1. DESCRIPTION

Viking Institutional Style Sprinklers are small, flush, solder link and lever sprinklers made with tamper-resistant construction. These flush-mount sprinklers can be ordered as Quick Response, Quick Response-Extended Coverage, and as Pendent or Horizontal Sidewall configurations. Viking institutional sprinklers have been specifically designed for use with concealed piping in institutional mental health occupancies, correctional facilities, or anywhere a likelihood of tampering with fire sprinklers by the occupants may exist.

The institutional sprinkler assembly consists of the sprinkler body and a 3 or 4 inch escutcheon plate. The sprinkler and escutcheon plate are available with a polished chrome or painted finish.

2. LISTINGS AND APPROVALS*

**cULus Listed**

Pendent: cULus Listed as Quick Response Flush sprinklers for standard areas of coverage in Light or Ordinary Hazard occupancies.

EC Pendent: cULus Listed as Quick Response, Extended Coverage Flush sprinklers for extended areas of coverage up to 16’ x 16’ (4.9 m x 4.9 m) in Light Hazard occupancies only.

HSW: cULus Listed as Quick Response Flush sprinklers for standard areas of coverage in Light or Ordinary Hazard occupancies below smooth, flat, horizontal ceilings only.

EC HSW: cULus Listed as Quick Response, Extended Coverage Flush sprinklers for extended areas of coverage up to 16’ x 16’ (4.9 m x 4.9 m) in Light Hazard occupancies only below smooth, flat, horizontal ceilings.

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

**NOTICE**

THE VIKING CORPORATION DISCLAIMS ANY RESPONSIBILITY FOR DAMAGES OR INJURY (INCLUDING DEATH) CAUSED BY THE OPERATION OR INOPERATION OF SPRINKLERS ARISING OUT OF THE MISUSE OF OR TAMPERING WITH VIKING BRAND SPRINKLERS INCLUDING, WITHOUT LIMITATION, ANY PERSONAL INJURY OR DEATH ARISING OUT OF OR CAUSED BY THE MANIPULATION OF, DISMANTLING OF, OR ATTEMPTED USE OF THE SPRINKLER OR ANY COMPONENT AS AN INSTRUMENT UNRELATED TO ITS INTENDED USE.

3. TECHNICAL DATA

Specifications:

Minimum Operating Pressure: 7 psi (0.5 bar)
Rated to: 175 psi (12 bar) water working pressure.
Factory tested hydrostatically to 500 psi (34.5 bar).
Thread size: 1/2" NPT or 15 mm BSPT
Nominal K-factor: 5.6 U.S. (80.6 metric**)

**Metric K-factor measurement shown is in Bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.

Material Standards:

Sprinkler Body: QM Brass or UNS-C84400 Casting
Deflector: Pendent - Copper UNS-C23000, HSW - Copper UNS-C51000
Deflector Pins: Stainless Steel 302
Button: UNS-C36000
Compression Screw: Brass UNS-C36000
Fusible Link Assembly: UNS-C51910 and Eutectic Solder
Fusible Link Levers: Stainless Steel UNS-S31600
Lever Bar: Copper Alloy UNS-C72500
Belleville Spring Sealing Assembly: Nickel Alloy, coated on both sides with PTFE Tape
Seal: UNS-C31400 or UNS-C31600 Bronze 1/2 to full hard
Pin Ring: Pendent - Copper UNS-C23000, HSW - Copper UNS-C51000

Ordering Information: (Refer to Table 1 and the current Viking List Price Book.)

<table>
<thead>
<tr>
<th>SIN</th>
<th>THREAD</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>VK426</td>
<td>NPT</td>
<td>QR Pendent</td>
</tr>
<tr>
<td>VK650</td>
<td>NPT</td>
<td>QR EC Pendent</td>
</tr>
<tr>
<td>VK427</td>
<td>NPT</td>
<td>QR HSW</td>
</tr>
<tr>
<td>VK651</td>
<td>NPT</td>
<td>QR EC HSW</td>
</tr>
<tr>
<td>VK426</td>
<td>BSPT</td>
<td>QR Pendent</td>
</tr>
<tr>
<td>VK650</td>
<td>BSPT</td>
<td>QR EC Pendent</td>
</tr>
<tr>
<td>VK427</td>
<td>BSPT</td>
<td>QR HSW</td>
</tr>
<tr>
<td>VK651</td>
<td>BSPT</td>
<td>QR EC HSW</td>
</tr>
</tbody>
</table>

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

Replaces F_032319 Rev 19.2
(Replaced escutcheon PNs)
### INSTRUCTIONS:
Choose a sprinkler style and base part number then,
1. add the suffix for the desired Finish
2. add the suffix for the desired Temperature Rating.
3. select an escutcheon plate and finish.

