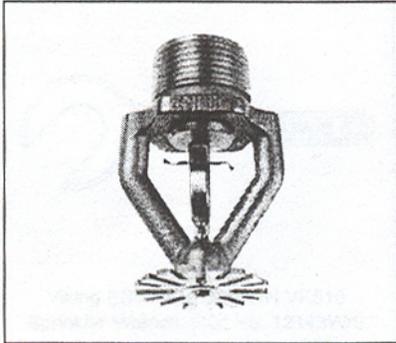




# TECHNICAL DATA

## ESFR PENDENT SPRINKLER SIN VK510 (K25.2)



### 1. PRODUCT NAME

Viking ESFR Pendent K25.2 Sprinkler  
SIN VK510

- Available since 2003.

### 2. MANUFACTURER

The Viking Corporation  
210 N. Industrial Park Road  
Hastings, Michigan 49058 USA  
Telephone: (269) 945-9501  
(877) 384-5464  
Fax: (269) 945-9599  
e-mail: techsvcs@vikingcorp.com

### 3. PRODUCT DESCRIPTION

Viking's ESFR Pendent K25.2 Sprinkler SIN VK510 is an extension of prior ESFR technology. The addition of a larger K-Factor allows ESFR performance at lower end-head pressures than ESFR K14 sprinklers. K25.2 ESFR sprinklers can:

- Eliminate the use of in-rack sprinklers when protecting high-piled storage of certain specified materials up to 40 ft. (12,2 m) with ceilings up to 45 ft. (13,7 m)\*
  - Reduce or eliminate the need for a system fire pump.
  - Provide flexibility when sizing system piping.
  - Provide a maximum deflector-to-ceiling distance of 18 inches (457 mm)\*\*.
- Sprinkler SIN VK510 may be used in the protection of ordinary types of storage. However, this sprinkler is primarily intended to protect the following types of storage, which tend to produce severe-challenge fires: palletized and solid pile storage and single, double, multiple row, and portable rack storage (no open-top

containers or solid shelves).

ESFR Sprinkler VK510 provides protection of most common storage materials, including:

- Encapsulated or unencapsulated Class I, II, III, and IV commodities\*.
- cULus Listed for protection of cartoned unexpanded plastic commodities and FM Approved for protection of cartoned and uncartoned unexpanded plastic commodities\*.
- FM Approved for protection of exposed expanded polystyrene and exposed expanded polyurethane commodities\*.

In addition, some storage arrangements of rolled paper, flammable liquids, aerosols, and rubber tires may be protected by sprinkler SIN VK510.

**\* REFER TO THE LATEST APPLICABLE FM LOSS PREVENTION DATA SHEETS, THE LATEST STANDARDS OF VdS, AND THE NATIONAL FIRE PROTECTION ASSOCIATION, AND THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.**

#### ESFR COLD STORAGE SYSTEM

Viking ESFR Sprinkler VK510 is also UL Listed for use with a maximum 50% by volume factory premix propylene glycol and water antifreeze solution. This Listing is based on full-scale fire testing at Underwriter's Laboratories. The following limitations of system design and application shall apply:

**Storage Arrangements:** Solid-piled, or open rack (single, double, multiple, or portable), palletized storage (pallets limited to wood), with no open-top containers or solid shelves.

**Commodity Classification:** Limited to Class II or less.

**Maximum Storage/Ceiling Heights and minimum pressure requirements:**

- Storage height up to 35 ft. (10,7 m) with ceiling height up to 40 ft. (12,2 m) with a minimum system design pressure of 40 PSI (278 kPa).

#### OR:

- Storage height up to 40 ft. (12,2 m) with ceiling height up to 45 ft-3 in. (13,8 m) with a minimum system design pressure of 60 PSI (414 kPa).

