1. DESCRIPTION

Viking Mirage® EC/QREC ELO Concealed Pendent Sprinkler VK538 is a thermostensitive solder link spray sprinkler designed for installation on concealed pipe systems where the appearance of a smooth ceiling is desired. With a K-factor of 11.2, the sprinkler produces flows required to meet Ordinary Hazard density requirements at lower pressures than 5.6K or 8.0K sprinklers. The fusible operating element and special deflector characteristics meet the challenges of quick response extended coverage standards. Sprinkler VK538 has cULus Listings as both standard and quick response.

The sprinkler is pre-assembled with a threaded adapter for installation with a low-profile cover assembly that provides up to ½" (12.7 mm) of vertical adjustment. The two-piece design allows installation and testing of the sprinkler prior to installation of the cover plate. The "push-on" and "thread-on" designs of the concealed cover plate assemblies allow easy installation of the cover plate after the system has been tested and the ceiling finish has been applied. The cover assembly can be removed and reinstalled, allowing temporary removal of ceiling panels without taking the sprinkler system out of service or removing the sprinkler. The Electroless Nickel PTFE (ENT) coating has been investigated for installation in corrosive atmospheres and is cULus Listed as corrosion resistant as indicated in the Approval Charts. The ENT finish is only available for the sprinkler assembly, the cover plate is not plated.

2. LISTINGS AND APPROVALS

cULus Listed: Category VNIV

Refer to the Approval Chart and Design Criteria for cULus Listing requirements that must be followed.

3. TECHNICAL DATA

Specifications:
Available since 2011.
Minimum Operating Pressure: 7 psi (0.5 bar).
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 is shown in bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.

Patented

Material Standards:
Sprinkler Body: Brass UNS-C84400
Deflector: Bronze UNS-CS1000
Deflector Pins: Stainless Steel
Fusible Element Assembly: Nickel Alloy and Eutectic Solder
Lever and Lever Bar: Stainless Steel
Seat: Bronze UNS-C31400 / UNS-C31600
Deflector Carrier: Brass UNS-C84400 or QM Brass
Retaining Bolt: Brass UNS-C36000
Screw: Brass UNS-C36000
Belleville Spring Sealing Assembly: Nickel Alloy, coated on both sides with PTFE Tape
Cover Adapter: Cold Rolled Steel UNS-G10080, Finish: Clear Chromate over Zinc Plating

Cover Assembly Materials:
Cover: Brass UNS-C26800 or Stainless Steel UNS-S30400
Base: Cold Rolled Steel UNS-G10080 / G10080, Finish: Copper Flash
Springs: Nickel Alloy
Solder: Non-eutectic

Ordering Information: Refer to Tables 1 and 2 (Also refer to the current Viking price list).

4. INSTALLATION

Refer to appropriate NFPA Installation Standards.
5. OPERATION
During fire conditions, when the temperature around the sprinkler approaches its operating temperature, the cover plate detaches. Continued heating of the exposed sprinkler causes the heat-sensitive fusible element assembly to disengage, releasing seat 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 Model VK538 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.

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**TABLE 1: SPRINKLER ORDERING INFORMATION**

Instructions:
(1) Select a Sprinkler Base Part Number
(2) Add the suffix for the desired Finish
(3) Add the suffix for the desired Sprinkler Temperature Rating
(4) Order a cover plate (refer to Table 2)

Example:
17115AE = 205 °F (96 °C) Temperature Rated Sprinkler with a standard Brass finish.

<table>
<thead>
<tr>
<th>SIN</th>
<th>Sprinkler Base Part Number</th>
<th>Size</th>
<th>1: Finishes</th>
<th>2: Temperature Ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>NPT Inch</td>
<td>BSPT mm</td>
<td>Description</td>
</tr>
<tr>
<td>VK538</td>
<td>17115</td>
<td>3/4</td>
<td>--</td>
<td>Brass</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ENT5,6</td>
</tr>
</tbody>
</table>

