



TECHNICAL DATA

STANDARD/QR ECOH ELO FUSIBLE ELEMENT UPRIGHT SPRINKLER VK535 AND PENDENT SPRINKLER VK537

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

Viking EC/QREC Ordinary Hazard ELO Fusible Element Sprinklers VK535 and VK537 are thermosensitive spray sprinklers available in several different finishes and temperature ratings to meet varying design requirements. The extra-large orifice produces the flows required to meet Ordinary Hazard density requirements at lower pressures than standard orifice or large orifice sprinklers. Upright Sprinkler VK535 is UL Listed as standard response and FM Approved as quick response; Pendent Sprinkler VK537 is UL Listed as standard response and quick response. The special Polyester and Teflon® coatings can be used in decorative applications where colors are desired.

2. LISTINGS AND APPROVALS



cULus Listed: Category VNIV



FM Approved: Class 2022

Refer to Approval Chart 1 and Design Criteria on pages 83q-r for cULus Listing requirements, and refer to Approval Chart 2 and Design Criteria on page 83s for FM Approval requirements that must be followed.

cULus Listing requires the spacing between upright VK535 sprinklers to be a minimum of 13 ft. (4 m) and the spacing between pendent VK537 sprinklers to be a minimum of 12 ft. (3.7 m) to prevent cold soldering.

3. TECHNICAL DATA

Specifications:

Available since 2007.

Minimum Operating Pressure: Refer to the Approval Charts.

Maximum Working Pressure: 175 psi (12 Bar). Factory tested hydrostatically to 500 psi (34.5 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 in Bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.

Overall Length: Part No. 14139: 2-5/16 (59 mm), Part No. 14611: 2-3/8" (61 mm)

Material Standards:

Sprinkler Frame: Brass UNS-C84400

Deflector: Brass UNS-C26000 for Sprinkler VK537. Copper UNS-C19500 for Sprinkler VK535

Fusible Element Assembly: Nickel Alloy

Trigger and Support: Stainless Steel UNS-S31600

Seat and Insert Assembly: Copper UNS-C11000 and Stainless Steel UNS-S30400

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

Screw: Brass UNS-C36000

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

For Polyester Coated Sprinklers: Belleville Spring-Exposed

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

Order EC/QREC Ordinary Hazard ELO Fusible Element Sprinklers 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.

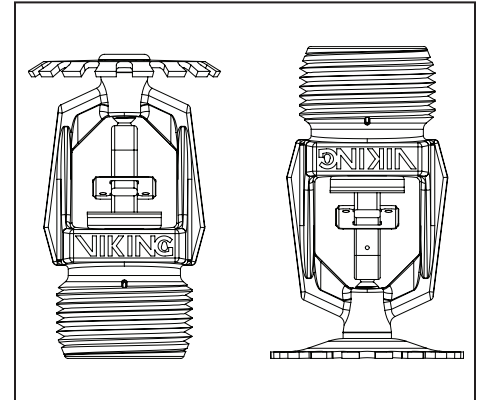
Finish Suffix: Brass = A, Chrome-Enloy® = F, White Polyester = M-/W, Black Polyester = M-/B, and Black Teflon® = N

Temperature Suffix (°F/°C): 165°/74° = C and 205°/96° = E

For example, sprinkler VK535 with a Brass finish and a 165 °F/74 °C temperature rating = Part No. 14139AC

Available Finishes And Temperature Ratings:

Refer to Table 1.



Sprinkler VK535

Sprinkler VK537

(NOTE: 12' x 12' area of coverage is not cULus Listed. Refer to the Approval Chart.)

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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Accessories: (Also refer to the “Sprinkler Accessories” section of the Viking data book.)

Sprinkler Wrenches:

A. Standard Wrench: Part No. 05118CW/B (available since 1981)

B. Wrench for recessed pendent sprinkler: 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, the heat-sensitive fusible element assembly disengages, releasing the seat and spring assemblies to open the waterway. 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

Viking Sprinklers VK535 and VK537 are 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.

