Trusted above all.

FSX-A Deluge Valve Set

Electric and Hydraulic Activation

FSX-A deluge valve set

Protect high-risk occupancies by providing large amounts of water

Deluge systems provide total flooding to an area through a system of piping and open nozzles or sprinklers. The system piping is empty until the deluge valve is activated by a hydraulic, electric or manual release system.

Deluge systems may be used to protect high-risk occupancies by providing large amounts of water to defined areas or by cooling surfaces to prevent deformation or structural collapse.

If foam additives are required, then these can be added to a deluge system with the addition of foam proportioning equipment.

Mode of activation

Electric activation
Electric activation of the deluge valve set is accomplished by means of a detection system, which triggers the solenoid valve in the event of fire. The solenoid valve opens, the pressure in the deluge valve control chamber drops and the nozzle pipe work will be flooded.

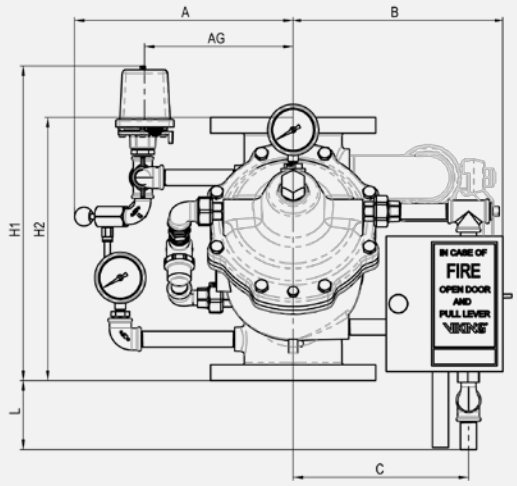
Electric activation with PORV
In case of a power failure the PORV valve ensures that the valve remains open and water continues to flow.

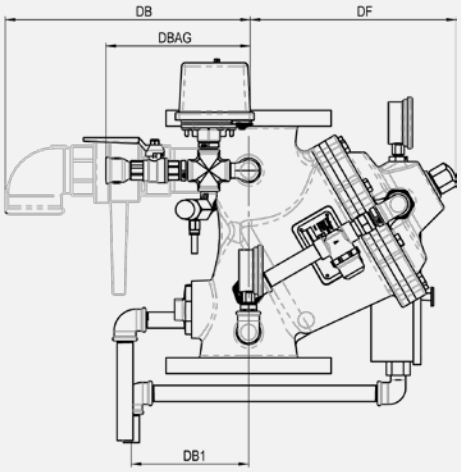
Remote activation
Removing the PORV option allows the valve to be opened ***and closed*** remotely from the valve.

Hydraulic activation
For hydraulic activation a pilot line is directly connected to the control chamber of the deluge valve. The system pressure of the water supply permanently charges the pilot line. Should a pilot sprinkler release, the pressure in the control chamber drops and the deluge valve opens.

Manual activation
All FSX-A valves are equipped with a ball valve inside the emergency release box for manual activation.

Dimensional drawings and measurements - FSX-A





	DN50/2”	DN80/3”	DN100/4”	DN150/6”	DN200/8”
A	310	320	290	320	355
AG	220	220	200	220	250
B	220	270	280	315	415
C	220	225	235	260	305
L	150	120	90	15	10
H1	400	410	420	500	575 or < H2
H2	280	310	350	480	600
DF max.	210	250	280	335	450
DB max.	210	245	330	325	325
DBAG	190	190	190	190	190
DB1	140	150	160	170	180
Weight (valve without trim)	15kg	23kg	37kg	61kg	133kg

Dimensions in mm

Friction loss information

Nominal diameter		EN 10220	Equivalent length		Schedule 40	Equivalent length		Friction loss @ 6m/s	
		mm	m	ft	mm	m	ft	bar	psi
DN50	2”	60.3x2.6	4.65	15.26	60.3x3.91	3.67	12.04	0.33	4.65
DN80	3”	88.9x2.9	10.63	34.87	88.9x5.49	7.77	25.49	0.48	6.77
DN100	4”	114.3x3.2	21.96	72.05	114.3x6.02	16.91	55.48	0.74	10.43
DN150	6”	168.3x4.0	34.98	114.70	168.3x7.11	28.83	94.59	0.74	10.43
DN200	8”	219.1x4.5	41.39	135.76	219.1x8.18	34.78	114.11	0.65	9.17

At a glance

Material of the deluge valve:

Housing	Ductile iron
Valve seat	Brass
Piston rod	Stainless steel
Valve disk	Brass
Diaphragm	NBR fiber-reinforced
Gaskets	NBR
Finish	RAL 3000 primer & varnish

Approvals	UL
Nominal diameter	DN50 / 2", DN80 / 3", DN100 / 4", DN150 / 6", DN200 / 8"
Max. operating pressure	17.2 bar / 250 PSI
Flange connection sizes	ANSI B16.5 CLASS 150 / DIN ISO in acc. with DIN EN 1092 (PN16)
Installation position	Vertical (horizontal without UL available on request)
Medium	Fresh water / foam water mixture
Operating temperature	4°C / 39°F up to 60°C / 140°F
Alarm	Alarm switch with changeover contact 1 NO contact, 1 NC contact
Activation	Electric 24 V DC 2/2-way solenoid valve / hydraulic activation (sprinkler) / manual activation

Examples of typical applications:

- Protection of machinery
- Industrial presses
- Transformer stations
- Tank system cooling
- Cable ducts
- Recycling systems
- Painting systems
- Theatre stages
- Petrochemical facilities
- Power plants
- Gas storage tanks
- Flammable materials storage

Features & advantages:

- Light weight
- Compact design reduces space requirement
- Corrosion-resistant internal parts
- Low pressure losses
- No water hammer due to diaphragm cushioned closing action
- Field replaceable diaphragm and rubber seals
- Suitable for high flow rates
- Functional and pressure tests of the valve set conducted by the manufacturer
- Designed to be reset without opening the valve
- Flexible options: you only choose what you really need
- Simple one-step self-priming operation
- Cost-effective solution for UL-listed applications

c UL US LISTED

ENGINEERED AND MANUFACTURED IN GERMANY

For further information, please contact your local Viking sales office or refer to the technical documentation.
The contents of this publication are subject to modifications without notice.

