

Model ELO-231™

11.2 K-factor Standard Response Standard Coverage

Upright & Pendent Fusible Solder Type Automatic Sprinkler

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General Description

The Central Model ELO-231, 11.2 K-factor, Standard Response, Standard Coverage, Pendent and Upright Sprinklers are automatic sprinklers of the fusible solder type. They are "standard response - spray sprinklers" which produce a hemispherical water distribution pattern below the deflector. The Model ELO-231 Sprinklers are intended for use in fire sprinkler systems designed in accordance with the standard installation rules recognized by the applicable Listing or Approval agency (e.g., UL Listing is based on the requirements of the National Fire Protection Association). Also, when acceptable to the Authority Having Jurisdiction, they may be used with a "Reduced Design Area" as indicated in Table 2.

The 11.2 K-factor Model ELO-231 Sprinklers were subjected to full scale, high-piled storage, fire tests to qualify their use in lieu of 5.6 or 8.0 K-factor standard spray sprinklers for the protection of high-piled storage.

Higher flow rates can be achieved at much lower pressures with the Model ELO-231 Sprinklers; making their use highly advantageous in high density applications, such as the protection of high-piled storage.

The use of the 11.2 K-factor Model ELO-231 Sprinkler also has the advantage of having a specific application listing, which in some cases can subsequently reduce the design area and the overall water demand of a sprinkler system. Refer to Table 2 for details.

Wax or lead coatings can be used to extend the life of the copper alloy components used in Model ELO-231 Sprinklers beyond that which would otherwise be obtained when exposed to corrosive atmospheres. Although wax & lead coated sprinklers have passed the standard corrosion tests of the applicable approval agencies, the testing is not

representative of all possible corrosive atmospheres. Consequently, it is recommended that the end user be consulted with respect to the suitability of these corrosion resistant coatings for any given corrosive environment. The effects of ambient temperature, concentration of chemicals, and gas/chemical velocity, should be considered, as a minimum, along with the corrosive nature of the chemical to which the sprinklers will be exposed.

Operation: A fusible alloy is sealed into a bronze actuating rod (center strut) by a stainless steel ball. When the alloy melts at its rated temperature, the ball is forced upward into the center strut, releasing the two ejectors and operating the sprinkler.

WARNING

The ELO-231 Upright and 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, in addition to the standards of any other authorities having jurisdiction. 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.



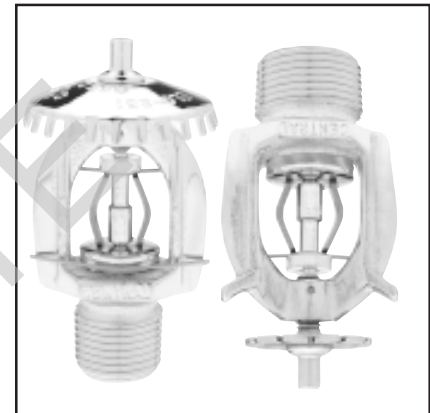
Technical Data

Sprinkler Identification Number
SIN C5111 - Upright
SIN C5211 - Pendent
SIN C5811 - Upright (1/2" NPT)

Approvals

UL & ULC Listed. FM & NYC Approved (Refer to Tables 1 & 2. The approvals apply only to the service conditions indicated in the Design Criteria Section)

Maximum Working Pressure
175 psi (12,1 bar)



Standard Spray Upright & Pendent Sprinklers

Pipe Thread Connection
1/2 inch NPT (Upright Only)
3/4 inch NPT

Discharge Coefficient
K = 11.2 GPM/psi^{1/2} (161,39 LPM/bar^{1/2})

Temperature Ratings
165°F/74°C, 212°F/100°C, 286°F/141°C

Finishes

Sprinkler: Chrome Plated, or Natural Brass

Corrosion Resistant Coatings

Sprinkler: Wax, Lead & Wax-over-Lead

Head Guard & Water Shield:

G-2 (Guard) - Up & Pend.
WSG-2 (Guard & Shield) - Up (UL only)
WS-2 (Shield) - Pendent (UL only)

(See Data Sheet 3-11.0 for details)

Physical Characteristics

The Model ELO-231 Upright & Pendent Sprinklers utilize a dezincification resistant (DZR) bronze frame and a brass deflector. The waterway is sealed with a copper cap and seal disk, and the fusible assembly is constructed of bronze and stainless steel components.

