



TECHNICAL DATA

QUICK RESPONSE EXTRA-LARGE ORIFICE UPRIGHT SPRINKLER VK531 (STORAGE-DENSITY/AREA)

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058

Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

1. DESCRIPTION

The Viking Quick Response Extra-Large Orifice Upright Sprinkler VK531 is a thermosensitive glass bulb spray sprinkler available in several different finishes and temperature ratings to meet design requirements. The special Polyester, Electroless Nickel PTFE (ENT), and PTFE coatings can be used in decorative applications where colors are desired. In addition, these coatings have been investigated for installation in corrosive atmospheres and are listed/approved as corrosion resistant as indicated in the Approval Charts. (Note: **FM Global approves the ENT coating as corrosion resistant.** FM Global has no approval classification for PTFE and Polyester coatings as corrosion resistant.)

The extra-large orifice provides greater flows at lower pressures than standard orifice or large orifice sprinklers. This feature allows reduced pipe sizing for hydraulically calculated sprinkler systems, which require high densities of water. Viking Standard Response Extra-Large Orifice Sprinklers may eliminate the need for a fire pump or reduce the size of the pump if it is required. On existing systems, replacing large orifice sprinklers with extra-large orifice sprinklers may provide the higher densities required to allow an increase in the hazard classification of an occupancy.

Viking Quick Response Extra-Large Orifice Upright Sprinkler VK531 may be ordered and/or used as an open sprinkler (glass bulb and pip cap assembly removed) on deluge systems. Refer to Ordering Instructions below.



2. LISTINGS AND APPROVALS



cULus Listed: Category VNIV

FM Approved: Class 2020



NOTE: Upright Sprinkler VK531 is cULus Listed as a Specific Application Sprinkler as indicated in Design Criteria on page 70j.

Refer to Approval Chart 1 and Design Criteria on page 70j for cULus Listing requirements, and refer to Approval Chart 2 and Design Criteria on page 70k for FM Approval requirements that must be followed.

3. TECHNICAL DATA

Specifications:

Available since 2000.

Maximum Working Pressure: 175 psi (12 bar). Factory tested hydrostatically to 500 psi (34.5 bar).

Thread size: 3/4" (20 mm) NPT

Nominal K-Factor: 11.2 U.S. (161.3 metric*)

* Metric K-factor measurement shown is when pressure is measured in Bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.

Glass-bulb fluid temperature rated to -65 °F (-55 °C)

Overall Length: 2-5/16" (58.7 mm)

Material Standards:

Sprinkler Frame: Brass UNS-C84400

Deflector: Brass UNS-C26000

Bulb: Glass, nominal 3 mm diameter

Pip Cap and Insert Assembly: Copper UNS-C11000 and Stainless Steel UNS-S30400

Compression Screw: Brass UNS-C36000

Belleville Spring Sealing Assembly: Nickel Alloy, coated on both sides with Teflon Tape

For PTFE Coated Sprinklers: Belleville Spring-Exposed, Screw-Nickel Plated, Pip Cap-PTFE Coated

For Polyester Coated Sprinklers: Belleville Spring-Exposed

For ENT Coated Sprinkler: Belleville Spring-Exposed, Screw and Pipcap-ENT plated.

Ordering Information: (Also refer to the current Viking price list.)

Order Quick Response Extra-Large Orifice Upright Sprinkler VK531 by first adding the appropriate suffix for the sprinkler finish and then the appropriate suffix for the temperature rating to the sprinkler base part number.

Finish Suffix: Brass = A, Chrome = F, White Polyester = M-W, Black Polyester = M-B, Black PTFE = N, ENT = JN

Temperature Suffix: 155 °F (68 °C) = B, 175 °F (79 °F) = D, 200 °F (93 °C) = E, 286 °F (141 °C) = G, OPEN = Z (PTFE only).

For example, sprinkler VK531 with a Brass finish and a 155 °F (68 °C) temperature rating = Part No. 10633AB

Available Finishes And Temperature Ratings: Refer to Table 1.

Accessories: (Also refer to the "Sprinkler Accessories" section of the

Viking Technical Data may be found on
The Viking Corporation's Web site at
<http://www.vikinggroupinc.com>.
The Web site may include a more recent
edition of this Technical Data Page.



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Viking data book.)

