TECHNICAL DATA

INSTITUTIONAL SPRINKLERS K5.6

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 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. Additionally, the VK427 can be used as Standard Response (FM only). 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: Category VNIV

FM Approved: Class 2015 (VK427 ONLY)

* Refer to the Approval Charts 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
Deflector: Pendent - Copper UNS-C23000 or UNS-C51000, 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
Seat: 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.)

SIN	THREAD	DESCRIPTION
VK426	NPT	QR Pendent
VK650	NPT	QR EC Pendent
VK427	NPT	QR or SR[1] HSW
VK651	NPT	QR EC HSW
VK426	BSPT	QR Pendent
VK650	BSPT	QR EC Pendent
VK427	BSPT	QR or SR[1] HSW
VK651	BSPT	QR EC HSW

1. VK427 is FM Approved as Standard Response (SR)

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

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TABLE 1: ORDERING INFORMATION

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[4].

Style	Sprinkler Base Part Number	SIN	Size		1: Available Finishes		2: Available Temperature Ratings		
			NPT Inch	BSPT mm	Description	Suffix[1]	Nominal Rating	Max. Ambient Ceiling Temperature[3]	Suffix
QR Pendent	19663	VK426	1/2	--	Chrome	F	165 °F (74 °C)	100 °F (38 °C)	C
QR Pendent	20110	VK426	--	15	Painted white	M-/W	205 °F (96 °C)	150 °F (65 °C)	E
QR or SR[6] HSW	22885	VK427	1/2	--	Painted gray	M-/RAL9006			
QR or SR[6] HSW	22908	VK427	--	15	**NOTE: The escutcheons are available with the same finishes as the sprinklers.**		**3: Escutcheons[4]**		
QR EC Pendent	19876	VK650	1/2	--			**Description**	**Base Part Number**	
QR EC Pendent	20111	VK650	--	15			3” (75 mm)	23196	
QR EC HSW	22884	VK651	1/2	--			4” (100 mm)	23197	
QR EC HSW	22907	VK651	--	15					

Examples

Sprinkler: **19663MC/RAL9006** = 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/RAL9006** = 3” Diameter Escutcheon with Painted gray finish.

Accessories

Sprinkler Wrench (see Figure 1): Socket Wrench: Part No. 22847MB[2]
Retaining Flange (see Figure 1): Part Number 10599 (includes 1/8” allen head set screw[5])
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.
6. The VK427 is FM Approved as Standard Response. Refer the Approval Charts and design criteria for further details.

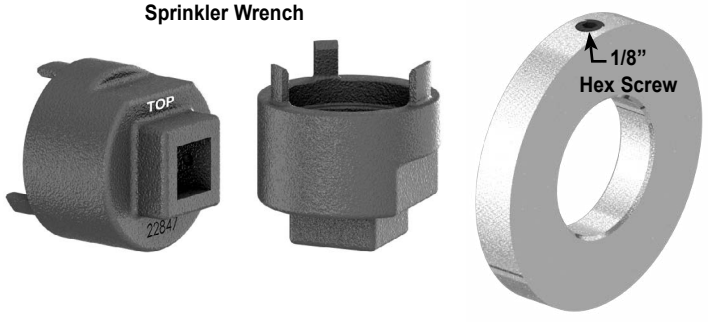

Figure 1: Sprinkler Accessories

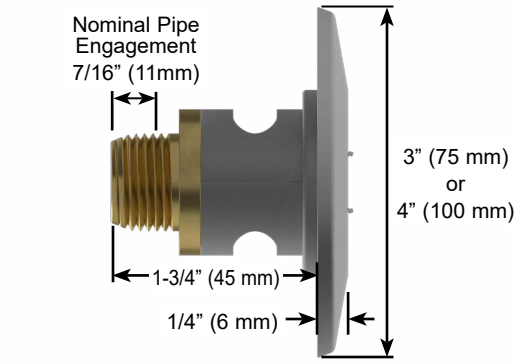

Figure 2: Sprinkler Dimensions (Pendent and HSW)