### TABLE 1: ORDERING INFORMATION

<table>
<thead>
<tr>
<th>Style</th>
<th>Sprinkler Base Part Number</th>
<th>SIN</th>
<th>Size</th>
<th>1: Available Finishes</th>
<th>2: Available Temperature Ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>NPT</td>
<td>Description</td>
<td>Nominal Rating</td>
</tr>
<tr>
<td>QR Pendent</td>
<td>19663</td>
<td>VK426</td>
<td>1/2</td>
<td>Chrome</td>
<td>165 °F (74 °C)</td>
</tr>
<tr>
<td>QR Pendent</td>
<td>20110</td>
<td>VK426</td>
<td>--</td>
<td>Painted white</td>
<td>205 °F (96 °C)</td>
</tr>
<tr>
<td>QR HSW</td>
<td>22885</td>
<td>VK427</td>
<td>1/2</td>
<td>Painted gray</td>
<td></td>
</tr>
<tr>
<td>QR EC Pendent</td>
<td>19876</td>
<td>VK650</td>
<td>1/2</td>
<td>Painted gray</td>
<td></td>
</tr>
<tr>
<td>QR EC HSW</td>
<td>22884</td>
<td>VK651</td>
<td>1/2</td>
<td>Painted gray</td>
<td></td>
</tr>
</tbody>
</table>

NOTE: The escutcheons are available with the same finishes as the sprinklers.

### Examples
- **Sprinkler**: 19663MC/VK426 Quick Response Pendent with Painted gray Finish and 165 °F (74 °C) Nominal temperature rating. This sprinkler is to be installed into an area with a maximum ambient temperature of 100 °F (38 °C) meaning if the area will experience temperatures above the maximum ambient rating, you shall use a higher temperature-rated sprinkler.
- **Escutcheon**: 23196M/VK426 3" Diameter Escutcheon with Painted gray finish.

### Accessories
- **Sprinkler Wrench (see Figure 1)**: Socket Wrench: Part No. 22847MB2
- **Retaining Flange (see Figure 1)**: Part No. 10599 (includes 1/8" allen head set screw5)
- **Sprinkler Cabinet**: Holds Up to 6 sprinklers: Part number 01731A

### Footnotes

1. Where a dash (-) is shown in the Finish suffix designation, insert the desired Temperature Rating suffix. See example above.
2. Requires a 1/2" ratchet which is not available from Viking.
3. 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.
4. The escutcheons are available with the same finishes as the sprinkler.
5. Requires a 1/8" allen wrench which is not available from Viking.

---

**Figure 1: Sprinkler Accessories**

**Figure 2: Sprinkler Dimensions (Pendent and HSW)**
Pendent Deflector

SIN Location

Sprinkler Type indicator

Sprinkler Type indicator

Horizontal Sidewall Deflector

Pendent

Sprinkler Data Location

Stamped around the perimeter, you will find:
• Sprinkler Identification Number (SIN)
• K-factor
• Coverage: No mark for Standard Coverage and “EC” for Extended Coverage
• Orientation type: PD or HSW
• Temperature Rating: See Ordering Information
• Year of manufacture
• Patent information
• Approval stamp

Figure 3: Sprinkler Components and Identification
4. INSTALLATION
Refer to appropriate NFPA, FM Global, and/or any other applicable installation standards.

NOTICES
- Sprinklers must be handled with care. They must be stored in a cool, dry place in their original shipping container. Never install sprinklers that have been dropped, damaged in any way, or exposed to temperatures in excess of maximum ambient temperature allowed. Such sprinklers should be destroyed immediately.
- Viking Institutional Sprinklers are not intended for use in corrosive environments. Use only sprinklers listed for corrosive environments when subject to corrosive atmospheres.
- Use care when locating sprinklers near fixtures that can generate heat. Do not install sprinklers where they will be exposed to temperatures that exceed the maximum recommended ambient temperature for the temperature rating used.
- Adequate heat must be provided when the Institutional Sprinklers are installed on wet-pipe systems.
- The sprinklers must be installed after the piping is in place to prevent mechanical damage. Before installing, be sure to have the appropriate sprinkler model and style, with the correct orifice size, temperature rating, and response characteristics.

WARNING
Viking sprinklers are manufactured and tested to meet the rigid requirements of the approving agency. The sprinklers are designed to be installed in accordance with recognized installation standards. Deviation from the standards or any alteration to the sprinkler after it leaves the factory including, but not limited to: painting, plating, coating, or modification, may render the sprinkler inoperative and will automatically nullify the approval and any guarantee made by The Viking Corporation. Flush sprinklers are decorative sprinklers and may be considered special purpose. As such, some Authorities may limit the use depending on the occupancy classification. Refer to the Authority Having Jurisdiction prior to installation.

