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

General Description

The TYCO Model EC-25, Extended Coverage 25.2K 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 CMDA sprinkler and as a Control Mode Specific Application (CMSA) sprinkler, as well as FM Approved for storage and non-storage applications.

When used in accordance with National Fire Protection Association (NFPA) 13, 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 ft² (18,2 m²), 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 NFPA 13.

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 Upright 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 Upright Sprinkler, refer to the available White Papers at www.tyco-fire.com.

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.

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 NFPA, in addition to the standards of any other authorities having jurisdiction. 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 sprinkler manufacturer with any questions.

Sprinkler Identification Number (SIN)

Refer to Table A for sprinkler identification number.



Technical Data

Approvals

UL and C-UL Listed: CMDA
(Standard Response)

FM Approved: CMDA and CMSA
(Quick Response)

NYC Approved under MEA 355-01-E

Approvals only apply to the service conditions indicated in the Design Criteria section.

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 w/TEFLON
Ejection Spring	INCONEL
Deflector Nut	Brass

Response Time Index (RTI)

Less than or equal to 50 $(m\text{-}s)^{0.5}$

Additional Technical Data

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

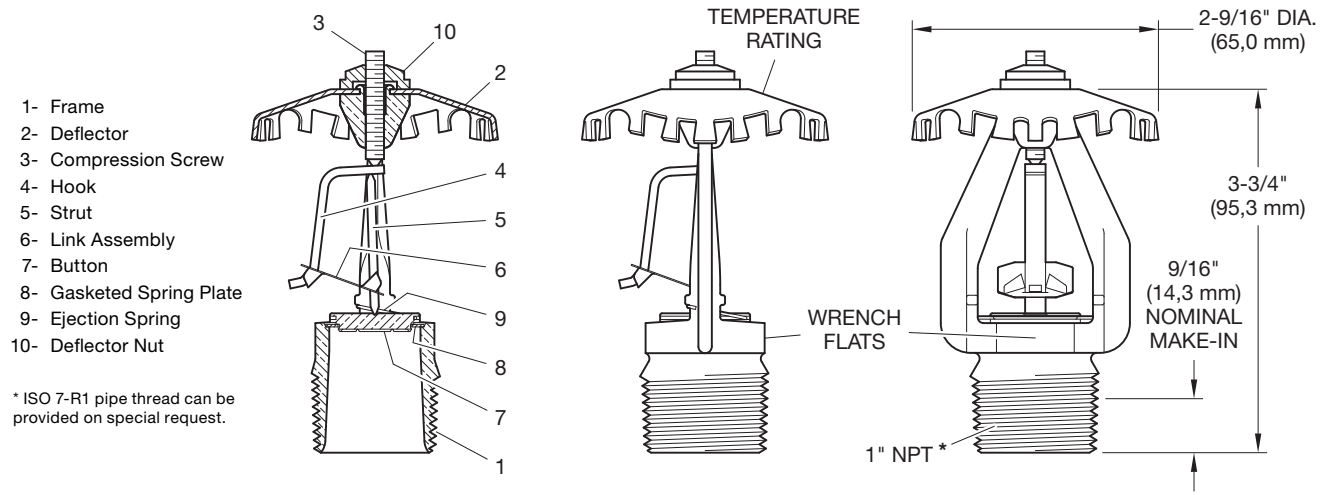


FIGURE 1
MODEL EC-25 UPRIGHT SPRINKLER, 25.2K
EXTENDED COVERAGE

Design Criteria

UL and C-UL Listing Criteria

NFPA 13, Chapters 12 thru 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:

- Protection of extra hazard and high-piled storage occupancies where area/density design criteria are provided.
- Unobstructed or non-combustible obstructed construction.
- Model EC-25 Sprinklers, having been specifically tested and Listed for non-combustible obstructed construction, are suitable for use within trusses or bar joists having non-combustible web members greater than 1 in. (25,4 mm) when applying the 4 times obstruction criteria rule defined under "Obstructions to Sprinkler Discharge Pattern Development."
- Maximum coverage area per sprinkler is 196 ft² (18,2 m²).
- Maximum distance between sprinklers is 15 ft (4,6 m) when the coverage area does not exceed 144 ft² (13,4 m²), and the maximum distance between sprinklers is 14 ft (4,3 m) when the coverage area does not exceed 196 ft² (18,2 m²).