Figure 1 - Model ELO-231, Upright Sprinkler

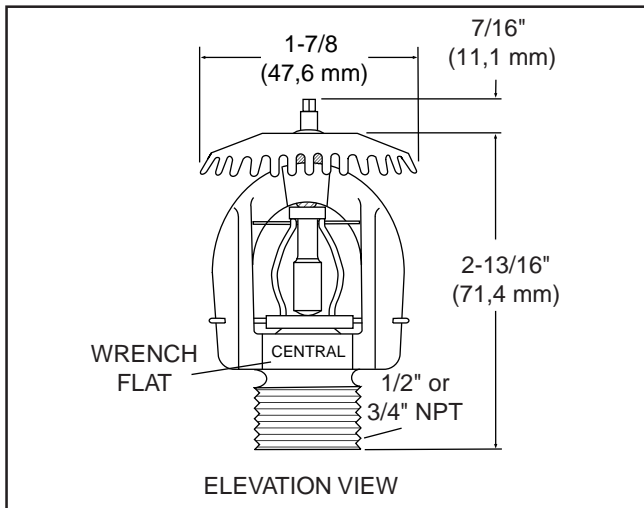


Figure 2 - ELO-231, Pendent Sprinkler

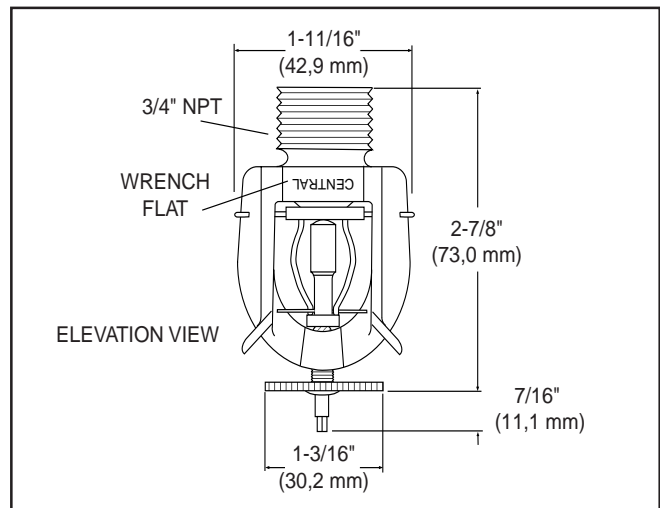


Table 1 - Laboratory Listings and Approvals (11.2 K-factor Sprinklers with 1/2" or 3/4" NPT)

		SPRINKLER FINISH				
		Pendent and Upright				
Temperature Rating	Frame Color Code	Natural Brass	Chrome Plated	Lead Coated	Wax Coated	Wax Over Lead Coated
165°F/74°C	Unpainted	1,3,4,6	1,3,4,6	1,4*	1,4*	1,4*
212°F/100°C	White	1,3,4,6	1,3,4,6	1,4*	1,4*	1,4*
286°F/141°C	Blue	1,3,4,6	1,3,4,6	1,4*	2,5*	2,5*

Notes:

1. Listed by Underwriters Laboratories, Inc.
 2. Listed by Underwriters Laboratories, Inc. for maximum 150°F/68°C ambient temperatures.
 3. Listed by Underwriters' Laboratories of Canada.
 4. Approved by Factory Mutual Research Corporation.
 5. Approved by Factory Mutual Research Corporation for maximum 150°F/68°C ambient temperatures.
 6. Approved by the City of New York under MEA 127-93-E
- * Upright Only

Table 2 - ELO-231 UL & ULC Specific Application Guidelines

<p>Type of Storage: Single, double, multiple-row and portable rack storage (No Solid Shelves) and solid piled or palletized storage.</p> <p>Commodity: Class I-IV, encapsulated or non-encapsulated. Group A and B plastics - cartoned, expanded or unexpanded as well as exposed, unexpanded.</p> <p>Maximum Storage Height: 20'-0" (6,1 m)</p> <p>Clearance: 36" (0,9 m) minimum from deflector to top of storage.</p> <p>Max. Ceiling Height in Area of Storage: 25'-0" (7,6 m)</p> <p>Construction Type: All types - deflector distances per NFPA 13.</p> <p>System Type: Wet or dry</p>	<p>Temperature Rating: 165°F/74°C 212°F/100°C 286°F/141°C</p> <p>Hydraulic Design Criteria: The density required is 0.60 gpm/sq. ft. (24,5 mm/min).</p> <p>Design Area: For wet systems 2000 sq. ft. (186 m²) and for dry systems use 2600 sq. ft. (242 m²)</p> <p>Spacing: Maximum spacing is 100 sq. ft. (9,3 m²). The maximum distance between sprinklers is 12'-0" (3,7 m) - 12'-6" (3,8 m) spacing is allowed in 25'-0" (7,6 m) bays. Minimum spacing is 6'-0" (1,8 m) apart unless separated by baffles.</p> <p>Obstructions: NFPA criteria for standard spray sprinklers.</p>
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**Figure 3 - Cross Section
Model ELO-231, Upright Sprinkler**

