



## TECHNICAL DATA

### MODEL VKFD25U UNBRAIDED FLEXIBLE SPRINKLER DROPS

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 Model VKFD25U Flexible Sprinkler Drops are a complete assembly intended for installation into commercial suspended ceilings with intermediate duty and heavy duty systems as described in ASTM C635 and C636. The hose assembly includes 25 mm diameter corrugated stainless steel flexible hose. The hose assembly includes an inlet nipple 1" NPT for attachment to the sprinkler system branch piping, a special outlet reducer fitting for attachment of a 1/2" or 3/4" NPT sprinkler. Also included is a support bar and brackets, which secure the complete flex sprinkler drop assembly to an intermediate or heavy duty commercial suspended ceiling support rail system.

The support bracket system (see Figure 4) locates and secures the sprinkler in the required position within the ceiling system. Viking Flexible Sprinkler Drops are available in various lengths to minimize the number of installed bends and meet the minimum material requirements of the installation. Available lengths are 39" and 59" assembly lengths and straight outlet fittings in 1/2" or 3/4" sprinkler connections.

Upon special request, Viking Flexible Sprinkler Drops can be manufactured to the following lengths: 27-9/16" or 71". Delivery times for special request items are extended; consult your Viking distributor for availability and delivery.

The unique assembly of the Viking Flexible Sprinkler Drop to the piping system and the outlet sprinkler fitting is made with a slip nut and seal design that allows assembly after forming the flex hose to proper installation shape, and the inlet and outlet end connections are securely in place. This prevents twisting of the flex sprinkler drop during installation and provides a secure leak-tight assembly. Each assembly comes with suspended ceiling rail support brackets, both short and tall. The short brackets are used for typical pendent frame style sprinklers with flat or recessed escutcheons. Note: When using short brackets, the ceiling tile must be installed before attaching the brackets to the ceiling's main tee bar supports. Tall brackets are used for typical concealed and flush mounted sprinklers. The mounting bracket system and special outlet fittings provide a generous amount of adjustment both laterally and vertically for flush and precise sprinkler installation. Note: The brackets must be attached to the ceiling's main tee bar supports, not to the cross support rail members.

Viking Flexible Sprinkler Drops provide several installation or retrofit benefits compared to rigid sprinkler drops:

- More efficient manpower
- Improved performance and installation quality
- Precise and flush sprinkler location
- Flexible installation for seismic or vibrating applications
- Flexible installation for fast track construction projects
- Corrosion resistant materials
- Fewer tools required for installation
- 100% factory tested
- Meets NFPA and EN guidelines
- Approved for use with suspended ceilings with intermediate- and heavy-duty systems designed per ASTM C635 and C636
- Compatible with Viking CPVC BlazeMaster® sprinkler systems



**Model VKFD25U Flexible Sprinkler Drop**  
(Shown with a Viking Concealed Sprinkler)

#### 2. LISTINGS AND APPROVALS

**cULus Listed:** Category VENF

Refer to Design Criteria on page 139v for cULus Listing requirements that must be followed.

Also refer to specific sprinkler technical data pages for sprinkler listings and other technical information.

#### 3. TECHNICAL DATA

##### Specifications:

Available since 2010.

- Hose tube diameter: 25 mm outside diameter
- Lengths available 27-9/16", 39-3/8", 59", and 71"
- Inlet 1" NPT, male pipe threads.
- Outlet reducer straight with 1/2" NPT or 3/4" NPT, female thread. See Figures 1-3.



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- Corrugated tube is annealed after forming to insure relief of all material stresses and removal of all scale.
- Limited flexibility design
- Intended use for direct connection to fire sprinklers
- Maximum Working Pressure = 200 PSI (13.8 bar)
- Test Pressure = 300 PSI (21 bar)
- Approved for wet and dry systems as noted in NFPA 13, NFPA 13D, and NFPA 13R
- Maximum ambient temperature: 225 °F (107 °C) EPDM seal

**WARNING: Refer to the sprinkler technical data page, as the temperature rating and maximum pressure rating of the sprinkler may be different than the Flexible Sprinkler Drop.**

- Minimum bend radius: 4" (102 mm) for cULus Listing

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.