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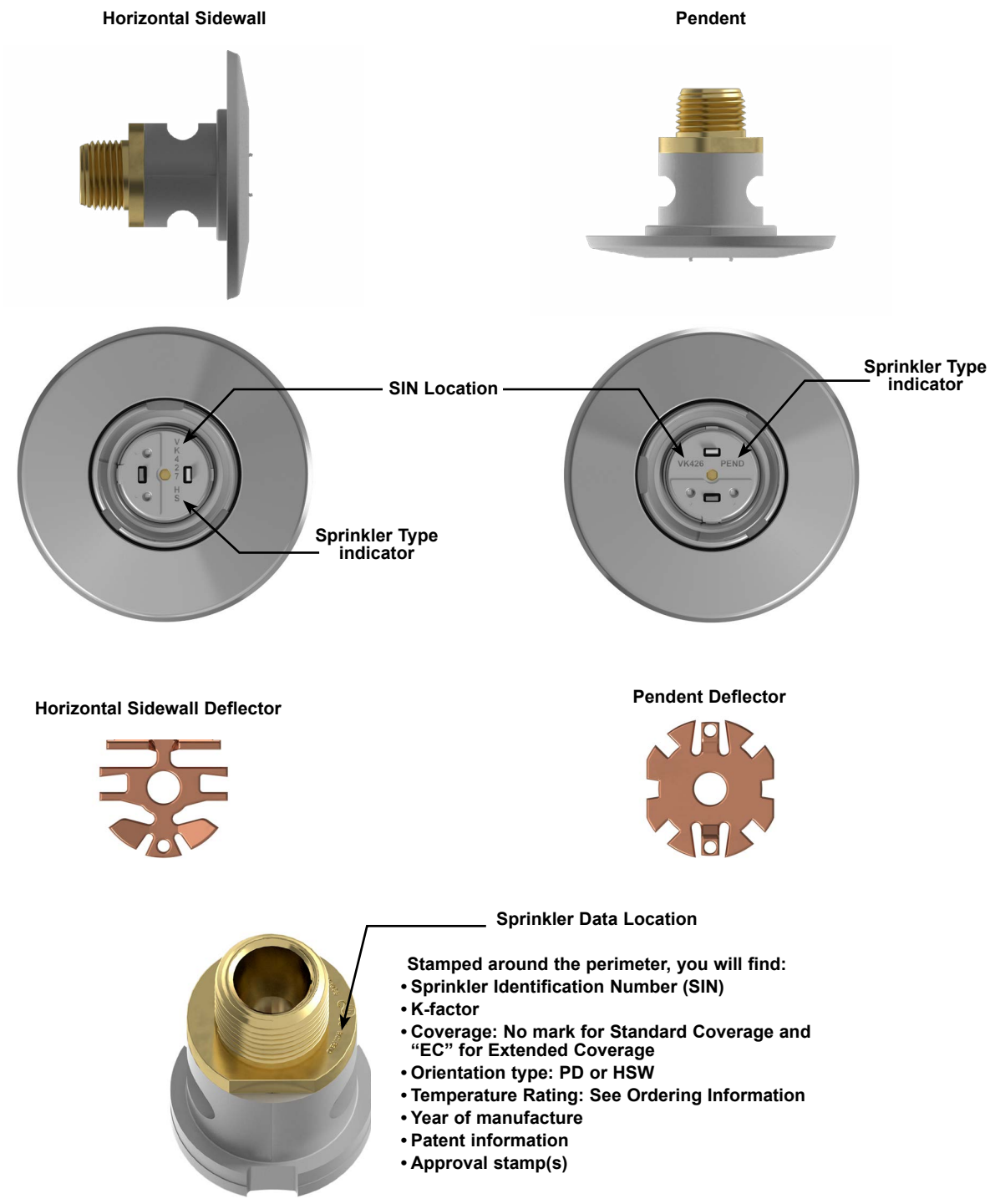

Figure 3: Sprinkler Components and Identification

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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) extenstion
- 1/8” hex wrench (used for retaining flange hex screw; not available from Viking)
- Level
- Pliers

INSTALLATION TIP:

Prior to final installation, temporarily install all components described in the procedure below to verify the correct measurements have been achieved. If necessary, re-cut the supply drop nipple and repeat the procedure in order to achieve the correct measurements.

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Procedure:

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. For an alternative bracing method, refer to Figure 8.

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.
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 is in a horizontal position.

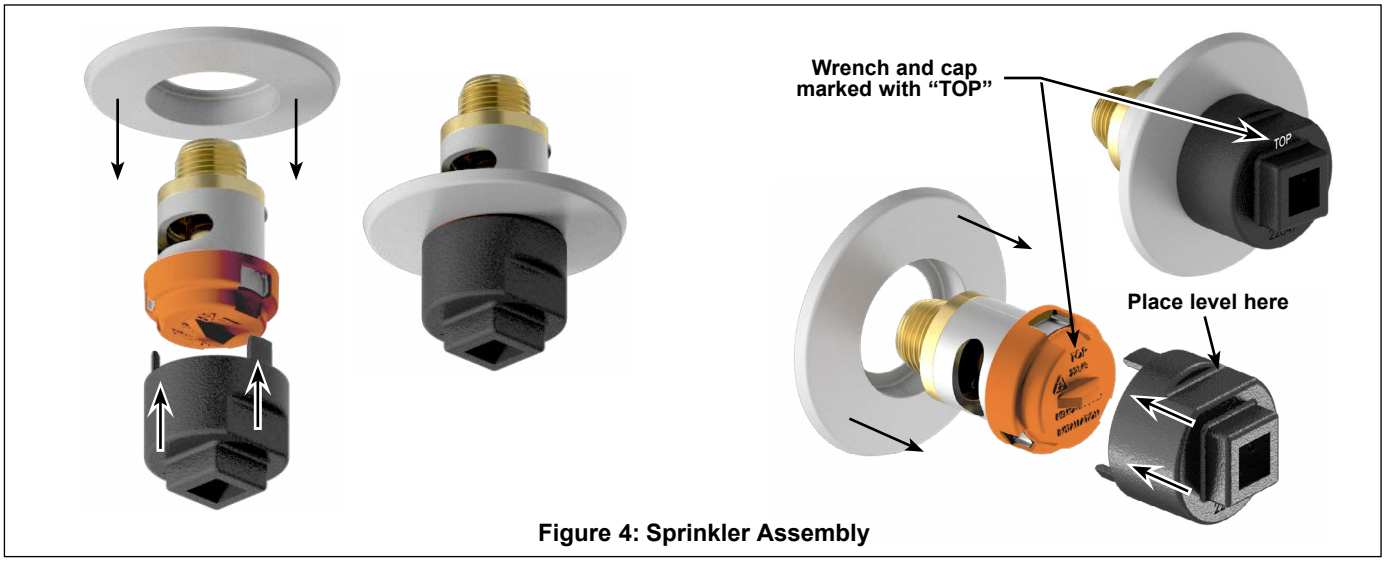

Figure 4: Sprinkler Assembly

9. To avoid damaging the sprinkler, carefully grasp the provided pull tab (manually or using pliers) and pull straight away from the sprinkler face to remove the protective cap.

