



**MODEL VKFD25 AND VKFD28
FLEXIBLE SPRINKLER DROPS**

Installation and Design Manual

January, 2010

Form No. F_112107



The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
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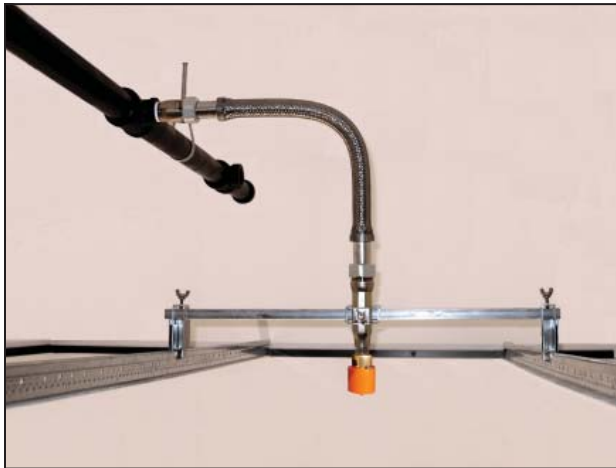


TECHNICAL DATA

MODEL VKFD25 & VKFD28 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



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



Model VKFD25U or VKFD28U Unbraided Flexible Sprinkler Drop
(Shown with a Viking Concealed Sprinkler)

I. BENEFITS

Viking Flexible Sprinkler Drops provide many benefits for installation or retrofit compared to fixed sprinkler drops:

- More efficient use of manpower.
- Improved performance and installation quality.
- Precise location of sprinklers.
- Flexible installation for Seismic applications.
- Corrosion-resistant materials.
- Few tools required for installation.
- 100% Factory Tested.
- Meets NFPA, EN, CNBOP, Apsad, and LPC guidelines.
- Approved for use with suspended ceilings with intermediate- and heavy-duty systems designed per ASTM C635 and C636.

Viking Flexible Sprinkler Drops are a complete unit assembly including 25 mm (Model VKFD25U) or 28 mm (Models VKFD28B and VKFD28U) diameter corrugated stainless steel flexible hose (braided or non-braided exterior) for the lowest friction loss in the industry, inlet nipple (1" or 1-1/4" NPT or BSPT*) to adapt the applicable codes), outlet reducer with straight or 90° angle* for attachment of sprinkler (1/2" or 3/4"). Also included are support bar and brackets for securing the complete flex drop assembly to the ceiling support rail system, and for locating and securing the sprinkler in the required position. 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.

*1-1/4" inlet nipple and angle style outlet reducer not available for Model VKFD25U.

II. INSTALLATION INSTRUCTIONS

Step 1: Insure proper sprinkler position where the sprinkler is to be located and cut the proper clearance hole in the ceiling tile as described in the sprinkler technical data page. The sprinkler should be installed near the center of the ceiling tile and between the main support rails of the suspended ceiling support system. The standard centerline of support beams is 2 ft. (610 mm), of which the support bar (Item 2 in Figure 1 furnished as standard) is 25-9/16" (650 mm) long. Note: A 4 ft. (1,219 mm) spacing is possible; in this case a 49-3/16" (1,250 mm) support bar kit (Part No. 14398/10) must be specified and ordered separately.

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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

FRAME STYLE PENDENT SPRINKLER 1/2" DR 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.

OUTLET REDUCER 90° ANGLE

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

Figure 1a (Standard Brackets Shown)

** FOR LONG BAR 49-3/16" (1,250 mm) LONG, ORDER PART NO. 14398 KIT SEPARATELY (10 BARS PER KIT)
 NOTE: ANGLE STYLE OUTLET REDUCER NOT AVAILABLE FOR MODEL VKFD25U.

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	49000703	RAIL CLIP, TALL	2
**2	14397	RECTANGULAR SUPPORT BAR, 25-9/16" (650 mm) LONG	1
3	41200013	WING BOLT, M6 x 5/8" (15 mm)	3
4	49000528	RAIL CLIP, SHORT	2
5	41200012	WING BOLT, M6 x 1" (25 mm)	2
6	41000113	FIXING BOLT, M6 x 1" (25 mm)	2
7	49000471	OUTLET REDUCER SUPPORT BRACKET	1

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

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

OUTLET REDUCER 90° ANGLE

FLUSH OR CONCEALED PENDENT SPRINKLER 1/2" DR 3/4" NPT USE WITH TALL BRACKET

Figure 1b (LPCB/Apsad/CNBOP Approved Only Brackets Shown)

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

Step 2: Refer to Figures 1-4.

For Standard Brackets: Attach the rail brackets to the ceiling support rails by clipping over the rail and inserting the small slotted clip (part of Item 5 or 6 in Figure 1a) in place to secure over the rail (see Figures 2 and 3).

Insert the rectangular support bar (Item 2 in Figure 1a) through the rail brackets and the outlet reducer support bracket (Item 8 in Figure 1a).

Insert the U-shaped clip supports (Item 9 or 10 in Figure 1a) into the rail bracket clips under the rectangular support bar.



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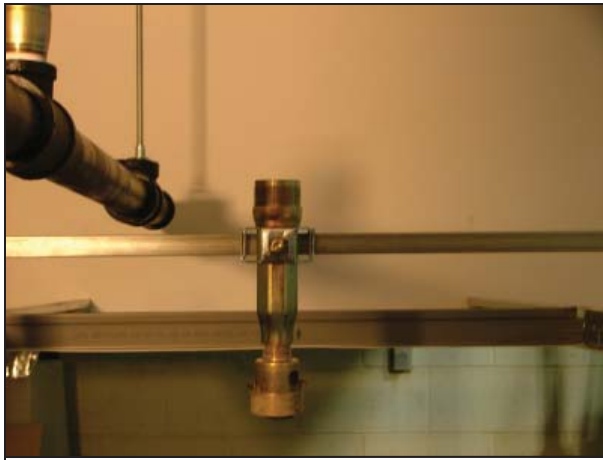


Figure 2



Figure 3

For LPCB/Apsad/CNBOP Approved Only Brackets (Figure 4): Attach the appropriate rail clips (Items 1 and 4 in Figure 1b), along with the outlet reducer support bracket (Item 6 in Figure 1b) and rectangular support bar (Item 2 in Figure 1b) to the ceiling grid using a screwdriver or your hand. Do not fully tighten the bolts on the brackets until the outlet reducer support bracket is centered over the opening in the ceiling tile.