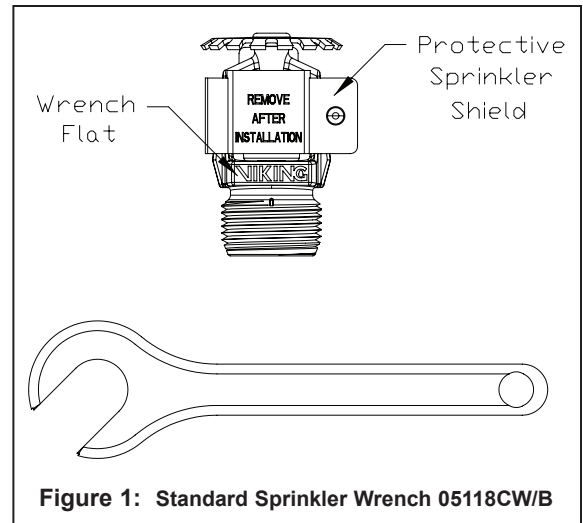


Figure 1: Standard Sprinkler Wrench 05118CW/B

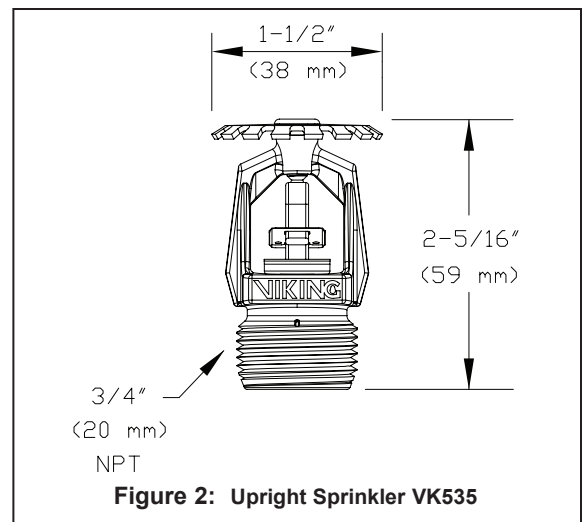


Figure 2: Upright Sprinkler VK535

TABLE 1: AVAILABLE SPRINKLER TEMPERATURE RATINGS AND FINISHES

Sprinkler Temperature Classification	Sprinkler Nominal Temperature Rating ¹	Maximum Ambient Ceiling Temperature ²	Frame Paint Color
Ordinary	165 °F (74 °C)	100 °F (38 °C)	None
Intermediate	205 °F (96 °C)	150 °F (65 °C)	White
High	280 °F (138 °C)	225 °F (107 °C)	Blue

Sprinkler Finishes: Brass, Chrome-Enloy[®], White Polyester³, Black Polyester³, and Black Teflon^{®3}

Footnotes

¹ Decorative sprinklers may not be color coded. The 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 For automatic sprinklers, the coatings indicated are applied to the exposed exterior surfaces only. Note that the spring is exposed on sprinklers with Polyester and Teflon[®] coatings. For Teflon[®] coated open sprinklers only, the waterway is coated.

	<h2 style="margin: 0;">TECHNICAL DATA</h2>	<h3 style="margin: 0;">STANDARD/QR ECOH ELO FUSIBLE ELEMENT UPRIGHT SPRINKLER VK535 AND PENDENT SPRINKLER VK537</h3>
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Sprinkler Base Part Number ¹	SIN	NPT Thread Size		Nominal K-Factor		Maximum Water Working Pressure	Overall Length	
		Inches	mm	U.S.	metric ²		Inches	mm
14139 Upright	VK535	3/4	20	11.2	161.3	175 psi (12 Bar)	2-5/16	59
14611 Pendent	VK537	3/4	20	11.2	161.3		2-3/8	61

