TECHNICAL DATA

ESFR UPRIGHT SPRINKLER SIN VK520 (K = 14.0)

ESFR Upright Sprinkler SIN VK520
(Shown with the ordinary temperature rated element.)

1. PRODUCT NAME

Viking Early Suppression Fast Response Upright Sprinkler SIN VK520† (K=14.0)

- Sprinkler Base Part Number 10625
- U.S. Patent No. 6,585,054

Available since 2000.

† The Sprinkler Identification Number (SIN) is stamped on the sprinkler deflector.

2. MANUFACTURER

THE VIKING CORPORATION
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Hastings, Michigan 49058 USA
Telephone: (269) 945-9501
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3. PRODUCT DESCRIPTION

Viking Early Suppression Fast Response (ESFR) Upright Sprinkler SIN VK520 is a fast response fusible element type sprinkler designed for early fire suppression.

With a 14.0 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.

ESFR Upright Sprinkler SIN VK520 may be used in the protection of ordinary types of storage. However, it is primarily intended to protect types of storage that tend to produce severe challenge fires: palletized and solid pile storage and single, double, multiple row, and portable open rack storage (no open-top containers or solid shelves).

Viking ESFR Upright SIN VK520 Sprinklers provide protection of most common storage materials up to 30 ft (9,1 m) high in buildings up to 35 ft (10,7 m) high, including:

- Encapsulated or unencapsulated Class I, II, III, and IV commodities*.
- Cartoned unexpanded plastics*.
- Cartoned expanded plastics*.

In addition, some storage arrangements of rolled paper and rubber tire storage may be protected by Viking ESFR Upright Sprinkler SIN VK520*.

*** REFER TO THE LATEST APPLICABLE FM LOSS PREVENTION DATA SHEETS, INCLUDING 2-2 AND 8-9, AND THE LATEST NFPA STANDARDS.**

4. TECHNICAL INFORMATION

Viking ESFR Upright Sprinkler SIN VK520 has special FM Approval for use with the following types of obstructed construction:

May be installed above continuous, ungrouped obstructions up to and including 4" (100 mm) wide.

Definition of "UNGROUPED": For pipes, conduits, or groups of pipes and conduit to be considered individual or ungrouped, they must be separated from the closest adjacent pipe, conduit, cable tray, etc., by a minimum of 6 times the width of the obstruction. For example, a 1" (25 mm) diameter conduit would need to be a minimum of 6" (150 mm) from the nearest pipe or conduit to be considered individual or ungrouped. A cable tray 4" (100 mm) wide would need to be a minimum of 24" (600 mm) from the nearest pipe, conduit, cable tray, etc., to be considered individual or ungrouped.

NOTE: No sprig required for sprinkler pipe sizes up to and including 3" (76,2 mm) nominal I.D.

APPROVAL: FM Approved and accepted for use, City of New York Department of Buildings—refer to the chart on page 121 b.

Rated to 175 psi (1 207 kPa) water working pressure.

Factory tested hydrostatically to 500 psi (3 447 kPa).

K-Factor: Nominal 14.0 U.S. (20,2 metric, for use when pressure is measured in kPa).

Thread Size: 3/4" (20 mm) NPT

Deflector Diameter: 2-7/8" (73,0 mm)

Overall Length: 3-3/8" (85,7 mm)

SPRINKLER MATERIALS

Frame: Brass Casting UNS-C84400

Seat (pip cap) and Insert Assembly: Copper UNS-C11000 and Stainless Steel UNS-S30400

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

Screw: Stainless Steel UNS-S31603

Deflector: Copper UNS-C19500 or UNS-C51000

Lock-Nut: Brass UNS-C36000

Trigger and Support: Stainless Steel UNS-S31600

Fusible Element Assembly: Beryllium Nickel, coated with black acrylic paint

Ejector Spring (for the ordinary temperature rated sprinkler only): 17-7 Stainless Steel

AVAILABLE FINISH: Brass

ACCESSORIES

Sprinkler Wrench Part No. 05118CW/B
- Available since 1981.

Sprinkler Cabinet Part No. 03985A
- Capacity: six (6) sprinklers
- Length: 12-5/8" (321 mm)
- Height: 9-1/8" (232 mm)
- Depth: 4-1/8" (105 mm)
- Finish: High Gloss Red Enamel
- Available since 1977.

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.

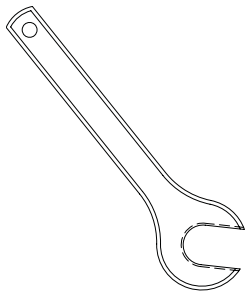
Note: Units of measure in parentheses may be approximations.

Form No. F_060298

Replaces page 121 a-d, dated May 28, 2004 (updated design requirements and re-formatted the page).