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L1.2.6/0814/en_ME • PB31We_01/08.14

Trusted above all.

Viking Middle East | LOB 19 Office # 2506 | Post Box No. 17531 | Jebel Ali Free Zone | Dubai - U.A.E. | T: +971 4 8895 561 | vikingdubai@vikingcorp.com
Viking S.A. *(ed.)* | Z.I. Haneboesch | L-4562 Differdange/Niederkorn | Luxembourg | T: +352 58 37 37 1 | vikinglux@vikingcorp.com | www.viking-emea.com

FIREKING

VIKING

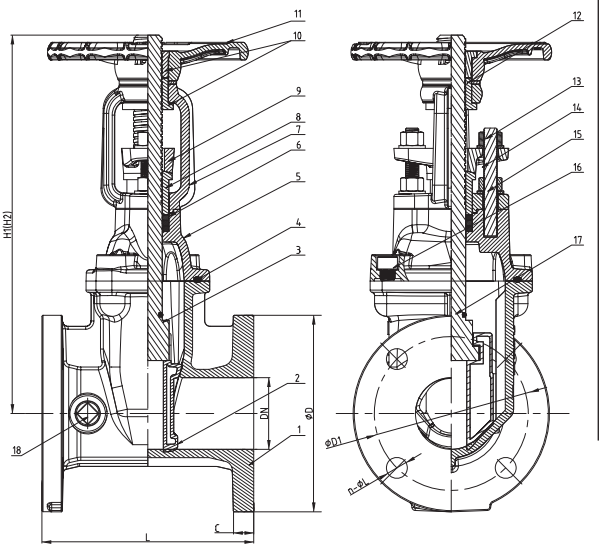
Outside Screw and Yoke (OS&Y) Gate Valve - Flanged

OSF

Control Valves

Technical Features

- **Sizes available (Nominal)** : 2"/DN50, 2½"/DN65, 3"/DN80, 4"/DN100, 5"/DN125, 6"/DN150, 8"/DN200, 10"/DN250 and 12"/DN300
- **Pressure data** : Working pressure : 300 psi (21 bar)
- **Seat type** : Resilient wedge
- **Finish** : Fusion bonded epoxy coated internal and external
- **Connections** : Flange diameter and thickness according to ANSI B16.1 Class 125, EN1092-2 PN10 or EN1092-2 PN16
- **Specifications** : Design and dimensions conform to AWWA C515.
- **Features** : Pre-notched, stainless steel stem for easy attachment of supervisory switch
- **Note** : Size 5" is only UL listed



FM APPROVED

c UL us LISTED

Outside Screw and Yoke (OS&Y) Gate Valve - Flanged - OSF

Physical Data

Nominal Pipe Size		Dimensions (mm)											Reference*			Weight (kg)
inch	Metric	L	H1 (Closed)	H2 (Open)	D	C	D1			n-ØL			ANSI	PN10	PN16	
							ANSI	PN16	PN10	ANSI	PN16	PN10				
2"	**DN50**	178	348	400	152	16.0	120.7	125		4-Ø19.1			OSF-0200	OSF-0200PN		14.7
2½"	**DN65**	190	373	440	178	17.5	139.7	145		4-Ø19.1			OSF-0250	OSF-0250PN		17.7
3"	**DN80**	203	408	490	191	19.1	152.4	160		4-Ø19.1	8-Ø19.1		OSF-0300	OSF-0300PN		23.1
4"	**DN100**	229	471	573	229	19.1	190.5	180		8-Ø19.1	8-Ø19.1		OSF-0400	OSF-0400PN		31.6
5"	**DN125**	254	541	665	254	19.1	215.9	210		8-Ø22.2	8-Ø19.1		OSF-0500**	OSF-0500PN**		42.2
6"	**DN150**	267	601	755	279	19.1	241.3	240		8-Ø22.2	8-Ø23		OSF-0600			53.2
8"	**DN200**	292	774	975	343	22.2	298.5	295		8-Ø22.2	12-Ø23	8-Ø23	OSF-0800	OSF-0800PN10	OSF-0800PN16	91.3
10"	**DN250**	330	939	1193	406	23.8	362.0	355	350	12-Ø25.4	12-Ø28	12-Ø23	OSF-1000	OSF-1000PN10	OSF-1000PN16	134.6
12"	**DN300**	356	1065	1370	483	25.4	431.8	410	400	12-Ø25.4	12-Ø28	12-Ø23	OSF-1200	OSF-1200PN10	OSF-1200PN16	200.0

* Valve flange drilling (size and location of bolt holes and pitch circle diameter) allows mating with the following flange types :

