1. DESCRIPTION
The Model V-EP (Eave Protection) Specific Application Attic Sprinkler is designed to provide superior fire protection in combustible and non-combustible sloped attic spaces when compared to standard spray attic protection. With specific application criteria for use with Model VK697 Attic Upright Specific Application Sprinklers, Viking Attic Sprinklers provide an extended coverage spacing alternative to standard spray sprinklers. They make it possible to use a 3 branch line design for spans up to 80 ft. (24.4 m) and a 5 branch line design for spans greater than 80 ft. (24.4 m) and up to 100 ft. (30.5 m). This eliminates the need for branch lines and greatly reduces the number of required sprinklers and associated material and installation costs. Model V-EP models also have lower minimum flow and pressure requirements than competitive products.

Viking Attic Sprinklers can be installed with either steel or CPVC piping (CPVC allowed on wet pipe systems only), and are available in brass or with corrosion-resistant Electroless Nickel PTFE (ENT) coatings where salt water and other corrosive elements are a consideration. They are cULus Listed with specific application guidelines for use as special sprinklers as defined by the National Fire Protection Association (NFPA), and are cULus Listed for extended coverage in combustible and non-combustible construction. The cULus Listing was achieved using full-scale fire tests within wood truss construction. Listed for specific pitches 2½:12 ≤ 6:12, and spans 80 ft. and 100 ft.

2. LISTINGS AND APPROVALS

- UL Listed: Category VNIV

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

3. TECHNICAL DATA
Specifications:
Minimum Operating Pressure: See Design Criteria - UL.
Rated to 175 psi (12 bar) water working pressure
Factory tested hydrostatically to 500 psi (34.5 bar)
Thread size: 1/2" (15 mm) NPT
Nominal K-Factor: 5.6 U.S. (80.6 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: 2-3/4" (69 mm)

Material Standards:
Frame Casting: Brass UNS-C84400 or QM Brass
Deflector: Brass UNS-C51000
Bulb: Glass, nominal 3 mm diameter
Belleville Spring Sealing Assembly: Nickel Alloy, coated on both sides with Teflon Tape
Screw: 18-8 Stainless Steel
Pip Cap and Insert Assembly: Copper UNS-C11000 and Stainless Steel UNS-S30400
Yoke: Phosphor Bronze - UNS-C51000
Deflector Screw: 316 Stainless Steel

Ordering Information: Refer to Table 1 or the current Viking price list.

4. INSTALLATION
Refer to appropriate NFPA Installation Standards.
5. OPERATION
During a fire condition, the heat sensitive liquid in the glass bulb expands, causing the glass to shatter, releasing the pip cap and sealing spring assembly. Water flowing through the sprinkler orifice strikes the deflector, forming a uniform spray pattern to extinguish or control the fire, and protect the piping in the attic space.

6. INSPECTIONS, TESTS AND MAINTENANCE
Refer to NFPA 25 for Inspection, Testing and Maintenance requirements.

7. AVAILABILITY
The Viking V-EP Specific Application 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.

TABLE 1: ORDERING INFORMATION

<table>
<thead>
<tr>
<th>Sprinkler Base Part No.</th>
<th>Size</th>
<th>1: Finishes</th>
<th>2: Temperature Ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NPT</td>
<td>Description</td>
<td>Nominal Rating</td>
</tr>
<tr>
<td>22768</td>
<td>1/2</td>
<td>--</td>
<td>Brass</td>
</tr>
<tr>
<td></td>
<td>ENT</td>
<td>JN</td>
<td>ENT</td>
</tr>
</tbody>
</table>

**Example:** 22768JNE = VK690 with an ENT Finish and 200 °F (93 °C) Nominal temperature rating. This sprinkler is to be installed into an area with a maximum ambient temperature of 150 °F (65 °C) meaning if the area will experience temperatures above the maximum ambient rating, you shall use a higher temperature-rated sprinkler.

