

## Model EC-25 (CMDA and CMSA Applications) Extended Coverage Upright Sprinklers K-factor 25.2 (360)

### General Description

The TYCO Model EC-25 Extended Coverage Upright Sprinkler is a UL listed, standard response, extended coverage Control Mode Density Area (CMDA) sprinkler for storage applications. It is also FM Approved as a quick response, extended coverage Control Mode Density Area (CMDA) sprinkler and as a Control Mode Specific Application (CMSA) sprinkler, as well as FM Approved for storage and non-storage applications.

In addition, these sprinklers may be used in accordance with the new Chapter 21 of the 2013 edition of NFPA 13. As such, tables 21.2.2 and 21.3.2 of NFPA 13 may be utilized for design options. When used in accordance with NFPA Chapter 21, smoke vents and draft curtains are not required as specified in the 2015 edition of the International Building Code (IBC) and International Fire Code (IFC) for CMSA sprinklers with an RTI of 50 or less and a design of 12 or fewer sprinklers.

These sprinklers offer a maximum coverage area of 196 ft<sup>2</sup> (18,2 m<sup>2</sup>), which is almost double the area offered by standard coverage sprinklers used for similar applications.

The Model EC-25 Upright Sprinklers comply with the criteria for the protection of retail stores as described in the 2013 Edition of NFPA 13, Section 20.3.

Where the FM Approval is utilized, the Model EC-25 Upright Sprinkler has successfully undergone full-scale fire

testing at FM Global for ceiling-only storage and non-storage applications. When used in conformance with applicable FM Global Property Loss Prevention Data Sheets, the Model EC-25 Sprinkler provides low hydraulic demand, the spacing advantages of extended coverage, and the obstruction benefits of an upright sprinkler.

For more information on applications and benefits of the Model EC-25 Sprinkler, refer to the available white papers at [www.tyco-fire.com](http://www.tyco-fire.com).

#### NOTICE

*The Model EC-25 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 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. The installing contractor or sprinkler manufacturer should be contacted with any questions.*

### Sprinkler Identification Number (SIN)

TY9128

### Technical Data

#### Approvals

- UL and C-UL Listed: CMDA (Standard Response)
- FM Approved: CMDA and CMSA (Quick Response)
- NYC under MEA 355-01-E (Approvals only apply to the service conditions indicated in the Design Criteria section.)



**Maximum Working Pressure**  
175 psi (12,1 bar)

**Pipe Thread Connection**  
• 1 inch NPT  
• ISO 7-R1

**Discharge Coefficient**  
K=25.2 GPM/psi<sup>1/2</sup> (362,9 LPM/bar<sup>1/2</sup>)

**Temperature Ratings**  
165°F (74°C)  
214°F (101°C)

**Maximum Coverage Area**  
196 ft<sup>2</sup> (18,2 m<sup>2</sup>)

**Finish**  
Natural Brass

#### Physical Characteristics

Frame .....	Brass
Deflector .....	Copper
Compression Screw .....	Stainless Steel
Hook .....	Monel
Strut .....	Monel
Link Assembly .....	Solder, Nickel
Button .....	Brass
Sealing Assembly .....	Beryllium Nickel with TEFLON
Ejection Spring .....	Inconel
Deflector Nut .....	Brass