**Footnotes**

1. Where a dash (-) is shown in the Finish suffix designation, insert the desired Temperature Rating suffix. See example above.
2. Based on NFPA 13, NFPA 13R, and NFPA 13D. Other limits may apply, depending on fire loading, sprinkler location, and other requirements of the Authority Having Jurisdiction. Refer to specific installation standards.
3. Requires a 3/8” ratchet (not available from Viking).
4. Also optional for removal of the protective cap. Ideal for sprinkler cabinets.
5. cULus Listed as corrosion resistant.
6. The corrosion resistant coatings have passed the standard corrosion test required by the approving agencies indicated in the Approval Chart. 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 ENT coating is applied to all exposed exterior surfaces, including the waterway.
7. The installer tool is for push-on style cover plates only.
TABLE 2: COVER PLATE ORDERING INFORMATION

Instructions:
(1) Select a Cover Plate Base Part Number
(2) Add the suffix for the desired Finish
(3) Add the suffix for the required Cover Plate Nominal Rating.

Example:
15765MC/W = 165 °F (74 °C) Temperature Rated 3-5/16" (84 mm) diameter, Thread-On style Round Cover Plate with a Painted White finish.

<table>
<thead>
<tr>
<th>1: Select a Cover Plate Base Part Number³</th>
<th>2: Select a Finish⁴</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Thread-On Style</strong></td>
<td><strong>Push-On Style</strong></td>
</tr>
<tr>
<td>Base Part Number</td>
<td>Size</td>
</tr>
<tr>
<td>15765</td>
<td>3-5/16</td>
</tr>
<tr>
<td>21878</td>
<td>3-5/16</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3: Temperature Rating Matrix¹,²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cover Plate Nominal Rating (Required)</td>
</tr>
<tr>
<td>135 °F (57 °C)</td>
</tr>
<tr>
<td>165 °F (74 °C)</td>
</tr>
<tr>
<td>165 °F (74 °C)</td>
</tr>
</tbody>
</table>

Footnotes
² 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.
² Part number shown is the base part number. For complete part number, refer to current Viking price list schedule.
² Where a dash (-) is shown in the Finish suffix designation, insert the desired Temperature Rating suffix. See example above.
² Stainless Steel versions are not available with any finishes or paint.

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Figure 1: Identification of Custom Paint for Concealed Covers

All custom color painted cover plates will have an identifying label affixed to the inside of the cover that indicates the custom color and will have a representative sample (a paint dot) of the paint on the label.
### Sprinkler Base Specifications

**Part Number**: 17115A  
**SIN**: VK538  
**NPT Thread Size**: 3/4" (20 U.S. threads)  
**Nominal K-Factor**: 11.2 (U.S.)  
**Maximum Water Working Pressure**: 175 psi (12 bar)  
**Overall Length**: 2-5/8" (66.6 mm)

### Approval Chart

**EC/QREC Ordinary Hazard ELO Sprinklers**

| Max. Sprinkler Spacing (L x W) | Maximum Area per Sprinkler | Minimum Water Supply Requirements | Listings  
---|---|---|---
| 20 ft. x 20 ft. (6.1 m x 6.1 m) | 400 ft² (37.2 m²) | Flow / Pressure: 60 gpm @ 28.7 psi (227.1 L/min @ 1.98 Bar)  
                               | | Flow / Pressure: 80 gpm @ 51.0 psi (302.8 L/min @ 3.52 Bar)  
                               | | cULus: AY1, AV2  
                               | | NYC: See Footnote 5.  
| 14 ft. x 14 ft. (4.3 m x 4.3 m) | 196 ft² (18.2 m²) | Flow / Pressure: 30 gpm @ 7.2 psi (113.6 L/min @ .50 Bar)  
                               | | Flow / Pressure: 39 gpm @ 12.1 psi (147.7 L/min @ .84 Bar)  
                               | | cULus: AZ1, BY1, AW2, BV2  
                               | | NYC: See Footnote 5.  
| 16 ft. x 16 ft. (4.9 m x 4.9 m) | 256 ft² (23.8 m²) | Flow / Pressure: 38 gpm @ 11.5 psi (143.9 L/min @ .79 Bar)  
                               | | Flow / Pressure: 51 gpm @ 20.7 psi (193.1 L/min @ 1.43 Bar)  
                               | | cULus: AZ1, BY1, AW2, BV2  
                               | | NYC: See Footnote 5.  
| 18 ft. x 18 ft. (5.5 m x 5.5 m) | 324 ft² (30.1 m²) | Flow / Pressure: 49 gpm @ 19.1 psi (185.5 L/min @ 1.32 Bar)  
                               | | Flow / Pressure: 65 gpm @ 33.7 psi (246.1 L/min @ 2.32 Bar)  
                               | | cULus: AZ1, BY1, AW2, BV2  
                               | | NYC: See Footnote 5.  
| 20 ft. x 20 ft. (6.1 m x 6.1 m) | 400 ft² (37.2 m²) | Flow / Pressure: 60 gpm @ 28.7 psi (227.1 L/min @ 1.98 Bar)  
                               | | Flow / Pressure: 80 gpm @ 51.0 psi (302.8 L/min @ 3.52 Bar)  
                               | | cULus: AX1, BY1, AU2, BV2  
                               | | NYC: See Footnote 5.  