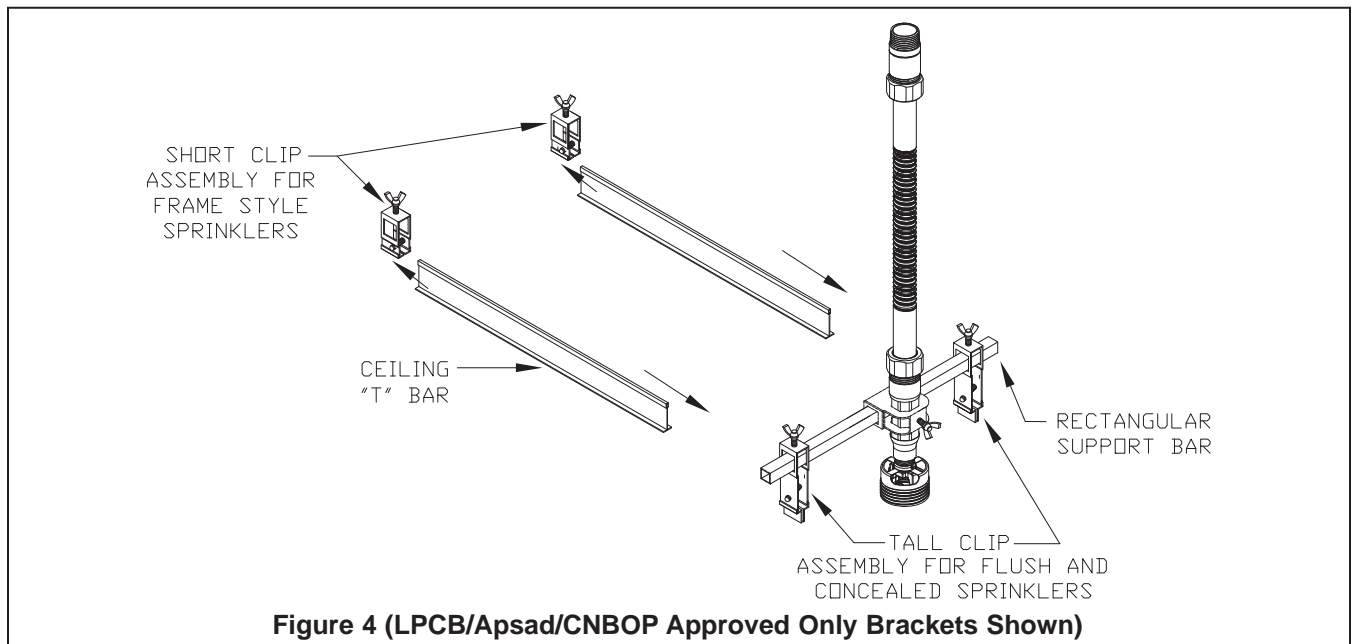


Figure 4 (LPCB/Apsad/CNBOP Approved Only Brackets Shown)

Tighten the wing screws of the rail brackets to approximately 20 in-lbs. Then tighten the wing screw of the outlet reducer support bracket to approximately 75 in-lbs.

Short Bracket/Clip Style: This style is applied when using standard pendent and recessed sprinklers.

For Standard Short Brackets/Clips: Refer to Figures 5a, 5b, and 6 for short rail bracket, clip and support assembly (Items 3, 4, 6, and 9 in Figure 1a). NOTE: The clip support slides into the clip and under the rectangular support bar before tightening the screw.

VIKING [®]	TECHNICAL DATA	MODEL VKFD25 & VKFD28 FLEXIBLE SPRINKLER DROPS
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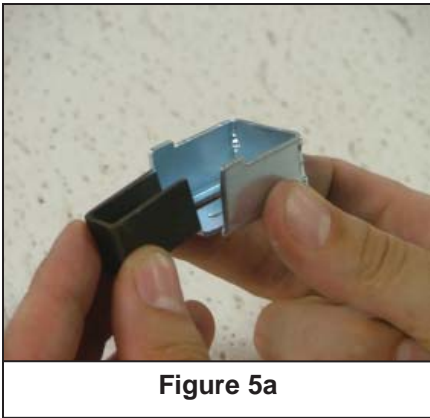


Figure 5a

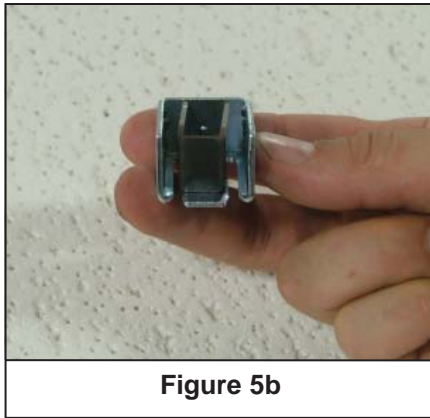


Figure 5b

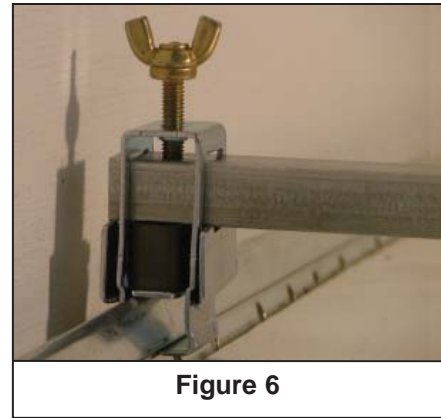


Figure 6

For LPCB/Apsad/CNBOP Approved Short Clips: Refer to Figure 7a for the short clip assembly (Items 3, 4, and 7 in Figure 1b).