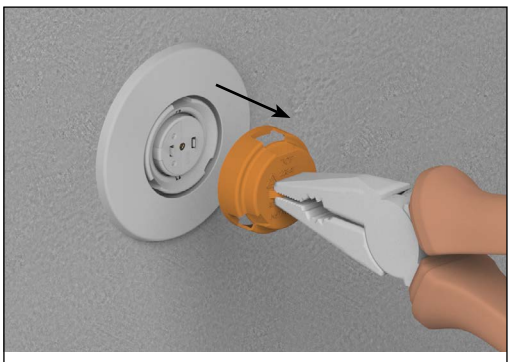

Figure 5: Removing the Protective Cap

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⚠ **Ensure the escutcheon plate is tight against the ceiling.**

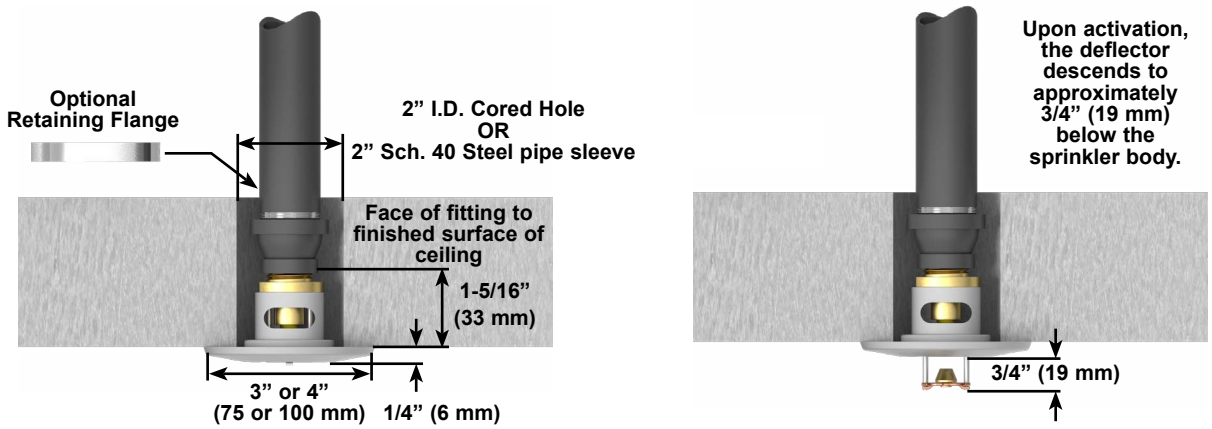

Figure 6: Installation Dimensions - Pendent

⚠ **Ensure the escutcheon plate is tight against the wall.**

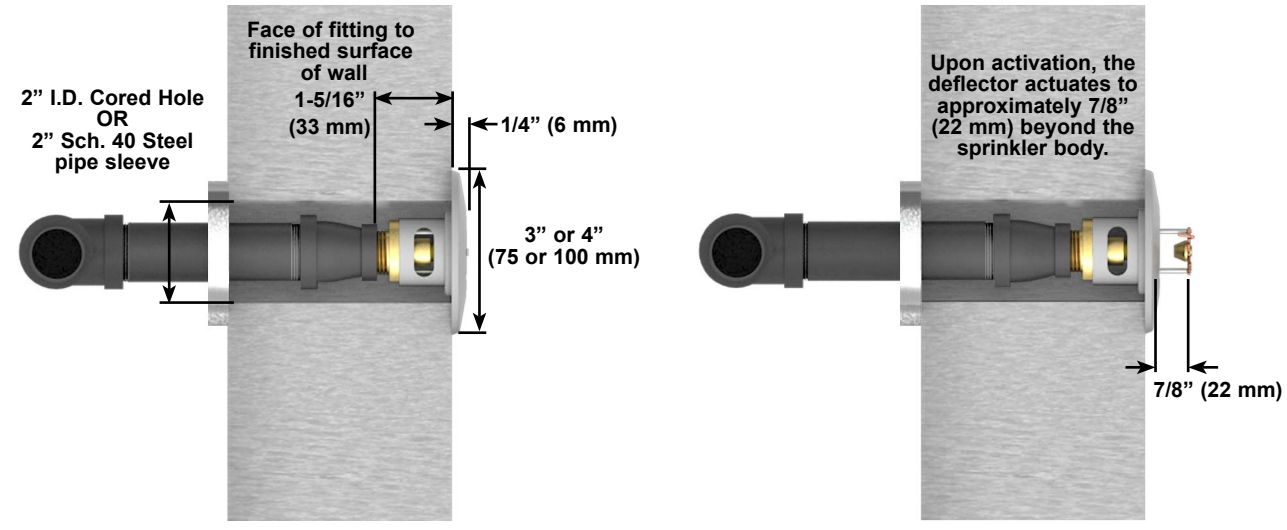

Figure 7: Installation Dimensions - HSW

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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.

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.

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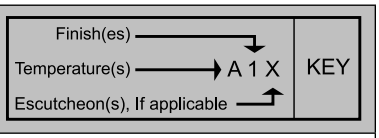
APPROVAL CHART
Viking Institutional Sprinklers



Sprinkler Base Part Number[1]	SIN	Thread Size		Listings and Approvals[2,4]	
		NPT Inch	BSPT mm	cULus (Quick Response)	FM (Standard Response)
19663	VK426	1/2	--	A1	-
20110	VK426	--	15	A1	-
22885	VK427	1/2	--	A1	A1
22908	VK427	--	15	A1	A1
19876	VK650	1/2	--	A1	-
20111	VK650	--	15	A1	-
22884	VK651	1/2	--	A1	-
22907	VK651	--	15	A1	-

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

Approved Finish Codes:
1 = Chrome, Painted White[3], and Painted Gray[3] (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.
4 Refer to the applicable cULus or FM Design Criteria in this document for further details.

