



TECHNICAL DATA

STANDARD RESPONSE UPRIGHT AND PENDENT SPRINKLERS

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

1. DESCRIPTION

Viking Standard Response Upright and Pendent Sprinklers are small thermosensitive glass bulb spray sprinklers available with various finishes and temperature ratings to meet design requirements. The special Polyester and Teflon® coatings can be used in decorative applications where colors are desired. In addition, these coatings have been investigated for installation in corrosive atmospheres and are cULus listed as corrosion resistant as indicated in the Approval Chart. (Note: FM Global has no approval classification for Teflon® and Polyester coatings as corrosion resistant.)

2. LISTINGS AND APPROVALS

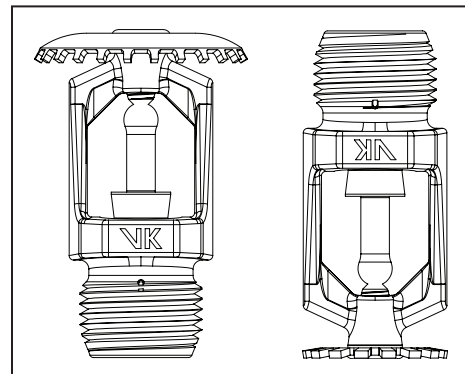


cULus Listed: Category VNIV



FM Approved: Classes 2002, 2015, 2016, and 2017

Refer to Approval Chart 1 and Design Criteria on page 12d for cULus Listing requirements, and refer to Approval Chart 2 and Design Criteria on page 12e for FM Approval requirements that must be followed.



3. TECHNICAL DATA

Specifications:

Available since 2004.

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: Refer to the Approval Chart

Nominal K-Factor: Refer to the Approval Chart

Glass-bulb fluid temperature rated to -65 °F (-55 °C)

Overall Length: 2-3/16" (56 mm)

Material Standards:

Frame Casting: Brass UNS-C84400 or QM Brass

Deflector: Brass UNS-C23000 or Copper UNS-C19500 for Sprinklers 12986, 12990, 12993, and 13001. Phosphor Bronze UNS-C51000 or Copper UNS-C19500 for Sprinklers 12987 and 12989. Brass UNS-C26000 for all other Sprinklers.

Bushing (for Sprinklers 12992, 12994, 13006, and 13007): Brass UNS-C36000

Bulb: Glass, nominal 5 mm diameter

Belleville Spring Sealing Assembly: Nickel Alloy, coated on both sides with Teflon Tape

Screw: Brass UNS-C36000

Pip Cap and Insert Assembly: Copper UNS-C11000 and Stainless Steel UNS-S30400

Pip Cap Attachment (for sprinklers 12987, 12989, 12992, 12994, 13006, and 13007): Brass UNS-C36000

For Teflon® Coated Sprinklers: Belleville Spring-Exposed, Screw-Nickel Plated, Pip Cap-Teflon® Coated

For Polyester Coated Sprinklers: Belleville Spring-Exposed

Ordering Information: (Also refer to the current Viking price list.)

Order Standard Response Upright and Pendent Sprinklers by first adding the appropriate suffix for the sprinkler finish and then the appropriate suffix for the temperature rating to the sprinkler base part number.

Finish Suffix: Brass = A, Chrome-Enloy® = F, White Polyester = M-W, Black Polyester = M-B, and Black Teflon® = N, Wax Coated = C, Wax Over Polyester = V-W

Temperature Suffix: 155 °F (68 °C) = B, 175 °F (79 °C) = D, 200 °F (93 °C) = E, 212 °F (100 °C) = M, 286 °F (141 °C) = G, 360 °F (182 °C) = H, 500 °F (260 °C) = L For example, sprinkler VK102 with a 1/2" thread, Brass finish and a 155 °F (68 °C) temperature rating = Part No. 12987AB

Available Finishes And Temperature Ratings: Refer to Table 1.

Accessories: (Also refer to the "Sprinkler Accessories" section of the Viking data book.)

Sprinkler Wrenches:

A. Standard Wrench: Part No. 10896W/B (available since 2000).

B. Wrench for Recessed Pendent Sprinklers: Part No. 16036W/B** (available since 2011)

C. Optional Protective Sprinkler Cap Remover/Escutcheon Installer Tool† Part No. 15915 (available since 2010.)

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.

