TECHNICAL DATA

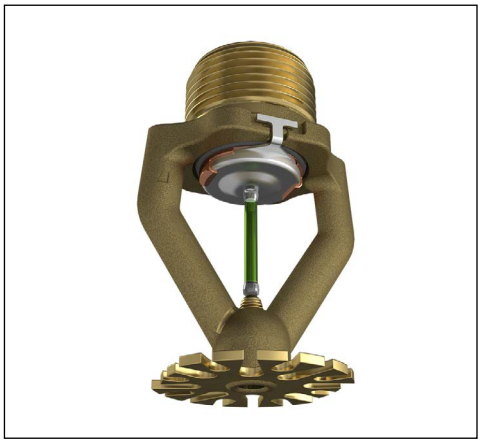
SPECIFIC APPLICATION ESFR PENDENT SPRINKLER VK5141 (K28.0)

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 Early Suppression Fast Response (ESFR) Pendent Sprinkler VK5141 is a fast response glass bulb type sprinkler designed for use in storage areas prone to high-challenge fires. With a 28.0 (404 metric) nominal K-Factor and special deflector, this sprinkler produces large, high-momentum water droplets in a hemispheric 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.

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



2. LISTINGS AND APPROVALS

UL Listed: Category VNWH (Listed as a Specific Application ESFR Sprinkler)

3. TECHNICAL DATA

Specifications:

Available since 2024
Maximum Working Pressure: 175 psi (12 bar).
Factory tested pneumatically to 95 psi (6.55 bar)
Thread size: 1” NPT or 25 mm BSPT
Nominal K-Factor: 28.0 U.S. (404 metric*)
* Metric K-factor measurement shown is in bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.
Overall Length: 3-1/4” (83 mm)
Deflector Diameter: 1-3/4” (45 mm)
Glass-bulb fluid temperature rated to -65 °F (-55 °C)

Material Standards:

Frame: Brass CW602N
Deflector: Phosphor Bronze UNS-C51000
Pip cap and Insert assembly: Copper UNS-C11000, Stainless Steel UNS-S30400 and UNS-S31600
Belleville Spring Sealing Assembly: Nickel Beryllium, coated on both sides with PTFE Tape
Compression Screw: Brass, UNS-C36000
Bulb: Glass, Nominal 3mm diameter

TABLE 1
SPRINKLER GENERAL INFORMATION

Item	Description
Sprinkler Identification Number (SIN)	VK5141
K-factor, gpm/psi½ (lpm/bar½)	28.0 (404)
Thread Size	1” NPT 25 mm BSPT
Sprinkler Orientation	Pendent
Maximum Working Pressure PSI (bar)	175 psi (12 bar)

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

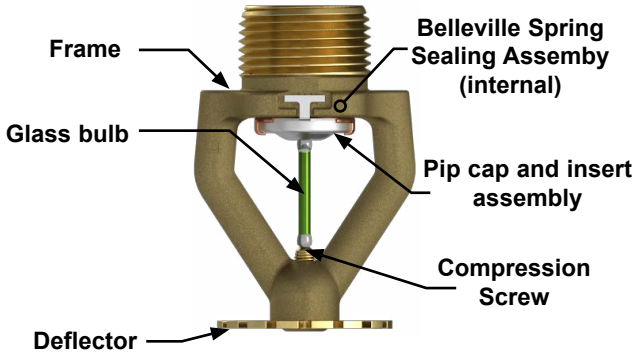


Figure 1: Sprinkler Components

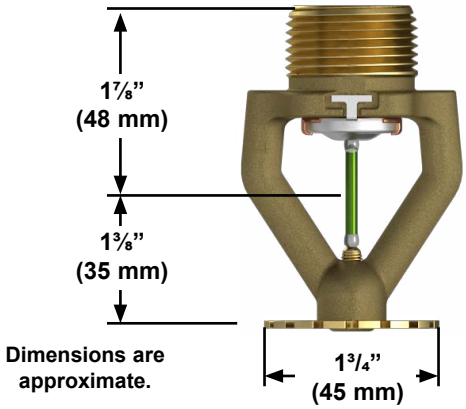


Figure 2: Sprinkler Dimensions

Replaces Form No. F_080622 Rev 05
(Switched 26519 wrench side to “B” in Accessories section and Fig 4.)