Figure 7a

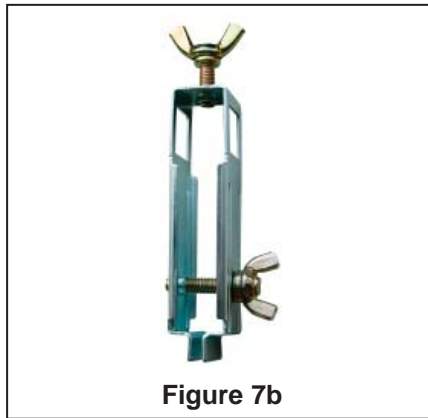


Figure 7b

Tall Bracket/Clip Style: This style is applied when using flush or concealed sprinklers.

For Standard Tall Brackets/Clips: Refer to Figures 8a, 8b, and 9 for tall rail bracket, clip and clip support assembly (Items 1, 3, 5, and 10 in Figure 1a).

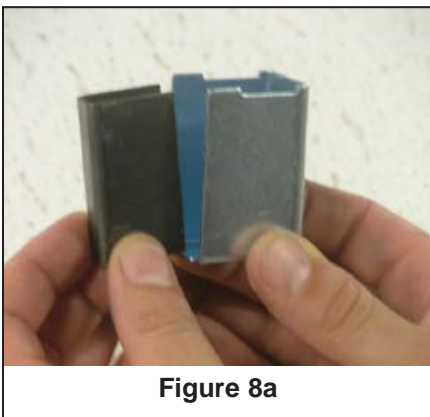


Figure 8a



Figure 8b

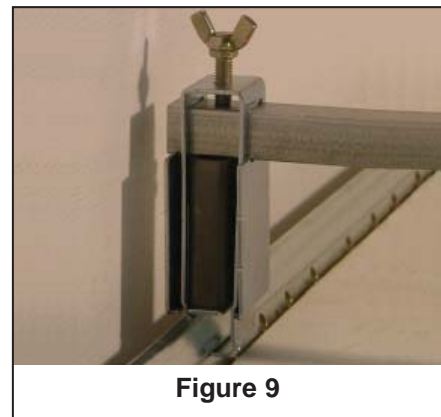


Figure 9

For LPCB/Apsad/CNBOP Approved Only Tall Brackets: Refer to Figure 7b for the tall clip assembly (Items 1, 3, and 5 in Figure 1b).



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Figure 10

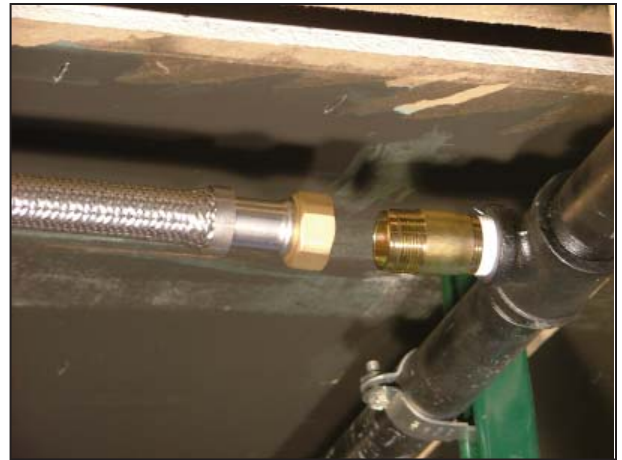


Figure 11

Step 3: As shown in Figure 10, install the special shoulder nipple (furnished as part of the hose assembly) into the branch line outlet tee or elbow. Make sure the tapered pipe thread is installed in the tee and the arrow and special shoulder thread are pointing towards the sprinkler location. Apply a non-hardening thread sealant compound or Teflon® tape to the male NPT (or BSPT) threads of the nipple that engages with the tee only. DO NOT apply sealant to the hose connection thread. Tighten the nipple into the tee with a pipe wrench for a leak-tight connection.



Figure 12

Typical return bend installation,
straight outlet sprinkler.

The Viking flexible sprinkler hose includes a slip nut on both ends for attachment to the branch line fitting and the sprinkler outlet fitting that is secured in the ceiling support system as shown in Figure 11. The hose is attached after it has been formed into the proper installation shape to eliminate having to rotate the hose when threading onto fittings. A rubber seal over both ends of hose makes the leak-tight sealed connections by hand-tight assembly, plus 1/4 turn to tighten to approximately 75 in-lbs of torque.

Step 4: Insure proper length of flexible hose from the branch line connection to the sprinkler location (Figure 12). Insure that the maximum number of specified bends, with the minimum bend radius, are adhered to. A radius tool is available, which provides a minimum bend radius of 3" (75 mm) (part number 14402) for LPCB or a minimum bend radius of 4" (102 mm) (part number 15450) for cULus. **NOTE: A larger minimum radius of 12" (305 mm) is required for FM Approvals.** To minimize friction loss, a large bend radius is recommended; however it must be a smooth, constant radius. Note that the radius of the flex hose must NOT fall in the non-corrugated ends.



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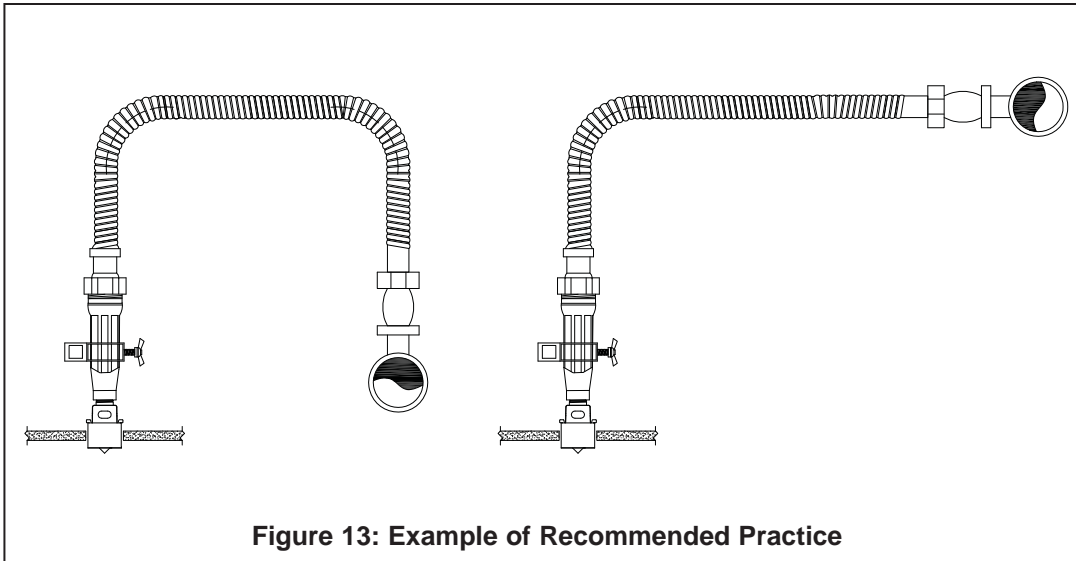


Figure 13: Example of Recommended Practice

Avoid long lengths of hose for the distance, as this would require more bends to install, possibly including low spots or kinks. Excessive numbers of bends will not properly drain and can cause severe pressure loss.

