



## TECHNICAL DATA

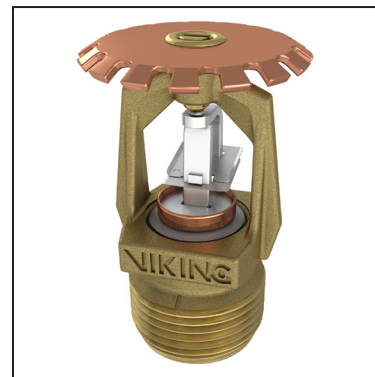
### STANDARD/QUICK RESPONSE ECOH ELO FUSIBLE ELEMENT UPRIGHT SPRINKLER VK535 (K11.2)

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 Sprinkler VK535 is a thermosensitive spray sprinkler 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. The special Polyester and PTFE 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 UL Design Criteria for cULus Listing requirements, and refer to Approval Chart 2 and FM Design Criteria 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) to prevent cold soldering.**

#### 3. TECHNICAL DATA

##### Specifications:

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: 2-5/16 (59 mm)

##### Material Standards:

Sprinkler Frame: Brass UNS-C84400

Deflector: Copper UNS-C19500 for Sprinkler

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 PTFE Tape

Screw: Brass UNS-C36000

For PTFE Coated Sprinklers: Belleville Spring-Exposed, Screw-Nickel Plated, Pip Cap-PTFE 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 = F, White Polyester = M-/W, Black Polyester = M-/B, and Black PTFE = 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.

**Accessories:** (Also refer to the "Sprinkler Accessories" section of the Viking data book.)

##### Sprinkler Wrenches:


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

##### Sprinkler Cabinets:

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

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

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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**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 Sprinkler VK535 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.

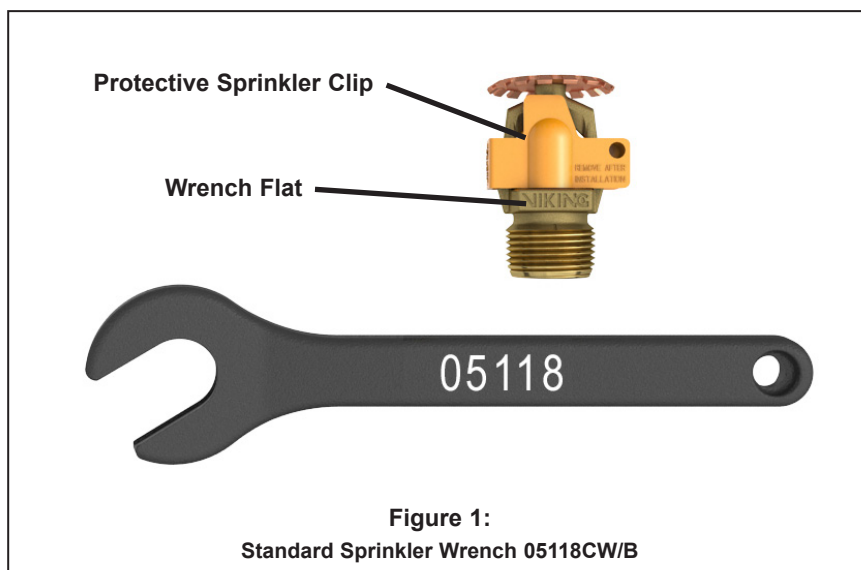


TABLE 1: AVAILABLE SPRINKLER TEMPERATURE RATINGS AND FINISHES			
Sprinkler Temperature Classification	Sprinkler Nominal Temperature Rating <sup>1</sup>	Maximum Ambient Ceiling Temperature <sup>2</sup>	Frame Paint Color
Ordinary	165 °F (74 °C)	100 °F (38 °C)	None
Intermediate	205 °F (96 °C)	150 °F (65 °C)	White
High	280 °F (138 °C)	225 °F (107 °C)	Blue
<b>Sprinkler Finishes:</b> Brass, Chrome, White Polyester <sup>3</sup> , Black Polyester <sup>3</sup> , and Black PTFE <sup>3</sup>			
<b>Footnotes</b>			
<sup>1</sup> Decorative sprinklers may not be color coded. The temperature rating is stamped on the deflector.			
<sup>2</sup> 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.			
<sup>3</sup> 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 PTFE coatings. For PTFE coated open sprinklers only, the waterway is coated.			