#### Material Standards:

Flexible Tube: UNS-S30400 Stainless Steel

Outlet Reducer (Straight): SPPS Steel (ASTM A53 EA) with yellow zinc plating

Inlet Nipple: SPPS Steel (ASTM A53 EA) with yellow zinc plating

Seal: EPDM

Slip Nut: SS41 (ASTM A283 D) Steel with zinc plating

Support Brackets (all): SS41 (ASTM A283 D) Steel with zinc plating

Support Bar: SS41 (ASTM A283 D) Steel with zinc plating

Insulating Collar: Nylon 66

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

The Following Model VKFD25U Flexible Sprinkler Drops are Available as Stock Assemblies:

Part No. 16038-10: 1" NPT x 1/2" x 39-3/8" length, straight outlet, unbraided

Part No. 16038-15: 1" NPT x 1/2" x 59" length, straight outlet, unbraided

Part No. 16135-10: 1" NPT x 3/4" NPT x 39-3/8" length, straight outlet, unbraided

Part No. 16135-15: 1" NPT x 3/4" NPT x 59" length, straight outlet, unbraided

**NOTE:** Other flex drop assembly lengths are available upon special order.

Each Carton Includes (10) Complete Assemblies with the Following Components:

- (10) Flexible hose assemblies, length 39-3/8" or 59".
- (10) Outlet fittings, 1/2" or 3/4" NPT, straight as specified.
- (10) Inlet fittings, 1" NPT as specified.
- (10) Sprinkler outlet brackets, fixed.
- (12) Rectangle nuts for sprinkler outlet bracket.
- (12) M6 x 5/8" (15 mm) long wing bolts (for sprinkler outlet bracket).
- (20) Short rail bracket packages, including bracket, clips, and supports.
- (20) Long rail bracket packages, including bracket, clips, and supports.
- (25) M6 x 3/4" (20 mm) long wing bolts (for rail brackets).
- (10) 5/8" (16 mm) square x 25-9/16" (650 mm) long support bars.
- (1) Set of Installation Instructions.

Available to Order Separately:

Optional 4" Bend Radius Gauge Tool Part No. 15450 (plastic)

Optional 4" Fixed Radius Clip Part No. 14403 (plastic)



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The Following Kits are Available for Replacement Components:

Note: These kits may be ordered in addition to the above offered stock assemblies for replacing the components as required. A 49-3/16" (1,250 mm) long support bar is available when the main support beams are spaced at 4 ft. (1,219 mm). These must be ordered separate from the standard Flexible Sprinkler Drop.

TABLE 1: KITS AVAILABLE FOR REPLACEMENT COMPONENTS	
16042	1/2" x 25 mm hose straight outlet fitting kit (10) / package
16137	3/4" x 25 mm hose straight outlet fitting kit (10) / package
14397	25-9/16" (650 mm) long support bar (10) / bundle
14398	49-3/16" (1,250 mm) long support bar (10) / bundle
14387	Short rail bracket kit (20) / package
14388	Short rail clip kit (20) / package
14409	Short rail clip support (20) / package
14389	Tall rail bracket kit (20) / package
14390	Tall rail clip kit (20) / package
14408	Tall rail clip support (20) / package
14400	Thumb screws outlet fitting M6 x 15 mm long (12) per kit
14401	Thumb screws rail brackets M6 x 20 mm long (25) per kit
16043	EPDM Seals for 25 mm hose assembly (20) / package
14411	Rectangle nut for sprinkler outlet bracket (12) / package
14391	Outlet reducer support bracket (10) / package
16040	Inlet nipple (10) / package

Hose Assembly Configurations of Standard Offering Include:

1. Unbraided 25 mm flex sprinkler hose.
2. Outlet fitting, straight.
3. Outlet size 1/2" or 3/4" NPT.
4. Inlet connection 1" NPT.

**NOTE:** Hose assemblies ordered from Viking only come with straight outlet as standard.

Friction Loss Data:

TABLE 2: MODEL VKFD25U FRICTION LOSS DATA WITH 4" (102 mm) MINIMUM BEND RADIUS					
Part Numbers	Outlet Size (Straight)	Hose Length with Fittings	Equivalent Length of UL 1" Schedule 40 Pipe (ft.)	Equivalent Length of UL 1" Schedule 40 Pipe (m)	Maximum Number of 90° Bends
16038-07	1/2"	27-9/16"	24 ft	7.3 m	1
16135-07	3/4" NPT	27-9/16"	30 ft	9.1 m	1
16038-10	1/2"	39-3/8"	52 ft	15.8 m	2
16135-10	3/4" NPT	39-3/8"	57 ft	17.4 m	2
16038-15	1/2"	59"	78 ft	23.8 m	3
16135-15	3/4" NPT	59"	88 ft	26.8 m	3
16038-18	1/2"	71"	97 ft	29.6 m	3
16135-18	3/4" NPT	71"	97 ft	29.6 m	3

\*Indicates standard Viking offering.