**Maximum System Volume of the Antifreeze Water Solution:** Limited to 1,100 gallons (4 163 liters).

**Minimum Temperature:** -21 °F (-29.4 °C).

**Maximum Percentage by Volume of Propylene Glycol:** 50% mixed with water for antifreeze solution.

- Where the minimum temperature in the area being protected is 8 °F (-13.3 °C) or above, 35% percent by volume of propylene glycol factory premixed with water must be used. Viking requires Firefighter Eliminator C premix 35% propylene glycol/water mixture with a freeze temperature rating (freeze point) of 2.4 °F (-16.4 °C).
- OR:**

- Where the minimum temperature in the area being protected is between 8 °F (-13.3 °C) and -21 °F (-29.4 °C), the percentage by volume of propylene glycol must be 50%, factory premixed with water for antifreeze solution. Viking requires Firefighter Eliminator F type 50% propylene glycol/water mixture, with a freeze temperature rating (freeze point) of -26 °F (-32.2 °C).

Refer to data page 45 a-i "Viking ESFR Cold Storage System" in the Freezer Storage section of the Viking data book.

### 4. TECHNICAL INFORMATION

**LISTINGS AND APPROVALS** (also see the Approval Chart)

- FM Approved and VdS Approved
- cULus Listed as a Specific Application ESFR Sprinkler

#### \*\*Sprinkler Position Requirements:

- **According to FM Global:** Install with the centerline of the thermal sensing element between 4" and 13" (102 and

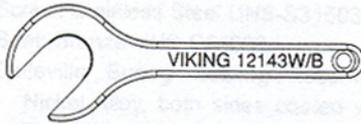
Note: Units of measure in parentheses may be approximations.  
Form No. F\_100102

Replaces page 124 a-c, dated June 10, 2005 (revised deflector-to-ceiling distance requirement).

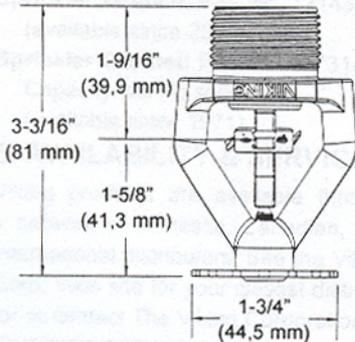


# TECHNICAL DATA

## ESFR PENDENT SPRINKLER SIN VK510 (K25.2)



Viking ESFR Pendent SIN VK510  
Sprinkler Wrench: Part No. 12143W/B  
**Figure 1**



(Dimensions are approximate.)  
ESFR Pendent Sprinkler SIN VK510  
**Figure 2**

- 330 mm) below the ceiling. Position the deflector between 5" (127 mm) and 18" (457 mm) below the ceiling.
  - **cULus Listing Requirement for Buildings up to 40 ft. (12,2 m) High:** Install with the deflector between 6" and 18" (152 and 457 mm) below the ceiling.
  - **cULus Listing Requirement for Buildings Between 40 ft. (12,2 m) and 45 ft. (13,7 m) High:** Install with the deflector between 6" and 14" (152 and 356 mm) below the ceiling.
- Rated to 175 psi (1 207 kPa) water working pressure.  
Factory tested hydrostatically to 500 psi (3 447 kPa).

Covered by one or more of the following patents: US6,502,643; US6,868,917; AU722593; GB2336777

Sprinkler Temperature Classification	Sprinkler Nominal Temperature Rating <sup>1</sup>	Max. Ambient Ceiling Temperature <sup>2</sup>	Frame Paint Color
Ordinary	165 °F (74 °C)	100 °F (38 °C)	None
Intermediate <sup>8</sup>	205 °F (96 °C)	150 °F (65 °C)	White

**Approval Chart**  
Viking ESFR Pendent Sprinkler SIN VK510  
Maximum 175 PSI WWP

Temperature	KEY
Finish	
A1X ← Escutcheon (if applicable)	

Pendent Deflector	Thread Size	Sprinkler Part No. <sup>3</sup>	Nominal K-Factor		Listings and Approvals <sup>5,6</sup>				
			U.S.	metric <sup>4</sup>	FM	VdS	cULus <sup>7</sup>	NYC	LPCB
Fast Response Fusible Element	1 inch NPT	12080	25.2	36,3	Yes	Yes	Yes	--	--
	25 mm BSP	12200	25.2	36,3	Yes	Yes	Yes	--	--