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D. Wrench for Wax Coated Sprinklers: Part No. 13577W/B** (available since 2006)

**A 1/2" ratchet is required (not available from Viking).

†Allows use from the floor by attaching a length of 1" diameter CPVC tubing to the tool. Ideal for sprinkler cabinets. Refer to Bulletin F_051808.

Sprinkler Cabinets:

- A. Six-head capacity: Part No. 01724A (available since 1971)
- B. Twelve-head capacity: Part No. 01725A (available since 1971)

4. INSTALLATION

Refer to appropriate NFPA Installation Standards.

5. OPERATION

During fire conditions, 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 sprinkler deflector, forming a uniform spray pattern to extinguish or control the fire.

6. INSPECTIONS, TESTS AND MAINTENANCE

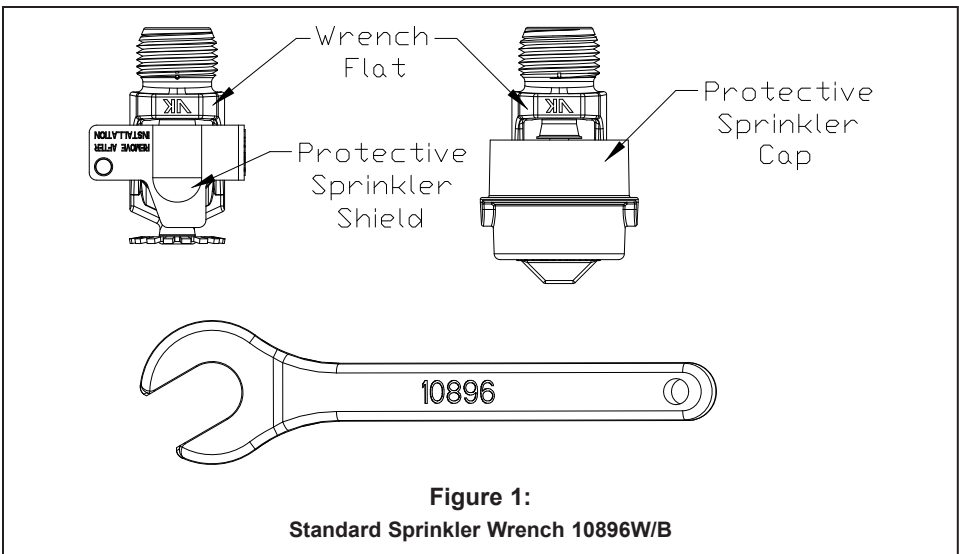
Refer to NFPA 25 for Inspection, Testing and Maintenance requirements.

7. AVAILABILITY

Viking Standard Response Upright and Pendent 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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TABLE 1: AVAILABLE SPRINKLER TEMPERATURE RATINGS AND FINISHES

Sprinkler Temperature Classification	Sprinkler Nominal Temperature Rating ¹	Maximum Ambient Ceiling Temperature ²	Bulb Color
Ordinary	155 °F (68 °C)	100 °F (38 °C)	Red
Intermediate	175 °F (79 °C)	150 °F (65 °C)	Yellow
Intermediate	200 °F (93 °C)	150 °F (65 °C)	Green
Intermediate	212 °F (100 °C)	150 °F (65 °C)	Green
High	286 °F (141 °C)	225 °F (107 °C)	Blue
Extra High	360 °F (182 °C)	300 °F (149 °C)	Mauve
Ultra High ³	500 °F (260 °C)	465 °F (240 °C)	Black

Sprinkler Finishes: Brass, Chrome-Enloy[®], White Polyester, Black Polyester, and Black Teflon[®]

Corrosion-Resistant Coatings⁴: White Polyester, Black Polyester, and Black Teflon[®] in all temperature ratings. Wax-Coated Brass and Wax over Polyester for sprinklers with the following temperature ratings:

155 °F (68 °C) Lt. Brown Wax 175 °F (79 °C) Brown Wax 200 °F (93 °C) Brown Wax 212 °F (100 °C) Brown Wax⁵
 286 °F (141 °C) Dk. Brown Wax⁵

