

Series ELO-231B — 160 K-factor Upright and Pendent Sprinklers Standard Response, Standard Coverage

General Description

The 160 K-factor, Series ELO-231B, 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 K160, ELO-231B Sprinklers were subjected to full scale, high-piled storage fire tests to qualify their use in lieu of 80 or 115 K-factor standard spray sprinklers for the protection of high-piled storage.

Higher flow rates can be achieved at much lower pressures with the K160, 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.

WARNINGS

*The K160, 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, 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. The installing contractor or manufacturer should be contacted 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.



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.

			SPRINKLER FINISH				
TYPE	TEMPERATURE	BULB LIQUID	NATURAL BRASS	CHROME-PLATED	LEAD COATED	WAX COATED	WAX OVER LEAD
UPRIGHT (TY5151 & TY5851)	68°C (155°F)	Red	1,2,3,4		3		
	93°C (200°F)	Green					
	141°C (286°F)	Blue			3	3 ^(a)	
PENDENT (TY5251)	68°C (155°F)	Red	1,2,3,4		3		
	93°C (200°F)	Green					
	141°C (286°F)	Blue			3	3 ^(a)	

NOTES:

1. Listed by Underwriters Laboratories, Inc. (UL Listed).
2. Listed by Underwriters Laboratories, Inc. for use in Canada (C-UL Listed).
3. Approved by Factory Mutual Research Corporation (FM Approved).
4. Approved by the City of New York under MEA 291-04-E.

(a). FM Approved for a maximum ceiling temperature of 66°C (150°F).

TABLE A
LABORATORY LISTINGS AND APPROVALS FOR K160 SERIES ELO-231B UPRIGHT AND PENDENT SPRINKLERS
(Refer to the Design Criteria Section)

Model/Sprinkler Identification Numbers

TY5151 - Upright K160, 3/4"NPT
TY5251 - Pendent K160, 3/4"NPT
TY5851 - Upright K160, 1/2"NPT
 TY5151 is a redesignation for C5151.

TY5251 is a redesignation for C5251, G1871, and S2531.

TY5851 is a redesignation for C5851.

Technical Data

Approvals

UL and C-UL Listed, FM and NYC Approved.

(Refer to Table A for complete approval information including corrosion resistant status. The approvals apply to the service conditions indicated in the Design Criteria section.)

Maximum Working Pressure

12,1 bar (175 psi)

Discharge Coefficient

161,4 l/min·bar^{0.5} (11.2 usgpm/psi^{0.5})

Temperature Ratings

Refer to Table A

Finish

Refer to Table A

Physical Characteristics

Frame.....Bronze
 Cap.....Bronze
 Sealing Assembly.....
Beryllium Nickel w/Teflon*
 Bulb (5mm dia.).....Glass
 Compression Screw.....Bronze
 Deflector.....Bronze

*Registered trademark of DuPont.

Design Criteria

UL and C-UL Listing Requirements

The K160, Model ELO-231B (TY5151, TY5251 & TY5851) 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 0,5 bar (7 psi) for wet or dry pipe systems.

FM Approval Requirements

The K160, Model ELO-231B (TY5151, TY5251 & TY5851) Sprinklers are to be installed in accordance with the applicable "control mode density/area" guidelines provided by Factory Mutual. (FM guidelines may differ from UL and C-UL Listing criteria.)

* Temperature rating is indicated on deflector.
 ** Pipe thread connections per ISO 7/1 can be provided on special request.

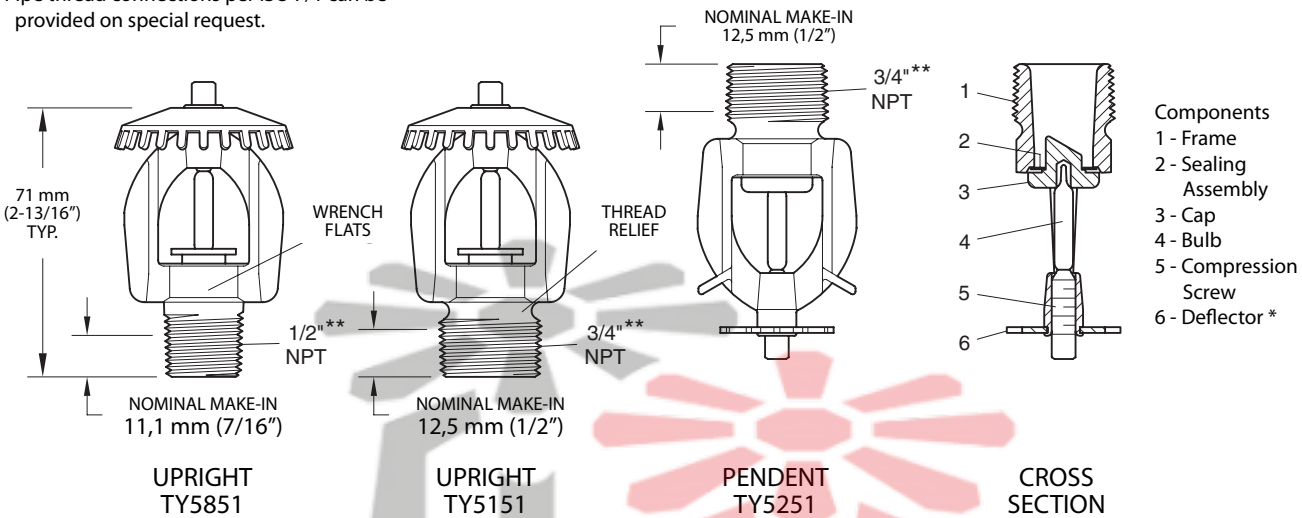


FIGURE 1
K160 SERIES ELO-231B UPRIGHT - 3/4\" NPT (TY5151), UPRIGHT - 1/2\" NPT (TY5851), AND PENDENT - 3/4\" NPT (TY5251) SPRINKLERS

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, activating the sprinkler and allowing water to flow.

