



TECHNICAL DATA

MODEL VKFD28B BRAIDED 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

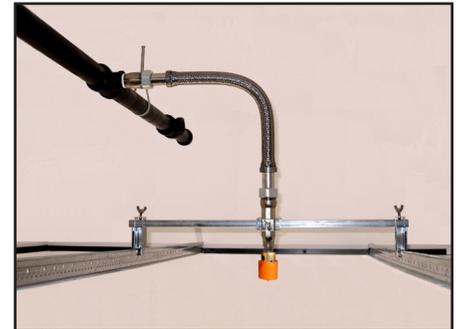
Viking Flexible Sprinkler Drops are intended for installation into commercial suspended ceilings with medium to heavy support tee bars as described in ASTM C635 and C636. The hose assembly includes 28 mm diameter corrugated stainless steel flexible hose with a braided stainless steel exterior. The hose assembly also includes an inlet nipple 1" NPT for attachment to the sprinkler system branch piping, a special outlet reducer fitting with straight or 90° angle 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 a medium 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 as follows: 39-3/8" and 59" assembly lengths and straight outlet fittings in 1/2" or 3/4" NPT sprinkler connections. Also available on special order are 90° angle outlet fittings, also available with 1/2" or 3/4" NPT sprinkler connection (refer to Table 1A on page 139i). Upon special request, Viking Flexible Sprinkler Drops can be manufactured to the following lengths: 27-9/16", 47-3/16", 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 long. 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. Long 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 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, EN, and LPC guidelines
- Approved for use with suspended ceilings with medium- and heavy-duty load grids with Tee bar design per ASTM C635 and 636



Model VKFD28B Flexible Sprinkler Drop
(Shown with a Viking Concealed Sprinkler)

2. LISTINGS AND APPROVALS

FM Approved: VKFD28B

Refer to Design Criteria on page 139m for FM Approval 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 2009.

- Braided hose inner tube diameter: 28 mm outside diameter
- Lengths available 27-9/16", 39-3/8", 47-3/16", 59", and 71"
- Inlet 1" NPT, male pipe threads.

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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- Outlet reducer straight with 1/2" or 3/4" NPT, or 90° angle with 1/2" or 3/4" NPT (suitable for both NPT and BSPT), both styles female thread. See Figures 1-3.
- Stainless Steel braided exterior, includes braid and corrugated tube of AISI 304 SST. Corrugated tube is polished and boron treated and annealed after forming to insure relief of all material stresses and removal of all scale.
Maximum Working Pressure = 200 PSI (13.8 bar)

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.

- Test Pressure = 400 PSI (28 bar)
- Approved for wet and dry systems as noted in NFPA 13
- Maximum ambient temperature: 225 °F (107 °C) EPDM seal, 300 °F (149 °C) for FM
- Minimum bend radius: 12" (305 mm) for FM Approval

Material Standards:

Flexible Tube: AISI 304 Stainless Steel

Braid: AISI 304 Stainless Steel

Outlet Reducer (Straight or Angled): SPPS Steel with yellow zinc plating

Inlet Nipple: SPPS Steel with yellow zinc plating

Seal: EPDM

Slip Nut: C3771BC Brass

Support Brackets (all): SS41 Galvanized Steel

Support Bar: SS41 Galvanized Steel

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

The Following Model VKFD28B Flexible Sprinkler Drops are Available as Stock Assemblies:

Part No. 14350-10: 1" NPT x 1/2" x 39-3/8" length, straight outlet, braided

Part No. 14350-15: 1" NPT x 1/2" x 59" length, straight outlet, braided

Part No. 14351-10: 1" NPT x 3/4" x 39-3/8" length, straight outlet, braided

Part No. 14351-15: 1" NPT x 3/4" x 59" length, straight outlet, braided

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, straight as specified.
- (10) Inlet fittings, 1" NPT as specified.
- (10) Sprinkler outlet brackets, fixed.
- (10) 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 short clips and clip supports.
- (20) Long rail bracket packages, including long clips and clip 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.



