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

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.

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docs.jci.com/tycofire/TFP342

Higher flow rates can be achieved at much lower pressures with the 11.2 K-factor, ELO-231B 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-231B Sprinklers beyond that which would otherwise be obtained when exposed to corrosive atmospheres. Although wax, lead, and polyester 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.

An upright intermediate level version of the Series ELO-231B Sprinklers for in-rack applications can be obtained by utilizing the Series ELO-231B Upright Sprinkler with the WSG-2 Guard & Shield, and a pendent intermediate level version of the Series ELO-231B Sprinklers can be obtained by utilizing the Series ELO-231B 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-231B 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-231B Pendent Sprinklers in recessed escutcheons will void all sprinkler warranties, as well as possibly void the sprinkler's Approvals and/or Listings.

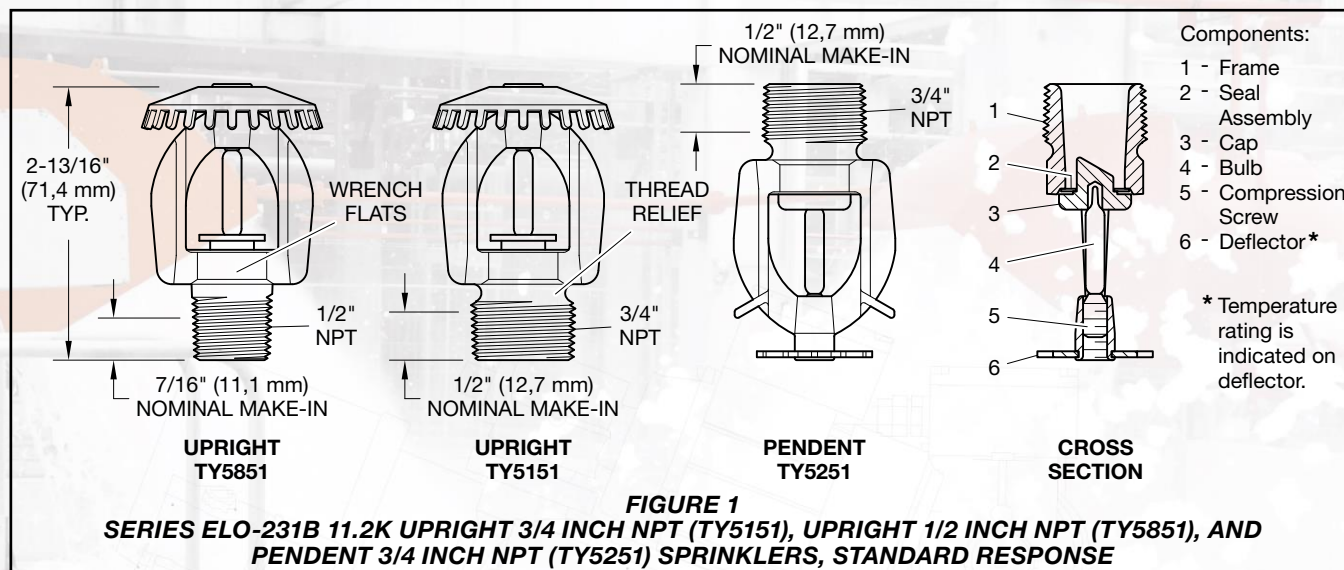
Sprinkler Identification Numbers (SINs)

See Table A

General Description

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

The 11.2 K-factor, ELO-231B 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.



Technical Data

Approvals

UL and C-UL Listed
 FM Approved
 NYC Approved
 VdS Approved
 EAC Approved

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

Finishes

See Table C

Physical Characteristics

FrameBronze
 CapBronze
 Sealing Assembly . . .Beryllium Nickel w/TEFLON
 Bulb (5 mm dia.) Glass
 Compression ScrewBronze
 DeflectorBronze

Additional Technical Data

See Table A

Operation

The glass bulb contains a fluid that expands when exposed to heat. When the rated temperature is reached, the fluid expands sufficiently to shatter the glass bulb, allowing the sprinkler to activate and water to flow.