ANSI = ANSI B16.1 Class 125 | PN10 = DIN 2501, BS 4504, EN 1092 - PN10 | PN16 = DIN 2501, BS 4504, EN 1092 - PN16

** UL Listed only

Outside Screw and Yoke (OS&Y) Gate Valve - Flanged - OSF

Materials List

Item	Description	Material	Specification	Item	Description	Material	Specification
1	Valve Body	Ductile Iron	ASTM A536, 65-45-12	10	Stem Nut	Brass	HPb59-1
2	Wedge Disc	Ductile Iron	ASTM A536, 65-45-12 & EPDM	11	Handwheel	Ductile Iron	ASTM A536, 65-45-12
3	Stem	Stainless Steel	AISI 420	12	Washer	Brass	HPb59-1
4	Bonet Gasket	EPDM	Commercial	13	Gland Nut	Carbon Steel	Zinc Plated
5	Bonnet	Ductile Iron	ASTM A536, 65-45-12	14	Stud	Carbon Steel	Zinc Plated
6	Washer	Brass	HPb59-1	15	Flat Washer	Carbon Steel	Zinc Plated
7	Yoke	Ductile Iron	ASTM A536, 65-45-12	16	Bolt	Carbon Steel	Zinc Plated
8	Stem Bushing	Brass	HPb59-1	17	O-Ring	EPDM	Commercial
9	Gland	Ductile Iron	ASTM A536, 65-45-12	18	Plug	Bronze	ASTM B583 C89833

Datasheet Created 11-03-2015

Outside Screw and Yoke (OS&Y) Gate Valve - Flanged

OSF

Control Valves

Installation

1. Piping systems and valves should be thoroughly cleaned and free from ingress of foreign materials.
2. Visually inspect the valve seating and ports for cleanliness immediately prior to installation.
3. All valves should be independently supported against movement and stress from the connected piping system.
4. Ensure that the valve pressure rating is compatible with service conditions.
5. Operate the valve at least once from the open to closed position.
6. Verify that packing nuts are tight before pressurizing the system.
7. Gate valves are not suitable for throttling applications.
8. Gate valves should be installed in the vertical position on horizontal pipework and in the horizontal position on vertical pipework.

Operation

Gate valves are manually operated multi-turn valves and are opened by a handwheel or other operating device, generally in a counter clockwise direction and then closed clockwise.

Closing Torque for Gate Valve Handwheel		
Size		Closing Torque Nm
2″	DN50	27
2½″	DN65	38
3″	DN80	71
4″	DN100	102
5″	DN125	122
6″	DN150	149
8″	DN200	203
10	DN250	251
12″	DN300	305

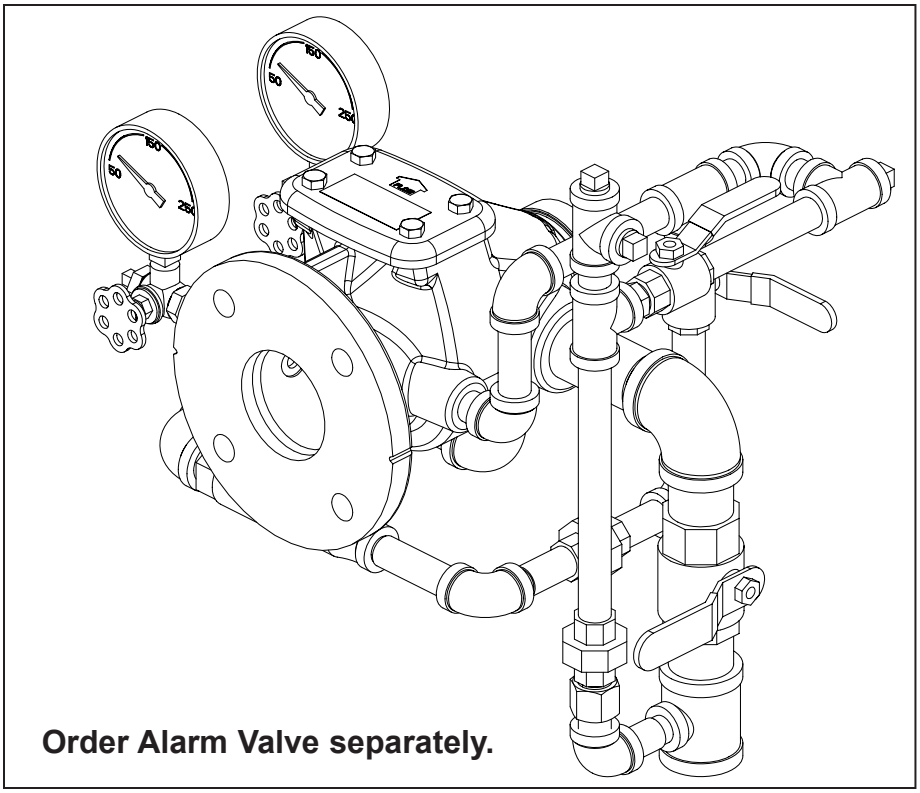
Inspection and Maintenance

1. Valves should be inspected periodically and should be cycled to prevent buildup of foreign materials in the piping system and valve body.
2. In the event of a packing leak adjust the packing nuts to increase pressure on the stem packing. Packing nuts should be tightening evenly approximately a quarter turn in a clockwise direction.
3. Always shut down the system before repacking the valve. Valves are designed with backseats for repacking under pressure but this is not recommended.

11-03-2015 Datasheet Created

TECHNICAL DATA

MODEL J-1
ALARM CHECK VALVE
HORIZONTAL TRIM



Order Alarm Valve separately.

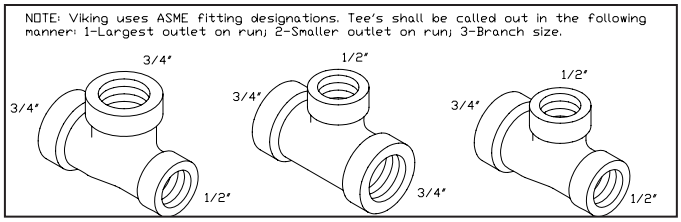
This Trim Chart is for use with the following Viking Trim Sets		
Valve Size	**Galvanized**	**Brass**
3” (DN80)	08763	11432
4” (DN100)	08765	11433
6” (DN150)	08767	11434
8” (DN200)	08769	11435

WARNING: Cancer and Reproductive Harm- www.P65Warnings.ca.gov

NOTES: For use with Trim Chart on page 28 b.