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Available to Order Separately: Optional 4" Bend Radius Gauge Tool Part No. 15450 (plastic)

TABLE 1A: KITS AVAILABLE TO CONVERT TO ANGLE OUTLET

14384	1/2" x 28 mm hose 90° angle fitting kit (10) / package
14385	3/4" x 28 mm hose 90° angle fitting kit (10) / package

TABLE 1B: KITS AVAILABLE FOR REPLACEMENT COMPONENTS

14382	1/2" x 28 mm hose straight outlet fitting kit (10) / package
14383	3/4" x 28 mm hose straight outlet fitting kit (10) / package
14397	25-9/16" (650 mm) lg support bar kit (10) / bundle
14398	49-3/16" (1,250 mm) lg support bar kit (10) / bundle
14387	Short rail bracket kit (20) / package
14388	Short rail clip kit (20) / package
14409	Short rail clip support (20) / package
14389	Long rail bracket kit (20) / package
14390	Long rail clip kit (20) / package
14408	Long rail clip support (20) / package
14400	Wing bolts outlet fitting M6 x 15 mm lg (12) per kit
14401	Wing bolts rail brackets M6 x 20 mm lg (25) per kit
14386	EPDM Seals for 28 mm hose assembly (20) / package
14411	Rectangle nut for sprinkler outlet bracket (12) / package
14378	Inlet Connection Nipple 1" NPT (1)

The Following Kits are Available to Convert to Angle Outlet, or for Replacement Components:

Note: These kits may be ordered in addition to the above offered stock assemblies for replacing the outlet fittings 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.

Hose Assembly Configurations of Standard Offering Include:

1. Braided 28 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. Conversion to 90° angle outlet fitting can be done by ordering the desired kit from Table 1A described above.

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TABLE 2A: FRICTION LOSS DATA FOR FM WITH 12" (305 mm) MINIMUM BEND RADIUS (1/2" OUTLET)					
Part Numbers	Outlet Type	Hose Length with Fittings	Equivalent Length of FM 1" Schedule 40 Pipe (ft.)	Equivalent Length of FM 1" Schedule 40 Pipe (meters)	Maximum Number of 90° Bends Allowed
14350-10	1/2" Straight or 90° Angle	39-3/8"*	18.2 ft	5.5 m	1
14350-15		59"*	27.1 ft	8.2 m	2

* Indicates standard Viking offering. Other hose lengths are available-contact Viking Technical Services at 877-384-5464 for friction loss data.

TABLE 2B: FRICTION LOSS DATA FOR FM WITH 12" (305 mm) MINIMUM BEND RADIUS (3/4" OUTLET)					
Part Numbers	Outlet Type	Hose Length with Fittings	Equivalent Length of FM 1" Schedule 40 Pipe (ft.)	Equivalent Length of FM 1" Schedule 40 Pipe (meters)	Maximum Number of 90° Bends Allowed
14351-10	3/4" Straight or 90° Angle	39-3/8"*	15.5 ft	4.7 m	1
14351-15		59"*	24.8 ft	7.6 m	2

* Indicates standard Viking offering. Other hose lengths are available-contact Viking Technical Services at 877-384-5464 for friction loss data.