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

Sprinkler Base Part Number[1]	SIN	Thread Size		cULus Listed Flows and Pressures				
		NPT Inch	BSPT mm	Coverage Area Ft x Ft. (m x m)	Minimum Flow[1] GPM (Lpm)	Minimum Pressure[2] PSI (bar)	Deflector to Ceiling Distance Inches (mm)	Minimum Spacing Ft. (m)
19876	VK650	1/2	--	16 x 16 (4,9 x 4,9)	26 (96)	21.6 (1,49)	Flush[3]	8 (2,4)
20111	VK650	--	15	16 x 16 (4,9 x 4,9)	26 (96)	21.6 (1,49)	Flush[3]	8 (2,4)
22884	VK651	1/2	--	16 x 16 (4,9 x 4,9)	26 (96)	21.6 (1,49)	4 to 12 (102 to 304)	8 (2,4)
22907	VK651	--	15	16 x 16 (4,9 x 4,9)	26 (96)	21.6 (1,49)	4 to 12 (102 to 304)	8 (2,4)

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" (6 mm). See Figure 6.

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DESIGN CRITERIA - UL

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 pendent spray 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 spacing allowed is 8 ft. (2.4 m) unless baffles are installed in accordance with NFPA 13.
- Maximum protection area allowed is 16' x 16' (4.9 m x 4.9 m).
- 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 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) unless baffles are installed in accordance with NFPA 13.
- 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 standard coverage sidewall spray 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 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 8 ft. (2.4 m) unless baffles are installed in accordance with NFPA 13.
- 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 sidewall spray 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.

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DESIGN CRITERIA - FM

FM Approval Requirements:
The Viking Standard Response Horizontal Sidewall Sprinkler VK427 is FM Approved as standard response sidewall Non-Storage sprinkler, as indicated in the FM Approval Guide. For specific application and installation requirements, reference the latest applicable FM Loss Prevention Data Sheets (including 2-0) and Technical Advisory Bulletins. FM Global Loss Prevention Data Sheets and Technical Advisory Bulletins 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 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.

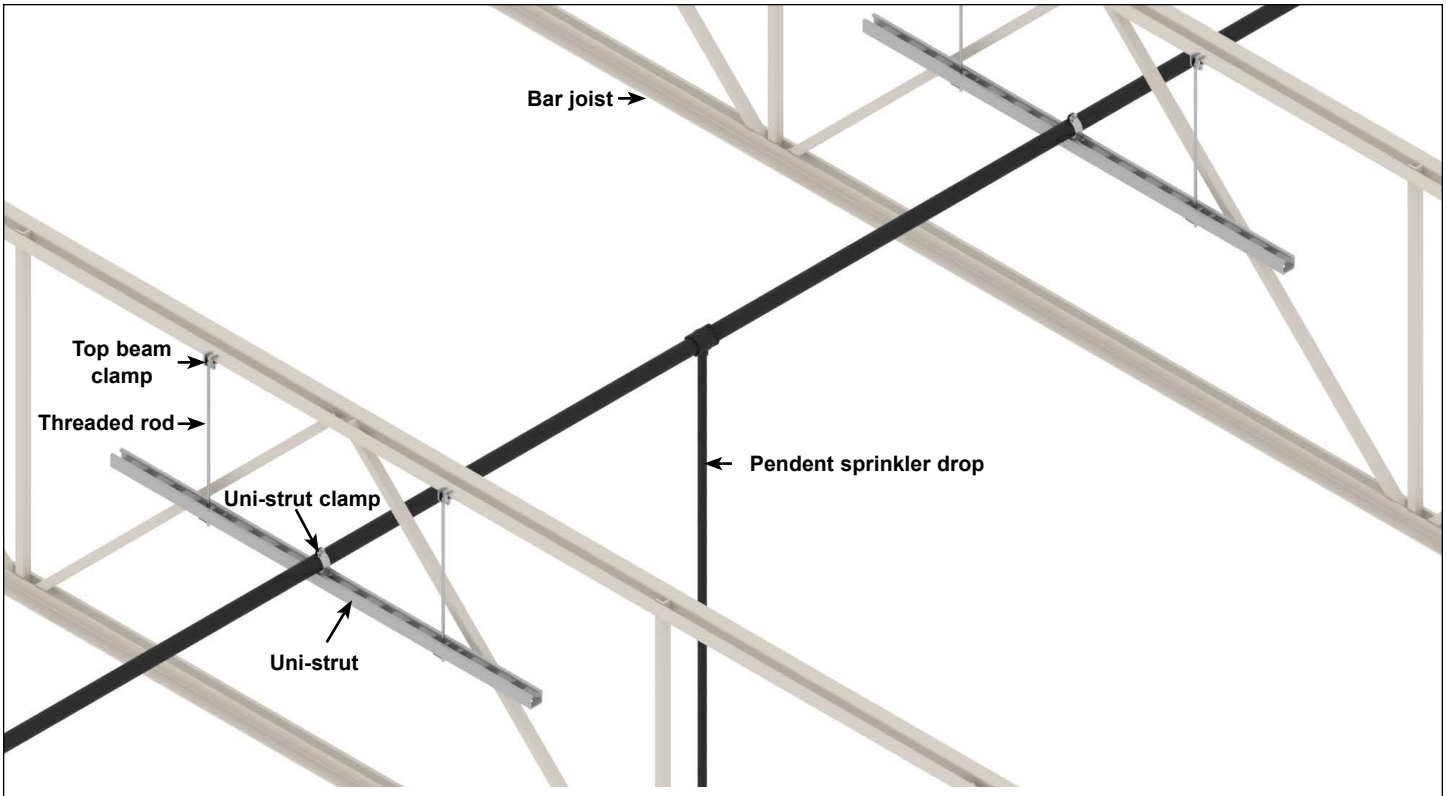

Figure 8: Alternative Bracing Method

NOTICE

Specific situations and conditions may exist that require alternative bracing methods to be used. Additional bracing methods may also be used; the material(s) used must not break down, drip, over-spray, or otherwise interfere with or impede the operation of the sprinkler—especially during fire conditions.