Approved Sprinkler Temperature Ratings		Approved Finish
A - 165 °F (74 °C)	B - 205 °F (96 °C) <sup>8</sup>	1 - Brass

- Footnotes**
- <sup>1</sup> The temperature rating is stamped on the deflector.
  - <sup>2</sup> 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.
  - <sup>3</sup> Base part number shown. For complete part number, refer to the price list.
  - <sup>4</sup> Metric K-Factor shown is for use when pressure is measured in kPa. When pressure is measured in BAR, multiply the metric K-Factor shown by 10.0.
  - <sup>5</sup> This chart shows listings and approvals available at the time of printing. Other approvals may be in process.
  - <sup>6</sup> Refer to the latest standards of NFPA 13, applicable FM Global Loss Prevention Data Sheets, and the latest VdS standards.
  - <sup>7</sup> cULus Listed as a Specific Application ESFR Sprinkler (refer to the deflector position requirements below).
  - <sup>8</sup> For the antifreeze application, intermediate temperature rated sprinklers are intended for installation in close proximity to heat sources only, as referenced in NFPA 13.

### Installation Guidelines (also applies for the ESFR Cold Storage System)

**NOTE: Sprinkler SIN VK510 is contained in a plastic cap for protection during shipping and installation. Remove the cap from the sprinkler AFTER installation.**

**Maximum Roof or Ceiling Slope:** 2 in 12 (167 mm/m or 9.5 degrees).  
**Note:** If the ceiling is beam and girder or panel construction, locate sprinklers in the bays rather than under the beams.

- Sprinkler Position:** Approved for use only in the pendent position in wet systems:
- **According to FM Global:** Install K25.2 ESFR sprinklers with the center line of the thermal sensing element between 4" and 13" (102 and 330 mm) below the ceiling. Position the deflector between 5" (127 mm) and 18" (457 mm) below the ceiling.
  - **cULus Listing Requirement for Buildings up to 40 ft. (12,2 m) High:** Install with the deflector between 6" and 18" (152 and 457 mm) below the ceiling.
  - **cULus Listing Requirement for Buildings Between 40 ft. (12,2 m) and 45 ft. (13,7 m) High:** Install with the deflector between 6" and 14" (152 and 356 mm) below the ceiling.
- Align the deflector parallel with the ceiling or roof.

**Deflector Distance from Walls:** At least 4" (102 mm) from walls, and no more than one-half the allowable distance permitted between sprinklers.

**Clearance from Deflector to Top of Storage:** At least 36" (914 mm).

**Distance Between Sprinklers:** The maximum area of coverage allowed per sprinkler is 100 ft<sup>2</sup> (9,3 m<sup>2</sup>)\*\*. The minimum area of coverage allowed per sprinkler is 64 ft<sup>2</sup> (5,8 m<sup>2</sup>) per FM Global Loss Prevention Data Sheet 2-2, and 80 ft<sup>2</sup> (7,4 m<sup>2</sup>) per NFPA 13.

- For buildings over 30 ft (9,1 m) high, spacing between sprinklers and/or branch lines must be from 8 to 10 ft (2,4 to 3,1 m)\*\*.
- For building heights up to 30 ft (9,1 m), the spacing allowed between sprinklers and/or branch lines is 8 to 12 ft (2,4 to 3,7 m), provided the area covered per sprinkler does not exceed the maximum 100 ft<sup>2</sup> (9,3 m<sup>2</sup>) allowed\*\*.

\*\*Refer to the Installation Standards for permissible deviations from the maximum sprinkler spacing rules above, to eliminate obstructions created by trusses and bar joists when using ESFR sprinklers.

