

## Series ELO-231 – 11.2 K-factor Upright and Pendent Sprinklers Standard Response, Standard Coverage

### General Description

TYCO Series ELO-231 11.2K Standard Response, Standard Coverage Upright and Pendent Sprinklers (Ref. Figure 1) are automatic sprinklers of the fusible solder type. They are standard response, spray sprinklers that produce a hemispherical water distribution pattern below the deflector.

The 11.2 K-factor, 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 11.2 K-factor, ELO-231 Sprinklers, making their use highly advantageous in high density applications, such as the protection of high-piled storage.

Wax or lead coatings can be used to extend the life of the copper alloy components used in Series ELO-231 sprinklers beyond that which would otherwise be obtained when exposed to corrosive atmospheres. Although wax and 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 envi-

ronment. 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.

An upright intermediate level version of the Series ELO-231 Sprinklers for in-rack applications can be obtained by utilizing the Series ELO-231 Upright Sprinkler with the WSG-2 Guard & Shield, and a pendent intermediate level version of the Series ELO-231 Sprinklers can be obtained by utilizing the Series ELO-231 Pendent Sprinkler with the WS-2 Shield. If there is a possibility of the pendent intermediate level version being exposed to mechanical damage, a G-2 Guard can be added.

#### NOTICE

*The 11.2 K-factor, Series 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 (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 product manufacturer with any questions.*

*Installation of Series ELO-231 Pendent Sprinklers in recessed escutcheons will void all sprinkler warranties, as well as possibly void the sprinkler's Approvals and/or Listings.*

### Sprinkler Identification Numbers (SINs)

Refer to Table A for sprinkler identification numbers.



### Technical Data

**Approvals**  
UL and C-UL Listed  
FM Approved  
NYC Approved

Refer to Table C for specific details on laboratory listings and approvals, including corrosion-resistant status. The approvals apply to the service conditions indicated in the Design Criteria section.

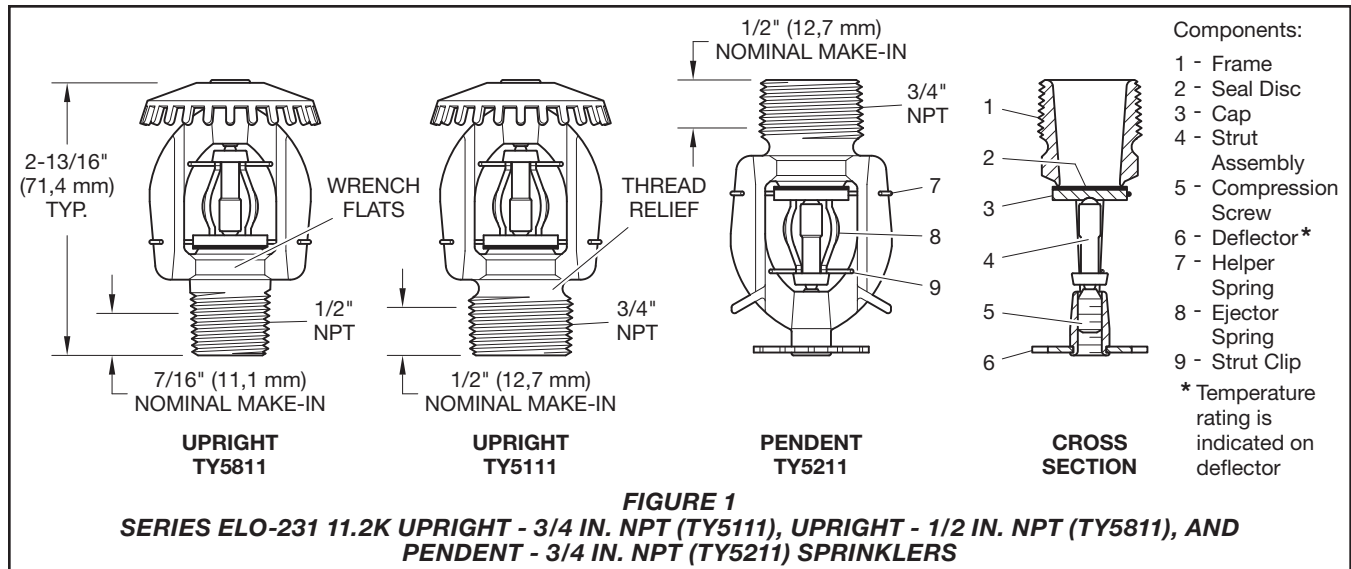
**Finishes**  
Refer to Table C

**Physical Characteristics**

Frame .....	Bronze
Seal Disc .....	Copper
Cap .....	Bronze
Strut Assembly . . .	Solder, Bronze Stainless Steel
Compression Screw .....	Bronze
Deflector .....	Bronze
Helper Spring .....	Stainless Steel
Ejector Spring .....	Nickel
Strut Clip .....	Stainless Steel