Footnotes

- ¹ The sprinkler temperature rating is stamped on the deflector.
- ² Based on NFPA-13. Other limits may apply, depending on fire loading, sprinkler location, and other requirements of the Authority Having Jurisdiction. Refer to specific installation standards.
- ³ Sprinklers of Ultra-High temperature rating are intended for use inside ovens, dryers, or similar enclosures with normal operating temperatures above 300 °F (149 °C). Where the ambient temperature around the Ultra-High temperature rated sprinkler is significantly reduced below 300 °F (149 °C), response time may be severely retarded.
- ⁴ The corrosion-resistant coatings have passed the standard corrosion test required by the approving agencies indicated on page 12d. 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 coatings indicated are applied to the exposed exterior surfaces only. Note that the spring is exposed on sprinklers with Polyester and Teflon[®] coatings.
- ⁵ Wax melting point is 170 °F (76 °C) for 212 °F (100 °C) and 286 °F (141 °C) temperature rated sprinklers.

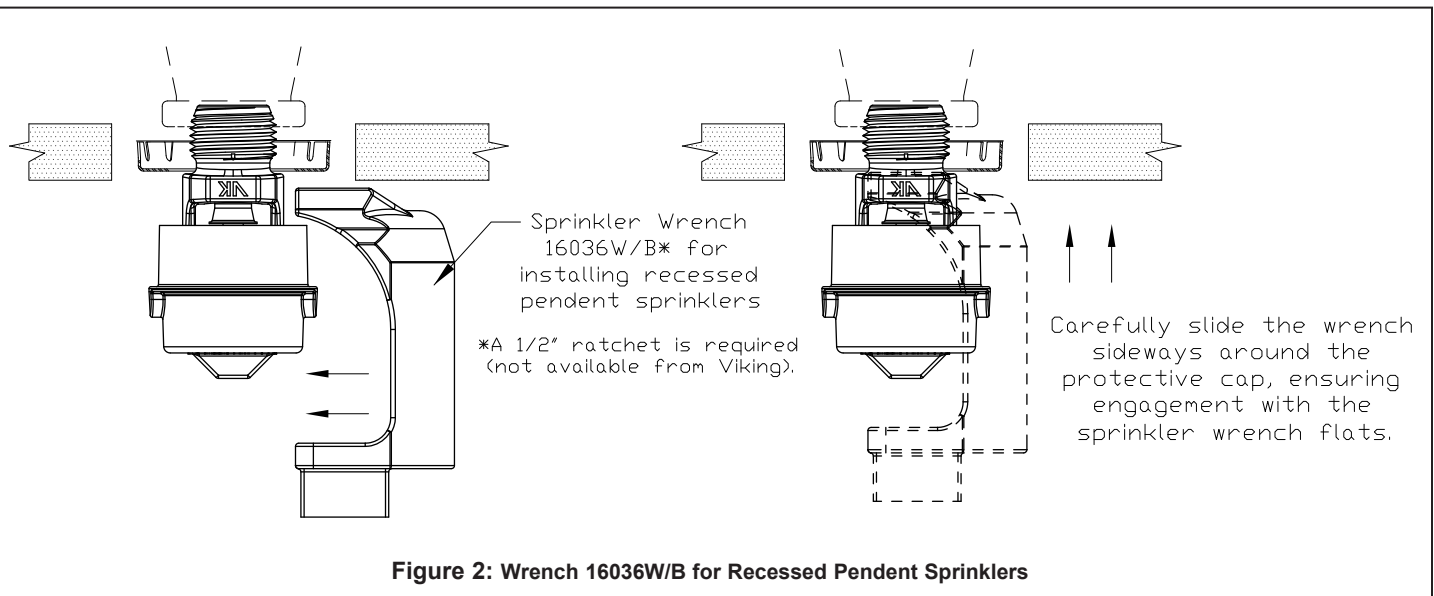


Figure 2: Wrench 16036W/B for Recessed Pendent Sprinklers

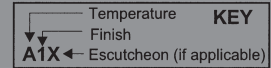


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Approval Chart 1 (UL)
 Standard Response Upright and Pendent Sprinklers
 Maximum 175 PSI (12 Bar) WWP