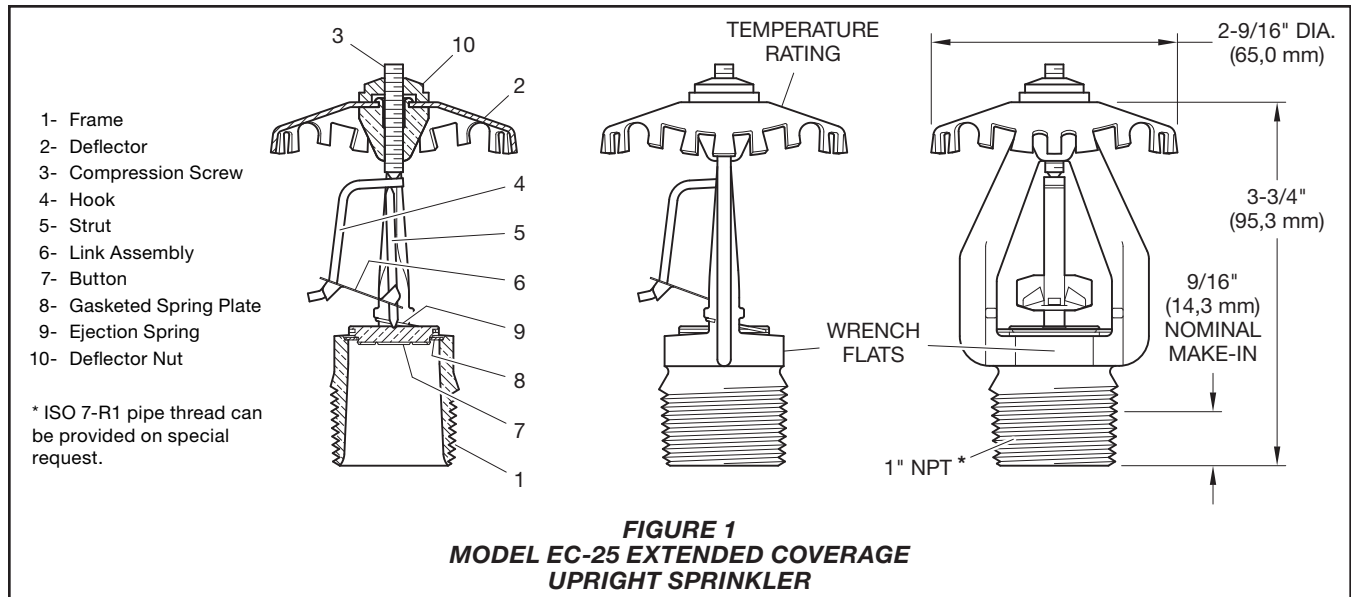
**Response Time Index (RTI)**  
Less than or equal to 50 (m-s)<sup>0.5</sup>

### 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, allowing the sprinkler to activate and flow water.

#### 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

### UL AND C-UL LISTING CRITERIA

#### NFPA 13, Chapter 12 through 20 - Density/Area Design

The TYCO Model EC-25 Extended Coverage Upright Sprinklers (TY9128) are UL and C-UL Listed for installation in accordance with the extended coverage upright spray sprinkler requirements of NFPA 13 or other applicable NFPA standards when used in conjunction with the following guidelines:

- Suitable for the protection of extra hazard and high-piled storage occupancies where area/density design criteria are provided.
- Suitable for “unobstructed” or “noncombustible obstructed” construction.
- The Model EC-25 Sprinklers having been specifically tested and listed for noncombustible obstructed construction are suitable for use within trusses or bar joists having noncombustible web members greater than 1 inch (25,4 mm) when applying the 4 times obstruction criteria rule defined under “Obstructions to Sprinkler Discharge Pattern Development”.
- The maximum coverage area per sprinkler is 196 ft<sup>2</sup> (18,2 m<sup>2</sup>).
- The maximum distance between sprinklers is 15 feet (4,6 m) when the coverage area does not exceed 144 ft<sup>2</sup> (13,4 m<sup>2</sup>), and the maximum distance between sprinklers is 14 feet (4,3 m) when the coverage area does not exceed 196 ft<sup>2</sup> (18,2 m<sup>2</sup>).

- The minimum distance between sprinklers is 8 feet (2,44 m).
- The minimum flow requirement is based on the design density applied over the actual coverage area per sprinkler.