Sprinkler Wrenches:

- A. Standard Wrench: Part No. 05118CW/B (available since 1981).
 - B. Wrench for coated sprinklers: Part No. 11663W/B** (available since 2001)
- **A 1/2" ratchet is required (not available from Viking).

Sprinkler Cabinets:

- A. Six-head capacity: Part No. 01724A (available since 1971)
- B. Twelve-head capacity: Part No. 01725A (available since 1971)

4. INSTALLATION

Refer to appropriate NFPA Installation Standards.

5. OPERATION

During fire conditions, when the temperature around the sprinkler reaches its operating temperature, the heat-sensitive liquid in the glass bulb expands, causing the bulb to shatter, releasing the pip cap and sealing spring assembly. Water flowing through the sprinkler orifice strikes the sprinkler deflector, forming a uniform spray pattern to extinguish or control the fire.

6. INSPECTIONS, TESTS AND MAINTENANCE

Refer to NFPA 25 for Inspection, Testing and Maintenance requirements.

7. AVAILABILITY

The Viking Quick Response Extra-Large Orifice Upright Sprinkler is available through a network of domestic and international distributors. See The Viking Corporation web site for the closest distributor or contact The Viking Corporation.

8. GUARANTEE

For details of warranty, refer to Viking's current list price schedule or contact Viking directly.

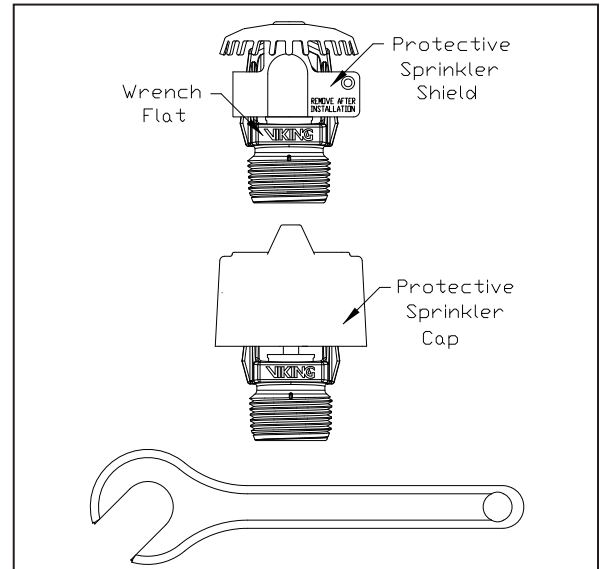


Figure 1: Sprinkler VK531 and Wrench 05118CW/B

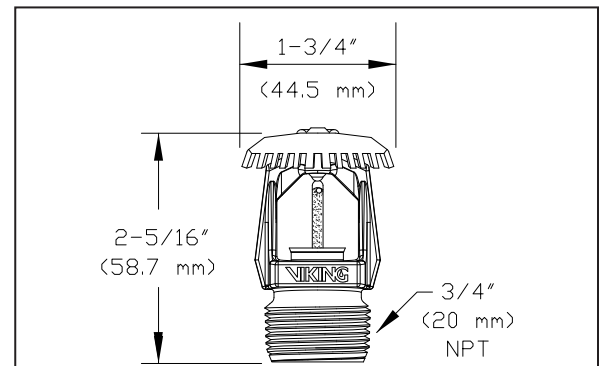


Figure 2: Sprinkler VK531 Dimensions

TABLE 1: AVAILABLE SPRINKLER TEMPERATURE RATINGS AND FINISHES

Sprinkler Temperature Classification	Sprinkler Nominal Temperature Rating ¹	Maximum Ambient Ceiling Temperature ²	Bulb Color
Ordinary	155 °F (68 °C)	100 °F (38 °C)	Red
Intermediate	175 °F (79 °C)	150 °F (65 °C)	Yellow
Intermediate	200 °F (93 °C)	150 °F (65 °C)	Green
High	286 °F (141 °C)	225 °F (107 °C)	Blue

Sprinkler Finishes: Brass, Chrome, White Polyester, Black Polyester, Black PTFE, and ENT

Corrosion-Resistant Coatings³: White Polyester, Black Polyester, and Black PTFE in all temperature ratings. ENT in all temperature ratings except 135°F (57°C).