### Cover Assembly Temperature Ratings

**U** = 135 °F (57 °C) over 21878, 23504  
**V** = 165 °F (74 °C) over 21878, 23504  
**W** = 135 °F (57 °C) or 165 °F (74 °C) over 21878, 23504  
**X** = 135 °F (57 °C) over 15765, 23495  
**Y** = 165 °F (74 °C) over 15765, 23495  
**Z** = 135 °F (57 °C) or 165 °F (74 °C) over 15765, 23495

### Cover Plate Finishes

1. Polished Chrome, Painted White, Painted Ivory, or Painted Black  
2. Stainless Steel

### 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. Meets New York City requirements, effective July 1, 2008.  
6. 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.  
7. Painted finish consists of Polyester Baked Enamel. Other paint colors are available on request with the same listings as the standard paint colors. Listings and approvals apply for any paint manufacturer. Contact Viking for additional information.

**NOTE:** Custom colors are indicated on a label inside the cover assembly. Refer to Figure 1.
### Approval Chart
**EC/QREC Ordinary Hazard ELO Sprinklers**

<table>
<thead>
<tr>
<th>Max. Sprinkler Spacing (L x W)</th>
<th>Maximum Area per Sprinkler</th>
<th>Minimum Water Supply Requirements</th>
<th>Listings</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 ft. x 20 ft. (6.1 m x 6.1 m)</td>
<td>400 ft² (37.2 m²)</td>
<td>Flow / Pressure</td>
<td>Flow / Pressure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ordinary Hazard Group I</td>
<td>Ordinary Hazard Group II</td>
</tr>
<tr>
<td></td>
<td></td>
<td>60 gpm @ 28.7 psi (227.1 L/min @ 1.98 Bar)</td>
<td>80 gpm @ 51.0 psi (302.8 L/min @ 3.52 Bar)</td>
</tr>
<tr>
<td><strong>Standard Response</strong></td>
<td></td>
<td>30 gpm @ 7.2 psi (113.6 L/min @ .50 Bar)</td>
<td>39 gpm @ 12.1 psi (147.7 L/min @ .84 Bar)</td>
</tr>
<tr>
<td>14 ft. x 14 ft. (4.3 m x 4.3 m)</td>
<td>196 ft² (18.2 m²)</td>
<td>30 gpm @ 7.2 psi (113.6 L/min @ .50 Bar)</td>
<td>39 gpm @ 12.1 psi (147.7 L/min @ .84 Bar)</td>
</tr>
<tr>
<td>16 ft. x 16 ft. (4.9 m x 4.9 m)</td>
<td>256 ft² (23.8 m²)</td>
<td>38 gpm @ 11.5 psi (143.9 L/min @ .79 Bar)</td>
<td>51 gpm @ 20.7 psi (193.1 L/min @ 1.43 Bar)</td>
</tr>
<tr>
<td>18 ft. x 18 ft. (5.5 m x 5.5 m)</td>
<td>324 ft² (30.1 m²)</td>
<td>49 gpm @ 19.1 psi (185.5 L/min @ 1.32 Bar)</td>
<td>65 gpm @ 33.7 psi (246.1 L/min @ 2.32 Bar)</td>
</tr>
<tr>
<td>20 ft. x 20 ft. (6.1 m x 6.1 m)</td>
<td>400 ft² (37.2 m²)</td>
<td>60 gpm @ 28.7 psi (227.1 L/min @ 1.98 Bar)</td>
<td>80 gpm @ 51.0 psi (302.8 L/min @ 3.52 Bar)</td>
</tr>
</tbody>
</table>