For example: when sprinkler spacing is 14 ft. x 12 ft. -6 in. (4,3 m x 3,8 m) or 175 ft<sup>2</sup> (16,3 m<sup>2</sup>), and the design density is 0.6 GPM/ft<sup>2</sup> (24,4 mm/min), the sprinkler design flow rate is 105 GPM (397 LPM) and the required design pressure is 17.4 psi (1,2 bar).

- The minimum clearance between the deflector and the top of storage is 36 inches (0,9 m). For clearances of 36 inches (0,9 m) up to 48 inches (1,21 m), the minimum design pressure is 22 psi (1,52 bar). For clearances of 48 inches (1,21 m) and greater, the minimum design pressure is established by the minimum flow requirement. However, the pressure can never be less than 7 psi (0,5 bar).
- Ordinary and intermediate temperature rated Model EC-25 Sprinklers have been investigated for use in high-piled storage occupancies at the hydraulic demand normally associated with high temperature sprinklers. As such, the Model EC-25 Sprinklers are listed storage sprinklers having a K-factor greater than 11.2 (161,4) and having ordinary and intermediate temperature ratings (that is, 165°F or 74°C and 214°F or 101°C). Consequently, the Model EC-25 Sprinklers, in accordance with NFPA 13, may be used in conjunction with the density curves for high temperature sprinklers.

- NFPA obstruction rules for Extended Coverage Sprinklers must be utilized.

#### System Type

Wet pipe, dry pipe, and preaction systems are acceptable.

#### FM APPROVAL CRITERIA

##### FM Loss Prevention Data Sheets 2-0, 3-26, and 8-9

The TYCO Model EC-25 Extended Coverage Upright Sprinklers (TY9128) are FM Approved to be utilized in accordance with the following guidelines.

#### Application

The Model EC-25 Extended Coverage Upright Sprinklers are FM Approved ceiling-level Storage Sprinklers for storage occupancy hazards and other similar high heat release type fires. When compared with other FM Approved Storage Sprinklers, the Model EC-25 Sprinkler provides low hydraulic demand, the spacing advantages of extended coverage, and the FM obstruction benefits of an upright sprinkler.

Model EC-25 Sprinklers should be used in conformance with applicable FM Global Property Loss Prevention Data Sheets.

#### Hydraulic Design

To determine the hydraulic design for the Model EC-25 Sprinkler refer to the applicable FM Global Property Loss Prevention Data Sheet.

#### System Type

Wet-pipe systems only

### Sprinkler Spacing

The maximum coverage area per sprinkler is 196 ft<sup>2</sup> (18,2 m<sup>2</sup>). The minimum coverage area per sprinkler is 100 ft<sup>2</sup> (9,3 m<sup>2</sup>). The maximum distance between sprinklers is 14 ft. (4,3 m). The minimum distance between sprinklers is 10 ft. (3,05 m).

**Note:** When a wall or obstruction makes a minimum spacing of 10 ft. (3,05 m) impossible, consult FM Global Property Loss Prevention Data Sheet 2.0 for applicable guidelines.

### Sprinkler Location

Locate sprinklers with respect to the ceiling/roof in accordance with FM Global Property Loss Prevention Data Sheet 2.0.

### Obstructions

Follow the obstruction requirements as detailed in FM Global Property Loss Prevention Data Sheet 2.0.

### Other Details

All other design details should be in accordance with FM Global Property Loss Prevention Data Sheet 2.0 as well as any other applicable FM Global Data Sheet.

### NFPA 13, CHAPTER 21 ALTERNATIVE SYSTEM DESIGN (CMSA)

The TYCO Model EC-25 Extended Coverage Upright Sprinklers (TY9128) have successfully undergone large-scale fire tests at Factory Mutual to comply with Chapter 21 of NFPA 13, 2013 Edition. As such, Tables 21.2.2 and 21.3.2 of NFPA 13 may be utilized for design options with the Model EC-25 Upright Sprinklers for providing ceiling-only protection.