**Accessories**

**Sprinkler Wrenches (see Figure 1):**
Standard Wrench: Part No. 21475M/B

**Sprinkler Cabinet:**
A. Up to 6 sprinklers: Part number 01724A
B. 6-12 Sprinklers: Part number 01725A

**Footnotes**

1. 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.
2. UL Listed as corrosion resistant.
3. The corrosion resistant and corrosion proofing 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.
4. The sprinkler temperature rating is stamped on the deflector.
### APPROVAL CHART

Viking V-EP Specific Application Sprinkler
For Combustible and Non-Combustible Sloped Attic Spaces

<table>
<thead>
<tr>
<th>Part Number</th>
<th>SIN</th>
<th>Maximum Pressure</th>
<th>Thread Size</th>
<th>Nominal K-Factor</th>
<th>Overall Length</th>
<th>Listings and Approvals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>NPT</td>
<td>BSPT</td>
<td>U.S.</td>
<td>metric</td>
</tr>
<tr>
<td>22768</td>
<td>VK690</td>
<td>175 psi</td>
<td>1/2&quot;</td>
<td>15 mm</td>
<td>5.6</td>
<td>80.6</td>
</tr>
</tbody>
</table>

Approved Temperature Rating
- A - 200 °F (93.3 °C)

Approved Finish
- 1 - Brass, 2 - ENT

1. Also 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 listings and approvals available at the time of printing. Other approvals may be in process.
4. Listed by Underwriters Laboratories Inc. for use in the United States and Canada.
5. cULus Listed as corrosion resistant.

### DESIGN CRITERIA - UL CHART 1

(Also refer to Approval Chart 1)

Allowable Roof Span, Flow, Pressure and Slope for Specific Application Sprinkler Protecting Attics

<table>
<thead>
<tr>
<th>Sprinkler Base Part Number</th>
<th>SIN</th>
<th>Type</th>
<th>Thread Size</th>
<th>Nominal K-Factor</th>
<th>Allowable Roof Span Ft. (M)</th>
<th>Minimum Flow</th>
<th>Minimum Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>NPT</td>
<td>BSPT</td>
<td>U.S.</td>
<td>metric</td>
<td>Gable Style</td>
</tr>
<tr>
<td>21716</td>
<td>VK697</td>
<td>Upright at ridge</td>
<td>1/2&quot;</td>
<td>15 mm</td>
<td>5.6</td>
<td>80.6</td>
<td>≤ 72 (22)</td>
</tr>
<tr>
<td>22768</td>
<td>VK690</td>
<td>V-EP on downslope</td>
<td>1/2&quot;</td>
<td>15 mm</td>
<td>5.6</td>
<td>80.6</td>
<td>≤ 80 (24.4)</td>
</tr>
<tr>
<td>21716</td>
<td>VK697</td>
<td>Upright at ridge</td>
<td>1/2&quot;</td>
<td>15 mm</td>
<td>5.6</td>
<td>80.6</td>
<td>≤ 80 (24.4)</td>
</tr>
<tr>
<td>22768</td>
<td>VK690</td>
<td>V-EP on downslope</td>
<td>1/2&quot;</td>
<td>15 mm</td>
<td>5.6</td>
<td>80.6</td>
<td>≤ 100 (30.5)</td>
</tr>
<tr>
<td>21716</td>
<td>VK697</td>
<td>Upright at eave</td>
<td>1/2&quot;</td>
<td>15 mm</td>
<td>5.6</td>
<td>80.6</td>
<td>≤ 100 (30.5)</td>
</tr>
</tbody>
</table>

1. Pitch and slope indicate the incline of a roof, expressed as a proportion of the vertical to the horizontal.
2. Dry pipe system maximum water delivery time, refer to NFPA 13, 2019, Chapter 8.

**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 or other similar organizations, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable.

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**Figure 1:**
Standard Sprinkler Wrench 21475M/B

**Figure 2:**
Sprinkler Dimensions

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Form No. F_011719  20.02.25  Rev 20.1
ADDITIONAL DESIGN CRITERIA - UL Chart 2
(Also refer to DESIGN CRITERA Chart 1)
Allowable roof span, flow, pressure and slope for attic protection using Viking V-EP Sprinklers

Design Criteria: Flow and Pressures refer to Design Chart 1.

System Type:
Wet systems and dry systems.

Piping Types:
Steel (wet and dry) CPVC (wet systems only).

Occupancy Classification: Light hazard only.

Viking V-EP Sprinkler Spacing

Maximum Coverage Area:
224 ft² (20.8 m²) as measured along the slope.
Coverage area is determined by the maximum distance thrown measured along the slope, multiplied by the distance along the branch line.