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Ordering Instructions

1. Choose a sprinkler base part number with the required thread size and listing or approval (refer to the approval chart).
2. Add the suffix for the desired finish.
3. Add the suffix for the desired temperature rating.

EXAMPLE: 25247AB = VK5141 with brass finish and 155 °F (68 °C) nominal temperature rating. This sprinkler is to be installed into an area with a maximum ambient temperature of 100 °F (38 °C).

NOTE: *The "TQ" suffix for the part numbers below indicates a special protective cap (Figure 3) intended for use with InstaSeal® fittings. When ordering sprinklers with TQ suffixes in combination with InstaSeal® fittings, refer to Form No. F_021223 for installation instructions.*

1. Sprinkler Base Part Number	
Part Number	**Thread Size**
25247XX-TQ*	1" NPT
25248XX-TQ*	25 mm BSPT

2. Finish	
Description	**Suffix**
Brass	A

3. Temperature Ratings			
Temperature Rating	**Bulb Color**	**Maximum Ambient Ceiling Temperature**	**Suffix**
155 °F (68 °C)	Red	100 °F (38 °C)	B
200 °F (93 °C)	Green	150 °F (66 °C)	E

*** Where "XX" is shown in the base part number, enter the desired suffixes for Finish and Temperature Rating (EXAMPLE: 25247AE-TQ)**

Accessories
Sprinkler wrench: 13635W/B (Use side B)
Sprinkler wrench: 26519M/B (Use Side B)
Sprinkler cabinet: 01731A (holds up to 6 sprinklers)

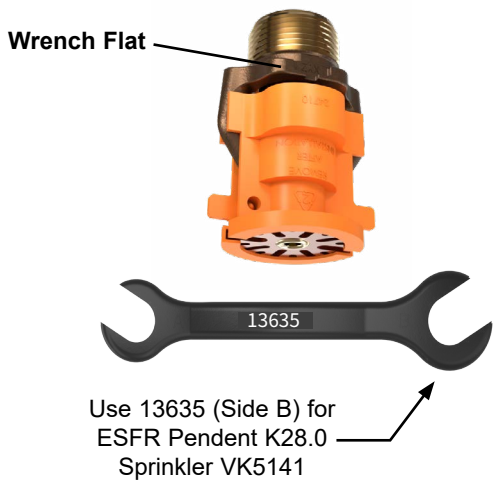

Figure 3:
Protective Caps and ESFR Pendent Sprinkler Wrench

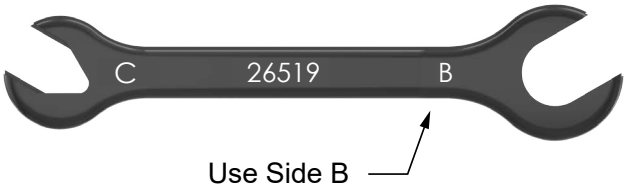

Figure 4:
ESFR Sprinkler Wrench 26519M/B

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4. INSTALLATION

⚠ WARNINGS

Viking sprinklers are manufactured and tested to meet rigid requirements of the approving agencies. The sprinklers are designed to be installed in accordance with recognized installation standards.

System design must be based on ESFR design guidelines described in the latest edition of NFPA Standards, the Authorities Having Jurisdiction, and also with the provisions of governmental codes, ordinances, and standards whenever applicable. 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.

Installation by insufficiently qualified personnel poses the risk of fatal consequences.

- **This sprinkler must be installed properly by qualified personnel familiar with safe practices and applicable and recognized design and installation standards issued, for example, by NFPA, FM, VdS, or LPCB, and trained how to properly perform the installation procedures.**

A damaged or compromised sprinkler poses the risk of fatal consequences. Damaged or compromised sprinklers will not operate properly which could lead to loss of life.