This allows for the protection of Palletized, Solid Piled, Bin Box, Shelf, or Back-to-Back Shelf Storage as well as Single, Double, and Multiple Row Open Rack protection of up to 30 ft. (9,1 m) of Cartoned Unexpanded Group A Plastic Commodities in a maximum 35 ft. (11 m) ceiling condition with extended spacing up to 196 sq. ft. while maintaining very reasonable flow and pressure requirements. Pipe sizes as well as water supply requirements can now be kept to a minimum when compared to other design methods for high piled storage challenges. Refer to Tables A and B of this data sheet for specific flow, pressure, and number of sprinklers to be calculated.

When used in accordance with NFPA Chapter 21, smoke vents and draft curtains are not required as specified in the 2015 edition of the International

Building Code (IBC) and International Fire Code (IFC) for CMSA sprinklers with an RTI of 50 or less and a design of 12 or fewer sprinklers.

### Construction Type For NFPA 13, Chapter 21, – Alternative Systems Designs

In accordance with NFPA 13 for Extended Coverage Sprinklers for High Piled Storage.

### Obstruction Criteria for NFPA 13 Chapter 21 – Alternative Systems Design

Follow Sections 8.8.5.1, (Extended Coverage Obstruction Guidelines for Sprinkler Discharge Pattern Development); 8.12.5.2 and 8.12.5.3 (ESFR Obstruction Criteria for obstruction that prevent the pattern from reaching the hazard below).

- Exception: When using the Upright EC-25 Sprinkler, any continuous obstruction 4 inches (100 mm) or less shall be permitted to be ignored in accordance with NFPA 13, section 21.5.3.2.3.

### Deflector Distance Below Ceiling

Follow NFPA 13, Section 8.8.4 for allowed deflector distances below ceiling.

### Clearance to Storage

Minimum 36 inches from deflector to top of storage required.

### Maximum Distance Between Sprinklers

14 ft. (4,3 m)

### Minimum Distance Between Sprinklers

10 ft. (3,0 m)

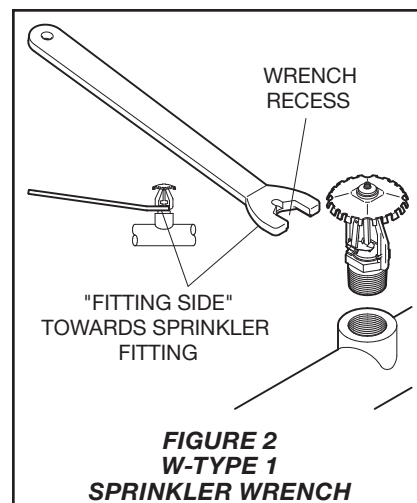
## Installation

The TYCO Model EC-25 Upright Sprinklers are to be installed in accordance with this section.

Damage to the fusible Link Assembly during installation can be avoided by handling the sprinkler using only the frame arms and the appropriate sprinkler wrench. Do not grip or apply any force to the Fusible Link Assembly. Damaged sprinklers must be replaced immediately.

A leak-tight 1 inch NPT sprinkler joint should be obtained by applying a minimum-to-maximum torque of 20 to 30 ft.-lbs. (26,8 to 40,2 Nm). Higher levels of torque may distort the sprinkler inlet with consequent leakage or impairment of the sprinkler.

**Step 1.** Install the Model EC-25 Sprinkler in the upright position.



**FIGURE 2**  
**W-TYPE 1**  
**SPRINKLER WRENCH**

**Step 2.** With pipe-thread sealant applied, hand-tighten the sprinkler into the sprinkler fitting. Do not apply any force to the Link Assembly, and handle the Model EC-25 Sprinkler only by the Frame arms.

**Step 3.** Wrench-tighten the Model EC-25 Sprinkler using only the W-Type 1 Sprinkler Wrench (Figure 2) and by fully engaging (seating) the wrench on the sprinkler Wrench Flats.

**Step 4.** After installation, inspect the Link Assembly of each Model EC-25 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 immediately.