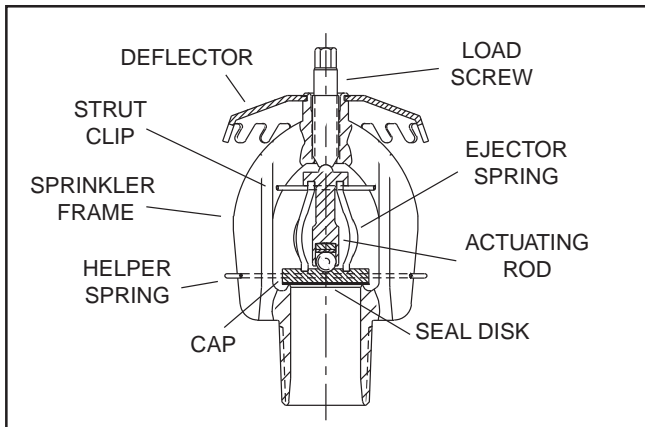
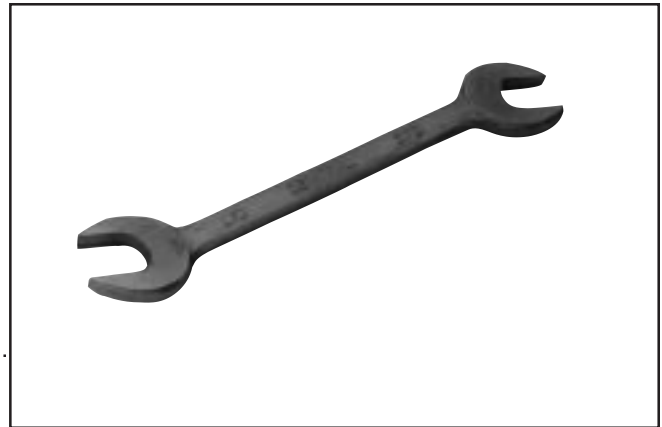


Figure 4 - W-Type 3, Sprinkler Wrench (Part #1073)



Design Criteria

The Model ELO-231, 11.2 K-factor Upright and Pendent Sprinklers (Ref. Table 1) are UL and ULC Listed and NYC Approved (MEA 127-93-E) as Standard Response, Standard Coverage, Spray Sprinklers for use accordance with current NFPA standards for the protection of light, ordinary & extra hazard as well as storage occupancies. These Area/Density sprinklers are listed with a minimum residual (flowing) pressure of 7 psi (0,5 bar) for non-storage occupancies and 10 psi (0,7 bar) for storage occupancies.

The Model ELO-231, 11.2 K-factor Upright and Pendent Sprinklers are UL and ULC Listed for use, when acceptable to the Authority Having Jurisdiction, as "specific application" sprinklers in accordance with the design parameters set forth in Table 2 of this Data Sheet.

The Model ELO-231, 11.2 K-factor Upright and Pendent Sprinklers (Ref. Table 1) are FM Approved for use in accordance with the FM Loss Prevention Data Sheets. These "Control Mode Area/Density Sprinklers" are approved with a minimum residual (flowing) pressure of 10 psi (0,7 bar).

These sprinklers can be used with any metallic flush or extended escutcheon, provided the maximum ceiling to top of sprinkler deflector dimension specified in NFPA 13 is maintained. These sprinklers are not listed or approved for recessed applications.

NOTE

Inquiries concerning the appropriateness of wax or lead coated sprinklers for a given corrosive environment should be submitted to the attention of the Technical Services Department. Wax or Lead coated sprinklers are not suitable for use in open sprinkler applications.