Item	Description
Sprinkler Identification Number (SIN)	TY5151 - Upright 3/4 in. NPT TY5251 - Pendent 3/4 in. NPT TY5851 - Upright 1/2 in. NPT <small>TY5151 is a re-designation for Central SIN C5151. TY5251 is a re-designation for Central, Gem, and Star SINs C5251, G1871, and S2531, respectively. TY5851 is a re-designation for Central SIN C5851.</small>
K-factor, (gpm/psi) (lpm/bar)	11.2 GPM/psi ^{1/2} (161,4 LPM/bar ^{1/2})
Temperature Rating °F (°C) ¹	155 °F (68 °C) ¹ 200 °F (93 °C) 286 °F (141 °C)
Thread Size	3/4 in. NPT or 1/2 in. NPT
Sprinkler Orientation	Upright/Pendent
Maximum Working Pressure, psi (bar)	175 psi (12,1 bar)

Note:
 1. For laboratory listings and approvals, see Table C.

TABLE A
SERIES ELO-231B 11.2K UPRIGHT AND PENDENT SPRINKLERS
TECHNICAL DATA

Design Criteria

UL and C-UL

Listing Requirements

TYCO Series ELO-231B 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 (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. For additional information, see Table B.

FM Approval Requirements

The 11.2 K-factor, Model ELO-231B 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.

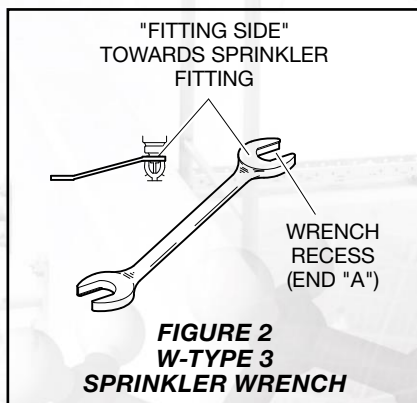
Storage Type	NFPA	FM Global
Sprinkler Type	Standard Coverage	Storage
Response Type	SR	SR
System Type	Wet, Dry	Wet, Dry
Temperature Rating °F (°C) ¹	155 °F (68 °C) ¹ 200 °F (93 °C) 286 °F (141 °C)	155 °F (68 °C) ¹ 200 °F (93 °C) 286 °F (141 °C)
Open Frame (that is, no solid shelves) Single, Double, Multiple-Row, 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
Rolled Paper Storage (Refer to the standard.)	Refer to NFPA 13	Refer to FM 8-21
Flammable 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
<p>Note: 1. Refer to Table C for laboratory listings and approvals. N/A - Not Applicable</p> <p style="text-align: center;">TABLE B SERIES ELO-231B 11.2K UPRIGHT AND PENDENT SPRINKLERS COMMODITY SELECTION AND DESIGN CRITERIA OVERVIEW</p>		

Sprinkler Type	Temperature Rating	Bulb Liquid	Sprinkler Finish				
			Natural Brass	Chrome Plated	Lead Coated	Wax Coated	Wax-Over-Lead Coated
Upright (TY5151) 3/4 in. NPT	155°F (68°C)	Red	1, 2, 3, 4, 5, 6			3, 6	
	200°F (93°C)	Green					
	286°F (141°C)	Blue					
Upright (TY5851) 1/2 in. NPT	155°F (68°C)	Red	1, 2, 3, 4, 5			3	
	200°F (93°C)	Green					
	286°F (141°C)	Blue					
Pendent (TY5251)	155°F (68°C)	Red	1, 2, 3, 4, 5, 6			3, 6	
	200°F (93°C)	Green					
	286°F (141°C)	Blue					

Notes:

- Listed by Underwriters Laboratories, Inc. (UL)
- Listed by Underwriters Laboratories, Inc. for use in Canada (C-UL)
- Approved by FM Global (FM Approvals)
- Approved by the City of New York (NYC) under MEA 291-04-E
- VdS Approved
- EAC Approved
- Listed/Approved for a maximum ceiling temperature of 150°F (66°C)

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



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-231B Upright and Pendent Sprinklers must be installed in accordance with the following instructions.

Note: Pendent sprinklers are to be installed in the pendent position; upright sprinklers are to be installed in the upright position.

Step 1. With pipe thread sealant applied to the pipe threads, hand-tighten the sprinkler into the sprinkler fitting.

Step 2. Tighten the sprinkler into the sprinkler fitting using only the W-Type 3 Sprinkler Wrench shown in Figure 2, except that an 8 in. or 10 in. adjustable 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 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 in. 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 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.