General Notes:

- Valve must be trimmed as shown. Any deviation from trim size or arrangement may affect the proper operation of the valve.
- All pipe, 3/4” (20 mm) and smaller, shall be galvanized steel except when other materials are specified in the technical data for the system used. All trim components must be listed for up to 300 PSI (20.7 bar) Water Working Pressure.
- Dimensions in parentheses are millimeter.
- Viking uses ASME fitting designations. Tee’s shall be called out in the following order: 1 - largest outlet on run; 2 - Smaller outlet on run; 3 - Branch size.



Note 1: When using a water motor alarm, a strainer is required. Circuit closer vent trim may be required when an alarm pressure switch is used. (See technical data for the retard chamber.)

Note 2: This location may be used for optional pressure relief valve (not available from Viking). Install 3/4” (20 mm) tee and listed pressure relief valve.

Note 3: To supply an optional excess pressure pump (not available from Viking and not a listed assembly), replace ½” ell marked “A” with a tee. Replace 3/4” ell marked “B” with a tee to connect outlet from excess pressure pump. Do not exceed listed water working pressure rating of system components. Perform hydrostatic tests in accordance with recognized Installation Standards.

Note 4: Location for non-interruptible pressure switch. When waterflow through the alarm valve occurs, supply to this location cannot be shut off until water flow through the alarm valve stops. **Caution -** Non-interuptable alarm port may only be used on systems with constant pressure. A retard chamber may not be installed on the non-interuptable alarm port.

Note 5: Component specified is included in Viking trim sets; do not substitute. Use of components other than specified will void any listings and approvals and may affect operation of the valve.

Note 6: 300 PSI (20.7 bar) water pressure gauges are provided with trim. 600 PSI (41.4 bar) water pressure gauges are available. Order separately when needed*. Refer to current Viking Price Book.

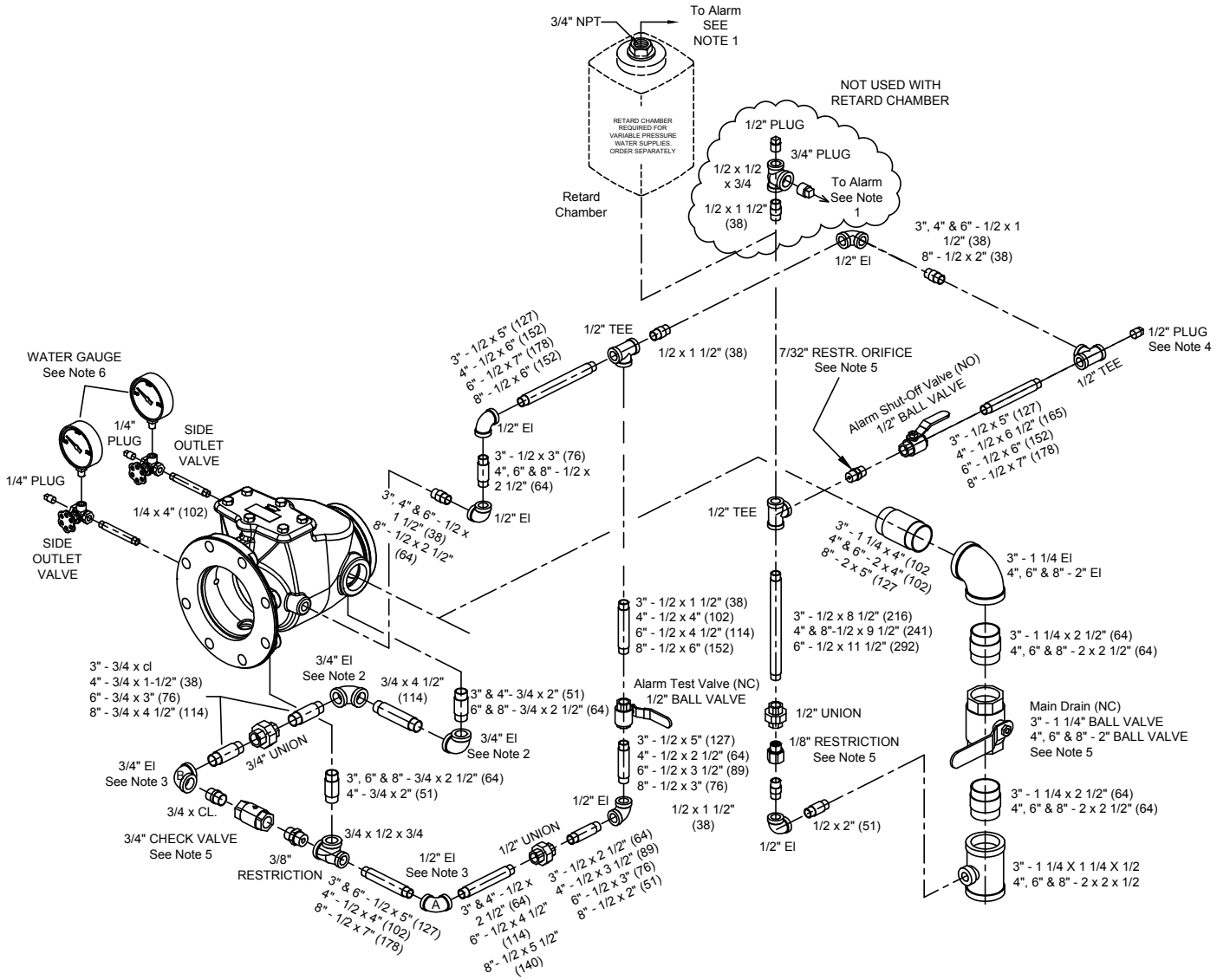
* NFPA 13 requires gauges to have a minimum limit not less than twice the normal water working pressure at the point where the gauges are installed. When normal water working pressure exceeds 150 PSI (10.3 bar), order 600 PSI (41.4 bar) water pressure gauges separately.