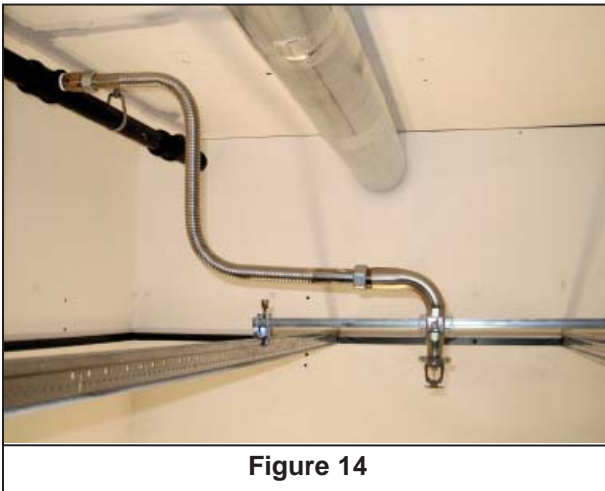


Figure 14

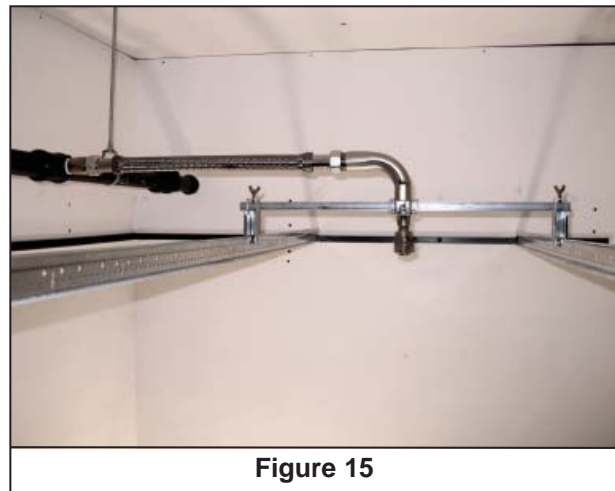


Figure 15

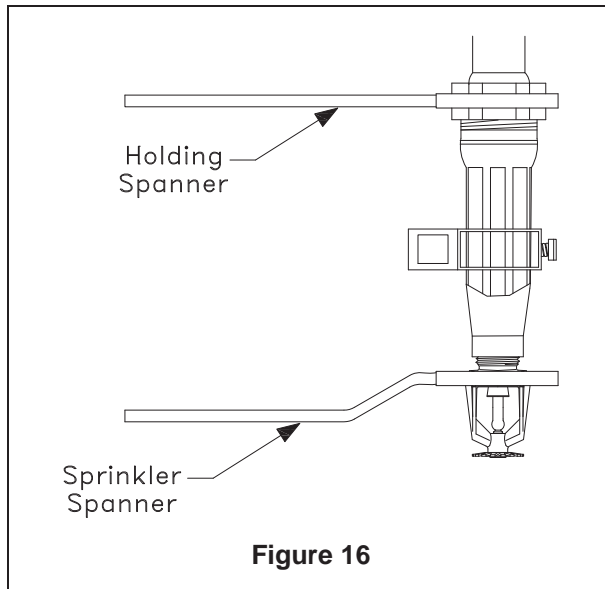
For routing flexible hose around obstructions, it is important to select the proper outlet fitting and length based on the type of obstruction routing required. Minimizing the number of bends must be adhered to as well as the minimum recommended bend radii and the discharge location from the branch piping. See Figure 13 for illustration of recommended practice. Figures 14 and 15 illustrate different use of fittings.

Fast Track Construction: When pre-installation requires the branch lines to be installed before sprinkler location is known (especially where the sprinkler is located close to the branch line) it is suggested to offset the outlet from the estimated sprinkler location by at least 12" (305 mm). This allows proper alignment of the flexible hose with a minimum bend radius as recommended.

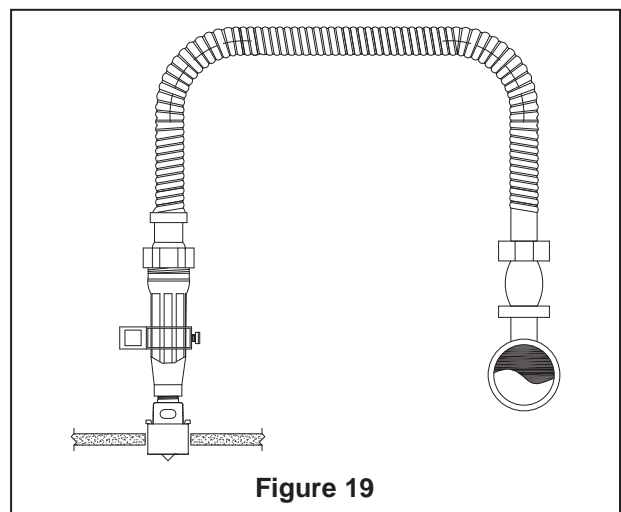
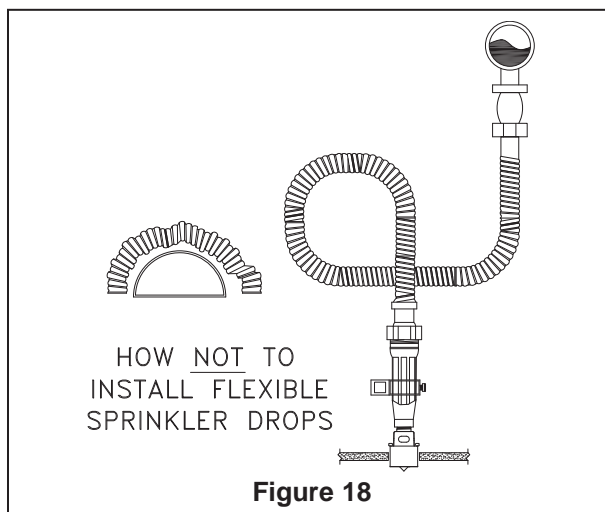
Step 5: Install the desired sprinkler head to the outlet reducer. Apply non-hardening thread sealant or Teflon® tape to the male threads of the sprinkler head. Refer to Figure 16 and tighten the sprinkler in the outlet reducer using the appropriate sprinkler head wrench. Assemble one end of the flexible hose to the reducer shoulder thread (Figure 17) and hand tighten, then tighten 1/4 turn to approximately 75 in-lbs of torque so as to not cut or crush the O-ring provided in the hose assembly.