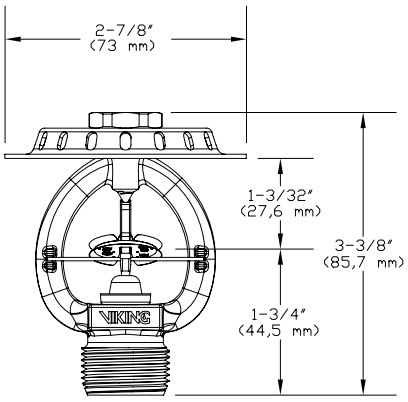
TECHNICAL DATA

ESFR UPRIGHT SPRINKLER
SIN VK520 (K = 14.0)

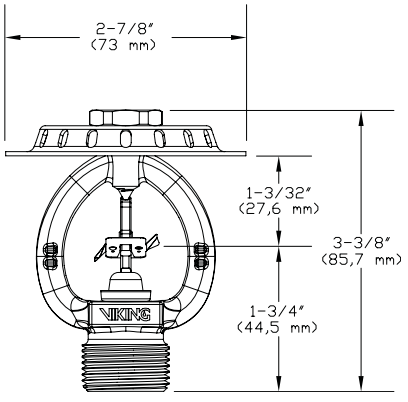


Viking ESFR Upright SIN VK520
Sprinkler Wrench: Part No. 05118CW/B

Figure 1



Ordinary Temperature Rated Sprinkler



Intermediate Temperature Rated Sprinkler

NOTE: The sprinkler is contained in a plastic cap for protection during shipping and installation. Carefully remove the cap from the sprinkler AFTER installation.

(Dimensions are approximate.)

Figure 2

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

Approval Chart

Viking ESFR Upright Sprinkler SIN VK520

KEY: Temperature, Finish, A1X ← Escutcheon (if applicable)

Upright Deflector	NPT Thread Size		Sprinkler Part No.[3]	Nominal K-Factor		Maximum Pressure	Approvals[5,6]	
Fast Response Fusible Element	Inches	mm		U.S.	metric[4]	(PSIG)	FM	NYC[7]
	3/4	20	10625	14.0	20,2	175 psi	A1, B1	A1

Approved Sprinkler Temperature Ratings	Approved Finish
A - 165 °F (74 °C) B - 205 °F (96 °C)	1 - Brass

Footnotes

[1] The 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] Base part number shown. For complete part number, refer to the price list.
[4] 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.
[5] This table shows listings and approvals available at the time of printing. Other approvals may be in process.
[6] Refer to the latest Factory Mutual Loss Prevention Data Sheets and standards of the National Fire Protection Association.
[7] Accepted for use, City of New York Department of Buildings, MEA 89-92-E, Vol. 18.

Installation Guidelines

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 upright position in wet systems: FM Global Loss Prevention Data Sheet 2-2 provides the following positioning requirement: Install K14.0 ESFR sprinklers with the center line of the thermal sensing element located a maximum of **13"** (330 mm) and a minimum of **4"** (102 mm) below the ceiling. **NOTE:** NFPA 13 indicates the following for ESFR upright sprinklers having a 14.0 nominal K-Factor: Position the deflector a maximum of **12"** (305 mm) and a minimum of 3" (76 mm) below the ceiling.

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^2 (9,3 m^2)**. The minimum area of coverage allowed per sprinkler is 64 ft^2 (5,8 m^2) per FM Global Loss Prevention Data Sheet 2-2, and 80 ft^2 (7,4 m^2) 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^2 (9,3 m^2) 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 Upright 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 the National Fire Protection Association and any other Authorities Having Jurisdiction, and also with provisions of governmental codes, ordinances, and standards whenever applicable.

VIKING®

TECHNICAL DATA

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SIN VK520 (K = 14.0)

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

(Also refer to the chart on page 121 b.)

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 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 would 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. **Viking recommends installing one style of sprinklers (either pendent or upright) throughout ESFR systems. However, provided the fusible elements are installed within the distance below the ceiling allowed by the installation standards, and when acceptable to the Authority Having Jurisdiction, Viking considers the practice of mixing upright and pendent ESFR sprinklers to be acceptable.**

C. Sprinklers must be installed after the piping is in place at the ceiling to prevent mechanical damage. **NOTE: No sprig is required for sprinkler pipe sizes up to and including 3" (76,2 mm) nominal I.D.** Before installing, be sure to have the appropriate sprinkler model and style, with the correct orifice size, temperature rating, and response characteristics.

D. With the sprinkler contained in the protective plastic 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.

E. **Use ONLY sprinkler wrench 05118CW/B (shown in Figure 1) for installing ESFR Sprinkler VK520!** With the sprinkler contained in the protective cap, install the sprinkler onto the piping by applying sprinkler wrench 05118CW/B to the sprinkler wrench flats only, while taking care not to damage the sprinkler operating parts.

- **DO NOT** use any other wrench, as this could damage the unit.
- **DO NOT** use the sprinkler deflector or operating 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.

F. 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 sprinkler wrench 05118CW/B only.

G. **After installation and testing and repairing of all leaks, remove the protective caps from the sprinklers. Do NOT use any type of tool to remove the cap. Remove the cap by hand: turn it slightly and pull it off the sprinkler. When removing caps, use care to prevent dislodging or damaging sprinkler ejector spring and fusible element. THE CAPS MUST BE REMOVED FROM SPRINKLERS BEFORE PLACING THE SYSTEM IN SERVICE!**

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. In addition, the Authorities 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. 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 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, with the correct orifice size, temperature rating, and response characteristics. A 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. Therefore, nothing should be hung from, attached to, or otherwise obstruct the discharge pattern. Refer to obstruction criteria in applicable Installation Standards.

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 unit.
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.