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Before installation, be sure to have the appropriate sprinkler model and style, with the correct K-Factor, temperature rating, and response characteristics. Sprinklers must be installed after the piping is in place to prevent mechanical damage. Keep sprinklers with protective caps or bulb shields contained within the caps or shields during installation and testing, and any time the sprinkler is shipped or handled.

1a. For frame-style sprinklers, install escutcheon (if used), which is designed to thread onto the external threads of the sprinkler. Refer to the appropriate sprinkler data page to determine approved escutcheons for use with specific sprinkler models.

1b. For flush and concealed style sprinklers: Cut the sprinkler nipple so that the ½" or 3/4" (15 mm or 20 mm)* NPT outlet of the reducing coupling is at the desired location, and centered in the opening* in the ceiling or wall.
*Size depends on the sprinkler model used. Refer to the sprinkler technical data page.

2. Apply a small amount of pipe-joint compound or tape to the external threads of the sprinkler only, taking care not to allow a build-up of compound in the sprinkler inlet. **NOTE:** Sprinklers with protective caps or bulb shields must have the caps or shields kept on them when applying pipe-joint compound or tape. *Exception: For domed concealed sprinklers, remove the protective cap for installation, and then place it back on the sprinkler temporarily..*

3. Refer to the appropriate sprinkler technical data page to determine the correct sprinkler wrench for the model of sprinkler used. DO NOT use the deflector or fusible element to start or thread the sprinkler into a fitting.
   a. Install the sprinkler onto the piping using the special sprinkler wrench only, taking care not to over-tighten or damage the sprinkler.
   b. For flush and concealed style sprinklers: the internal diameter of the special sprinkler installation wrench is designed for use with the sprinkler contained in the protective cap. *Exception: For domed concealed sprinklers, remove the protective cap for installation, and then place it back on the sprinkler temporarily.* Thread the flush or concealed sprinkler into the ½" or 3/4" (15 mm or 20 mm)* NPT outlet of the coupling by turning it clockwise with the special sprinkler wrench. *Thread size depends on the particular sprinkler model used. Refer to the sprinkler technical data page.

C. Installation Instructions - Dry Sprinklers

WARNING: Viking dry sprinklers are to be installed in the 1" outlet (for dry and preaction systems), or run of malleable, ductile iron, or Nibco CPVC* threaded tee fittings (for wet systems) that meet the dimensional requirements of ANSI B16.3 (Class 150), or cast iron threaded tee fittings that meet the dimensional requirements of ANSI B16.4 (Class 125), even at branch line ends. The threaded end of the dry sprinkler is designed to allow the seal to penetrate and extend into the fitting to a predetermined depth. This prevents condensation from accumulating and freezing over the sprinkler seal. ***NOTE: When using CPVC fittings with Viking dry sprinklers, use only new Nibco Model 5012-S-BI. When selecting other CPVC fittings, contact Viking Technical Services.**

1. **DO NOT** install the dry sprinkler into a threaded elbow, coupling, or any other fitting that could interfere with thread penetration. Such installation would damage the brass seal.
2. **DO NOT** install dry sprinklers into couplings or fittings that would allow condensation to accumulate above the seal when the sprinkler is located in an area subject to freezing.
3. **NEVER** try to modify dry sprinklers. They are manufactured for specific "A" or "B" dimensions and cannot be modified.

The dry sprinkler must be installed after the piping is in place to prevent mechanical damage. Before installation, be sure to have the correct sprinkler model and style, with the appropriate "A" or "B" dimension(s), temperature rating, orifice size, and response characteristics. Keep sprinklers with protective caps or bulb shields contained within the caps or shields during installation and testing, and any time the sprinkler is shipped or handled. *Exception:* For concealed and adjustable recessed dry sprinklers, the protective caps and shields are removed for installation.

To install the dry sprinkler, refer to the instructions below and the appropriate sprinkler technical data page for illustrated instructions.

Dry upright sprinklers must be installed above the piping, in the upright position only. When installing dry upright or plain barrel style vertical sidewall sprinklers on piping located close to the ceiling, it may be necessary to lower the sprinkler into the fitting from above the ceiling. When installing dry upright or plain barrel vertical sidewall sprinklers from below the ceiling, verify that the opening in the ceiling is a minimum 1-1/2" (38.1 mm) in diameter.

For dry upright or plain barrel vertical sidewall sprinklers in the upright position: First, install the escutcheon (if used) over the threaded end of the sprinkler barrel. Slide the escutcheon past the external threads. NOTE: When installing the dry upright or plain barrel vertical sidewall sprinkler from above the ceiling, it will be necessary to install the escutcheon after lowering the threaded end of the sprinkler through the ceiling penetration.

A. **For all dry sprinklers:** Apply a small amount of pipe-joint compound or tape to the external threads of the sprinkler barrel only, taking care not to allow a build-up of compound or tape over the brass inlet and seal. **NOTE:** Sprinklers with protective caps or bulb shields must be contained within the caps or shields before applying pipe-joint compound or tape.