**Additional Technical Data**  
Refer to Table A for additional technical data.

**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.



## 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.

## Design Criteria

### UL and C-UL

#### Listing Requirements

TYCO Series ELO-231 11.2K Standard Response, Standard Coverage Upright and Pendent Sprinklers are to be installed in accordance with NFPA 13 standard sprinkler position and area/density flow calculation requirements for light, ordinary, or extra hazard occupancies, as well as high piled storage occupancies, such as solid piled, palletized, rack storage, bin box, and shelf storage including but not limited to Class I-IV and Group A plastics, with a minimum residual (flowing) pressure of 7 psi (0,5 bar) for wet or dry pipe systems.

#### FM Approval Requirements

The 11.2 K-factor, Model ELO-231 Sprinklers are to be installed in accordance with the applicable control mode density/area guidelines provided by FM Global.

**Note:** FM Approval guidelines may differ from UL and C-UL Listing criteria.

Item	Description
Sprinkler Identification Number (SIN)	TY5111 – Upright - 3/4 in. NPT TY5211 – Pendent - 3/4 in. NPT TY5811 – Upright - 1/2 in. NPT TY5111 is a redesignation for Central SIN C5111. TY5211 is a redesignation for Central SIN C5211. TY5811 is a redesignation for Central SIN C5811.
K-factor, (gpm/psi) (lpm/bar)	11.2 gpm/psi <sup>1/2</sup> (161,4 lpm/bar <sup>1/2</sup> )
Temperature Rating °F (°C) <sup>1</sup>	165°F (74°C) <sup>1</sup> 212°F (100°C) 286°F (141°C)
Thread Size	3/4 in. NPT or ISO 7-R 3/4 1/2 in. NPT
Sprinkler Orientation	Upright/Pendent
Maximum Working Pressure, psi (bar)	175 psi (12,1 bar)
<b>NOTES</b> 1. Refer to Table C for laboratory listings and approvals.	
<b>TABLE A</b> <b>SERIES ELO-231 UPRIGHT AND PENDENT SPRINKLER</b> <b>TECHNICAL DATA</b>	

Storage Type	NFPA	FM Global
Sprinkler Type	Standard Coverage	Storage
Response Type	SR	SR
System Type	Wet	Wet
Temperature Rating °F (°C) <sup>1</sup>	165°F (74°C) <sup>1</sup> 212°F (100°C) 286°F (141°C)	165°F (74°C) <sup>1</sup> 212°F (100°C) 286°F (141°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)	N/A	N/A

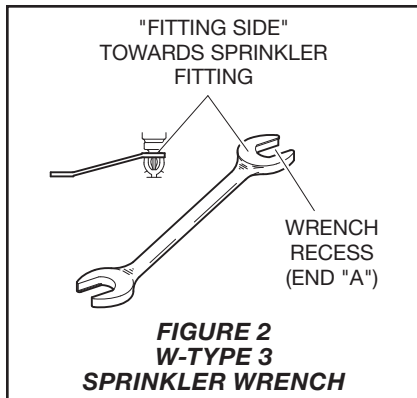
**NOTES**  
1. Refer to Table C for laboratory listings and approvals.  
N/A – Not Applicable

**TABLE B**  
**SERIES ELO-231 UPRIGHT AND PENDENT SPRINKLERS**  
**COMMODITY SELECTION AND DESIGN CRITERIA OVERVIEW**

SPRINKLER TYPE	TEMPERATURE RATING	FRAME COLOR	SPRINKLER FINISH				
			NATURAL BRASS	CHROME PLATED	LEAD COATED	WAX COATED	WAX-OVER-LEAD COATED
UPRIGHT (TY5111 & TY5811)	165°F (74°C)	Unpainted	1, 2, 3, 4			1, 2, 3, 4	
	212°F (100°C)	White					
	286°F (141°C)	Blue				1, 2, 3, 4	1*, 2*, 3*, 4*
PENDENT (TY5211)	165°F (74°C)	Unpainted	1, 2, 3, 4			1, 2, 4	
	212°F (100°C)	White					
	286°F (141°C)	Blue				1, 2, 4	1*, 2*, 4*

**NOTES**  
1. UL Listed  
2. C-UI Listed  
3. FM Approved  
4. Approved by the City of New York (NYC) under MEA 291-04-E  
\* Listed/Approved for a maximum ceiling temperature of 150 °F (66 °C)

**TABLE C**  
**11.2K SERIES ELO-231 UPRIGHT & PENDENT SPRINKLERS, STANDARD RESPONSE**  
**LABORATORY LISTINGS AND APPROVALS**



## Installation

TYCO Series ELO-231 11.2K Standard Response, Standard Coverage Upright and Pendent Sprinklers must be installed in accordance with this section.