# TECHNICAL DATA

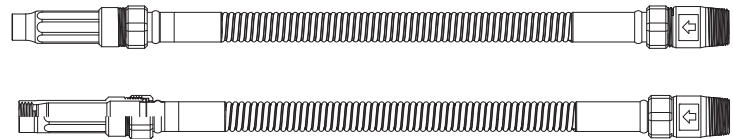
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**Figure 1: Flexible Sprinkler Drop Installed**



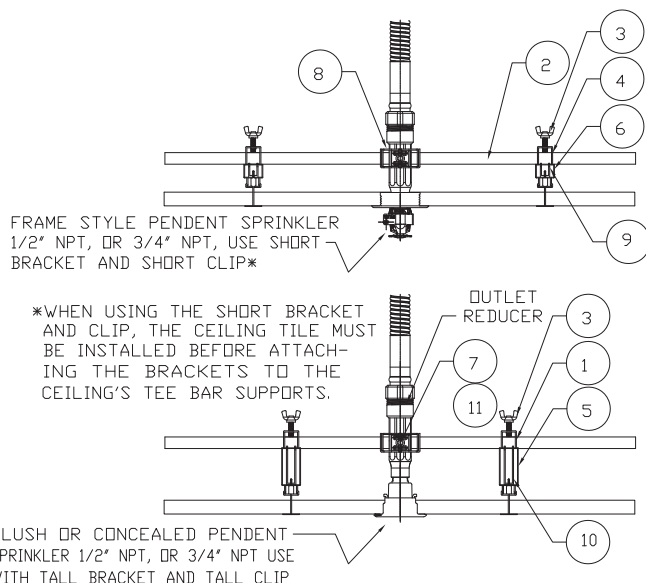
1" NPT INLET × 1/2" NPT, OR 3/4" NPT  
STRAIGHT OUTLET, UNBRAIDED

**Figure 2: Flexible Sprinkler Drop - Drawing**

### 4. INSTALLATION

Viking Flexible Sprinkler Drops are manufactured and tested to meet the latest rigid requirements of the approving agencies. They are designed and tested to be installed in accordance with the Approved and Listed installation instructions as provided with the product and the recognized installation standards NFPA 13, NFPA 13R, and NFPA 13D. Deviations from these standards or any alterations to the support system or sprinkler after leaving the factory including, but not limited to painting, plating, coating or modification may render the sprinkler inoperative or the support system non-compliant, automatically nullifying the approvals and any guarantee made by The Viking Corporation. The use of certain types of sprinklers may be limited due to occupancy and hazard. Refer to the Authority Having Jurisdiction prior to installation. For complete installation instructions for this product, please refer to the Viking Flex Drop Installation and Design Manual, Form No. F\_112107.

Keep sprinklers with protective shields or caps contained within the shields or caps during installation and testing, and any time the sprinkler is shipped or handled.



INSTALLATION NOTE: ATTACH THE BRACKETS TO THE CEILING'S MAIN TEE BAR SUPPORTS. DO NOT ATTACH TO CROSS SUPPORT RAIL MEMBERS.

NO.	PART NO.	DESCRIPTION	QTY.
1	14389	BRACKET, LONG	2
**2	14397	RECTANGULAR SUPPORT BAR, 25-9/16" (650 mm) LONG	1
3	14401	WING BOLT, M6 × 3/4" (20 mm)	2
4	14387	BRACKET, SHORT	2
5	14390	CLIP, LONG	2
6	14388	CLIP, SHORT	2
7	14400	WING BOLT, M6 × 5/8" (15 mm)	1
8	14391	OUTLET REDUCER SUPPORT BRACKET, FIXED	1
9	14409	CLIP SUPPORT, SHORT	2
10	14408	CLIP SUPPORT, LONG	2
11	14411	RECTANGLE NUT	1

\*\* FOR BAR 49-3/16" (1,250 mm) LONG, ORDER PART NO. 14398 KIT SEPARATELY (10 BARS PER KIT)

**Figure 3: Flexible Sprinkler Drop Support System**



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**Remove plastic protective sprinkler caps or bulb shields AFTER the 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.