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B. Refer to the appropriate sprinkler technical data page to determine the correct sprinkler wrench for the model of sprinkler used.
C. Install the dry sprinkler on the piping using the special dry sprinkler wrench only, while taking care not to damage the sprinkler. **NOTE:** Thread the sprinkler into the fitting hand tight, plus 1/2 turn with the dry sprinkler wrench.
D. *For adjustable standard and adjustable recessed dry pendent and sidewall sprinklers: Escutcheons can be installed after the sprinklers have been installed onto the piping. Refer to the appropriate sprinkler technical data page for escutcheon installation instructions and illustrations.*

D. Installation Instructions - Testing

4. After installation, the entire sprinkler system must be tested. The test must be conducted to comply with the installation standards. Viking *high pressure* sprinklers may be hydrostatically tested at a maximum of 300 psi (20.7 bar) for limited periods of time (two hours), for the purpose of acceptance by the Authority Having Jurisdiction.
   a. Make sure the sprinkler is properly tightened. If a thread leak occurs, normally the sprinkler must be removed, new pipe-joint compound or tape applied, and then reinstalled. This is due to the fact that when the joint seal is damaged, the sealing compound or tape is washed out of the joint. Air testing [do not exceed 40 psi (2.76 bar)] the sprinkler piping prior to testing with water may be considered in areas where leakage during testing must be prevented. Refer to the Installation Standards and the Authority Having Jurisdiction.
   b. **Remove plastic protective sprinkler caps or bulb shields AFTER the wall or ceiling finish work is completed where the sprinkler is installed and there no longer is a potential for mechanical damage to the sprinkler operating elements.** To remove the bulb shields, simply pull the ends of the shields apart where they are snapped together. To remove caps from frame style sprinklers, turn the caps slightly and pull them off the sprinklers. **SPRINKLER CAPS OR BULB SHIELDS MUST BE REMOVED FROM SPRINKLERS BEFORE PLACING THE SYSTEM IN SERVICE!** Retain a protective cap or shield in the spare sprinkler cabinet.
5. For flush style sprinklers: the ceiling ring can now be installed onto the sprinkler body. Align the ceiling ring with the sprinkler body and thread or push it on (depends on sprinkler model) until the outer flange touches the surface of the ceiling. Note the maximum adjustment is 1/4" (6.35 mm). DO NOT MODIFY THE UNIT. If necessary, re-cut the sprinkler drop nipple as required.
6. For concealed sprinklers: the cover assembly can now be attached.
   a. Remove the cover from the protective box, taking care not to damage the cover plate assembly.
   b. Gently place the base of the cover plate assembly over the sprinkler protruding through the opening in the ceiling.
   c. Push the cover plate assembly onto the sprinkler until the unfinished brass flange of the cover plate base (or the cover adapter, if used) touches the surface of the ceiling.
   d. Refer to the applicable technical data sheet to determin the maximum adjustment available for concealed sprinklers. DO NOT MODIFY THE UNIT. If necessary, re-cut the sprinkler drop nipple.

NOTE: If it is necessary to remove the entire sprinkler unit, the system must be taken out of service. See section 6. INSPECTIONS, TESTS AND MAINTENANCE and follow all warnings and instructions.

5. OPERATION

Refer to the appropriate sprinkler technical data page(s). During fire conditions, the operating element fuses or shatters (depending on the type of sprinkler), releasing the pip cap and sealing assembly. Water flowing through the sprinkler orifice strikes the sprinkler deflector, forming a uniform spray pattern to extinguish or control the fire.

IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. 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. The sprinkler technical data page may contain installation requirements specific for the sprinkler model selected. The use of certain types of sprinklers may be limited due to occupancy and hazard. Refer to the Authority Having Jurisdiction prior to installation.

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6. INSPECTIONS, TESTS AND MAINTENANCE

NOTICE: Refer to NFPA 25 for Inspection, Testing and Maintenance requirements. **NOTICE:** The owner is responsible for having the fire-protection system and devices inspected, tested, and maintained in proper operating condition in accordance with this guide, and applicable NFPA standards. In addition, the Authority Having Jurisdiction may have additional maintenance, testing, and inspection requirements that must be followed.

A. Sprinklers must be inspected on a regular basis for corrosion, mechanical damage, obstructions, paint, etc. Frequency of inspections may vary due to corrosive atmospheres, water supplies, and activity around the sprinkler unit.

B. Sprinklers or cover plate assemblies that have been field painted, caulked, 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 NFPA 25 and the Authority Having Jurisdiction for the specified period of time after which testing and/or replacement is required. Never attempt to repair or reassemble a sprinkler. Sprinklers and cover assemblies that have operated cannot be reassembled or re-used, but must be replaced. When replacement is necessary, use only new sprinklers and cover assemblies with identical performance characteristics.

C. The sprinkler discharge pattern is critical for proper fire protection. Therefore, nothing should be hung from, attached to, 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.

1. Remove the system from service, drain all water, and relieve all pressure on the piping.

2a. For frame-style sprinklers, use the special sprinkler wrench to remove the old sprinkler by turning it counterclockwise to unthread it from the piping.

2b. For flush and concealed style sprinklers: Remove the ceiling ring or cover plate assembly before unthreading the sprinkler body from the piping. Ceiling rings and cover plates can be removed either by gently unthreading them or pulling them off the sprinkler body (depends on the sprinkler model used). After the ceiling ring or cover plate assembly has been removed from the sprinkler body, place the plastic protective cap (from the spare sprinkler cabinet) over the sprinkler to be removed and then fit the sprinkler wrench over the cap. Then use the wrench to unthread the sprinkler from the piping. *Exception: Domed concealed sprinklers are removed without the plastic cap.*

3. Install the new sprinkler unit by following the instructions in section 4. INSTALLATION. Care must be taken to ensure that the replacement sprinkler is the proper model and style, with the correct K-Factor, temperature rating, and response characteristics. A fully stocked spare sprinkler cabinet should be provided for this purpose. For flush or concealed sprinklers: stock of spare ceiling rings or cover plates should also be available in the spare sprinkler cabinet.

E. Place the system back in service and secure all valves. Check for and repair all leaks. Sprinkler systems that have been subjected to a fire must be returned to service as soon as possible. The entire system must be inspected for damage, and repaired or replaced as necessary. Sprinklers that have been exposed to corrosive products of combustion or high ambient temperatures, but have not operated, should be replaced. Refer to the Authority Having Jurisdiction for minimum replacement requirements.