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Step 6: Properly form the required bend radii around bend tool or cylindrical formed object or pipe, to provide constant and smooth radius (Figure 18), and align the hose for connection to the special shoulder nipple installed in the sprinkler system branch line tee. Refer to Figure 19. First, attach the hose slip nut onto the shoulder nipple fitting hand tight, plus 1/4 turn to tighten to approximately 75 in-lbs of torque. **DO NOT** use sealant compound on the shoulder nipple threads. Next, properly form the flexible hose, forming the proper number of bends and minimum bend radius to align with the sprinkler outlet reducer. Attach the slip nut of the flexible hose to the sprinkler outlet reducer hand tight, same as above. **DO NOT** apply sealant to this thread, as the O-ring makes the seal. See Step 4 for suggested methods of proper hose alignment methods and examples of improper methods.



Step 7: After checking alignment of the sprinkler with the clearance hole and flush positioning with the finished ceiling surface, verify that all wing screws and the hose slip nuts are secure. The outlet reducer support bracket screw should be tightened to 75 in-lbs and the rail support bracket screws are to be tightened to 20 in-lbs. Test the system for leaks per the hydrostatic test procedure of the applicable edition of NFPA 13, EN12845, or other local installation standard.



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III. TECHNICAL FEATURES

- Hose diameter: 25 mm (Model VKFD25U) or 28 mm (Models VKFD28B and VKFD28U) outside diameter
- Lengths available 27-9/16" (700 mm), 39-3/8" (1,000 mm), 47-3/16" (1,200 mm)*, 59" (1,500 mm), and 71" (1,800 mm).
- Inlet 1" NPT, 1-1/4" NPT, 1" BSPT, or 1-1/4" BSPT** male pipe threads.
- 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.
- Stainless steel braided exterior or non-braided corrugated plain hose. Corrugated tube is annealed after forming to insure relief of all material stresses and removal of all scale.
- Maximum working pressure: 200 PSI (13.8 bar)
- Maximum ambient temperature: 225 °F (197 °C) with EPDM seal, 300 °F (149 °C) for FM.
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: 3" (75 mm) for LPCB/Apsad/LPCB, 4" (102 mm) for cULus, and 12" (305 mm) for FM.
- Intended for use in both wet and dry systems.
- Maximum sprinkler K-factor: 5.6 U.S. (80 metric) for the 1/2" outlet (Model VKFD28), 8.0 U.S. (115.2 metric) for the 1/2" outlet (Model VKFD25), 14.0 U.S. (202 metric) for the 3/4" outlet.
- Approvals: Model VKDF25U-cULus. Model VKFD28B-FM, LPCB, Apsad, and CNBOP. Model VKFD28U-LPCB, Apsad, and CNBOP.
- Approved for use in suspended ceilings with intermediate and heavy duty systems designed per ASTM C635 and C636.
- Compatible with Viking CPVC BlazeMaster® sprinkler systems.
- Meets NFPA 13, NFPA 13D, NFPA 13R, EN, and LPC guidelines.
- Intended for use in wet or dry systems.

*Available with Models VKFD28B and VKFD28U only.

**1-1/4" inlet not available with Model VKFD25U.

IV. MATERIALS

Flexible Tube: AISI 304 or UNS-S30400 Stainless Steel

Braid (when used): AISI 304 or UNS-S30400 Stainless Steel

Outlet Reducer (straight or angled): SPPS Steel (ASTM A53 EA) with yellow zinc plating

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

Seal: EPDM

Slip Nut: C3771BC Brass [or SS41 Steel (ASTM A283 D) with zinc plating for the cULus unbraided version]

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

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

V. PRODUCT NUMBERING SYSTEM

FM Approved Model VKFD28B (Braided) Sprinkler Flex Drops Offered 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. 15178-10: 1" BSPT x 1/2" x 1,000 mm (39-3/8") length, straight outlet, braided

Part No. 15178-15: 1" BSPT x 1/2" x 1,500 mm (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

Part No. 15179-10: 1" BSPT x 3/4" x 1,000 mm (39-3/8") length, straight outlet, braided

Part No. 15179-15: 1" BSPT x 3/4" x 1,500 mm (59") length, straight outlet, braided

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



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LPCB/CNBOP/Apsad Approved Model VKFD28 Sprinkler Flex Drops Offered as Stock Assemblies:

To order one assembly, two part numbers are required. The first part number refers to the box of hoses and support bars and the second part number refers to the fittings:

Hoses - Box of 10 including 10 hoses and 10 support bars

TABLE 1A: LPCB/CNBOP/APSAD APPROVED MODEL VKFD28		
Length	Braided	Unbraided
700 mm	VKFD-B1H	VKFD-B1G
1000 mm	VKFD-B1C	VKFD-B1A
1200 mm	VKFD-B1F	VKFD-B1E
1500 mm	VKFD-B1D	VKFD-B1B

Fittings - Box including 10 inlet nipples, 10 outlet nipples, 10 outlet brackets, 20 rail clips and associated bolts