<h3 style="margin: 0;">Approval Chart 1 (UL)</h3> <p style="margin: 0;">EC/QREC Fusible Element Ordinary Hazard ELO Sprinklers</p>	<table border="1" style="border-collapse: collapse;"> <tr> <td style="padding: 2px;">Temperature</td> <td style="padding: 2px;">KEY</td> </tr> <tr> <td style="padding: 2px;">Finish</td> <td style="padding: 2px;"></td> </tr> <tr> <td style="padding: 2px;">A1X ← Escutcheon (if applicable)</td> <td style="padding: 2px;"></td> </tr> </table>	Temperature	KEY	Finish		A1X ← Escutcheon (if applicable)	
Temperature	KEY						
Finish							
A1X ← Escutcheon (if applicable)							

Maximum Sprinkler Spacing (L x W ⁵)	Maximum Area per Sprinkler	Minimum Water Supply Requirements ⁵		Listings and Approvals ³ (See Design Criteria on pg 83r.)			
		Ordinary Hazard Group I	Ordinary Hazard Group II	Pendent VK537		Upright VK535	
		Flow / Pressure	Flow / Pressure	cULus ⁴	NYC	cULus ⁴	NYC

Standard Response							
16 ft. x 16 ft. (4.9 m x 4.9 m)	256 ft ² (23.8 m ²)	38 gpm @ 11.5 psi (143.9 L/min @ .79 Bar)	51 gpm @ 20.7 psi (193.1 L/min @ 1.43 Bar)	A1X, B1Y	See Footnote 6.	A1	See Footnote 6.
18 ft. x 18 ft. (5.5 m x 5.5 m)	324 ft ² (30.1 m ²)	49 gpm @ 19.1 psi (185.5 L/min @ 1.32 Bar)	65 gpm @ 33.7 psi (246.1 L/min @ 2.32 Bar)	A1X, B1Y	See Footnote 6.	A1	See Footnote 6.
20 ft. x 20 ft. (6.1 m x 6.1 m)	400 ft ² (37.2 m ²)	60 gpm @ 28.7 psi (227.1 L/min @ 1.98 Bar)	80 gpm @ 51.0 psi (302.8 L/min @ 3.52 Bar)	A1X, B1Y	See Footnote 6.	A1	See Footnote 6.

Quick Response (cULus only)							
14 ft. x 14 ft. (4.3 m x 4.3 m)	196 ft ² (18.2 m ²)	30 gpm @ 7.2 psi (113.6 L/min @ .50 Bar)	39 gpm @ 12.1 psi (147.7 L/min @ .84 Bar)	A1X, B1Y	See Footnote 6.	A1	See Footnote 6.

Approved Temperature Ratings	Approved Finishes	Approved Escutcheons
A - 165 °F (74 °C) and 205 °F (96 °C) B - 165 °F (74 °C)	1 - Brass, Chrome-Enloy®, White Polyester, Black Polyester, and Black Teflon®	X - Standard surface-mounted escutcheons or the Microfast® Model F-1 Adjustable Escutcheon Y - Standard surface-mounted escutcheons or the Microfast® Model F-1 Adjustable Escutcheon, or recessed with the Micromatic® Model E-1 or E-2 Recessed Escutcheon

Footnotes

¹ Part number shown is the base part number. For complete part number, refer to current Viking price list 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 chart shows listings and approvals available at time of printing. Check with the manufacturer for any additional approvals.

⁴ cULus Listed for use in the U.S. and Canada.

⁵ To determine "Minimum Water Supply Requirement" for areas of coverage where length and width of actual sprinkler spacing are not equal, select the "Maximum Sprinkler Spacing" from the chart that is equal to or greater than the larger of the actual spacing (length or width) dimensions used. Example: When using 10'-6" x 13'-0" sprinkler spacing, provide the "Minimum Water Supply Requirement" listed in the chart for 14'-0" x 14'-0" spacing. For areas of coverage smaller than shown, use the "Minimum Water Supply Requirement" in the appropriate hazard group for the next larger area listed. The distance from sprinklers to walls shall not exceed one-half the "Maximum Sprinkler Spacing" listed for the "Minimum Water Supply Requirement" used.

⁶ Meets New York City requirements, effective July 1, 2008.