Storage Arrangement	Commodity Class	Max. Storage Height		Max. Ceiling/ Roof Height		Type of System	Number of Design Sprinklers	Min. Operating Pressure	Max. Coverage Area	Hose Stream Allowance	Water Supply Duration (hours)
		ft	m	ft	m						
Palletized, Solid-Piled, Bin Box, Shelf, or Back-to-Back Shelf Storage	Class I through Class IV, encapsulated and unencapsulated, and cartoned non-expanded plastics	25	7,6	30	9,1	Wet	6	30 psi (2,1 bar)	14 ft x 14 ft (4,3 m x 4,3 m)	250 gpm (950 L/min)	1
		30	9,1	35	11	Wet	8	40 psi (2,8 bar)	12 ft x 12 ft (3,7 m x 3,7 m)	250 gpm (950 L/min)	1
		30	9,1	35	11	Wet	8	40 psi (2,8 bar)	14 ft x 14 ft (4,3 m x 4,3 m)	500 gpm (1900 L/min)	1.5

**TABLE A**  
**NFPA 13, CHAPTER 21 - ALTERNATIVE SYSTEM DESIGN**  
**PALLETIZED, SOLID-PILED, BIN BOX, SHELF, OR BACK-TO-BACK SHELF STORAGE**  
**OF CLASS I - IV AND CARTONED NON-EXPANDED PLASTIC COMMODITIES**

Storage Arrangement	Commodity Class	Max. Storage Height		Max. Ceiling/ Roof Height		Type of System	Number of Design Sprinklers	Min. Operating Pressure	Max. Coverage Area	Hose Stream Allowance	Water Supply Duration (hours)
		ft	m	ft	m						
Sprinkler protection criteria for open-frame rack storage	Class I through Class IV, encapsulated and unencapsulated, and cartoned non-expanded plastics	25	7,6	30	9,1	Wet	6	30 psi (2,1 bar)	14 ft x 14 ft (4,3 m x 4,3 m)	250 gpm (950 L/min)	1
		30	9,1	35	11	Wet	8	40 psi (2,8 bar)	12 ft x 12 ft (3,7 m x 3,7 m)	250 gpm (950 L/min)	1
		30	9,1	35	11	Wet	8	40 psi (2,8 bar)	14 ft x 14 ft (4,3 m x 4,3 m)	500 gpm (1900 L/min)	1.5

**TABLE B**  
**NFPA 13, CHAPTER 21 - ALTERNATIVE SYSTEM DESIGN**  
**OPEN-FRAME RACK (SINGLE, DOUBLE, AND MULTIPLE ROW) STORAGE**  
**OF CLASS I - IV AND CARTONED NON-EXPANDED PLASTIC COMMODITIES**

## Care and Maintenance

The TYCO Model EC-25 Upright Sprinkler 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 decision.

Inspection, testing, and maintenance must be performed as indicated below and in accordance with the local requirements and/or national codes. Any impairment must be immediately corrected.

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 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](http://www.tyco-fire.com).

## Ordering Procedure

Contact your local distributor for availability. When placing an order, indicate the full product description and Part Number (P/N).

### Sprinkler Assemblies with 1 Inch NPT Pipe Threads

Specify: Model EC-25 Extended Coverage Upright Sprinkler (TY9128), (specify) temperature rating, natural brass, and P/N (specify):

165°F (74°C) . . . . . P/N 58-450-1-165  
214°F (101°C) . . . . . P/N 58-450-1-214

### “Special Order” Sprinkler Assemblies with ISO 7-R1 Pipe Threads

Specify: Model EC-25 Extended Coverage Upright Sprinkler (TY9128) with ISO 7-R1 pipe thread, (specify) temperature rating, natural brass, and P/N (specify):

165°F (74°C) . . . . . P/N 58-451-1-165  
214°F (101°C) . . . . . P/N 58-451-1-214

### Sprinkler Wrench

Specify W-Type 1 Sprinkler Wrench, P/N 56-872-1-025