VIKING®

TECHNICAL DATA

MODEL J-1
ALARM CHECK VALVE
HORIZONTAL TRIM

Available since 1997



Order Alarm Valve separately.

Refer to page 28a for Notes

VIKING®

TECHNICAL DATA

MODEL J-1
ALARM CHECK VALVE
HORIZONTAL TRIM

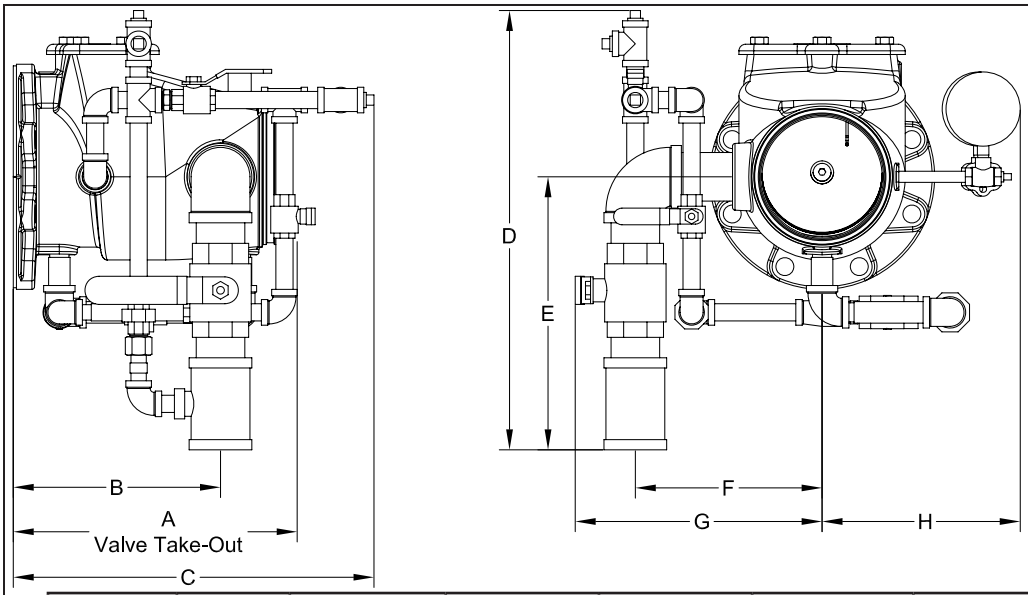


Figure 2 - Dimensions for Constant Pressure Water Supply

Size	A	B	C	D	E	F	G	H
3" (DN80)	10-3/16" (259)	7-1/4" (184)	13-15/16" (354)	18-11/16" (475)	10-1/16" (256)	7-3/4" (197)	9-7/8" (251)	8-5/16" (211)
4" (DN100)	10-5/8" (270)	7-3/8" (187)	15" (381)	21-1/2" (545)	13-3/8" (339)	8-3/8" (213)	9-15/16" (252)	8-11/16" (221)
6" (DN150)	13-3/8" (340)	10-1/8" (257)	17-5/8" (448)	21-1/2" (545)	13-3/8" (339)	9-1/8" (232)	12-1/16" (306)	9-11/16" (246)
8" (DN200)	17" (432)	8-5/16" (210)	17" (432)	21-1/2" (545)	13-3/8" (339)	11-1/2" (292)	14-7/16" (367)	10-11/16" (271)

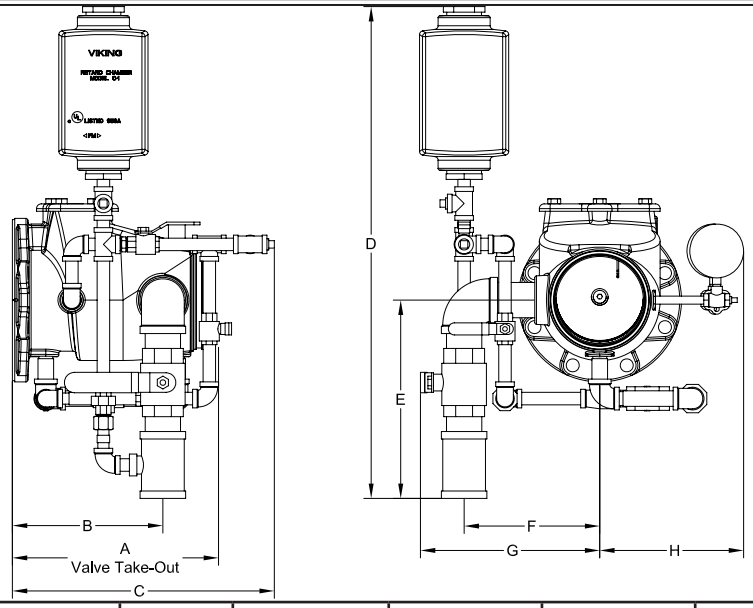


Figure 3 - Dimensions for Variable Pressure Water Supply

Size	A	B	C	D	E	F	G	H
3" (DN80)	10-3/16" (259)	7-1/4" (184)	13-15/16" (354)	27-5/16" (694)	10-1/16" (256)	7-3/4" (197)	9-7/8" (251)	8-5/16" (211)
4" (DN100)	10-5/8" (270)	7-3/8" (187)	15" (381)	31-3/8" (796)	13-3/8" (339)	8-3/8" (213)	9-15/16" (252)	8-11/16" (221)
6" (DN150)	13-3/8" (340)	10-1/8" (257)	17-5/8" (448)	31-3/8" (796)	13-3/8" (339)	9-1/8" (232)	12-1/16" (306)	9-11/16" (246)
8" (DN200)	17" (432)	8-5/16" (210)	17" (432)	31-3/8" (796)	13-3/8" (339)	11-1/2" (292)	14-7/16" (367)	10-11/16" (271)