General Information:
The tamper-resistant design of the Viking Institutional Sprinklers is dependant upon proper installation as outlined in this document as well as proper piping design and installation. Proper installation ensures that the sprinkler assembly will be held in place by the force of the escutcheon pressing outward on the sprinkler body.

Pay close attention to the instructions below when installing these sprinklers.
Proper installation requires the following:
- The fitting in which the sprinkler is to be installed must be properly located according to the dimensions indicated below.
- The sprinkler fitting and drop nipple should be secured in place by installing the retaining flange as shown in the procedure below.
- The centerline of the fitting in which the sprinkler is to be installed must be perpendicular to the surface of the finished surface.
- Remove the sprinkler cap before placing the system into service.
- After installation, the entire system must be tested in accordance with recognized installation standards. The test is applied after sprinkler installation to ensure that no damage has occurred to the sprinkler during shipping and installation, and to make sure the unit has been properly tightened. If a thread leak occurs, normally the unit must be removed, new pipe-joint compound or tape applied, and then reinstalled. This is due to the fact that when the joint seal leaks, the sealing compound or tape is washed out of the joint.

Tools and recommended supplies:
- PTFE Tape
- Institutional Sprinkler Wrench Part Number 22847M/B (requires a 1/2” socket wrench which is not available from Viking)
- 1/2” Ratchet wrench and (optional) extension
- 1/8” hex wrench (used for retaining flange hex screw; not available from Viking)
- Level

INSTALLATION TIP:
Prior to final installation, temporarily install all components described in the procedure below to verify the correct measurements have been acheived. If necessary, re-cut the supply drop nipple and repeat the procedure in order to acheive the correct measurements.
Procedure:

1. Install all piping and cut the sprinkler drop nipple so that the ½" (15 mm) NPT outlet of the reducing coupling is at the correct elevation and centered in a 2" (50 mm) diameter opening in the ceiling.

   NOTE: If the retaining flange assembly is to be used, slide the flange over the sprinkler drop nipple prior to threading the nipple into the branch line tee.

2. Inspect the sprinkler assembly for damage.

3. Ensure the protective cap is on the sprinkler then apply a small amount of pipe-joint compound or tape (not shown) to the external threads of the sprinkler only, taking care not to allow a build-up of compound in the sprinkler inlet.

4. Install the escutcheon onto the sprinkler body as shown. DO NOT install the sprinkler without the escutcheon.

5. For HSW sprinklers Align the “TOP” marking on the wrench with the same marking on the protective cap. Place the sprinkler wrench over the protective cap on the sprinkler body.

   NOTE: The wrench is uniquely designed to fit over the sprinkler cap and into the sprinkler in a specific alignment.

6. Install the sprinkler into the fitting.

   NOTE: The Escutcheon plate MUST be tight against the ceiling or wall.

7. Tighten the sprinkler to approximately 7-14 ft-lbs.

8. If desired, use a level to ensure the HSW Institutional Sprinkler in a horizontal position.

5. OPERATION

The sprinkler is recessed into the mounting surface, flush to the wall, with only a portion of the fusible link assembly exposed beyond the wall. The concealed deflector is held inside the sprinkler body until the eutectic metal solder link is fused. When the sprinkler fuses, the deflector extends to discharge and distribute water.

The special escutcheon plates shown on this document are the only escutcheon rings that may be used with these institutional sprinklers, and all of these sprinklers must be installed with an escutcheon plate.

The sprinkler piping behind the wall leading to the sprinkler must be secured to prevent any movement of the sprinkler. One method of anchoring the pipe behind the wall is to use the retaining flange and screw assembly that are available from Viking. The flange slides over the sprinkler nipple prior to threading the nipple into the tee.
Ensure the escutcheon plate is tight against the ceiling.

Upon activation, the deflector actuates to approximately 7/8” (22 mm) beyond the sprinkler body.

![Figure 5: Installation Dimensions - Pendent](image)

Ensure the escutcheon plate is tight against the wall.

Upon activation, the deflector actuates to approximately 7/8” (22 mm) beyond the sprinkler body.

![Figure 6: Installation Dimensions - HSW](image)
6. INSPECTIONS, TESTS AND MAINTENANCE

**NOTICE**

The owner is responsible for maintaining the fire protection system and devices in proper operating condition. For minimum maintenance and inspection requirements, refer to NFPA 25 for Inspection, Testing and Maintenance requirements. In addition, the Authority Having Jurisdiction may have additional maintenance requirements that must be followed.