Installation

The **Series ELO-231B Sprinklers** must be installed in accordance with the following instructions:

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 1,5 mm (1/16\") for the 57°C (135°F) to 2,5 mm (3/32\") for the 141°C (286°F) temperature ratings.

A leak tight 3/4\" NPT sprinkler joint should be obtained with a torque of 13 to 27 Nm (10 to 20 ft.lbs.). A maximum of 41 Nm (30 ft.lbs.) of torque is to be used to install sprinklers with 3/4\" NPT connections. A leak tight 1/2\" NPT sprinkler joint should be obtained with a torque of 9,5 to 19 Nm (7 to 14 ft.lbs.). A maximum of 29 Nm (21 ft. lbs.) of torque may be used to install sprinklers with 1/2\" NPT connections. Higher levels of torque may distort the sprinkler inlet and cause 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. Readjust the position of the sprinkler fitting to suit.

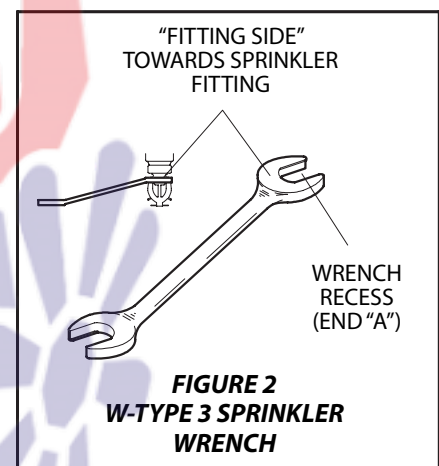
The **Series ELO-231B Upright and Pendent Sprinklers** must be installed in accordance with the following instructions.

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 a 200 or 250 mm (8 or 10\") 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 Crescent wrench, as applicable is to be applied to the wrench flats.

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 (M3) 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 tak-

en, 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 one-half inch away from the area requiring retouching. The wax will melt and run down onto the sprinkler.

Care and Maintenance

Series ELO-231B Sprinklers must be maintained and serviced in accordance with the following instructions:

NOTES

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 (ref. Installation Section Note).

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 (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 in accordance with local requirements and/or national code.

Limited Warranty

Products manufactured by Tyco Fire & Building Products (TFBP) 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 TFBP. No warranty is given for products or components manufactured by companies not affiliated by ownership with TFBP 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 TFBP to be defective shall be either repaired or replaced, at TFBP's sole option. TFBP neither assumes, nor authorizes any person to assume for it, any other obligation in connection with the sale of products or parts of products. TFBP 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 TFBP 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 TFBP's 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.

This limited warranty sets forth the exclusive remedy for claims based on failure of or defect in products, materials or components, whether the claim is made in contract, tort, strict liability or any other legal theory.

This warranty will apply to the full extent permitted by law. The invalidity, in whole or part, of any portion of this warranty will not affect the remainder.

Ordering Procedure

A Part Number (P/N) is not specified when ordering sprinklers with thread connections per ISO 7/1.

Contact your local distributor for availability.

Sprinkler Assemblies with NPT Thread Connection:

Specify: (specify SIN), K160, (specify temperature rating), Series ELO-231B Standard Response (specify Pendent or Upright) Sprinkler with (specify finish), P/N (specify from Table B).

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 TY-B Sprinklers, P/N (specify).

Red for 68°C.....P/N 56-065-1-155
Blue for 93°C & 141°CP/N 56-065-1-286

NOTES

Each wax stick is suitable for retouching up to twenty-five sprinklers.

The wax used for 141°C sprinklers is the same as for 93°C sprinklers, and, therefore, the 141°C sprinkler is limited to the same maximum ceiling temperature as the 93°C sprinkler (i.e. 65°C).

P/N 50 — XXX — X — XXX

TYPE		FINISH		TEMPERATURE RATING	
510	UPRIGHT 3/4" NPT (TY5151)	1	NATURAL BRASS	155	68°C (155°F)
512	PENDENT 3/4" NPT (TY5251)	9	CHROME PLATED	200	79°C (200°F)
501	UPRIGHT 1/2" NPT (TY5851)	6	WAX COATED	286	141°C (286°F)
		7	LEAD COATED		
		8	WAX OVER LEAD		

TABLE B
PRODUCT SYMBOL NUMBER SELECTION K160 SERIES
ELO-231B STANDARD RESPONSE UPRIGHT AND PENDENT
SPRINKLERS

COMINSA



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