Item	Description
Sprinkler Identification Number (SIN)	TY9128
K-factor (gpm/psi) (lpm/bar)	25.2 gpm/psi½ (362,9 lpm/bar½)
Temperature Rating °F (°C)	165°F (74°C) 212°F (100°C)
Thread Size	1 in. NPT or ISO 7-R 1
Sprinkler Orientation	Upright
Maximum Working Pressure, psi (bar)	175 psi (12,1 bar)

TABLE A
MODEL EC-25 UPRIGHT SPRINKLER
TECHNICAL DATA

- Minimum distance between sprinklers is 8 ft (2,44 m).
- Minimum flow requirement is based on the design density applied over the actual coverage area per sprinkler. For example, when:

  A sprinkler spacing is 14 ft × 12 ft – 6 in. (4,3 m × 3,8 m) or 175 ft² (16,3 m²), and the design density is 0.6 gpm/ft² (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 in. (0,9 m). For clearances of 36 in. (0,9 m) up to 48 in. (1,21 m), the minimum design pressure is 22 psi (1,52 bar). For clearances of 48 in. (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 Upright 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 Upright Sprinklers are listed storage sprinklers having a K-factor greater than 11.2 (161,4) and having ordinary and intermediate temperature ratings of 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 pre-action systems are acceptable.

FM Approval Criteria

FM Loss Prevention Data Sheets 2-0, 3-26, and 8-9
TYCO Model EC-25 Extended Coverage 25.2K 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

Storage Type	NFPA	FM Global
Sprinkler Type	CMDA	CMDA/CMSA
Response Type	SR	QR
System Type	Wet/Dry/ Preaction	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)	Refer to NFPA 13	N/A

N/A – Not Applicable

TABLE B
MODEL EC-25 UPRIGHT SPRINKLER
COMMODITY SELECTION AND DESIGN CRITERIA OVERVIEW

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 Upright Sprinkler provides low hydraulic demand, the spacing advantages of extended coverage, and the FM Global obstruction benefits of an upright sprinkler.

Model EC-25 Upright 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 Upright 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 ft² (18,2 m²). The minimum coverage area per sprinkler is 100 ft² (9,3 m²). 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 – Alternative System Design (CMSA) Criteria

The TYCO Model EC-25 Extended Coverage Upright Sprinklers (TY9128) have successfully undergone large-scale fire tests at FM Global to comply with the current edition of NFPA 13. As such, 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, Single, Double, and Multiple Row Open Racks. Protection is 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 ft² (18,2 m²). This protection is delivered 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.

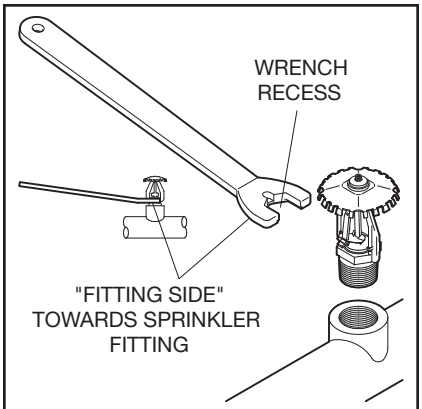


FIGURE 2
W-TYPE 1
SPRINKLER WRENCH

When used in accordance with NFPA 13, 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
In accordance with NFPA 13 for Extended Coverage Sprinklers for High Piled Storage.

Obstruction Criteria
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 obstructions that prevent the pattern from reaching the hazard below.

Exception: *When using Model EC-25 EC-25 Upright Sprinkler, any continuous obstruction 4 in. (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 in. (0,9 m) from the deflector to the 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 Extended Coverage 25.2K 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 in. NPT sprinkler joint should be obtained by applying a minimum-to-maximum torque of 20 to 30 lb-ft (26,8 to 40,2 N·m). Higher levels of torque may distort the sprinkler inlet with consequent leakage or impairment of the sprinkler.

Note: *Install the Model EC-25 Upright Sprinkler in the upright position.*

Step 1. 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 Upright Sprinkler only by the Frame arms.

Step 3. Wrench-tighten the Model EC-25 Upright Sprinkler using only the W-Type 1 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 Model EC-25 Upright 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.

Care and Maintenance

The TYCO Model EC-25 Extended Coverage 25.2K Upright 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 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.

Ordering Procedure

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

Sprinkler Assemblies
Specify: Model EC-25 Extended Coverage 25.2K Upright Sprinklers (TY9128), (specify temperature rating), with Natural Brass finish, P/N (specify):

165°F (74°C) . . . . . P/N 58-450-1-165
212°F (100°C) . . . . . P/N 58-450-1-214

Special Order
Sprinkler Assemblies with ISO 7-R 1 Thread Connection
Specify: Model EC-25 Extended Coverage 25.2K Upright Sprinklers (TY9128) with ISO 7-R 1 thread connection, (specify temperature rating), with Natural Brass finish, P/N (specify):

165°F (74°C) . . . . . .P/N 58-451-1-165
212°F (100°C) . . . . . .P/N 58-451-1-214

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

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