A. The sprinklers must be inspected on a regular basis for corrosion, mechanical damage, obstructions, paint, etc. The frequency of inspections may vary due to corrosive atmospheres, water supplies, and activity around the device.

B. Sprinklers that have been painted or mechanically damaged must be replaced immediately. Sprinklers showing signs of corrosion shall be tested and/or replaced immediately as required. Installation standards require sprinklers to be tested and, if necessary, replaced after a specified term of service. Refer to the installation standards and the Authority Having Jurisdiction for the specified period of time after which testing and/or replacement is required. Sprinklers that have operated cannot be reassembled or reused, but must be replaced. When replacing sprinklers, use only new sprinklers.

C. The sprinkler discharge pattern is critical for proper fire protection. Nothing should be hung from the sprinkler, attached to it, or otherwise obstruct the discharge pattern. All obstructions must be immediately removed or, if necessary, additional sprinklers installed.

D. When replacing existing sprinklers, the system must be removed from service. Refer to the appropriate system description and/or valve instructions. Prior to removing the system from service, notify all Authorities Having Jurisdiction. Consideration should be given to employment of a fire patrol in the affected area.

7. AVAILABILITY

Viking Institutional Sprinklers 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.
### APPROVAL CHART

**Viking Institutional Sprinklers**

<table>
<thead>
<tr>
<th>Sprinkler Base Part Number</th>
<th>SIN</th>
<th>Thread Size</th>
<th>Listings and Approvals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NPT Inch</td>
<td>BSPT mm</td>
<td>cULUs</td>
</tr>
<tr>
<td>19663 VK426</td>
<td>1/2</td>
<td>--</td>
<td>A1</td>
</tr>
<tr>
<td>20110 VK426</td>
<td>--</td>
<td>20</td>
<td>A1</td>
</tr>
<tr>
<td>22885 VK427</td>
<td>1/2</td>
<td>--</td>
<td>A1</td>
</tr>
<tr>
<td>22908 VK427</td>
<td>--</td>
<td>20</td>
<td>A1</td>
</tr>
<tr>
<td>19876 VK650</td>
<td>1/2</td>
<td>--</td>
<td>A1</td>
</tr>
<tr>
<td>20111 VK650</td>
<td>--</td>
<td>20</td>
<td>A1</td>
</tr>
<tr>
<td>22884 VK651</td>
<td>1/2</td>
<td>--</td>
<td>A1</td>
</tr>
<tr>
<td>22907 VK651</td>
<td>--</td>
<td>20</td>
<td>A1</td>
</tr>
</tbody>
</table>

**Approved Temperature Rating Codes:**
- A = 165 °F (74 °C) and 205 °F (96 °C)

**Approved Finish Codes:**
- 1 = Chrome, Painted White, and Painted Gray (RAL9006)

**Footnotes**

1. Base Part number is shown. For complete part number, refer to Viking's current price schedule.
2. This table shows the listings and approvals available at the time of printing. Check with the manufacturer for any additional approvals.
3. Other colors are available upon request with the same Listings and Approvals as the standard colors.

### LISTED FLOW RATES AND COVERAGE AREAS (LIGHT HAZARD) FOR Viking EXTENDED COVERAGE Institutional Sprinklers

<table>
<thead>
<tr>
<th>Sprinkler Base Part Number</th>
<th>SIN</th>
<th>Thread Size</th>
<th>Coverage Area Ft x Ft. (m x m)</th>
<th>Minimum Flow GPM (Lpm)</th>
<th>Minimum Pressure PSI (bar)</th>
<th>Deflector to Ceiling Distance Inches (mm)</th>
<th>Minimum Spacing Ft. (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NPT Inch</td>
<td>BSPT mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19876 VK650</td>
<td>1/2</td>
<td>--</td>
<td>16 x 16 (4,9 x 4,9)</td>
<td>26 (96)</td>
<td>21.6 (1,49)</td>
<td>Flush²</td>
<td>8 (2,4)</td>
</tr>
<tr>
<td>20111 VK650</td>
<td>--</td>
<td>20</td>
<td>16 x 16 (4,9 x 4,9)</td>
<td>26 (96)</td>
<td>21.6 (1,49)</td>
<td>Flush²</td>
<td>8 (2,4)</td>
</tr>
<tr>
<td>22884 VK651</td>
<td>1/2</td>
<td>--</td>
<td>16 x 16 (4,9 x 4,9)</td>
<td>26 (96)</td>
<td>21.6 (1,49)</td>
<td>4 to 12 (102 to 304)</td>
<td>8 (2,4)</td>
</tr>
<tr>
<td>22907 VK651</td>
<td>--</td>
<td>20</td>
<td>16 x 16 (4,9 x 4,9)</td>
<td>26 (96)</td>
<td>21.6 (1,49)</td>
<td>4 to 12 (102 to 304)</td>
<td>8 (2,4)</td>
</tr>
</tbody>
</table>