VIKING®

TECHNICAL DATA

FRAME STYLE SPRAY NOZZLES

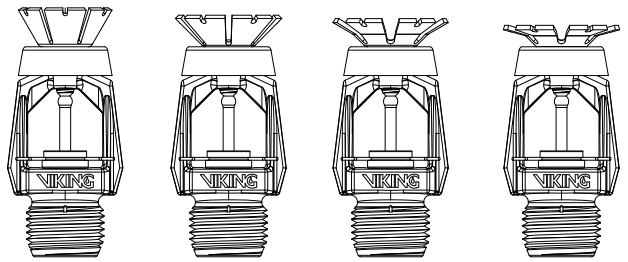
The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

1. DESCRIPTION

Viking Frame Style Spray Nozzles are small, directional spray nozzles for use on water spray systems. They are thermosensitive glass bulb style nozzles, however they may be ordered OPEN (glass bulb and pip cap assembly removed) for use on deluge systems.

These Frame Style Spray Nozzles are available in various finishes, temperature ratings, orifice sizes, and spray pattern discharge angles to meet design requirements. When spraying, the nozzles discharge a cone-shaped spray pattern. The deflector determines the included angle of spray pattern discharge. A special ring provides uniform distribution throughout the spray pattern.

Other features include the small frame, which allows proper nozzle positioning even in congested areas, and the nominal 3 mm glass bulb contained entirely inside the frame for protection from most mechanical damage. The glass bulb operating elements are resistant to more corrosive atmospheres than metal elements. The special Teflon® coating has been investigated for installation in corrosive atmospheres and is cULus listed as corrosion resistant as indicated in the Approval Chart.



60° **90°** **120°** **150°**

Nozzles are shown with deflectors in the upright position for clarity. May be installed in any position to meet design requirements.

2. LISTINGS AND APPROVALS

cULus Listed: Category VGYZ

NYC Approved: MEA 89-92-E, Volume 29

NOTE: International approval certificates are available upon request. Refer to the Approval Chart on page 31d and Design Criteria on page 31e for cULus listing requirements that must be followed.

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.

3. TECHNICAL DATA

Specifications:

Minimum Operating Pressure: 7 PSI (0.5 bar)
Rated to 175 PSI (12 bar) water working pressure.
Factory tested hydrostatically to 500 PSI (34.5 bar)
Refer to page 31e-i for spray patterns.
Frame Style Spray Nozzles are available in various orifice sizes. The smallest nozzle passage is 1/4" (6 mm) for Part Nos. 16964-16967; 5/16 (8 mm) for Part Nos. 16960-16963; 3/8" (10 mm) for Part Nos. 16956-16959; 7/16" (11 mm) for Part Nos. 16952-16955; 1/2" (13 mm) for Part Nos. 16948-16951.
The spray nozzle deflector is identified with the U.S. K-Factor, spray angle, and temperature rating.
Thread size: 1/2" (15 mm) NPT
Nominal K-Factors: Refer to the Approval Chart
Glass-bulb fluid temperature rated to -65 °F (-55 °C)
Overall Length: Refer to the Approval Chart

Spray Nozzle Material Standards:

Frame Casting: Brass UNS-C84400
Deflector: Copper UNS-C19500
Ring: Copper UNS-C19500
Bulb: Glass, nominal 3 mm diameter
Belleville Spring Sealing Assembly: Nickel Alloy, coated on both sides with Teflon Tape
Screw: Brass UNS-C36000
Bushing (Small Orifice Nozzles): Brass UNS-C36000
Pip Cap: Brass UNS-C31600

Replaces page 31a-e, dated April 16, 2010. (New part numbers, changed 5 mm bulb to 3 mm, removed SIN numbers, revised pip cap material, replaced image.)

VIKING®

TECHNICAL DATA

FRAME STYLE SPRAY NOZZLES

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

For Teflon® Coated Nozzles: Belleville Spring-Exposed, Screw-Nickel Plated (painted black for appearance only), Pip Cap-Teflon® Coated

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

Order Frame Style Spray Nozzles by selecting the appropriate part number from the Approval Chart. Add the appropriate suffix for the nozzle finish and then the appropriate suffix for the temperature rating to the spray nozzle base part number.

Finish Suffix: Brass = A, Black Teflon® = N

Temperature Suffix (°F/°C): 135°/57° = A, 155°/68° = B, 175°/79° = D, 200°/93° = E, 286°/141° = G, OPEN = Z.

For example, a 60° Spray Nozzle, 5.6 K-Factor with a Brass finish and a 155 °F/68 °C temperature rating = Part No. 16948AB

Available Finishes And Temperature Ratings:

Refer to Table 1.

Accessories: (Also refer to the "Sprinkler Accessories" section of the Viking data book.)

Spray Nozzles Wrenches:

A. Standard Wrench: Part No. 10896W/B (available since 2000).

B. Wrench for coated spray nozzles: Part No. 13577W/B** (available since 2006)

**A ½" ratchet is required (not available from Viking).

Sprinkler Cabinets:

A. Six-head capacity: Part No. 01724A (available since 1971)

B. Twelve-head capacity: Part No. 01725A (available since 1971)

4. INSTALLATION

WARNING: Viking Frame Style Spray Nozzles are manufactured and tested to meet the rigid requirements of the approving agency. The nozzles are designed to be installed in accordance with recognized installation standards. Deviation from the standards or any alteration to the nozzle after it leaves the factory including, but not limited to: painting, plating, coating, or modification, may render the unit inoperative and will automatically nullify the approval and any guarantee made by The Viking Corporation.