Base Part Number ¹	SIN	Sprinkler Style	Thread Size		Nominal K-Factor		Overall Length		cULus Listings ^{3,4} (Refer also to Design Criteria below.)
			NPT	BSP	U.S.	metric ²	Inches	mm	
Standard Orifice									
12986	VK100	Upright	1/2"	15 mm	5.6	80.6	2-3/16	56	A1, B3, C4, D2
13001	VK145	Upright	1/2"	15 mm	5.6	80.6	2-3/16	56	--
12990	VK145	Upright	--	15 mm	5.6	80.6	2-3/16	56	--
12993	VK100	Upright	--	15 mm	5.6	80.6	2-3/16	56	A1, B3, C4, D2
12987	VK102	Pendent	1/2"	15 mm	5.6	80.6	2-3/16	56	A1, B3, C4, D2, B1X
12989	VK102	Pendent	--	15 mm	5.6	80.6	2-3/16	56	A1, B3, C4, D2, B1X
Small Orifice⁵									
13006 ⁶	VK001	Upright	1/2"	15 mm	2.8	40.3	2-3/16	56	A1, B3, C4
13007 ⁶	VK001	Upright	--	15 mm	2.8	40.3	2-3/16	56	A1, B3, C4
12994 ⁶	VK003	Pendent	1/2"	15 mm	2.8	40.3	2-3/16	56	A1, B3, C4, B1X
12992 ^{6,7}	VK003	Pendent	--	15 mm	2.8	40.3	2-3/16	56	A1, B3, C4

<p align="center">Approved Temperature Ratings</p> <p>A - 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), 286 °F (141 °C), and 360 °F (182 °C) B - 155 °F (68 °C), 175 °F (79 °C), and 200 °F (93 °C) C - 286 °F (141 °C) D - 500 °F (260 °C)⁸</p>	<p align="center">Approved Finishes</p> <p>1 - Brass, Chrome-Enloy[®], White Polyester^{9,10}, Black Polyester^{9,10}, and Black Teflon⁹ 2 - Brass and Chrome-Enloy[®] 3 - Wax-Coated Brass and Wax Over Polyester⁹ 4 - High Temperature 200 °F (93 °C) Wax Coating (corrosion resistant); maximum ambient temperature allowed at ceiling = 150 °F (65 °C)</p>	<p align="center">Approved Escutcheons</p> <p>X - Installed with standard surface-mounted escutcheons or the Viking Microfast[®] Model F-1 Adjustable Escutcheon, or recessed with the Viking Micromatic[®] Model E-1 or E-2 Recessed Escutcheon.</p>
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Footnotes


¹ Base part number shown. For complete part number, 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 U.S. and Canada.
⁵ Listings are limited to Light-Hazard Occupancies where allowed by the installation standards being applied, with hydraulically calculated wet systems only.
⁶ The sprinkler orifice is bushed.
⁷ Sprinkler 12992 is available on special order.
⁸ Sprinklers of Ultra-High temperature rating are intended for use inside ovens, dryers, or similar enclosures with normal operating temperatures above 300 °F (149 °C). Where the ambient temperature around the Ultra-High temperature rated sprinkler is significantly reduced below 300 °F (149 °C), the response time of the Ultra-High temperature rated sprinkler may be severely retarded.
⁹ cULus Listed as corrosion-resistant.
¹⁰ Other colors are available on request with the same Listings and Approvals as the standard colors.

DESIGN CRITERIA - UL
 (Also refer to Approval Chart 1 above.)

cULus Listing Requirements:
 Standard Upright and Pendent Sprinklers are cULus Listed as indicated in Approval Chart 1 for installation in accordance with the latest edition of NFPA 13 for standard spray sprinklers.

- Designed for use in Light, Ordinary, and Extra Hazard occupancies (exception: small orifice sprinklers are limited to Light Hazard where allowed by the installation standards being applied, with hydraulically calculated wet systems only).
- The sprinkler installation rules contained in NFPA 13 for standard spray upright and pendent sprinklers must be followed.

IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. Also refer to page SR1-3 for general care, installation, and maintenance information. Viking sprinklers are to be installed in accordance with the latest edition of Viking technical data, the appropriate standards of NFPA, LPCB, APSAD, VdS or other similar organizations, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable.