**Footnotes**

1. Based on the minimum flow in GPM (lpm) from each sprinkler.
2. Based on Nominal K-factor.
3. The sprinkler face protrudes downward from the ceiling 1/4” (5mm). See Figure 5.
STANDARD COVERAGE PENDENT
cULus Listing Requirements:
The sprinkler VK426 is cULus Listed as a Quick Response, Flush, Pendent Sprinkler as indicated in the Approval Chart for installation in accordance with the latest edition of NFPA 13. The following requirements must be followed:
• Designed for use in Light and Ordinary Hazard occupancies.
• The sprinkler must be installed in the pendent position in fixed fire protection systems (wet, dry, deluge, or preaction systems).
• Protection areas and maximum spacing shall be in accordance with the tables provided in NFPA 13.
• Minimum spacing allowed is 6 ft. (1.8 m) unless baffles are installed in accordance with NFPA 13.
• Minimum distance from walls is 4 in. (100 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 and obstruction rules contained in NFPA 13 for standard coverage spray pendent sprinklers must be followed.

EXTENDED COVERAGE PENDENT
cULus Listing Requirements:
The sprinkler VK650 is cULus Listed as an Extended Coverage, Quick Response, Flush, Pendent Sprinkler as indicated in the Approval Chart for installation in accordance with the latest edition of NFPA 13. The following requirements must be followed:
• Designed for use in Light Hazard occupancies only.
• The sprinkler must be installed in the pendent position in fixed fire protection systems (wet, dry, deluge, or preaction systems).
• Minimum distance from walls is 4 in. (100 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 and obstruction rules contained in NFPA 13 for extended coverage pendent spray sprinklers must be followed.

STANDARD COVERAGE HORIZONTAL SIDEWALL
cULus Listing Requirements:
The sprinkler VK427 is cULus Listed as a Quick Response, Flush, Horizontal Sidewall Sprinkler as indicated in the Approval Chart for installation in accordance with the latest edition of NFPA 13. The following requirements must be followed:
• Designed for use in Light and Ordinary Hazard occupancies below smooth, flat, horizontal ceilings.
• The sprinkler must be installed in the horizontal sidewall position in fixed fire protection systems (wet, dry, deluge, or preaction systems).
• Orient the top of the deflector parallel with the ceiling. The wrench ear on the top of the Viking Institutional Style Quick Response Flush Horizontal Sidewall Sprinkler is marked with the word “top”.
• Must be located with deflector 4" to 12" (102 mm to 304 mm) below the ceiling, and flush with the wall in which they are installed.
• Protection areas and maximum spacing shall be in accordance with the tables provided in NFPA 13.
• Minimum spacing allowed is 6 ft. (1.8 m).
• Minimum distance from end walls is 4 in. (100 mm).
• Maximum distance from end 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 and obstruction rules contained in NFPA 13 for standard coverage spray horizontal sidewall sprinklers must be followed.

EXTENDED COVERAGE HORIZONTAL SIDEWALL
cULus Listing Requirements:
The sprinkler VK651 is cULus Listed as an Extended Coverage, Quick Response, Flush, Horizontal Sidewall Sprinkler as indicated in the Approval Chart for installation in accordance with the latest edition of NFPA 13. The following requirements must be followed:
• Designed for use in Light Hazard occupancies only below smooth, flat, horizontal ceilings.
• The sprinkler must be installed in the horizontal sidewall position in fixed fire protection systems (wet, dry, deluge, or preaction systems).
• Orient the top of the deflector parallel with the ceiling. The wrench ear on the top of the Viking Institutional Style Quick Response Flush Horizontal Sidewall Sprinkler is marked with the word “top”.
• Must be located with deflector 4" to 12" (102 mm to 304 mm) below the ceiling, and flush with the wall in which they are installed.
• Maximum Protection area allowed is 16" x 16" (4.9 m x 4.9 m)
• Maximum spacing shall be in accordance with the tables provided in NFPA 13.
• Minimum spacing allowed is 6 ft. (1.8 m).
• Minimum distance from end walls is 4 in. (102 mm).
• Maximum distance from end 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 and obstruction rules contained in NFPA 13 for extended coverage spray horizontal sidewall sprinklers must be followed.

IMPORTANT: Always refer to 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.