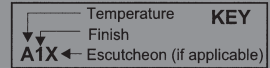
Footnotes

- ¹ The sprinkler temperature rating is stamped on the deflector.
- ² Based on NFPA-13. Other limits may apply, depending on fire loading, sprinkler location, and other requirements of the Authority Having Jurisdiction. Refer to specific installation standards.
- ³ The corrosion-resistant coatings have passed the standard corrosion test required by the approving agencies indicated in the Approval Charts. These tests cannot and do not represent all possible corrosive environments. Prior to installation, verify through the end-user that the coatings are compatible with or suitable for the proposed environment. For automatic sprinklers, the coatings indicated are applied to the exposed exterior surfaces only. Note that the spring is exposed on sprinklers with Polyester, ENT, and PTFE coatings. For PTFE coated open sprinklers only, the waterway is coated. For all ENT coated sprinklers, the waterway is coated.

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Approval Chart 1 (UL)										
Quick Response Extra-Large Orifice Upright Sprinkler VK531 Maximum 175 PSI (12 Bar) WWP										
Base Part Number ¹	SIN	Sprinkler Style	Thread Size		Nominal K-Factor		Overall Length		Listings and Approvals ³ (Refer also to Design Criteria below.)	
			NPT	BSP	U.S.	metric ²	Inches	mm	cULus ^{4,5}	NYC
10633	VK531	Upright	3/4"	20 mm	11.2	161.3	2-5/16	58.7	A1	See Footnote 6.
Approved Temperature Ratings						Approved Finishes				
A - 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), and 286 °F (141 °C)						1 - Brass, Chrome, White Polyester ⁷ , Black Polyester ⁷ , Black PTFE ⁷ , and ENT ⁷				
Footnotes										
<p>¹ Base part number shown. For complete part number, refer to Viking's current price schedule.</p> <p>² Metric K-factor measurement shown is when pressure is measured in Bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.</p> <p>³ This table shows the listings and approvals available at the time of printing. Other approvals may be in process.</p> <p>⁴ Listed by Underwriters Laboratories Inc. for use in the U.S. and Canada.</p> <p>⁵ cULus-Listed only for use in wet pipe sprinkler systems (or preaction systems qualifying as wet systems).</p> <p>⁶ Meets New York City requirements, effective July 1, 2008.</p> <p>⁷ cULus Listed as corrosion-resistant.</p>										



DESIGN CRITERIA - UL

(Also refer to Approval Chart 1 above.)

cULus Listing Requirements:

Quick Response Extra-Large Orifice Upright Sprinkler VK531 is cULus Listed for installation in accordance with the latest edition of NFPA 13 for standard upright spray sprinklers:

- Designed for use in hazard occupancies up to and including Ordinary Hazard Group II with a minimum operating pressure of 7 PSI (0.5 bar).
- Also Listed for use in High-Piled Storage Occupancies as defined in NFPA 13 with a minimum operating pressure of 7 PSI (0.5 bar).
- Listed only for use in wet pipe sprinkler systems (or preaction systems qualifying as wet systems).
- The sprinkler installation and obstruction rules contained in NFPA 13 for standard spray upright sprinklers must be followed.

Also:

When acceptable to the Authority Having Jurisdiction, Viking Quick Response Extra-Large Orifice Upright Sprinkler VK531 may be used as a specific-application head with a density of .6/2000 ft.² for wet systems (or preaction systems qualifying as wet systems) to protect single-, double-, multiple-row, and portable rack storage of Class I-IV, Group A and B Plastics, cartoned, expanded or unexpanded, as well as exposed unexpanded when the following conditions are met:

- A maximum storage height of 20 ft. (6.1 m).
- A maximum ceiling height of 25 ft. (7.6 m).
- A 36-inch (914 mm) minimum clearance from the deflector to the top of storage.

Otherwise, design to the appropriate density/area requirements.

IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. Also refer to pages QR1-3 for general care, installation, and maintenance information. Viking sprinklers are to be installed in accordance with the latest edition of Viking technical data, the appropriate standards of NFPA, LPCB, APSAD, VdS or other similar organizations, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable.