Installation

The Model ELO-231 Upright & Pendent Sprinklers must be installed in accordance with the following instructions.

NOTES

A leak tight 1/2 inch NPT sprinkler joint should be obtained with a torque of 7 to 14 ft.lbs. (9,5 to 19,0 Nm). A maximum of 21 ft.lbs. (28,5 Nm) of torque is to be used to install 1/2 inch NPT sprinklers. 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). A maximum of 30 ft.lbs. (40,7 Nm) of torque is to be used to install 3/4 inch NPT sprinklers. Higher levels of torque may distort the sprinkler inlet with consequent leakage or impairment of the sprinkler.

Step 1. Upright sprinklers must be installed only in the upright position and pendent sprinklers must be installed only in the pendent position. The deflector is to be parallel to the ceiling, roof, or mounting surface, as applicable.

Step 2. With pipe thread sealant applied to the pipe threads, hand tighten the sprinkler into the sprinkler fitting.

Step 3. Tighten the sprinkler into the sprinkler fitting using only the W-Type 3 Sprinkler Wrench (Ref. Figure 4), except that an 8 or 10 inch adjustable Crescent wrench is to be used for wax coated sprinklers. With reference to Figure 1 & 2, both the Combination Wrench and the adjustable Crescent wrench are to be applied to the wrench flats only.

When installing wax coated sprinklers with the adjustable Crescent wrench, additional care needs to be exercised to prevent damage to the wax coating on the sprinkler wrench flats or frame arms and, consequently, exposure of bare metal to the corrosive environment. The jaws of the

wrench should be opened sufficiently wide to pass over the wrench flats without damaging the wax coating. Before wrench tightening the sprinkler, the jaws of the wrench are to be adjusted to just contact the sprinkler wrench flats. After wrench tightening the sprinkler, loosen the wrench jaws before removing the wrench.

After installation, the sprinkler wrench flats and frame arms must be inspected and the wax coating retouched (repaired) whenever the coating has been damaged and bare metal is exposed. The wax coating on the wrench flats can be retouched by gently applying a heated 1/8 inch diameter steel rod to the areas of wax that have been damaged, to smooth it back over areas where bare metal is exposed.

NOTES

Only retouching of the wax coating applied to the wrench flats and frame arms is permitted, and the retouching is to be performed only at the time of the initial sprinkler installation.

The steel rod should be heated only to the point at which it can begin to melt the wax, and appropriate precautions need to be taken, when handling the heated rod, in order to prevent the installer from being burned.

If attempts to retouch the wax coating with complete coverage are unsuccessful, additional wax can be ordered in the form of a wax block. Care should be exercised to assure that the proper rated temperature wax block is ordered. Only the correct temperature wax is to be used, and retouching of wrench flats and frame arms is only permitted at the time of initial sprinkler installation. With the steel rod heated as previously described, touch the rod to the area requiring additional wax with the rod angled downward, and then touch a portion of the wax block to the rod approximately one-half inch away from the area requiring retouching. The wax will melt and run down onto the sprinkler.



Care & Maintenance

The Model ELO-231 Upright & Pendent Sprinklers must be maintained and serviced in accordance with the following instructions.

NOTES

Before closing a fire protection system main control valve for maintenance work on the fire protection system it controls, permission to shut down the affected fire protection systems must be obtained from the proper authorities. All personnel who may be affected by this action must be notified.

Sprinklers which are found to be leaking or exhibiting visible signs of corrosion must be replaced.

Automatic sprinklers must never be shipped or stored where their temperatures will exceed 100°F/38°C and they must never be painted, plated, coated or otherwise altered after leaving the factory. Modified or overheated 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.

Frequent visual inspections are recommended to be initially performed for wax and/or lead coated sprinklers, after the installation has been completed, to verify the integrity of the wax and/or lead coating. Thereafter, annual inspections per NFPA 25 should suffice; however, instead of inspecting from the floor level, a random sampling of close-up visual inspections should be made, so as to better determine the exact sprinkler condition and the long term integrity of the wax and/or lead coating, as it may be affected by the corrosive conditions present.

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.

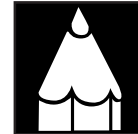


Limited Warranty

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 Information

Ordering Information: When placing an order, indicate the full product name. Please specify the quantity, model, style, orifice size, temperature rating, type of finish or coating, and sprinkler wrench. Refer to price list for complete listing of Part Numbers.

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