A leak-tight 3/4 in. NPT sprinkler joint should be obtained by applying a minimum-to-maximum torque of 10 to 20 lb-ft (13,4 to 26,8 N·m). A leak-tight 1/2 in. NPT sprinkler joint should be obtained by applying a minimum-to-maximum torque of 7 to 14 lb-ft (9,5 to 19,0 N·m). Higher levels of torque can distort the sprinkler inlet with consequent leakage or impairment of the sprinkler.

Do not attempt to make up for insufficient adjustment in the escutcheon plate by under- or over-tightening the sprinkler. Re-adjust the position of the sprinkler fitting to suit.

The Series ELO-231 Upright and Pendent Sprinklers must be installed in accordance with the following instructions:

**Step 1.** Pendent sprinklers are to be installed in the pendent position, and upright sprinklers are to be installed in the upright position.

**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 2), except that an 8 in. or 10 in. adjustable Crescent wrench is to be used for wax coated sprinklers. With reference to Figure 1, the W-Type 3 Sprinkler Wrench or the adjustable wrench, as applicable, is to be applied to the wrench flats.

When installing wax-coated sprinklers with the adjustable 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 re-touched (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 in. diameter steel rod to the areas of wax that have been damaged, to smooth it back over areas where bare metal is exposed.

**Note:** 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 stick (the end of which is color coded). Only the correct color-coded 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 the wax stick to the rod approximately 1/2 in. away from the area requiring retouching. The wax will melt and run down onto the sprinkler.*

## Care and Maintenance

TYCO Series ELO-231 11.2K Standard Response, Standard Coverage Upright and Pendent Sprinklers must be maintained and serviced in accordance with this section.

Before closing a fire protection system control valve for maintenance work on the fire protection system that it controls, permission to shut down the affected fire protection system 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 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 to the sprinklers 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 corrosion resistant sprinklers, after the installation has been completed, to verify the long term potential integrity of the sprinkler coatings. 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 corrosion resistant 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, such as NFPA 25, in addition to the standards of any other authorities having jurisdiction. Contact the installing contractor or product manufacturer with any questions.

It is recommended that automatic sprinkler systems be inspected, tested, and maintained by a qualified Inspection Service in accordance with local requirements and/or national codes.

P/N 50 – XXX – X – XXX

		SIN			SPRINKLER FINISH			TEMPERATURE RATING
110	11.2K UPRIGHT (3/4 in. NPT)	TY5111	1	NATURAL BRASS	165	165°F (74°C)		
112	11.2K PENDENT (3/4 in. NPT)	TY5211	6	WAX COATED	212	212°F (100°C)		
210	11.2K UPRIGHT (1/2 in. NPT)	TY5811	7	LEAD COATED	286	286°F (141°C)		
			8	WAX-OVER-LEAD COATED				
			9	CHROME PLATED				

**TABLE D**  
**SERIES ELO231 11.2K UPRIGHT AND PENDENT SPRINKLERS, STANDARD RESPONSE**  
**PART NUMBER SELECTION**

## 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 name and part number (P/N).

### Sprinkler

Specify: ELO-231 11.2K Standard Response (specify Pendent or Upright) Sprinkler, SIN (specify), temperature rating (specify), with (specify) finish, P/N (specify from Table D)

### Sprinkler Wrench

Specify: W-Type 3 Sprinkler Wrench, P/N 56-895-1-001

### Wax Sticks

(for retouching wrench-damaged wax coating)

Specify: (specify Color) color-coded Wax Stick for retouching (specify temperature rating) temperature-rated Series ELO-231 Sprinklers, P/N (specify):

Red for 165°F (74°C) ..... 56-065-1-155  
Blue for 212°F (100°C) and  
286°F (141°C) ..... 56-065-1-286

**Note:** Each wax stick is suitable for retouching up to twenty-five sprinklers. The wax used for 286°F (141°C) sprinklers is the same as for 212°F (100°C) sprinklers, and, therefore, the 286°F (141°C) sprinkler is limited to the same maximum ceiling temperature as the 212°F (100°C) sprinkler, such as 150°F (66°C).