Along the Branch Line:
- Minimum Spacing: 6'-0" (1,8 m) between V-EP’s and 7'-0" (2,13 m) from Viking VK697 Attic Uprights. 6'-0" (1,83 m) from Standard Spray Sprinklers.
- Maximum Spacing: 8'-0" (2,44 m) between V-EP’s (perpendicular to slope).
- Minimum Spacing of a V-EP to a VK697 Sprinkler: 2’ (0,61 m)

Measured Down the Slope:
- Minimum Spacing: 4’-0” (1,2 m) from Ridge Viking VK697 Attic Uprights.
- Maximum Spacing: 16’-0” (4,9 m) from Ridge Viking VK697 Attic Uprights.

Deflector Position below Peak Ridge:
For all roof pitches as per the listing from 2½:12 ≤ 6:12 the maximum deflector distance down for a VK697 is 24” (610 mm), and the minimum deflector distance down is 16” (406 mm).

Deflector Position (on Slope) Below Top Chord Truss:
V-EP 1” (25 mm) to 3” (76 mm) down from bottom of a 6” (152 mm) top chord truss.
- Maximum Depth (top chord): 6” (152 mm)

Deflector Position above Scissor Truss:
For all roof pitches as per the listing from 2½:12 ≤ 6:12 the minimum distance above a Scissor Truss is 18” (457 mm).

Maximum distance from center line of the ridge:
1’ (305 mm) on either side of the center line.

Distance away from hip ridge:
- Minimum: 1’ (305 mm)
- Maximum: 3’ (914 mm)

Maximum Sprinkler Throw:
28ft (4 ft upslope and 24 ft downslope)

Minimum distance from Truss:
6” (152 mm) from nearest face of the truss.

Distance from Shear Wall:
4” – 6” (102 - 152 mm) from face of wall.

Distance from Draft Curtain:
4” – 6” (102 - 152 mm) from face of draft curtain and a minimum of 8” above the bottom.

Draft Curtains:
Where used to allow Attic Sprinkler installation shall be constructed to contain heat, may be constructed of ½” plywood.

Continues on next page.
Use of UL Listed CPVC Blazemaster Piping (Wet Systems Only):

Can be used to supply the sprinklers protecting the floor below the combustible concealed space when covered with 6” (152 mm) of non-combustible insulation over the horizontal or vertical piping, and extending 12” (304 mm) on both sides of the center line of the piping. If the piping is located in the joist, the width of the joist channel must be entirely covered to 6” (152 mm) above the top of the piping. The area above the piping must be protected with the Viking Model V-EP’s, or the Viking VK697 Attic Upright Sprinklers. Listed CPVC Blazemaster piping may also be used exposed to feed wet systems using Viking V-EP sprinklers in accordance with the following requirements, and in accordance with Figure 5:

- Risers are vertical and protected by V-EP or VK697 sprinklers located a maximum of 12” away from the riser centerline.
- Model V-EP or VK697 sprinklers are mounted directly to the branchline.
- Model V-EP or VK697 sprinklers are installed on arm-overs a maximum of 6” (152 mm) laterally from the center line of the branch line.
- Model V-EP or VK697 sprinklers are installed on Vertical Sprigs attached to the branchline.
- Model V-EP or VK697 sprinklers are installed on angled sprigs a maximum of 6” (152 mm) laterally from the centerline of the branchline.
- Installed with a minimum lateral distance of 18” (457 mm) from any device that produces and releases heat, i.e Attic furnace, Kitchen or Bathroom Exhaust fan, Flue Vents, Heat Lamps, and other such devices.

**NOTICE**

Insulation requirements are provided solely for Fire Protection purposes and not for freeze protection.

**NOTICE**

Non-combustible insulation being used needs to be verified for chemical compatibility with the CPVC piping at www.lubrizol.com

Obstruction Criteria:

Refer to Figures 4–10
Refer to Sections 11.2.5.2 of NFPA 13, 2019 for requirements if installed on greater than 2-1/2” diameter piping.

Hydraulic Requirements:

Viking V-EP Sprinklers must be calculated in accordance with the figures and guidelines in this document. The design area shall include the most hydraulically demanding sprinklers, and in certain cases may require more than one set of calculations to verify the systems design.

