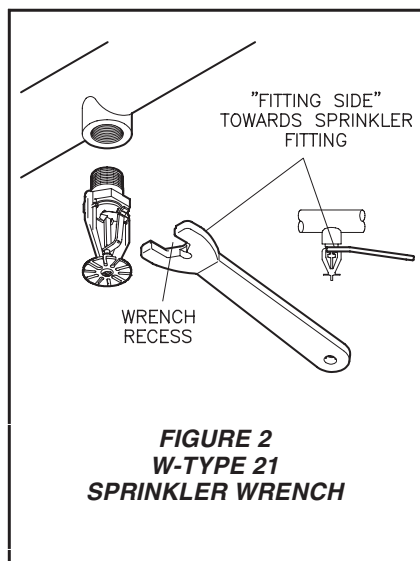
Step 1. The ESFR-17 Sprinkler must be installed in the pendent position.

Step 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 ESFR-17 Sprinkler only by the Frame arms.

Step 3. Wrench tighten the ESFR-17 Sprinkler using only the W-Type 21 Sprinkler Wrench (Ref. Figure 2) and by fully engaging (seating) the wrench on the sprinkler wrench flats.

Step 4. After installation, inspect the Link Assembly of each 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 has not been bent, creased, or forced out of its normal position in any way.

Damaged sprinklers must be replaced.



Care and Maintenance

The Model ESFR-17 must be maintained and serviced in accordance with the following instructions:

NOTE

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 systems 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 shipped or stored where their temperature will exceed 100°F/38°C and they must never be painted, plated, coated, or otherwise altered after leaving the factory. Modified or over-heated sprinklers must be replaced.

Care must be exercised to avoid damage - before, during, and after installation. Sprinklers damaged by dropping, striking, wrench twist/slippage, or the like, must be replaced.

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.

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. Please specify the Sprinkler Identification Number (SIN), quantity, and temperature rating. Refer to the Price List for complete listing of Part Numbers.

Contact your local distributor for availability.

Sprinkler Assemblies with NPT Thread Connections:

Specify: (specify temperature rating), natural brass, TY7226 Pendent Sprinkler, PSN (specify).

165°F/74°C..... P/N 58-445-1-165
214°F/101°C..... P/N 58-445-1-214

Sprinkler Wrench

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

OBSOLETE