**Quick Response**

<table>
<thead>
<tr>
<th>Approved Temperature Ratings</th>
<th>Cover Assembly Temperature Ratings¹</th>
<th>Cover Plate Finishes⁶</th>
<th>Footnotes</th>
</tr>
</thead>
<tbody>
<tr>
<td>A - 165 °F (74 °C)</td>
<td>U = 135 °F (57 °C) cover 21878, 23504</td>
<td>1 - Polished Chrome, Painted White, Painted Ivory, or Painted Black</td>
<td>¹ Part number shown is the base part number. For complete part number, refer to current Viking price list schedule.</td>
</tr>
<tr>
<td>B - 205 °F (96 °C)</td>
<td>V = 165 °F (74 °C) cover 21878, 23504</td>
<td>2 - Stainless Steel</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>W = 135 °F (57 °C) or 165 °F (74 °C) cover 21878, 23504</td>
<td></td>
<td>³ This chart shows listings and approvals available at time of printing. Check with the manufacturer for any additional approvals.</td>
</tr>
<tr>
<td></td>
<td>X - 135 °F (57 °C) cover 15765, 23495</td>
<td></td>
<td>⁴ cULus Listed for use in the U.S. and Canada.</td>
</tr>
<tr>
<td></td>
<td>Y - 165 °F (74 °C) cover 15765, 23495</td>
<td></td>
<td>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&quot; x 13'-0&quot; sprinkler spacing, provide the “Minimum Water Supply Requirement” listed in the chart for 14'-0&quot; x 14'-0&quot; 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.</td>
</tr>
<tr>
<td></td>
<td>Z - 135 °F (57 °C) or 165 °F (74 °C) cover 15765, 23495</td>
<td></td>
<td>⁶ Painted finish consists of Polyester Baked Enamel. Other paint colors are available on request with the same listings as the standard paint colors. Listings and approvals apply for any paint manufacturer. Contact Viking for additional information.</td>
</tr>
</tbody>
</table>

**Footnotes**: Custom colors are indicated on a label inside the cover assembly. Refer to Figure 1.
### DESIGN CRITERIA - UL
(Also refer to the UL Approval Chart.)

**cULus Listing Requirements:**

EC/QREC OH-ELO Pendent Sprinkler VK538 is cULus Listed as indicated in the Approval Chart for installation in accordance with the latest edition of NFPA 13 for extended coverage pendent spray sprinklers as indicated below:

- The minimum water supplies and maximum areas of coverage shown in Approval Chart 1 are designed to provide the following design densities:
  - 0.15 gpm/ft$^2$ (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.
- Minimum spacing allowed is 8 ft. (2.4 m) unless baffles are installed in accordance with NFPA 13.
- Minimum distance from walls is 4 in. (102 mm).
- Maximum distance from walls shall be no more than one-half of the allowable distance between sprinklers. The distance shall be measured perpendicular to the wall.
- The sprinkler installation rules contained in NFPA 13 for extended coverage pendent spray sprinklers must be followed.
- Limited to use with smooth, flat, horizontal ceilings only.

**NOTE:** Concealed sprinklers must be installed in neutral or negative pressure plenums only.

**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 2:** Sprinkler Installation and Correct Use of Wrenches

1. Carefully slide the wrench sideways around the deflector and pins.
2. Carefully press the wrench upward and turn slightly to ensure engagement with the sprinkler wrench flats.

**Figure 3:** Sprinkler Dimensions and Cover Installation

- **3/4" (20 mm) NPT**
- **2-5/8" (66.6 mm) Maximum**
- **3" (76 mm)**
- **2-1/2" (63.5 mm) Minimum**
- **3-5/16" (84.1 mm) Minimum**

Note: Upon sprinkler activation, the deflector descends to approximately 1" (25.4 mm) below the sprinkler body.