- **NEVER use a sprinkler that has been exposed to temperatures exceeding the maximum allowed ambient temperature.**
- **NEVER use a sprinkler with a loss of liquid from the glass bulb or damage to the fusible element. A small bubble should be visible within the glass bulb; rotate the sprinkler to a horizontal position while observing the bulb to see the bubble.**
- **NEVER use a sprinkler that has been dropped or damaged.**
- **ALWAYS protect the sprinkler from mechanical damage during storage, transport, and handling.**
- **NEVER use sprinklers that have been painted by anyone other than the manufacturer.**
- **ALWAYS protect sprinklers from being painted during installation or replacement in accordance with the installation standards.**
- **NEVER clean sprinklers with anything other than 7 psi or lower compressed air.**
- **NEVER apply soap, water, ammonia, adhesives, solvents or any other fluids on sprinklers.**
- **Destroy every damaged or compromised sprinkler.**
- **ALWAYS provide adequate heat to wet pipe systems.**

NOTES:

- **If the sprinkler will be installed into an InstaSeal® IS-W2 fitting, refer to Form No. F_021223.**
- **Use ONLY the designated sprinkler wrench. DO NOT use any other type of wrench; doing so may damage the sprinkler.**
- **Install the sprinklers AFTER the piping is installed. Installing sprinklers on loose pipe can lead to damage.**
- **The sprinkler is designed to be installed while the protective cap is in place.**
- **DO NOT use the sprinkler deflector or glass bulb to start or thread the sprinkler into a fitting.**

1. Apply a small amount of pipe-joint compound or tape to the male threads only, while taking care not to allow a build-up of compound in the sprinkler orifice.

   NOTICE: Over-tightening the sprinkler can cause permanent damage. Tighten the sprinkler to a MAXIMUM torque of 30 ft-lbs. (40.7 N-m).
2. Install the sprinkler onto the piping by applying the sprinkler wrench (side B only) to the sprinkler wrench flats only, while taking care not to damage the sprinkler operating parts.

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After Sprinkler Installation

1. After installation, the entire sprinkler system must be tested. The test must be conducted to comply with the Installation Standards. Make sure the sprinkler 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 is damaged, the sealing compound or tape is washed out of the joint. Immediately replace any damaged units, using the special sprinkler wrench only.
2. **After installation and testing and repairing of all leaks, remove the protective caps from the sprinklers.**
   ***NOTICE:* When removing caps, use care to prevent dislodging or damaging the sprinkler's glass bulb.**
   - Do NOT use any type of tool to remove the cap.
   - Remove the cap by hand.

5. THE CAPS MUST BE REMOVED FROM SPRINKLERS BEFORE PLACING THE SYSTEM IN SERVICE.

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

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 the NFPA standard that describes care and maintenance of sprinkler systems. In addition, the Authorities Having Jurisdiction may have additional maintenance, testing, and inspection 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 atmosphere, 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. For Viking ESFR Pendent Sprinklers, refer to the Installation Standards (e.g., NFPA 25) and the Authorities 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. 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.
   2. Using the special sprinkler wrench, remove the old sprinkler and install the new sprinkler. Care must be taken to ensure that the replacement sprinkler is the proper model and style, with the correct orifice size, temperature rating, and response characteristics. A fully stocked spare sprinkler cabinet should be provided for this purpose.
   3. Place the system back in service and secure all valves. Check the replaced sprinklers and repair all leaks.
E. Sprinkler systems that have been subject 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, but have not operated, should be replaced. Refer to the Authorities Having Jurisdiction for minimum replacement requirements.

7. AVAILABILITY

The Viking Model VK5141 Sprinkler is available through a network of domestic and international distributors. See The Viking Corporation web site for the closest distributor or contact The Viking Corporation.

8. GUARANTEE

For details of warranty, refer to Viking's current list price schedule or contact Viking directly.

