



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

Visit the Viking website for the latest edition of this technical data page www.vikinggroupinc.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 Electroless Nickel PTFE (ENT) coatings can be used in decorative applications where colors are desired. In addition, the ENT coating has been investigated for installation in corrosive environments and is Listed/Approved as indicated in the Approval Chart(s).

2. LISTINGS AND APPROVALS



cULus Listed: Category VNIV



FM Approved: Class 2022

Refer to the Approval Chart(s) and Design Criterion for listing and 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).

Thread size: 3/4" 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

Bellville Spring Sealing Assembly: Nickel Alloy, coated on both sides with PTFE Tape

Screw: Brass UNS-C36000

For Polyester Coated Sprinklers: Belleville Spring-Exposed

For ENT Coated Sprinklers: Belleville Spring-Exposed, Screw and Pip Cap-ENT Coated

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 ENT = JN

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 Viking website.)

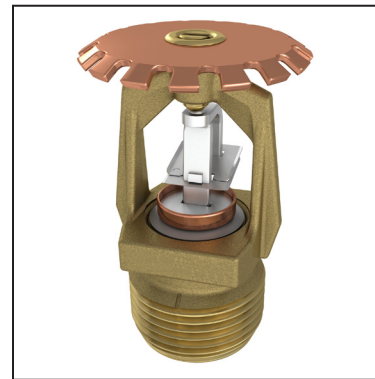
Sprinkler Wrenches:

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)



WARNING: Cancer and Reproductive Harm-
www.P65Warnings.ca.gov

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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.

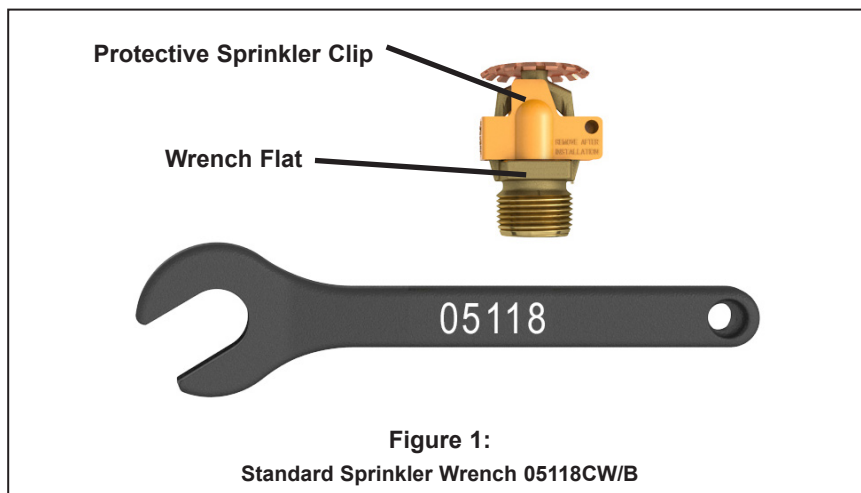


TABLE 1: AVAILABLE SPRINKLER TEMPERATURE RATINGS AND FINISHES

| Sprinkler Temperature Classification | Sprinkler Nominal Temperature Rating 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, White Polyester⁵, Black Polyester⁵, and ENT^{3,4}
Corrosion Resistant Sprinkler Coatings: ENT^{3,4}

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 The corrosion resistant coatings have passed the standard corrosion test required by the approving agencies indicated in the Approval Chart(s). 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. Note that the spring is exposed on sprinklers with ENT coatings. For ENT coated automatic sprinklers, the waterway is coated.
- ⁴ cULus Listed as corrosion resistant.
- ⁵ For automatic sprinklers, the coatings indicated are applied to the exposed exterior surfaces only. Note that the spring is exposed on sprinklers with Polyester coatings.



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| Approval Chart 1 (UL) | | | | | | | | |
|--|--|--|----|--|---------------------|---|-----------------|--------------------|
| EC/QREC Fusible Element Ordinary Hazard ELO Sprinkler VK535 | | | | | | | | |
| <div style="float: right; border: 1px solid black; padding: 2px;"> KEY Temperature Finish A1X ← Escutcheon (if applicable) </div> | | | | | | | | |
| 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 | VK535 | 3/4 | -- | 11.2 | 161.3 | 175 psi (12 Bar) | 2-5/16 | 59 |
| Maximum Sprinkler Spacing (L x W ⁵) | Maximum Area per Sprinkler | Minimum Water Supply Requirements ⁵ | | | | Listings and Approvals ³ (See Design Criteria.) | | |
| | | Ordinary Hazard Group I | | Ordinary Hazard Group II | | | | |
| | | Flow / Pressure | | Flow / Pressure | | | | cULus ⁴ |
| 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) | | 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) | | 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) | | 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) | | A1 | See Footnote 6. | |
| Approved Temperature Ratings | | | | Approved Finishes | | | | |
| A - 165 °F (74 °C) and 205 °F (96 °C) | | | | 1 - Brass, Chrome, White Polyester, Black Polyester and ENT ⁷ | | | | |
| 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. ⁷ cULus Listed as corrosion resistant. | | | | | | | | |



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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/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) 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 Form No. F_080614 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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|  | <h2 style="margin: 0;">TECHNICAL DATA</h2> | <p>STANDARD/QUICK RESPONSE ECOH ELO FUSIBLE ELEMENT UPRIGHT SPRINKLER VK535 (K11.2)</p> |
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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 | | | KEY Temperature Finish A1X ← Escutcheon (if applicable) |
|---|--|--|---|
| Maximum Sprinkler Spacing (L x W²) | Maximum Area per Sprinkler | Refer to Design Criteria below. 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). | FM Approval¹ |
| 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 A - 165 °F (74 °C), 205 °F (96 °C), and 280 °F (138 °C) | | Approved Finishes 1 - Brass, Chrome, White Polyester, Black Polyester, and ENT | |
| Footnotes ¹ This chart shows the FM Approvals available at time of printing. Check with the manufacturer for any additional approvals. 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. | | | |

| DESIGN CRITERIA - FM (Also refer to Approval Chart 2 above.) |
|--|
| <p>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.</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 Form No. F_080614 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.</p> |