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Approval Chart 2 (FM)									
Quick Response Extra-Large Orifice Upright Sprinkler VK531									
Maximum 175 PSI (12 Bar) WWP									
Base Part Number ¹	SIN	Sprinkler Style	Thread Size		Nominal K-Factor		Overall Length		FM Approvals ³ (Refer also to Design Criteria below.)
			NPT	BSP	U.S.	metric ²	Inches	mm	
10633	VK531	Upright	3/4"	20 mm	11.2	161.3	2-5/16	58.7	A1
Approved Temperature Ratings A - 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), and 286 °F (141 °C)							Approved Finishes 1 - Brass, Chrome, and ENT ⁴		
Footnotes									
¹ Base part number shown. For complete part number, refer to Viking's current price schedule.									
² Metric K-factor measurement shown is when pressure is measured in Bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.									
³ This table shows the FM Approvals available at the time of printing. Other approvals may be in process.									
⁴ FM Approved as corrosion-resistant.									

Temperature Finish Escutcheon (if applicable)	KEY A1X ←
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DESIGN CRITERIA - FM

(Also refer to Approval Chart 2 above.)

FM Approval Requirements:
 Quick Response Extra-Large Orifice Upright Sprinkler VK531 is FM Approved as a quick response upright **Non-Storage** sprinkler and as a quick response upright **Storage** sprinkler as indicated in the FM Approval Guide. For specific application and installation requirements, reference the latest applicable FM Loss Prevention Data Sheets (including 2-0 and 8-9). FM Global Loss Prevention Data Sheets contain guidelines relating to, but not limited to: minimum water supply requirements, hydraulic design, ceiling slope and obstructions, minimum and maximum allowable spacing, and deflector distance below the ceiling.

NOTE: The FM installation guidelines may differ from cULus and/or NFPA criteria.

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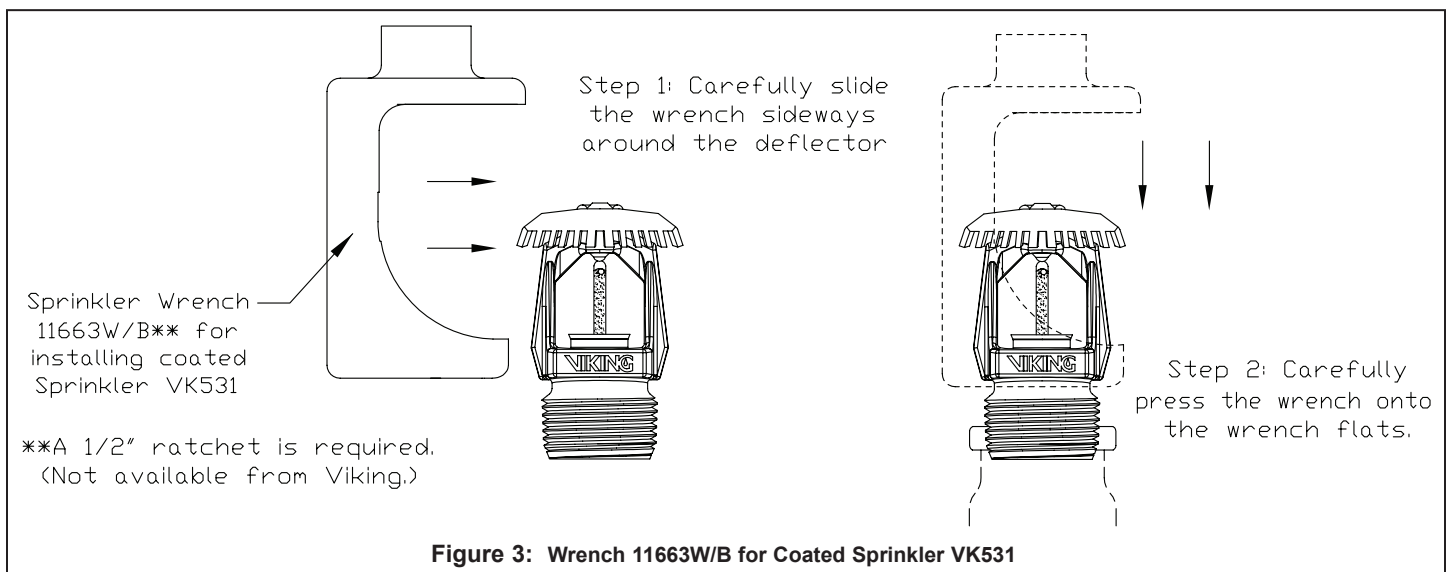


Figure 3: Wrench 11663W/B for Coated Sprinkler VK531