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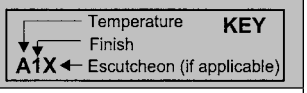
Approval Chart - UL

ESFR Pendent Sprinkler VK5141
Maximum 175 PSI (12 bar) WWP



Base Part Number[1]	SIN	Thread Size	Nominal K-Factor		Overall Length		Listings[3,4] (Refer also to Design Criteria.)
			U.S.	metric[2]	Inches	mm	UL[5]
25247	VK5141	1” NPT	28.0	404	3-3/16	81	A1
25248	VK5141	25 mm BSPT	28.0	404	3-3/16	81	A1

Approved Temperature Ratings	Approved Finish
A - 155 °F (68 °C) and 200 °F (93 °C)	1 - Brass

Footnotes

1. Base part number shown. For complete part number, refer to the price list.
2. Metric K-Factor measurement shown is when pressure is measured in bar. When pressure is measured in kPa, divide the metric K-Factor shown by 10.0.
3. This chart shows listings and approvals available at the time of printing. Other approvals may be in process.
4. Refer to the latest standards of NFPA 13.
5. Listed by Underwriters Laboratories Inc. for use in the U.S. as an ESFR Sprinkler.

TABLE 3:
COMMODITY SELECTION AND DESIGN CRITERIA OVERVIEW FOR MODEL VK5141 ESFR PENDENT SPRINKLERS

Storage Type	NFPA
Sprinkler Type	ESFR
Response Type	ESFR
System Type	Wet Pipe system only
Temperature Rating(s) ºF (ºC)	155 ºF (68 ºC) and 200 ºF (93 ºC)
Open Frame Single, Double, or Portable Rack Storage of Class I-IV and Group A or B Plastics	Refer to NFPA 13.
Solid Pile or Palletized Storage of Class I-IV and Group A or B Plastics	Refer to NFPA 13.

IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. Viking ESFR Pendent Sprinklers are to be installed in accordance with the latest edition of Viking technical data, the latest standards of NFPA, VdS, LPCB, and any other Authorities Having Jurisdiction, and also with provisions of governmental codes, ordinances, and standards whenever applicable.

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TABLE 4:
COMMODITY SELECTION AND DESIGN CRITERIA OVERVIEW FOR MODEL VK5141
SPECIFIC APPLICATION LISTING - UL

Description	For all building heights
Sprinkler Type	ESFR
Temperature Rating	155 ºF (68 ºC) and 200 ºF (93 ºC)
Response Type	ESFR
Sprinkler Position	Pendent, frame arms aligned with pipe, deflectors parallel with ceiling or roof
System Type	Wet Pipe System only
Maximum Area of Coverage*	100 ft^2 (9,3 m^2)
Minimum Area of Coverage	64 ft^2 (5,9 m^2)
Maximum Ceiling Slope	Refer to NFPA 13.
Maximum Spacing	10 ft. spacing (3,0 m)
Minimum Spacing	8 ft. spacing (2,4 m)
Deflector Distance from Walls	Minimum of 4 in. (102 mm) from walls but no more than 1/2 the allowable distance permitted between sprinklers
Deflector to Top of Storage	Minimum of 36 in. (914 mm)
Deflector to Ceiling Distance	For all building heights 6–14 in. (152–356 mm)
Maximum Ceiling Height	48 ft. (14,6 m)
Maximum Storage Height	43 ft. (13,1 m)
Storage Arrangement**	Single- and double-row rack storage (no open top containers or solid shelves) and palletized and solid pile storage (no open top containers or solid shelves).
Commodity	Class I-IV commodities encapsulated or nonencapsulated and cartoned, nonexpanded Group A plastics.
Sprinkler System Design	NFPA 13 for ESFR Sprinklers based upon 35 psi (2,4 bar) design pressure 166 gpm (628,4 lpm) with 12 sprinkler remote area (4x3)
Obstruction Critera	Refer to NFPA 13
Minimum Aisle Width	5 ft. (1.52 m)
Hose Stream Allowance and Water Supply Duration	250 gpm (946 lpm) for 60 minutes

* The maximum coverage area must not exceed 100 ft^2 (9,29 m^2).
**Does not include the protection of multiple-row racks.