The following figures cover Hydraulic Requirements for Viking V-EP Sprinklers only, and when installed with Viking VK697’s.

Refer to Figures:

Figures 11–16
Figure 3:
Exposed CPVC with V-EP Sprinklers
Refer to Figures 4 and 5 below. Maximum 6” (152 mm) obstruction allowed provided it sits at least 36” (914 mm) vertically below the Viking V-EP Sprinkler. Larger or closer obstructions require an additional sprinkler on the opposite side of the obstruction. This criteria only limits the obstructions that run across the trusses or rafters, not the top chord of the trusses or the depth of the rafter.

Refer to Figures 6 and 7 below where the maximum spacing for Attic Upright Sprinklers is 12 ft. (3,7m) and standard spray sprinklers is 15 ft (4,6m). Any horizontal obstruction that is 4 ft. (1,2 m) or less in width requires minimum 6” (152 mm) clearance over the top to allow for sufficient water flow over and under. The clearance must be measured perpendicular to and from the bottom of the rafter. If the clearance is less than 6” (152 mm), an additional sprinkler is required on the opposite side of the obstruction. If the obstruction is more than 4 ft. (1,2 m) wide, an additional sprinkler is required underneath.
Refer to Figure 8 below. For vertical obstructions, the maximum dimension of the obstruction is the width and the horizontal distance is measured horizontally.

**TABLE 2: OBSTRUCTION CRITERIA**

<table>
<thead>
<tr>
<th>Dimension X</th>
<th>Distance Y</th>
<th>Additional Sprinklers Required Beyond Obstruction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Horizontal Dimension of Obstruction</td>
<td>Minimum Horizontal Distance to Obstruction</td>
<td></td>
</tr>
<tr>
<td>All vertical obstructions</td>
<td>&lt; 6&quot; (152 mm)</td>
<td>YES</td>
</tr>
<tr>
<td>1/2&quot; - 1&quot; (13 mm - 25 mm)</td>
<td>6&quot; (152 mm)</td>
<td>NO</td>
</tr>
<tr>
<td>1&quot; - 4&quot; (25 mm - 102 mm)</td>
<td>12&quot; (304 mm)</td>
<td>NO</td>
</tr>
<tr>
<td>4&quot; - 8&quot; (101 mm - 203 mm)</td>
<td>24&quot; (610 mm)</td>
<td>NO</td>
</tr>
<tr>
<td>8&quot; - 10 &quot; (203 mm - 254 mm)</td>
<td>5'-0&quot; (1,52 m)</td>
<td>NO</td>
</tr>
<tr>
<td>10&quot; - 20&quot; (254 mm - 508 mm)</td>
<td>10'-0&quot; (3,05 m)</td>
<td>NO</td>
</tr>
<tr>
<td>20&quot; - 30&quot; (508 mm - 762 mm)</td>
<td>15'-0&quot; (4,57 m)</td>
<td>NO</td>
</tr>
<tr>
<td>30&quot; - 40 &quot; (762 mm - 1016 mm)</td>
<td>20'-0&quot; (6,10 m)</td>
<td>NO</td>
</tr>
<tr>
<td>40&quot; - 48&quot; (1016 mm - 1219 mm)</td>
<td>25'-0&quot; (7,62 m)</td>
<td>NO</td>
</tr>
<tr>
<td>&gt; 48&quot; (1219 mm)</td>
<td>Any distance</td>
<td>YES</td>
</tr>
</tbody>
</table>
If a V-EP Sprinkler is 36” (914 mm) or greater above the space, and 36” (914 mm) or greater clearance above the space is present, additional sprinklers are not required.

If a V-EP sprinkler is 36” (914 mm) or greater above the space, and a 12” - 36” (304 - 914 mm) clearance above the space is present, intermediate level standard sprinklers are required.
72' (21.9 m) Span, Gable Style Roof
2½:12 ≤ 6:12 Pitch
Ridge VK697 Sprinklers: 8' X 24' Area Coverage
Down Slope V-EP Sprinklers: 8' X 24' Area Coverage

Wet Systems:
2 Calculations Required
1. Figure 11A - Calculate the 5 most demanding VK697 Ridge Sprinklers.
   Down slope V-EP Sprinklers staggered arrangement. Continue to #2 below.
2. Figure 11B - Calculate the 5 most demanding sprinklers:
   3 X VK697 Ridge sprinklers
   2 X V-EP Down slope sprinklers

NOTE: If additional sprinklers are required behind an obstruction, add 2 additional sprinklers to the calculation.