	<h2 style="margin: 0;">TECHNICAL DATA</h2>	<h2 style="margin: 0;">STANDARD RESPONSE UPRIGHT AND PENDENT SPRINKLERS</h2>
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Approval Chart 2 (FM) Standard Response Upright and Pendent Sprinklers Maximum 175 PSI (12 Bar) WWP									
Base Part Number ¹	SIN	Sprinkler Style	Thread Size		Nominal K-Factor		Overall Length		FM Approvals ³ (Refer also to Design Criteria below.)
			NPT	BSP	U.S.	metric ²	Inches	mm	
Standard Orifice									
12986	VK100	Upright	1/2"	15 mm	5.6	80.6	2-3/16	56	A1, C2, E1, F4
13001	VK145	Upright	1/2"	15 mm	5.6	80.6	2-3/16	56	A1, C2, E1
12990	VK145	Upright	--	15 mm	5.6	80.6	2-3/16	56	A1, C2, E1
12993	VK100	Upright	--	15 mm	5.6	80.6	2-3/16	56	A1, C2, E1, F4
12987	VK102	Pendent	1/2"	15 mm	5.6	80.6	2-3/16	56	A1, C5, E1, D1X
12989	VK102	Pendent	--	15 mm	5.6	80.6	2-3/16	56	A1, C5, E1, D3X
Small Orifice⁴									
13006 ⁵	VK001	Upright	1/2"	15 mm	2.8	40.3	2-3/16	56	D3, D5
13007 ⁵	VK001	Upright	--	15 mm	2.8	40.3	2-3/16	56	D3, D5
12994 ⁵	VK003	Pendent	1/2"	15 mm	2.8	40.3	2-3/16	56	D3, C6X
12992 ^{5,6}	VK003	Pendent	--	15 mm	2.8	40.3	2-3/16	56	D3
Approved Temperature Ratings A - 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), 212 °F (100 °C), 286 °F (141 °C), and 360 °F (182 °C) B - 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), 286 °F (141 °C), and 360 °F (182 °C) C - 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), and 212 °F (100 °C) D - 155 °F (68 °C), 175 °F (79 °C), and 200 °F (93 °C) E - 500 °F (260 °C) ⁷ F - 155 °F (68 °C)					Approved Finishes 1 - Brass, Chrome-Enloy [®] , White Polyester [®] , and Black Polyester [®] 2 - White Polyester [®] , Black Polyester [®] , and Wax-Coated Brass (corrosion resistant) 3 - Brass and Chrome-Enloy [®] 4 - Wax-Coated Brass and Wax Over Polyester 5 - Wax-Coated Brass (corrosion resistant) 6 - Brass			Approved Escutcheons X - Installed with standard surface-mounted escutcheons or the Viking Microfast [®] Model F-1 Adjustable Escutcheon, or recessed with the Viking Micromatic [®] Model E-1 or E-2 Recessed Escutcheon	
Footnotes									
¹ Base part number shown. For complete part number, 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 FM Approvals available at the time of printing. Other approvals may be in process. ⁴ FM Approved as standard response Non-Storage upright and pendent sprinklers. For specific application and installation requirements, reference the latest applicable FM Loss Prevention Data Sheets (including Data Sheet 2-0). ⁵ The sprinkler orifice is bushed. ⁶ Sprinkler 12992 is available on special order. ⁷ Sprinklers of Ultra-High temperature rating are intended for use inside ovens, dryers, or similar enclosures with normal operating temperatures above 300 °F (149 °C). Where the ambient temperature around the Ultra-High temperature rated sprinkler is significantly reduced below 300 °F (149 °C), the response time of the Ultra-High temperature rated sprinkler may be severely retarded. ⁸ Other colors are available on request with the same Listings and Approvals as the standard colors.									

DESIGN CRITERIA - FM (Also refer to Approval Chart 2 above.)
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FM Approval Requirements:

The sprinklers indicated in Approval Chart 2 are FM Approved as standard response **Non-Storage** upright and pendent sprinklers as indicated in the FM Approval Guide. For specific application and installation requirements, reference the latest applicable FM Loss Prevention Data Sheets (including Data Sheet 2-0). FM Global Loss Prevention Data Sheets contain guidelines relating to, but not limited to: minimum water supply requirements, hydraulic design, ceiling slope and obstructions, minimum and maximum allowable spacing, and deflector distance below the ceiling.

NOTE: The FM installation guidelines may differ from cULus and/or NFPA criteria.

IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. Also refer to page SR1-3 for general care, installation, and maintenance information. Viking sprinklers are to be installed in accordance with the latest edition of Viking technical data, the appropriate standards of NFPA, FM Global, LPCB, APSAD, VdS or other similar organizations, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable.



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