Installation

TYCO Series ELO-231B 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 ft-lb to 20 ft-lb (13,4 N·m 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 ft-lb to 14 ft-lb (9,5 N·m to 19,0 N·m). Higher levels of torque can distort the sprinkler inlet with consequent leakage or impairment of the sprinkler.

Notes: Do not install any bulb type sprinkler if the bulb is cracked or there is a loss of liquid from the bulb. With the sprinkler held horizontally, a small air bubble should be present. The diameter of the air bubble is approximately 1/16 in. (1,6 mm) for the 155°F (68°C) to 3/32 in. (2,4 mm) for the 286°F (141°C) temperature ratings.

P/N 50 — XXX — X — XXX

		SIN	SPRINKLER FINISH		TEMPERATURE RATING	
501	11.2K UPRIGHT (1/2 in. NPT)	TY5851	1	NATURAL BRASS	155	155°F (68°C)
510	11.2K UPRIGHT (3/4 in. NPT)	TY5151	6	WAX COATED	200	200°F (93°C)
512	11.2K PENDENT (3/4 in. NPT)	TY5251	7	LEAD COATED	286	286°F (141°C)
			8	WAX-OVER-LEAD COATED		
			9	CHROME PLATED		

TABLE D
SERIES ELO-231B 11.2K UPRIGHT AND PENDENT SPRINKLERS, STANDARD RESPONSE PART NUMBER SELECTION

Care and Maintenance

TYCO Series ELO-231B 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 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. For additional information, refer to Installation section.

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.

Limited Warranty

For warranty terms and conditions, visit www.tyco-fire.com.

Ordering Procedure

Sprinkler Assemblies with NPT Thread Connection

Specify: Series ELO-231B 11.2K Standard Response (specify Pendent or Upright) Sprinkler, SIN (specify), (specify temperature rating), 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-231B Sprinklers, P/N (specify):

Red for 155°F (68°C) 56-065-1-155
 Blue for 200°F (93°C)
 and 286°F (141°C) 56-065-1-286

Notes: 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 200°F (93°C) sprinklers, and, therefore, the 286°F (141°C) sprinkler is limited to the same maximum ceiling temperature as the 200°F (93°C) sprinkler, such as 150°F (66°C).

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TFP342 Change History Appendix

ISSUE DATE	NOTES
08-22	Page 1, updated QR code and URL; Page 6, changed corporate address and telephone number to 1467 Elmwood Avenue, Cranston, RI 02910 Telephone +1-401-781-8220, formerly 1400 Pennbrook Parkway, Lansdale, PA 19446 Telephone +1-215-362-0700.
04-22	Page 2, Approvals sub-section, and Page 4, Table C, added EAC Approved for TY5151 and TY5251 only.
11-21	Added QR code and URL to allow convenient access to electronic version from printed document.
10-21	Updated Table C to add VdS Approved for Natural Brass and Chrome Plated finishes in all temperature ratings.
08-18	Updated Tyco® branding and document format; Added Johnson Controls copyright; Added disclaimer stating specifications and information subject to change without notice; Added reference to Regulatory and Health Warning Technical Data Sheet TFP2300.
05-18	Organized technical information into tables as required by UL.
09-17	Added statement prohibiting sprinklers featuring K-factors greater than 5.6 and 1/2 in. NPT thread size from installation in new construction, explicitly for retrofit applications only; Added VdS Approved.
11-16	Corrected Table B SIN number for 11.2K Upright (1/2" NPT) to TY5851, formerly shown as TY5111.
04-16	Removed option for sprinklers featuring ISO 7-1 pipe threads.
03-07	Changed UL and C-UL Listed minimum residual (flowing) pressure for high piled storage to 7 psi (0,5 bar), formerly shown as 10 psi (0,7 bar).
01-05	Added reference to Installer Warning data sheet TFP700; Added NYC Approved.
08-03	Added Design Criteria section; Removed all references to specific application listings in response to changes included in NFPA 13 2002.
01-03	Added new Tyco Fire & Building Products masthead; Corrected metric conversion for 0.60 gpm/ft ² to (24,4 mm/min), formerly (34 mm/min).
11-02	New Technical Data Sheet TFP342 describes Series ELO-231B Upright and Pendent Sprinklers.

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