7. AVAILABILITY

Viking 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.

TECHNICAL DATA — SPRINKLER OVERVIEW

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1. DESCRIPTION

Viking fire sprinklers consist of a threaded frame with a specific waterway or orifice size and a deflector for distributing water in a specified pattern. A closed or sealed sprinkler refers to a complete assembly, including the thermosensitive operating element. An open sprinkler does not use an operating element and is open at all times. The distribution of water is intended to extinguish a fire or to control its spread.

Viking sprinklers are available in several models and styles. Refer to specific sprinkler technical data pages for available styles, finishes, temperature ratings, thread sizes, and nominal K-Factors for the particular model selected.

2. LISTINGS AND APPROVALS

Refer to the Approval Charts on the appropriate sprinkler technical data page(s) and/or approval agency listings.

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

3. TECHNICAL DATA

Pressure Ratings:

Maximum allowable water working pressure is 175 psig (12 Bar) unless rated and specified for high water working pressure [250 psig (17.2 bar)].

Sprinkler Identification:

Viking sprinklers are identified and marked with the word “Viking”, the sprinkler identification number (SIN) consisting of “VK” plus a three digit number*, the model letter, and the year of manufacture.

Available Finishes:

Viking sprinklers are available in several decorative finishes. Some models are available with corrosion-resistant coatings or are fabricated from non-corrosive material. Refer to the sprinkler technical data page for additional information.

Available Temperature Ratings:

Viking sprinklers are available in several temperature ratings that relate to a specific temperature classification. Applicable installation rules mandate the use and limitations of each temperature classification. In selecting the appropriate temperature classification, the maximum expected ceiling temperature must be known. When there is doubt as to the maximum temperature at the sprinkler location, a maximum-reading thermometer should be used to determine the temperature under conditions that would show the highest readings to be expected. In addition, recognized installation rules may require a higher temperature classification, depending upon sprinkler location, occupancy classification, commodity classification, storage height, and other hazards. In all cases, the maximum expected ceiling temperature dictates the lowest allowable temperature classification. Sprinklers located immediately adjacent to a heat source may require a higher temperature rating.

K-Factors:

Viking sprinklers are available in several orifice sizes with related K-Factors. The orifice is a tapered waterway and, therefore, the K-Factor given is nominal. Nominal U.S. K-Factors are provided in accordance with the 1999 edition of NFPA 13, Section 3-2.3. Refer to the specific data page for appropriate K-Factor information.

Available Styles:

Viking sprinklers are available for installation in several positions as indicated by a stamping on the deflector. The deflector style dictates the appropriate installation position of the sprinkler; it breaks the solid stream of water issuing from the sprinkler orifice to form a specific spray pattern. The following list indicates the various styles and identification of Viking sprinklers.

UPRIGHT SPRINKLER: A sprinkler intended to be installed with the deflector above the frame so water flows upward through the orifice, striking the deflector and forming an umbrella-shaped spray pattern downward. Marked “SSU” (Standard Sprinkler Upright) or “UPRIGHT” on the deflector.

PENDENT SPRINKLER: A sprinkler intended to be oriented with the deflector below the frame so water flows downward through the orifice, striking the deflector and forming an umbrella-shaped spray pattern downward. Marked “SSP” (Standard Sprinkler Pendent) or “PENDENT” on the deflector.

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.

CONVENTIONAL SPRINKLER: An “old style” sprinkler intended to be installed with the deflector in either the upright or pendent position. The deflector provides a spherical type pattern with 40 to 60 percent of the water initially directed downward and a proportion directed upward. Must be installed in accordance with installation rules for conventional or old style sprinklers. DO NOT USE AS A REPLACEMENT FOR STANDARD SPRAY SPRINKLERS. Marked “C U/P” (Conventional Upright/Pendent) on the deflector.

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VERTICAL SIDEWALL (VSW) SPRINKLER: A sprinkler intended for installation near the wall and ceiling. The deflector provides a water spray pattern outward in a quarter-spherical pattern and can be installed in the upright or pendent position with the flow arrow in the direction of discharge. Marked “SIDEWALL” on the deflector with an arrow and the word “FLOW”. (Note: Some vertical sidewall sprinklers can only be installed in the upright or pendent position—in this case, the sprinkler will also be marked “UPRIGHT” or “PENDENT”.)

HORIZONTAL SIDEWALL (HSW) SPRINKLER: A sprinkler intended for installation near the wall and ceiling. The special deflector provides a water spray pattern outward in a quarter-spherical pattern. Most of the water is directed away from the nearby wall with a small portion directed at the wall behind the sprinkler. The top of the deflector is oriented parallel with the ceiling or roof. The flow arrows point in the direction of discharge. Marked “SIDEWALL” and “TOP” with an arrow and the word “FLOW”.

EXTENDED COVERAGE (EC) SPRINKLER: A spray sprinkler designed to discharge water over an area having the maximum dimensions indicated in the individual listings. Maximum area of coverage, minimum flow rate, orifice size, and nominal K-Factor are specified in the individual listings. EC sprinklers are intended for Light-Hazard occupancies with smooth, flat, horizontal ceilings unless otherwise specified. In addition to the above markings, the sprinkler is marked “EC”.

QUICK RESPONSE (QR) SPRINKLER: A spray sprinkler with a fast- actuating operating element. The use of quick response sprinklers may be limited due to occupancy and hazard. Refer to the Authority Having Jurisdiction (AHJ) prior to installing.

QUICK RESPONSE EXTENDED COVERAGE (QREC) SPRINKLER: A spray sprinkler designed to discharge water over an area having the maximum dimensions indicated in the individual listing. This is a sprinkler with an operating element that meets the criteria for quick response. QREC sprinklers are only intended for Light Hazard occupancies. The sprinkler is marked “QREC”.