TABLE 1: AVAILABLE SPRINKLER TEMPERATURE RATINGS AND FINISHES

Sprinkler Temperature Classification	Sprinkler Nominal Temperature Rating[1]	Maximum Ambient Ceiling Temperature[2]	Bulb Color
Ordinary	135 °F (57 °C)	100 °F (38 °C)	Orange
Ordinary	155 °F (68 °C)	100 °F (38 °C)	Red
Intermediate	175 °F (79 °C)	150 °F (65 °C)	Yellow
Intermediate	200 °F (93 °C)	150 °F (65 °C)	Green
High	286 °F (141 °C)	225 °F (107 °C)	Blue

Sprinkler Finishes: Brass and Black Teflon®

Corrosion-Resistant Coatings[3]: Black Teflon®

Footnotes

[1] The sprinkler 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] The corrosion-resistant coating has passed the standard corrosion test required by the approving agencies indicated in the Approval Chart. These tests cannot and do not represent all possible corrosive environments. Prior to installation, verify through the end-user that the coating is compatible with or suitable for the proposed environment. For automatic spray nozzles, the coating is applied to the exposed exterior surfaces only. Note that the spring is exposed on sprinklers with Teflon® coatings. For Teflon® coated open spray nozzles only, the waterway is coated.

VIKING®

TECHNICAL DATA

FRAME STYLE SPRAY NOZZLES

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

Approval Chart

Frame Style Spray Nozzles[2]

Open or Automatic

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

Base Part Number[1] (Specify Open or Automatic)	Pattern	Thread Size		Nominal Orifice		Nominal K-Factor		Overall Length		Listings and Approvals[4] (Refer also to Design Criteria on page 31d.)	
		NPT	BSP	Inches	mm	U.S.	metric[3]	Inches	mm	cULus[5]	NYC[6]
1/2" (13 mm) Orifice											
16948	60°	1/2"	15 mm	1/2"	13 mm	5.6	80.6	2-11/16	68.3	A1, B1	A1, B1
16949	90°	1/2"	15 mm	1/2"	13 mm	5.6	80.6	2-9/16	65.1	A1, B1	A1, B1
16950	120°	1/2"	15 mm	1/2"	13 mm	5.6	80.6	2-17/32	64.3	A1, B1	A1, B1
16951	150°	1/2"	15 mm	1/2"	13 mm	5.6	80.6	2-1/2	63.5	A1, B1	A1, B1
7/16" Orifice[7]											
16952	60°	1/2"	15 mm	7/16"	--	4.2	57	2-11/16	68.3	A1, B1	A1, B1
16953	90°	1/2"	15 mm	7/16"	--	4.2	57	2-9/16	65.1	A1, B1	A1, B1
16954	120°	1/2"	15 mm	7/16"	--	4.2	57	2-17/32	64.3	A1, B1	A1, B1
16955	150°	1/2"	15 mm	7/16"	--	4.2	57	2-1/2	63.5	A1, B1	A1, B1
3/8" (10 mm) Orifice[7]											
16956	60°	1/2"	15 mm	3/8"	10 mm	2.8	40.3	2-11/16	68.3	A1, B1	A1, B1
16957	90°	1/2"	15 mm	3/8"	10 mm	2.8	40.3	2-9/16	65.1	A1, B1	A1, B1
16958	120°	1/2"	15 mm	3/8"	10 mm	2.8	40.3	2-17/32	64,3	A1, B1	A1, B1
16959	150°	1/2"	15 mm	3/8"	10 mm	2.8	40.3	2-1/2	63.5	A1, B1	A1, B1
5/16" Orifice[7]											
16960	60°	1/2"	15 mm	5/16"	--	1.9	27.4	2-11/16	68.3	A1, B1	A1, B1
16961	90°	1/2"	15 mm	5/16"	--	1.9	27.4	2-9/16	65.1	A1, B1	A1, B1
16962	120°	1/2"	15 mm	5/16"	--	1.9	27.4	2-17/32	64.3	A1, B1	A1, B1
16963	150°	1/2"	15 mm	5/16"	--	1.9	27.4	2-1/2	63.5	A1, B1	A1, B1
1/4" Orifice											
16964	60°	1/2"	15 mm	1/4"	--	1.4	20.2	2-11/16	68.3	A1, B1	A1, B1
16965	90°	1/2"	15 mm	1/4"	--	1.4	20.2	2-9/16	65.1	A1, B1	A1, B1
16966	120°	1/2"	15 mm	1/4"	--	1.4	20.2	2-17/32	64.3	A1, B1	A1, B1
16967	150°	1/2"	15 mm	1/4"	--	1.4	20.2	2-1/2	63.5	A1, B1	A1, B1

Approved Temperature Ratings

A - 135 °F (57 °C), 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), and 286 °F (141 °C)
B - Open (glass bulb and pip cap removed)

Approved Finishes

1 - Brass and Black Teflon® for use on water-based deluge and water spray systems.

Footnotes

[1] Base part number is shown. When ordering, specify either open or automatic. For complete part number, see current Viking price schedule.

[2] The spray nozzle deflector is identified with the U.S. K-Factor, spray angle, and temperature rating.

[3] Metric K-factor shown is for use when pressure is measured in bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.

[4] This chart shows the listings and approvals available at the time of printing. Other approvals may be in process. Check with the manufacturer for any additional approvals.