Figure 11A: Wet System Design for 72 ft (21.9 m) Roof Span

Figure 11B: Wet System Design for 72 ft (21.9 m) Roof Span with Obstruction
Dry Systems:
2 Calculations Required
1. Figure 12A - Calculate the 6 most demanding VK697 Ridge Sprinklers. Down slope V-EP Sprinklers staggered arrangement. Continue to #2 below.
2. Figure 12B - Calculate the 6 most demanding sprinklers:
   4 X VK697 Ridge sprinklers
   2 X V-EP Down slope sprinklers

NOTE: If additional sprinklers are required behind an obstruction, add 2 additional sprinklers to the calculation.

Figure 12A: Dry System Design for 72 ft (21,9 m) Roof Span

Figure 12B: Dry System Design for 72 ft (21,9 m) Roof Span with Obstruction
80' (24,4 m) Span, Gable Style Roof  
2½:12 ≤ 6:12 Pitch  
Ridge VK697 Sprinklers: 8' X 24' Area Coverage  
Down Slope V-EP Sprinklers: 8' X 28' Area Coverage

Figure 13A: Wet System Design for 80 ft (24,4 m) Roof Span

Wet Systems:
2 Calculations Required
1. Figure 13A - Calculate the 5 most demanding VK697 Ridge Sprinklers.  
   Down slope V-EP Sprinklers staggered arrangement. Continue to #2 below.
2. Figure 13B - Calculate the 5 most demanding sprinklers:  
   3 X VK697 Ridge sprinklers  
   2 X V-EP Down slope sprinklers

NOTE: If additional sprinklers are required behind an obstruction, add 2 additional sprinklers to the calculation.

Figure 13B: Wet System Design for 80 ft (24,4 m) Roof Span with Obstruction
80' (24,4 m) Span, Gable Style Roof
2½:12 ≤ 6:12 Pitch
Ridge VK697 Sprinklers: 8’ X 24’ Area Coverage
Down Slope V-EP Sprinklers: 8’ X 28’ Area Coverage

Dry Systems:
2 Calculations Required
1. Figure 14A - Calculate the 6 most demanding VK697 Ridge Sprinklers. Down slope V-EP Sprinklers staggered arrangement. Continue to #2 below.
2. Figure 14B - Calculate the 6 most demanding sprinklers:
   4 X VK697 Ridge sprinklers
   2 X V-EP Down slope sprinklers

NOTE: If additional sprinklers are required behind an obstruction, add 2 additional sprinklers to the calculation.
Wet Systems:
2 Calculations Required
1. Figure 15A - Calculate the 5 most demanding VK697 Ridge Sprinklers. Down slope V-EP Sprinklers staggered arrangement. Continue to #2 below.
2. Figure 15B - Calculate the 5 most demanding sprinklers:
   3 X VK697 Ridge sprinklers
   2 X V-EP Down slope sprinklers

NOTE: If additional sprinklers are required behind an obstruction, add 2 additional sprinklers to the calculation.

Figure 15A: Wet System Design for 100 ft (30,5 m) Roof Span

Figure 15B: Wet System Design for 100 ft (30,5 m) Roof Span with Obstruction
Dry Systems:
2 Calculations Required
1. Figure 16A - Calculate the 6 most demanding VK697 Ridge Sprinklers. Down slope V-EP Sprinklers staggered arrangement. Continue to #2 below.
2. Figure 16B - Calculate the 6 most demanding sprinklers:
   4 X VK697 Ridge sprinklers
   2 X V-EP Down slope sprinklers

NOTE: If additional sprinklers are required behind an obstruction, add 2 additional sprinklers to the calculation.

Figure 16A: Dry System Design for 100 ft (30,5 m) Roof Span

Figure 16B: Dry System Design for 100 ft (30,5 m) Roof Span with Obstruction
80' (24,4 m) Span, Hip End Style Roof
Ridge VK697 Sprinklers: 8' X 24' Area Coverage
Down Slope V-EP Sprinklers: 8’ X 28’ Area Coverage

Figure 17: 80 ft (24,4 m) Roof Span for Hip End Style Roof