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Approval Chart 1 (UL)								KEY	
EC/QREC Fusible Element Ordinary Hazard ELO Sprinkler VK535								Temperature	Finish
Sprinkler Base Part Number <sup>1</sup>	SIN	NPT Thread Size		Nominal K-Factor		Maximum Water Working Pressure	Overall Length		
		Inches	mm	U.S.	metric <sup>2</sup>		Inches	mm	
14139	VK535	3/4	20	11.2	161.3	175 psi (12 Bar)	2-5/16	59	
Maximum Sprinkler Spacing (L x W <sup>5</sup> )	Maximum Area per Sprinkler	Minimum Water Supply Requirements <sup>5</sup>				Listings and Approvals <sup>3</sup> (See Design Criteria.)			
		Ordinary Hazard Group I		Ordinary Hazard Group II		cULus <sup>4</sup>		NYC	
		Flow / Pressure		Flow / Pressure					
Standard Response									
16 ft. x 16 ft. (4.9 m x 4.9 m)	256 ft <sup>2</sup> (23.8 m <sup>2</sup> )	38 gpm @ 11.5 psi (143.9 L/min @ .79 Bar)		51 gpm @ 20.7 psi (193.1 L/min @ 1.43 Bar)		A1	See Footnote 6.		
18 ft. x 18 ft. (5.5 m x 5.5 m)	324 ft <sup>2</sup> (30.1 m <sup>2</sup> )	49 gpm @ 19.1 psi (185.5 L/min @ 1.32 Bar)		65 gpm @ 33.7 psi (246.1 L/min @ 2.32 Bar)		A1	See Footnote 6.		
20 ft. x 20 ft. (6.1 m x 6.1 m)	400 ft <sup>2</sup> (37.2 m <sup>2</sup> )	60 gpm @ 28.7 psi (227.1 L/min @ 1.98 Bar)		80 gpm @ 51.0 psi (302.8 L/min @ 3.52 Bar)		A1	See Footnote 6.		
Quick Response (cULus only)									
14 ft. x 14 ft. (4.3 m x 4.3 m)	196 ft <sup>2</sup> (18.2 m <sup>2</sup> )	30 gpm @ 7.2 psi (113.6 L/min @ .50 Bar)		39 gpm @ 12.1 psi (147.7 L/min @ .84 Bar)		A1	See Footnote 6.		
Approved Temperature Ratings					Approved Finishes				
A - 165 °F (74 °C) and 205 °F (96 °C) B - 165 °F (74 °C)					1 - Brass, Chrome, White Polyester, Black Polyester, and Black PTFE				
Footnotes									
<sup>1</sup> Part number shown is the base part number. For complete part number, refer to current Viking price list schedule.									
<sup>2</sup> 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.									
<sup>3</sup> This chart shows listings and approvals available at time of printing. Check with the manufacturer for any additional approvals.									
<sup>4</sup> cULus Listed for use in the U.S. and Canada.									
<sup>5</sup> 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.									
<sup>6</sup> Meets New York City requirements, effective July 1, 2008.									



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### DESIGN CRITERIA - UL

(Also refer to Approval Chart 1.)

#### cULus Listing Requirements:

ECOH-ELO Fusible Element Upright Sprinkler VK535 is cULus Listed as indicated in Approval Chart 1 for installation in accordance with the latest edition of NFPA 13 for extended coverage upright 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/ft<sup>2</sup> (6.1 mm/min) for Ordinary-Hazard Group I densities; 0.2 gpm/ft.<sup>2</sup> (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) to prevent cold soldering.
- Viking ECOH-ELO Fusible Element Upright 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 is 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.**

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<b>Approval Chart 2 (FM)</b> Quick Response Extended Coverage ELO Upright Sprinkler VK535 For HC-1, HC-2, and HC-3 Occupancies Maximum 175 PSI (12 Bar) WWP	<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 <sup>2</sup> )	Maximum Area per Sprinkler	<u>Refer to Design Criteria below.</u>	FM Approval <sup>1</sup>
12 ft. x 12 ft. (3.7 m x 3.7 m)	144 ft <sup>2</sup> (13.4 m <sup>2</sup> )	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).	A1
14 ft. x 14 ft. (4.3 m x 4.3 m)	196 ft <sup>2</sup> (18.2 m <sup>2</sup> )		A1
16 ft. x 16 ft. (4.9 m x 4.9 m)	256 ft <sup>2</sup> (23.8 m <sup>2</sup> )		A1

<b>Approved Temperature Ratings</b> A - 165 °F (74 °C), 205 °F (96 °C), and 280 °F (138 °C)	<b>Approved Finishes</b> 1 - Brass, Chrome, White Polyester, and Black Polyester
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**Footnotes**

<sup>1</sup> This chart shows the FM Approvals available at time of printing. Check with the manufacturer for any additional approvals.

<sup>2</sup> 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.

**DESIGN CRITERIA - FM**  
 (Also refer to Approval Chart 2 above.)

**FM Approval Requirements:**

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.

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

**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.**