For concealed style sprinklers, the cover plate assembly can now be installed onto the sprinkler.

- Remove the cover from the protective box, taking care not to damage the cover plate assembly.
- From below the ceiling, gently place the base of the cover plate assembly over the sprinkler protruding through the ceiling opening.
- Push the cover plate assembly onto the sprinkler until the unfinished brass flange of the cover plate base touches the ceiling.
- Available cover plate adjustment is  $\frac{1}{2}$ " (12.7 mm) +/-  $\frac{1}{4}$ " (6.4 mm).

For frame style sprinklers with the Model E-1 or E-2 Escutcheon, press on or thread on the outer escutcheon cup until the flanges touch the surface of the ceiling.

- The maximum recess is  $\frac{1}{2}$ " (12.7 mm). Note: The face of the escutcheon adapter may extend up to  $\frac{11}{32}$ " (8.7 mm) beyond edge of escutcheon cup, resulting in  $\frac{27}{32}$ " (21.4 mm) total adjustment range.

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 sprinkler technical data page for the sprinkler model used with the Flexible Sprinkler Drop.

## 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 latest edition of Viking technical data 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.

- 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.
- Sprinklers that have been field 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 (e.g., NFPA 25) 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 re-used, but must be replaced. When replacement is necessary, use only new sprinklers.
- 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.
- 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.
  - Remove the system from service, drain all water, and relieve all pressure on the piping.
  - Using the special sprinkler wrench, remove the old sprinkler and install the new unit. Care must be taken to ensure that the replacement sprinkler is the proper model and style, with the appropriate orifice size, temperature rating, and response characteristics. A fully stocked spare sprinkler cabinet should be provided for this purpose.
  - 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 Flexible Sprinkler Drops 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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### DESIGN CRITERIA

#### cULus Listing Requirements:

- Approved for use in suspended ceilings with intermediate and heavy duty systems designed per ASTM C635 and C636.
- Meets NFPA 13, NFPA 13D and NFPA 13R guidelines and EN12845.
- Intended for use in wet or dry systems.
- The maximum permissible number of bends is (2) x 90° for 39-3/8" lengths and (3) x 90° for 59" lengths at the manufacturer's specified bend radius of 4" (102 mm) for cULus.
- In suspended ceiling, Viking Flexible Sprinkler Drops must be installed in accordance with Viking Flex Drop Installation and Design Manual, Form No. F\_112107.
- In suspended ceilings, outlet reducer must be secured to the ceiling support system with brackets supplied.

Hydraulic calculations for NFPA systems must include the values in Table 2 on page 139s using the maximum number of bends that includes the inlet and outlet fittings as indicated. Authorities Having Jurisdiction will require proper hydraulic calculations and inspect for proper bend radii and maximum quantity of bends as indicated in the table. Refer to the Viking Flex Drop Installation and Design Manual, Form No. F\_112107, for proper application and installation of Flexible Sprinkler Drops.

**NOTE:** Refer to the specific sprinkler data page for the sprinkler model used with the Flexible Sprinkler Drop.

#### **CAUTIONS:**

- Minimum Inside Bend Radius: 4" (102 mm) Static cULus unbraided
- Maximum Sprinkler K-Factor: 8.0 U.S. (115.2 metric) for the 1/2" outlet, 14.0 U.S. (202 metric) for the 3/4" outlet
- Maximum Number of Bends per Hose: Refer to Table 2 on page 139s.
- Repeated bending of one portion of the flexible tube before installation may cause breakage or loss of resisting pressure.
- When using concealed sprinklers, they must be installed in neutral or negative pressure plenums only.

**IMPORTANT:** Always refer to Bulletin Form No. F\_091699 - Care and Handling of Sprinklers. Also refer to the appropriate sprinkler data page. Viking sprinklers and Flexible Sprinkler Drops are designed to be installed in accordance with the latest edition of Viking technical data, the latest 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 use of certain types of sprinklers may be limited due to occupancy and hazard. Refer to the Authority Having Jurisdiction prior to installation.