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

General Description
TYCO Model ESFR-17 Pendent Sprinklers are Early Suppression, Fast Response (ESFR) sprinklers having a nominal K-factor of 16.8, see Figures 1 and 2. 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 Pendent 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
- uncartoned, unexpanded plastics
- uncartoned, expanded plastics
- some storage arrangements of rubber tires, roll paper, and aerosols

For more specific criteria, see Table B in this technical data sheet as well as the applicable design standard.

The Model ESFR-17 Pendent Sprinklers provide the system designer with hydraulic and sprinkler placement options not presently available to traditional ESFR Sprinklers having a nominal K-factor of 14.0. In particular, Model ESFR-17 Pendent Sprinklers are 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 system piping, as well as possibly reducing or eliminating the need for a system fire pump.

Applications for the ESFR-17 Pendent Sprinklers are expanding beyond currently recognized installation standards. For information on research fire tests, such as flammable liquids and aerosols, that may be acceptable to an authority having jurisdiction, contact Technical Services.

WARNING
Orange protector must not be removed until sprinkler is to be placed in service. The W-Type 35 sprinkler wrench must be used for proper installation of the sprinkler. Failure to do so may result in equipment damage or failure.

NOTICE
The Model ESFR-17 Pendent 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 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 or 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 technical data sheet are not intended to provide complete installation criteria.

Sprinkler Identification Number (SIN)
See Table A for sprinkler identification number.

Technical Data
Approvals
UL and C-UL Listed
FM Approved

Finish
Natural Brass

Physical Characteristics
Frame ......................... Brass
Deflector ...................... Bronze
Compression Screw ........... Stainless Steel
Hook .......................... MONEL
Strut .......................... MONEL
Link Assembly ................. Solder, Nickel
Button ....................... Phosphor Bronze
Sealing Assembly .......... Beryllium Nickel w/TEFLON

Additional Technical Data
See Table A for additional technical data.
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.

Design Criteria

The following general guidelines provided for the TYCO Model ESFR-17 Pendent Sprinklers can be used for a quick reference.

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 Global may differ. Consequently, the appropriate standard must be used for a given installation. See Table B for additional information.

In all cases, the appropriate NFPA or FM Global installation standard must be referenced to ensure applicability and to obtain complete installation guidelines. 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

- TFP313
  Model ESFR-22 (TY8226)
  K=22.4 Pendent Sprinkler

- TFP315
  Model ESFR-17 (TY7226)
  K=16.8 Pendent Sprinkler

- TFP316
  Model ESFR-17 (TY7126)
  K=16.8 Upright Sprinkler

### TABLE A
MODEL ESFR-17 PENDENT SPRINKLER TECHNICAL DATA

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sprinkler Identification Number (SIN)</td>
<td>TY7223</td>
</tr>
<tr>
<td>K Factor, (gpm/psi(^{1/2})) (Lpm/bar(^{1/2}))</td>
<td>16.8 gpm/psi(^{1/2}) (241.9 Lpm/bar(^{1/2}))</td>
</tr>
<tr>
<td>Temperature Rating °F (°C)</td>
<td>165°F (74°C) 212°F (100°C)</td>
</tr>
<tr>
<td>Thread Size</td>
<td>3/4 in. NPT or ISO 7-R 3/4</td>
</tr>
<tr>
<td>Sprinkler Orientation</td>
<td>Pendent</td>
</tr>
<tr>
<td>Maximum Working Pressure, psi (bar)</td>
<td>175 psi (12.1 bar)</td>
</tr>
</tbody>
</table>

![FIGURE 1
MODEL ESFR-17 PENDENT SPRINKLER, 16.8K, 165°F (74°C) EARLY SUPPRESSION, FAST RESPONSE](image-url)

![FIGURE 2
MODEL ESFR-17 PENDENT SPRINKLER, 16.8K, 212°F (100°C) EARLY SUPPRESSION, FAST RESPONSE](image-url)
### Storage Type