**WARNING:** Viking ESFR Pendent Sprinklers are to be installed in accordance with current Viking technical data, the latest applicable Factory Mutual Loss Prevention Data Sheets, including 2-2 and 8-9, the latest standards of Verband der Sachversicherer, the National Fire Protection Association, and any other Authorities Having Jurisdiction, and also with provisions of governmental codes, ordinances, and standards whenever applicable.



## TECHNICAL DATA

### ESFR PENDENT SPRINKLER SIN VK510 (K25.2)

#### SPRINKLER MATERIALS

Frame: Brass Casting UNS-C84400  
 Deflector: Bronze UNS-C51000  
 Screw: Stainless Steel UNS-S31603  
 Seat: Bronze UNS-C51000  
 Belleville Spring Sealing Assembly:  
 Nickel Alloy, both sides coated with  
 Teflon Tape  
 Fusible Element Assembly: Beryllium  
 Nickel, coated with black acrylic  
 paint.  
 Trigger and Support: Stainless Steel  
 UNS-S31600

**AVAILABLE FINISH:** Brass

#### ACCESSORIES:

**Sprinkler Wrench:** Part No. 12143W/B  
 (available since 2003)

**Sprinkler Cabinet:** Part No. 01731A  
 Capacity: six (6) sprinklers  
 (available since 1971)

#### 5. AVAILABILITY & SERVICE

Viking products are available through a network of domestic, Canadian, and international distributors. See the Viking Corp. Web site for your closest distributor or contact The Viking Corporation.

Viking technical data may be found on The Viking Corporation's Web site at <http://www.vikingcorp.com>. The web site may include a more recent edition of this technical data page.

#### 6. GUARANTEES

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

#### 7. DESIGN & INSTALLATION

**WARNING:** Viking sprinklers are manufactured and tested to meet rigid requirements of the approving agency. 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 Viking technical data, applicable FM Global Loss Prevention Data Sheets, the latest NFPA Standards, the latest standards of Verband der Sachversicherer, and the Authorities Having Jurisdiction. 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.

A. 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 or damaged in any way or exposed to temperatures in excess of the maximum ambient temperature allowed. Such sprinklers should be destroyed immediately. NOTE: Wet-pipe systems must be provided with adequate heat.

B. The sprinklers must be installed after the piping is in place at the ceiling 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.

C. With the sprinkler contained in the orange plastic protective cap, 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.

D. With the sprinkler contained in the protective cap, install the sprinkler onto the piping by applying the special sprinkler wrench to the sprinkler wrench flats only, while taking care not to damage the sprinkler operating parts. DO NOT use any other type of wrench, as this could damage the unit. DO NOT use the sprinkler deflector or fusible element to start or thread the sprinkler into a fitting. DO NOT exceed 50 ft. lbs. of torque (hand tight, plus approximately two full turns with the wrench) to install these sprinklers. Higher levels of torque may distort the sprinkler inlet with consequent leakage or impairment of the sprinkler.

E. 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. Immediately replace any damaged units using the special sprinkler wrench.

**F. After installation and testing and repairing of all leaks, remove the protective caps from the sprinklers. THE CAPS MUST BE REMOVED FROM SPRINKLERS BEFORE PLACING THE SYSTEM IN SERVICE! Remove the cap by hand: turn it slightly and pull it off the sprinkler.**

#### 8. 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 this document and the NFPA standard that describes care and maintenance of sprinkler systems. The Authority 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. Refer to the installation standards (e.g., NFPA 25) and the Authorities Having Jurisdiction for the specified period of time after which sprinkler 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 of the proper model and style, orifice size, temperature rating, and response characteristics. A



## TECHNICAL DATA

### ESFR PENDENT SPRINKLER SIN VK510 (K25.2)

fully stocked spare sprinkler cabinet should be provided for this purpose, as required by NFPA 13.

- C. The sprinkler discharge pattern is critical for proper fire protection. 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 AHJs.

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 designated sprinkler installation wrench, remove the old sprinkler and install the new unit.
  3. Place the system back in service and secure all valves. Check the replaced sprinklers, repairing 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 Authority Having Jurisdiction for minimum replacement requirements.