FLUSH SPRINKLER: A decorative spray sprinkler intended for installation with a concealed piping system. The unit is mounted flush with the ceiling or wall, with the fusible link exposed. Upon actuation, the deflector extends beyond the ceiling or wall to distribute water discharge. The sprinkler is marked “SSP”, “PEND”, or “SIDEWALL” and “TOP”.

CONCEALED SPRINKLER: A decorative spray sprinkler intended for installation with a concealed piping system. The sprinkler is hidden from view by a cover plate installed flush with the ceiling or wall. During fire conditions, the cover plate detaches, and upon sprinkler actuation, the deflector extends beyond the ceiling or wall to distribute water discharge. The sprinkler is marked “SSP”, “PEND”, or “SIDEWALL” and “TOP”.

RECESSED SPRINKLER: A spray sprinkler assembly intended for installation with a concealed piping system. The assembly consists of a sprinkler installed in a decorative adjustable recessed escutcheon that minimizes the protrusion of the sprinkler beyond the ceiling or wall without adversely affecting the sprinkler distribution or sensitivity. Refer to the appropriate technical data page for allowable sprinkler models, temperature ratings, and occupancy classifications. DO NOT RECESS ANY SPRINKLER NOT LISTED FOR USE WITH THE ESCUTCHEON.

CORROSION-RESISTANT SPRINKLER: A special service sprinkler with non-corrosive protective coatings, or that is fabricated from non-corrosive material, for use in atmospheres that would normally corrode sprinklers.

DRY SPRINKLER: A special-service sprinkler intended for installation on dry pipe systems or wet pipe systems where the sprinkler is subject to freezing temperatures. The unit consists of a sprinkler permanently secured to an extension nipple with a sealed inlet end to prevent water from entering the nipple until the sprinkler operates. The unit MUST be installed in a tee fitting. Dry upright sprinklers are marked with the “B” dimension [distance from the face of the fitting (tee) to the top of the deflector]. Dry pendent and sidewall sprinklers are marked with the “A” dimension [the distance from the face of fitting (tee) to the finished surface of the ceiling or wall].

LARGE DROP SPRINKLER: A type of special application sprinkler used to provide fire control of specific high-challenge fire hazards. Large drop sprinklers are designed to produce an umbrella-shaped spray pattern downward with a higher percentage of “large” water droplets than standard spray sprinklers. The sprinkler has an extra-large orifice with a nominal K-Factor of 11.2. Marked “HIGH CHALLENGE” and “UPRIGHT”.

EARLY SUPPRESSION FAST-RESPONSE (ESFR) SPRINKLER: A sprinkler intended to provide fire suppression of specific high-challenge fire hazards through the use of a fast response fusible link, 14.0, 16.8, or 25.2 nominal K-Factor, and special deflector. ESFR sprinklers are designed to produce high-momentum water droplets in a hemispherical pattern below the deflector. This permits penetration of the fire plume and direct wetting of the burning fuel surface while cooling the atmosphere early in the development of a high-challenge fire. Marked “ESFR” and “UPRIGHT” or “PEND”.

INTERMEDIATE LEVEL/RACK STORAGE SPRINKLER: A standard spray sprinkler assembly designed to protect its operating element from the spray of sprinklers installed at higher elevations. The assembly consists of a standard or large orifice upright or pendent sprinkler with an integral upright or pendent water shield and guard assembly. Use only those sprinklers that have been tested and listed for use with the assembly. Refer to the technical data page for allowable sprinkler models.

RESIDENTIAL SPRINKLER: A sprinkler intended for use in the following occupancies: one- and two-family dwellings with the fire protection sprinkler system installed in accordance with NFPA 13D; residential occupancies up to four stories in height with the fire protection system installed in accordance with NFPA 13R; and where allowed by the Authority Having Jurisdiction in residential portions of any occupancy with the fire protection system installed in accordance with NFPA 13.

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Residential sprinklers have a unique distribution pattern and utilize a “fast response” heat sensitive operating element. They enhance survivability in the room of fire origin and are designed to provide a life safety environment for a minimum of ten minutes. For this reason, residential sprinklers must not be used to replace standard sprinklers unless tested for and approved by the Authority Having Jurisdiction. In addition to standard markings, the unit is identified as “RESIDENTIAL SPRINKLER” or “RES”.

4. INSTALLATION

Refer to appropriate NFPA Installation Standards.

5. OPERATION

Refer to the appropriate sprinkler technical data page(s).

6. INSPECTIONS, TESTS AND MAINTENANCE

Refer to NFPA 25 for Inspection, Testing and Maintenance requirements.

7. AVAILABILITY

Viking 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.

IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers and the appropriate sprinkler general care, installation, and maintenance guide. 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. The sprinkler technical data page may contain installation requirements specific for the sprinkler model selected. The use of certain types of sprinklers may be limited due to occupancy and hazard. Refer to the Authority Having Jurisdiction prior to installation.

BULLETIN

REGULATORY AND HEALTH WARNINGS

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1. DESCRIPTION

Regulatory and Health Warnings applying to materials used in the manufacture and construction of fire protection products are provided herin as they relate to legally mandated jurisdictional regions.

⚠ WARNING

STATE OF CALIFORNIA, USA

Installing or servicing fire protection products such as sprinklers, valves, piping etc. can expose you to chemicals including, but not limited to, lead, nickel, butadiene, titaninum dioxide, chromium, carbon black, and acrylonitrile which are known to the State of California to cause cancer or birth defects or other reproductive harm.

For more information, go to **www.P65Warnings.ca.gov**

2. WARRANTY TERMS AND CONDITIONS

For details of warranty, refer to Viking's current list price schedule at **www.vikinggroupinc.com** or contact Viking directly.