TABLE 1B: LPCB/CNBOP/APSAD APPROVED MODEL VKFD28			
Part No.	Rail Clip	Inlet	Outlet
VKFD-B2	Short	1"/DN25	1/2"
VKFD-B3	Short	1"/DN25	3/4"
VKFD-B4	Short	1-1/4"/DN32	1/2"
VKFD-B5	Short	1-1/4"/DN32	3/4"
VKFD-B6	Tall	1"/DN25	1/2"
VKFD-B7	Tall	1"/DN25	3/4"
VKFD-B8	Tall	1-1/4"/DN32	1/2"
VKFD-B9	Tall	1-1/4"/DN32	3/4"

Kits Available to Convert to Angle Outlet and for Larger Ceiling Tiles:

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 (Part Number 14398/10) 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 2: KITS AVAILABLE TO CONVERT TO ANGLE OUTLET MODEL VKFD28B AND VKFD28U ONLY	
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



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The Following Kits are Available for Replacement Components:

TABLE 3: REPLACEMENT COMPONENTS - MODEL VKFD28		
Description	FM PART NO.	FM, LPCB, CNBOP, APSAD PART NO.
1/2" outlet nipple	14382	14382
3/4" outlet nipple	14383	14383
25-9/16" (650 mm) long support bar	14397	14397
49-3/16" (1,250 mm) long support bar	14398	14398
FM short rail bracket	14387	--
FM short rail clip	14388	--
FM short rail clip support	14409	--
LPCB short clip	--	49000528
FM tall rail bracket	14389	--
FM tall rail clip	14390	--
FM tall rail clip support	14408	--
LPCB tall clip	--	49000703
Wing bolts for FM rail clips (short and tall)	14401	--
Wing bolts for LPCB rail clip (short and tall)	--	41200013
Standard side bolt for LPCB short clip	--	49000528
Wing side bolt for LPCB tall clip	--	41200012
FM outlet bracket	14391	--
FM outlet bracket rectangle nut	14411	--
Wing bolt for FM outlet bracket	14400	--
LPCB outlet bracket	--	49000471
Wing bolt for LPCB outlet bracket	--	41200013
EPDM seals	14386	14386



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Model VKFD25U (Unbraided cULus Version) Flexible Sprinkler Drops Offered 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" x 39-3/8" length, straight outlet, unbraided

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

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

The Following Kits are Available for Replacement Components:

TABLE 4: KITS AVAILABLE FOR REPLACEMENT COMPONENTS - MODEL VKFD25U UNBRAIDED	
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 standard sprinkler outlet bracket (12) / package
14391	Outlet reducer support bracket (10) / package
16040	Inlet nipple (10) / package



TECHNICAL DATA

MODEL VKFD25 & VKFD28 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

Friction Loss Data:

TABLE 5A: MODEL VKFD28B BRAIDED FLEXIBLE SPRINKLER DROPS FRICTION LOSS DATA FOR FM WITH 12" (305 mm) MINIMUM BEND RADIUS (1/2" OUTLET)						
Part Numbers		Outlet Type (Straight or 90° Angle)	Hose Length with Fittings	Equivalent Length of FM 1" Schedule 40 Pipe (ft.)	Equivalent Length of FM 1" Schedule 40 Pipe (m)	Maximum Number of 90° Bends Allowed**
NPT	BSPT					
14350-10	15178-10	1/2"	39-3/8" (1,000 mm)*	18.2 ft	5.5 m	1
14350-15	15178-15		59" (1,500 mm)*	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.
 **Applies for FM Approval only; for LPCB requirements, refer to Table 5C.

TABLE 5B: MODEL VKFD28B BRAIDED FLEXIBLE SPRINKLER DROPS FRICTION LOSS DATA FOR FM WITH 12" (305 mm) MINIMUM BEND RADIUS (3/4" OUTLET)						
Part Numbers		Outlet Type (Straight or 90° Angle)	Hose Length with Fittings	Equivalent Length of FM 1" Schedule 40 Pipe (ft.)	Equivalent Length of FM 1" Schedule 40 Pipe (m)	Maximum Number of 90° Bends Allowed**
NPT	BSPT					
14351-10	15179-10	3/4"	39-3/8" (1,000 mm)*	15.5 ft	4.7 m	1
14351-15	15179-15		59" (1,500 mm)*	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.
 **Applies for FM Approval only; for LPCB requirements, refer to Table 5C.

TABLE 5C: MODEL VKFD28B BRAIDED FLEXIBLE SPRINKLER DROPS FRICTION LOSS DATA FOR LPCB WITH 3" (75 mm) MINIMUM BEND RADIUS (1/2" OR 3/4" OUTLET)						
Length (mm)	Part Numbers	Outlet Size (Straight or 90° Angle)	Hose Length with Fittings	Average Equivalent Length of 1" Schedule 40 Pipe (ft.)	Average Equivalent Length of 1" Schedule 40 Pipe (m)	Maximum Number of 90° Bends Allowed**
1,000	VKFD-B1C	1/2" or 3/4"	39-3/8" (1,000 mm)*	19.12 ft	5.8 m	3
1,500	VKFD-B1D	1/2" or 3/4"	59" (1,500 mm)*	28.8 ft	8.78 m	3

*Indicates standard Viking offering. Other hose lengths are available-contact Viking Technical Services at 877-384-5464 for friction loss data.
 **A 90° elbow (if used) is considered one 90° bend. Applies for LPCB Approval only; for FM requirements, refer to Tables 5A and 5B.

TABLE 5D: MODEL VKFD25U UNBRAIDED FLEXIBLE SPRINKLER DROPS FRICTION LOSS DATA FOR cULus WITH 4" (102 mm) MINIMUM BEND RADIUS (1/2" OR 3/4" OUTLET)					
Part Numbers	Outlet Size (Straight)	Hose Length with Fittings (inches)	Equivalent Length of UL 1" Schedule 40 Pipe (ft.)	Equivalent Length of UL 1" Schedule 40 Pipe (m)	Maximum Number of 90° Bends Allowed**
16038-10	1/2"	39-3/8*	52 ft	15.8 m	2
16135-10	3/4"	39-3/8*	57 ft	17.4 m	2
16038-15	1/2"	59*	78 ft	23.8 m	3
16135-15	3/4"	59*	88 ft	26.8 m	3

*Indicates standard Viking offering. Other hose lengths are available-contact Viking Technical Services at 877-384-5464 for friction loss data.
 **Applies for cULus Listing only; for LPCB requirements for Model VKFD28U, refer to Table 5E.