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DESIGN CRITERIA - UL

(Also refer to Approval Chart 1 on page 83q.)

cULus Listing Requirements:

ECOH-ELO Fusible Element Upright Sprinkler VK535 and Pendent Sprinkler VK537 are cULus Listed as indicated in Approval Chart 1 for installation in accordance with the latest edition of NFPA 13 for extended coverage upright and pendent spray sprinklers as indicated below:

- The minimum water supplies and maximum areas of coverage shown in the Approval Chart are designed to provide the following design densities: 0.15 gpm/ft² (6.1 mm/min) for Ordinary-Hazard Group I densities; 0.2 gpm/ft.² (8.1 mm/min) for Ordinary-Hazard Group II densities.
- The sprinkler installation rules contained in NFPA 13 for extended coverage upright and pendent spray sprinklers must be followed with the exception that cULus Listing requires the spacing between upright VK535 sprinklers to be a minimum of **13 ft. (4 m)** and the spacing between pendent VK537 sprinklers to be a minimum of **12 ft. (3.7 m)** to prevent cold soldering.
- Viking ECOH-ELO Fusible Element Upright and Pendent Sprinklers are cULus Listed for use in unobstructed construction, and noncombustible obstructed construction consisting of solid steel and/or concrete beams as defined in the latest edition of NFPA 13.
- Ceiling slope not to exceed 2/12 (9.5°).

Also, Viking ECOH-ELO Upright Sprinkler VK535 and Pendent Sprinkler VK537 are specifically cULus Listed for:

- For non-combustible obstructed construction within trusses or bar joists having non-combustible web members greater than 1" (25.4 mm) when applying the 4 times obstruction criteria rule as defined in NFPA 13 under "Obstructions to Sprinkler Discharge Pattern Development".
- For installation under concrete tees when installed as follows:
 1. The stems of the concrete tee construction must be spaced between 3 ft (0.9 m) and 7 ft-6 in (2.3 m) on center. The depth of the concrete tees must not exceed 30 in (762 mm). The maximum permitted concrete tee length is 32 ft (9.8 m). However, where the concrete tee length exceeds 32 ft (9.8 m), non-combustible baffles, equal in height to the depth of the tees, can be installed so that the space between the tees does not exceed 32 ft (9.8 m).
 2. The sprinkler deflector is to be located in a horizontal plane at or above 1" (25.4 mm) below the bottom of the concrete tee stems.
 3. When the sprinkler deflector is located higher than a horizontal plane 1" (25.4 mm) beneath the bottom of the concrete tee stems, the obstruction to sprinkler discharge criteria requirements of NFPA 13 for extended coverage upright sprinklers applies.

IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. Also refer to pages EC1-3 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.