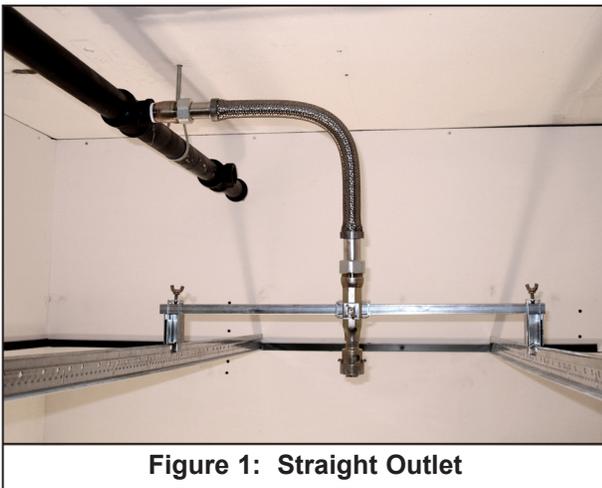


Figure 1: Straight Outlet



Figure 2: Angle Outlet



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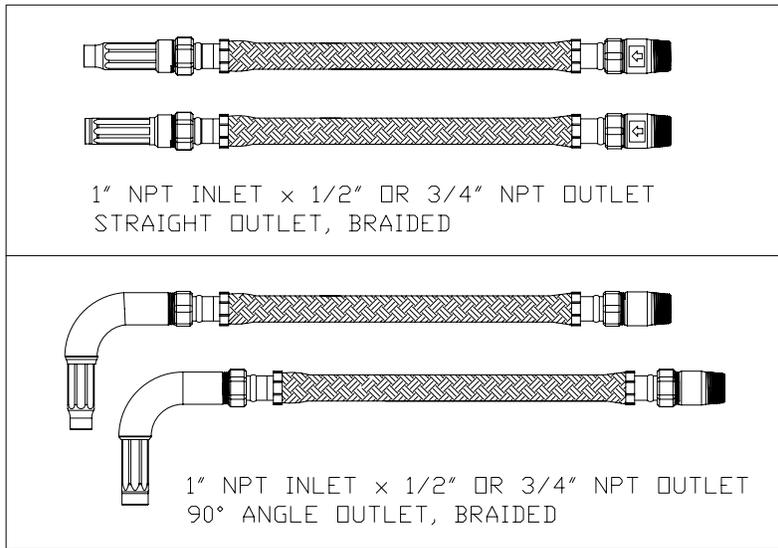


Figure 3

**Straight outlet offered as standard.
90° angled outlet offered as special order.**

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, TALL	2
**2	14397	RECTANGULAR SUPPORT BAR, 25-9/16" (650 mm) LONG	1
3	14401	WING BOLT, M6 x 3/4" (20 mm)	2
4	14387	BRACKET, SHORT	2
5	14390	CLIP, TALL	2
6	14388	CLIP, SHORT	2
7	14400	WING BOLT, M6 x 5/8" (15 mm)	1
8	14391	OUTLET REDUCER SUPPORT BRACKET, FIXED	1
9	14409	CLIP SUPPORT, SHORT	2
10	14408	CLIP SUPPORT, TALL	2
11	14411	RECTANGLE NUT	1

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

FRAME STYLE PENDENT SPRINKLER 1/2" OR 3/4" NPT USE WITH SHORT BRACKET AND SHORT CLIP*

*WHEN USING THE SHORT BRACKET AND CLIP, THE CEILING TILE MUST BE INSTALLED BEFORE ATTACHING THE BRACKETS TO THE CEILING'S TEE BAR SUPPORTS.

FLUSH OR CONCEALED PENDENT SPK 1/2" NPT OR 3/4" NPT USE WITH TALL BRACKET AND TALL CLIP

Figure 4: Support System for Straight or Angle Outlet Fittings



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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. 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.

NOTE: 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.

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.

- a. Remove the cover from the protective box, taking care not to damage the cover plate assembly.
- b. From below the ceiling, gently place the base of the cover plate assembly over the sprinkler protruding through the ceiling opening.
- c. Push the cover plate assembly onto the sprinkler until the unfinished brass flange of the cover plate base touches the ceiling.
- d. 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, E-2, or F-1 Escutcheon, press on or thread on the outer escutcheon cup until the flanges touch the surface of the ceiling.

- a. With the Model E-1 or E-2 Escutcheon, 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 the edge of the 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.

- 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 atmospheres, water supplies, and activity around the device.
- B. 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.
- 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.



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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. 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.
 3. Place the system back in service and secure all valves. Check for and repair all leaks.
- E. 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.

DESIGN CRITERIA

FM Approval Requirements:

- Approved for use in ceilings with medium and heavy load grids (ASTM C635 and C636).
- Meets NFPA 13, NFPA 13D and NFPA 13R guidelines.
- Intended for use in wet or dry systems.
- 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 Tables 2A and 2B on page 139j 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 tables. **Note that FM minimum bend radius is 12" (305 mm).** Refer to the Viking Flex Drop Installation and Design Manual, Form No. F_112107, for proper application and installation of Flex 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: 12" (305 mm) for FM**
- **Maximum Sprinkler K-Factor: 5.6 U.S. (80 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 Tables 2A and 2B on page 139j.**
- **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.

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