	TECHNICAL DATA	MODEL VKFD25 & VKFD28 FLEXIBLE SPRINKLER DROPS
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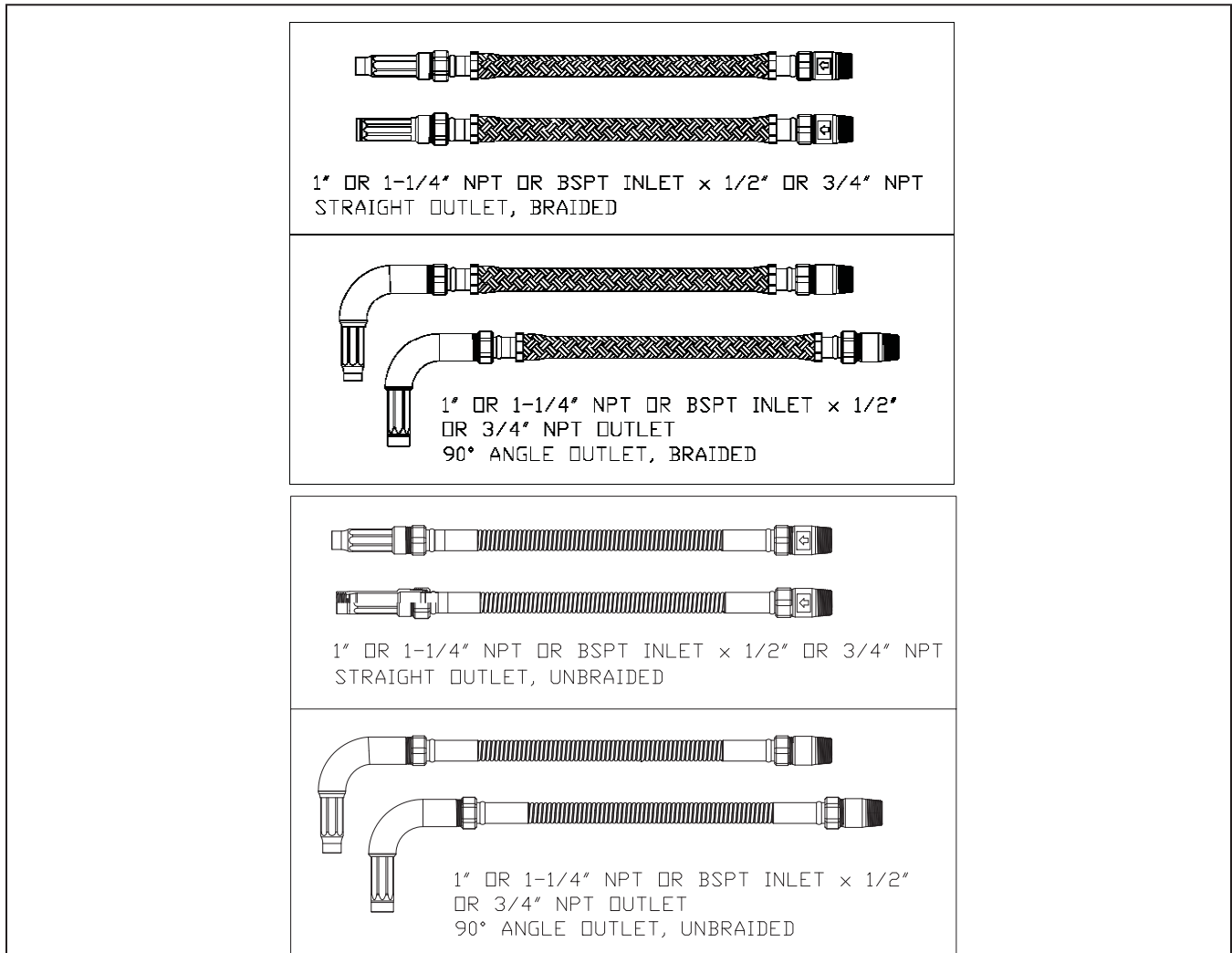
TABLE 5E: MODEL VKFD28U UNBRAIDED FLEXIBLE SPRINKLER DROPS FRICTION LOSS DATA FOR LPCB WITH 3" (75 mm) MINIMUM BEND RADIUS (1/2" OR 3/4" OUTLET)					
Length (mm)	Part Numbers	Outlet Size (Straight or 90° Angle)	Hose Length with Fittings	Equivalent Length** of 1" Schedule 40 pipe	Maximum Number of 90° Bends Allowed**
1,000*	VKFD-B1A	1/2" or 3/4"	39-3/8" (1,000 mm)*	19.12 ft (5.8 m)	3
1,500*	VKFD-B1B	1/2" or 3/4"	59" (1,500 mm)*	28.8 ft (8.78 m)	3

*Indicates standard Viking offering. Other hose lengths are available-contact Viking Technical Services at 877-384-5464 for friction loss data.
 **Equivalent length is for a straight hose with one 90° bend. A 90° outlet elbow (if used) is considered one 90° bend.
 **Applies for LPCB Approval only; for cULus requirements for Model VKFD25U, refer to Table 5D.

VI. HOSE ASSEMBLY CONFIGURATIONS

Includes:

1. Braided or unbraided hose
2. Outlet fitting straight
3. Outlet size 1/2" or 3/4" NPT
4. Inlet connection 1" NPT or BSPT, or 1-1/4" NPT or BSPT



NOTE: Angle style outlet reducer not available for Model VKFD25U.