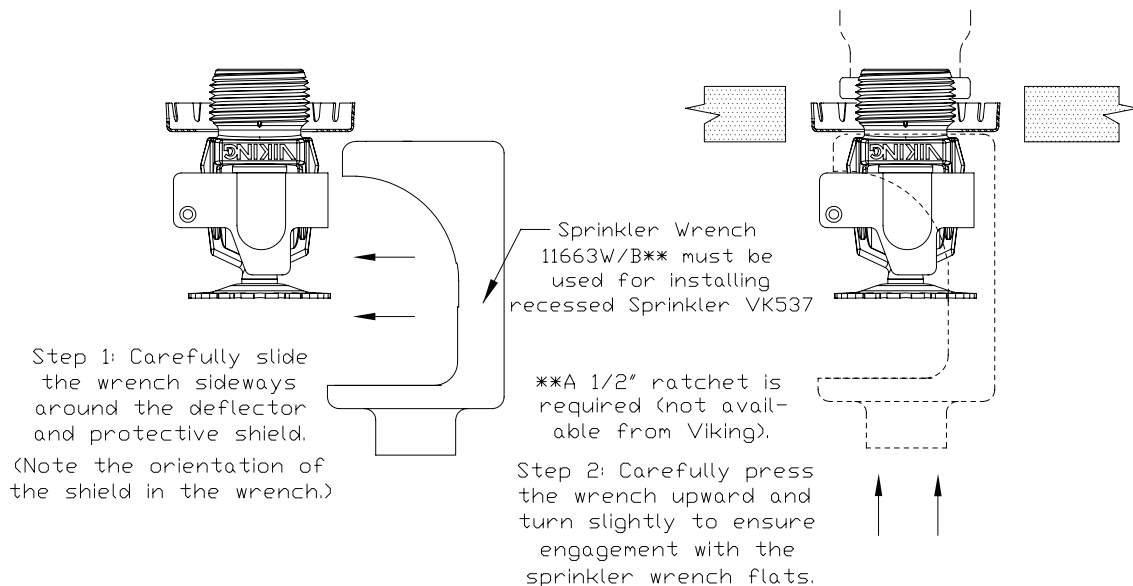


Figure 3: Wrench 11663W/B for Recessed Pendent Sprinkler VK537

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Approval Chart 2 (FM) Quick Response Extended Coverage ELO Upright Sprinkler VK535 For HC-1, HC-2, and HC-3 Occupancies Maximum 175 PSI (12 Bar) WWP									
		<p><u>Refer to Design Criteria below.</u></p> <p>NOTE: FM installation guidelines may differ from cULus and/or NFPA criteria. Refer to the latest applicable FM Loss Prevention Data Sheets (including 2-0 and 3-26).</p>	<table border="1" style="font-size: small;"> <tr> <td style="text-align: center;">Temperature</td> <td style="text-align: center;">KEY</td> </tr> <tr> <td style="text-align: center;">Finish</td> <td></td> </tr> <tr> <td style="text-align: center;">A1X ←</td> <td style="text-align: center;">Escutcheon (if applicable)</td> </tr> </table>	Temperature	KEY	Finish		A1X ←	Escutcheon (if applicable)
Temperature	KEY								
Finish									
A1X ←	Escutcheon (if applicable)								
Maximum Sprinkler Spacing (L x W ²)	Maximum Area per Sprinkler	FM Approval ¹ Upright Sprinkler VK535							
12 ft. x 12 ft. (3.7 m x 3.7 m)	144 ft ² (13.4 m ²)	A1							
14 ft. x 14 ft. (4.3 m x 4.3 m)	196 ft ² (18.2 m ²)	A1							
16 ft. x 16 ft. (4.9 m x 4.9 m)	256 ft ² (23.8 m ²)	A1							
Approved Temperature Ratings		Approved Finishes							
A - 165 °F (74 °C), 205 °F (96 °C), and 280 °F (138 °C)		1 - Brass, Chrome-Enloy®, White Polyester, and Black Polyester							
Footnotes									
<p>¹ This chart shows the FM Approvals available at time of printing. Check with the manufacturer for any additional approvals.</p> <p>² To determine "Minimum Water Supply Requirement" for areas of coverage where length and width of actual sprinkler spacing are not equal, select the "Maximum Sprinkler Spacing" from the chart that is equal to or greater than the larger of the actual spacing (length or width) dimensions used. Example: When using 10'-6" x 13'-0" sprinkler spacing, provide the "Minimum Water Supply Requirement" listed in the chart for 14'-0" x 14'-0" spacing. For areas of coverage smaller than shown, use the "Minimum Water Supply Requirement" in the appropriate hazard group for the next larger area listed. The distance from sprinklers to walls shall not exceed one-half the "Maximum Sprinkler Spacing" listed for the "Minimum Water Supply Requirement" used.</p>									

DESIGN CRITERIA - FM (Also refer to Approval Chart 2 above.)
<p>FM Approval Requirements:</p> <p>Sprinkler VK535 is FM Approved as a quick response Non-Storage extended coverage upright sprinkler as indicated in the FM Approval Guide for use in occupancy hazard classifications HC-1, HC-2, and HC-3. For specific application and installation requirements, reference the latest applicable FM Loss Prevention Data Sheets (including Data Sheets 2-0 and 3-26). 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.</p> <p>NOTE: The FM installation guidelines may differ from cULus and/or NFPA criteria.</p>
<p>IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. Also refer to page EC1-3 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, FM Global, LPCB, APSAD, VdS or other similar organizations, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable.</p>



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