<table>
<thead>
<tr>
<th>Sprinkler Type</th>
<th>NFPA</th>
<th>FM Global</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESFR</td>
<td></td>
<td>Storage</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Response Type</th>
<th></th>
<th>QR</th>
</tr>
</thead>
<tbody>
<tr>
<td>FR</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>System Type</th>
<th></th>
<th>Wet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wet</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Temperature Rating °F (°C)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>165°F (74°C)</td>
<td></td>
<td>165°F (74°C)</td>
</tr>
<tr>
<td>212°F (100°C)</td>
<td></td>
<td>212°F (100°C)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>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</th>
<th>Reference</th>
<th>FM Global</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refer to NFPA 13</td>
<td>Refer to FM 2-0 and 8-9</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Solid Pile or Palletized Storage of Class I-IV and Group A or B Plastics</th>
<th>Reference</th>
<th>FM Global</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refer to NFPA 13</td>
<td>Refer to FM 2-0 and 8-9</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Idle Pallet Storage</th>
<th>Reference</th>
<th>FM Global</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refer to NFPA 13</td>
<td>Refer to FM 2-0, 8-9, and 8-24</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rubber Tire Storage</th>
<th>Reference</th>
<th>FM Global</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refer to NFPA 13</td>
<td>Refer to FM 2-0 and 8-3</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Roll Paper Storage (Refer to the Standard)</th>
<th>Reference</th>
<th>FM Global</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refer to NFPA 13</td>
<td>Refer to FM 8-21</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Flammable/Ignitable Liquid Storage (Refer to the Standard)</th>
<th>Reference</th>
<th>FM Global</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refer to NFPA 30</td>
<td>Refer to FM 7-29</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Aerosol Storage (Refer to the Standard)</th>
<th>Reference</th>
<th>FM Global</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refer to NFPA 30B</td>
<td>Refer to FM 7-31</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Automotive Components in Portable Racks (Control mode only; refer to the Standard)</th>
<th>N/A</th>
</tr>
</thead>
</table>

### TABLE B

#### MODEL ESFR-17 PENDENT SPRINKLER

**COMMODITY SELECTION AND DESIGN CRITERIA OVERVIEW**

- **TFP318**
  Model ESFR-1 (TY6226)
  K=14.0 Pendent Sprinkler

- **TFP319**
  Model ESFR-14 (TY6236)
  K=14.0 Pendent Sprinkler

- **TFP320**
  Model ESFR-17 (TY7229)
  K=16.8 Pendent Sprinkler

**Roof Construction**

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

Where the depths of the 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%) and 1 in. rise for 6 in. 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

**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 13**

**Deflector-to-Ceiling Distance**

6 in. to 14 in. (152 mm to 356 mm)

**FM Global 2-0**

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

N/A – Not Applicable
Wrench-tighten the Model ESFR-17 Sprinkler for damage. In particular, verify that the Link Assembly and Hook are positioned as illustrated in Figures 1 and 2, and that the Link Assembly is not bent, creased, or forced out of normal position in any way. Replace damaged sprinklers.

### Step 3. 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 Figures 1 and 2, 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-17 Early Suppression, Fast Response 16.8K 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 system 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. See Installation Section for additional information.

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 with 3/4 NPT Thread Connection

Specify: Model ESFR-17 Early Suppression, Fast Response 16.8K Pendent Sprinklers (TY7223) with 3/4 NPT thread connection, (specify temperature rating), with Natural Brass finish, P/N (specify):

- 165°F (74°C) ............... 58-457-1-165
- 212°F (100°C) ............... 58-457-1-214

#### Special Order Sprinkler Assemblies with ISO 7-R 3/4 Thread Connection

Specify: Model ESFR-17 Early Suppression, Fast Response 16.8K Pendent Sprinklers (TY7223) with ISO 7-R 3/4 thread connection, (specify temperature rating), with Natural Brass finish, P/N (specify):

- 165°F (74°C) ............... 58-458-1-165
- 212°F (100°C) ............... 58-458-1-214

#### Sprinkler Wrench

Specify: W-Type 35 Sprinkler Wrench P/N 56-463-1-001