	TECHNICAL DATA	MODEL VKFD25 & VKFD28 FLEXIBLE SPRINKLER DROPS
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VII. COMPONENTS



Short Rail Support Package (Standard)

Includes (2) ea. of the following:

Short Bracket	P/N 14387
Short Rail Clip	P/N 14388
Short Rail Clip Support	P/N 14409



Tall Rail Support Package (Standard)

Includes (2) ea. of the following:

Tall Bracket	P/N 14389
Tall Rail Clip	P/N 14390
Tall Rail Clip Support	P/N 14408



Short Rail Support Package (LPCB, Apsad, and CNBOP)

LPCB Short Clip	P/N 49000528
Wing Bolt for LPCB Clip	P/N 41200013
Standard Side Bolt for LPCB Clip	P/N 49000528



Tall Rail Support Package (LPCB, Apsad, and CNBOP)

LPCB Tall Clip	P/N 49000703
Wing Bolt for LPCB Clip	P/N 41200013
Wing Side Bolt for LPCB Clip	P/N 41200012



TECHNICAL DATA

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Outlet Reducer Support Bracket (Standard)

Includes (1) per assembly:

Outlet Reducer Support Bracket	P/N 14391
with Rectangle Nut	P/N 14411
	(shipped separate)



Outlet Reducer Support Bracket (LPCB only)

Outlet Reducer Support Bracket	P/N 49000471
Wing Bolt for LPCB Outlet Bracket	P/N 41200013



Support Bar

Includes (1) per assembly.

Standard is 25-9/16" (650 mm) long for 2 ft. rail spacing.

If 4 ft. spacing is required, special order 49-3/16" (1,250 mm) long support.

Support Bar 25-9/16" (650 mm) long P/N 14397

Support Bar 49-3/16" (1,250 mm) long P/N 14398



Inlet Fitting

1" NPT, 1" BSPT, 1-1/4" NPT, or 1-1/4" BSPT x flex hose thread and seal shoulder:

For VKFD28B and VKFD28U:

Inlet Fitting 1" NPT	P/N 14378
Inlet Fitting 1-1/4" NPT	P/N 14380
Inlet Fitting DN25, 1" BSPT	P/N 14379
Inlet Fitting DN32, 1-1/4" BSPT	P/N 14381

For VKFD25U

Inlet Fitting 1" NPT	P/N 16040
Inlet Fitting 1" BSPT	P/N 16041

NOTE: 1-1/4" inlet not available for Model VKFD25U.

	TECHNICAL DATA	MODEL VKFD25 & VKFD28 FLEXIBLE SPRINKLER DROPS
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Outlet Reducer

Straight with 1/2" NPT female outlet:

For VKFD28B and VKFD28U:

1/2" NPT Outlet P/N 14382

For VKFD25U:

1/2" NPT Outlet P/N 16042



Outlet Reducer

Straight with 3/4" NPT female outlet:

For VKFD28B and VKFD28U:

3/4" NPT Outlet P/N 14383

For VKFD25U:

3/4" NPT Outlet P/N 16137



Outlet Reducer

Angled 90° with 1/2" NPT female thread:

1/2" NPT Angle Outlet P/N 14384

NOTE: Angle style outlet not available for Model VKFD25U.



Outlet Reducer

Angled 90° with 3/4" NPT female thread:

3/4" NPT Angle Outlet P/N 14385

NOTE: Angle style outlet not available for Model VKFD25U.



TECHNICAL DATA

MODEL VKFD25 & VKFD28 FLEXIBLE SPRINKLER DROPS

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Wing Bolts

M6 x 15 mm for outlet reducer support bracket

(1) per standard assembly: P/N 14400

(3) per LPCB assembly: P/N 41200013 (also for rail clips)

M6 x 20 mm for standard rail support brackets

(2) per standard assembly: P/N 14401

OR

M6 x 25 mm for LPCB tall rail clips

(2) per LPCB assembly: P/N 41200012

Bolts (not shown)

M6 x 1" (25 mm) for LPCB short clips

(2) per LPCB assembly: P/N 41000113



Bend Radius Gauge Tool

(Optional-order separately)

3" Radius Gauge Tool (LPCB) P/N 14402

4" Radius Gauge Tool (cULus) P/N 15450



Fixed Radius Clip

(Optional-order separately)

3" Radius Clip (LPCB) P/N 15913

4" Radius Clip (cULus) P/N 14403



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Each Carton for Model VKFD28B (FM Approved version) or VKFD25U (cULus Listed version) Includes (10) Complete Assemblies with the Following Components:

- (10) Flexible hose assemblies, length as specified.
- (10) Outlet reducer, straight or angled, ½" or ¾" as specified.
- (10) Inlet fittings, 1" or 1-1/4" NPT as specified*.
- (10) Outlet reducer support brackets.
- (10) Rectangle nuts for standard outlet bracket.
- (12) M6 x 5/8" (15 mm) long wing bolts.
- (20) Short rail bracket packages, including brackets, clips, and clip supports.
- (20) Tall rail bracket packages, including brackets, clips, and clip supports.
- (25) M6 x 3/4" (20 mm) long wing bolts (for rail brackets)
- (10) 5/8" (16 mm) rectangular x 25-9/16" (650 mm) long support bars.
- (1) Set of Installation Instructions.

*1-1/4" inlet and angle style outlet reducer not available for Model VKFD25U.

Each Carton for Model VKFD28 (LPCB/Apsad/CNBOP Approved version only) Includes (10) Complete Assemblies with the Following Components:

NOTE: 2 boxes must be ordered. The box of hoses and support bars includes:

- (10) Flexible hose assemblies, length as specified.
- (10) 5/8" (16 mm) rectangular x 25-9/16" (650 mm) long support bars.
- (1) Set of Installation Instructions.

The box of fittings includes:

- (10) Outlet fittings, straight or angled, ½" or ¾" as specified.
- (10) Inlet fittings, 1" or 1-1/4" NPT or BSPT as specified.
- (10) Outlet reducer support brackets.
- (20) Short or tall rail clip packages as specified
- (30) M6 x 5/8" (15 mm) long wing bolts
- (20) M6 x 1" (25 mm) long wing bolts or fixing bolts

Available to Order Separately:

- Optional 3" Bend Radius Gauge Tool Part No. 14402
- Optional 4" Bend Radius Gauge Tool Part No. 15450
- Optional 3" Fixed Radius Clip Part No. 15913
- Optional 4" Fixed Radius Clip Part No. 14403

Standard Product Stocked by Viking and SupplyNet:

(See standard product offering as indicated in the Flexible Sprinkler Drop Assembly technical data page for braided.)