[5] Listed by Underwriters Laboratories Inc. for use in the U.S. and Canada.

[6] Accepted for use, City of New York Department of Buildings, MEA 89-92-E, Vol. 29.

[7] The orifice is bushed.

VIKING®

TECHNICAL DATA

FRAME STYLE SPRAY NOZZLES

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

DESIGN CRITERIA

(Also refer to the Approval Chart on page 31c.)

cULus Listing Requirements:

Frame Style Spray Nozzles are small, directional spray nozzles for use on water spray systems. Refer to the installation standards, such as NFPA 13, for minimum water supply requirements, nozzle pressure, and installation guidelines.

IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. Viking frame style spray nozzles are to be installed in accordance with the latest edition of Viking technical data, the appropriate 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 Approval Chart on page 31c shows listings and approvals of Frame Style Spray Nozzles for use on water spray systems and water based deluge systems. The chart shows listings and approvals available at the time of printing. Other approvals are in process. Check with the manufacturer for any additional approvals.

A. **Spray nozzles are to be installed in accordance with the latest edition of Viking technical data, the latest published 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 Frame Style Spray Nozzles may be limited due to occupancy and hazard. Refer to the Authority Having Jurisdiction prior to installation.**

B. Frame Style Spray Nozzles are installed on fixed fire protection systems, such as deluge systems, where total flooding is required.

C. Handle sprinklers and spray nozzles with care. They must be stored in a cool, dry place in their original shipping container. Never install a sprinkler or spray nozzle that has been dropped, damaged, or exposed to temperatures exceeding the maximum ambient temperature allowed (refer to Table 1 below).

D. Never install any glass-bulb sprinkler if the bulb is cracked or if there is a loss of liquid from the bulb. A small air bubble should be present in the glass bulb. Any sprinkler with a loss of liquid from the glass bulb or damage to the fusible element should be destroyed immediately.

E. Corrosion-resistant sprinklers and spray nozzles must be installed when subject to corrosive atmospheres. When installing corrosion resistant nozzles, take care not to damage the corrosion resistant coating.

F. Spray nozzles must be installed after the piping is in place to prevent mechanical damage.

G. Sprinklers and spray nozzles must be protected from mechanical damage. Where open sprinklers are used, care must be taken to prevent foreign materials from entering the orifice. Foreign materials may accumulate and restrict or plug the waterway and may prevent proper operation of the spray nozzle.

H. Before installing, be sure to have the appropriate sprinkler model and style, with the correct K-Factor, temperature rating, and response characteristics. When installing automatic (closed) Frame Style Spray Nozzles, proceed to paragraphs I, J, and K below.

1. **When installing open Frame Style Spray Nozzles:** Hydrostatic testing must be completed prior to spray nozzle installation. Install plugs in place of spray nozzles for test purposes only. In areas where leakage during testing must be prevented, system piping may be air tested prior to testing with water. Refer to the appropriate installation standard and the Authority Having Jurisdiction. When hydrostatic testing is complete, verify that all test plugs have been removed. Proceed to paragraphs I and K below. Omit paragraph J.

I. **For Automatic (closed) and Open Frame Style Spray Nozzles:** Before installing, be sure to have the appropriate model and style, with the correct orifice size, temperature rating, and response characteristics. Frame Style Spray Nozzle deflectors are identified with the U.S. K-Factor, spray angle, and temperature rating.

1. Apply a small amount of pipe-joint compound or tape to the external threads of the spray nozzle only, taking care not to allow a build-up of compound inside the inlet.
2. Install the nozzle on the fixed piping, using the special sprinkler/spray nozzle wrench only. Take care not to over-tighten or damage the spray nozzle operating parts. DO NOT use the deflector to start or thread the unit into a fitting.

J. **For automatic (closed) spray nozzle installations:** After installation, the entire fixed pipe system must be tested. The test must be conducted to comply with the installation standards. Make sure the spray nozzle 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. In areas where leakage during testing must be prevented, system piping may be air tested prior to testing with water. Refer to the appropriate installation standard and the Authority Having Jurisdiction.

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

K. **For Automatic (closed) and Open Frame Style Spray Nozzles:** Spray nozzles must be protected from mechanical damage. Where open spray nozzles are used, care must be taken to prevent foreign materials from entering the orifice. Foreign materials may accumulate and restrict or plug the waterway and may prevent proper operation of the spray nozzle. Wet pipe systems must be provided with adequate heat. When installing Frame Style Spray Nozzles on dry systems, refer to the Installation Guides and the Authority Having Jurisdiction.

5. OPERATION

During fire conditions, the heat-sensitive liquid in the glass bulb expands, causing the bulb to shatter, releasing the pip cap and sealing spring assembly. Water flowing through the orifice strikes the special deflector to direct a specific spray pattern toward the surface covered.

6. INSPECTIONS, TESTS AND MAINTENANCE

NOTICE: Refer to NFPA 25 for Inspection, Testing and Maintenance requirements. **NOTICE:** The owner is responsible for having the fire-protection system and devices inspected, tested, and maintained in proper operating condition in accordance with this guide, and applicable NFPA standards. In addition, the Authority Having Jurisdiction may have additional maintenance, testing, and inspection requirements that must be followed.

A. Sprinklers and spray nozzles must be inspected on a regular basis for corrosion, mechanical damage, obstructions, paint, etc. Where open spray nozzles are installed, verify that foreign materials (such as dust, dirt, etc.) do not restrict or plug the waterway. Frequency of inspections may vary due to corrosive atmospheres, water supplies, and activity around the device.

B. Sprinklers or spray nozzles that have been filed painted, caulked, 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 NFPA 25 and the Authority Having Jurisdiction for the specified period of time after which testing and/or replacement is required. Never attempt to repair or reassemble a sprinkler. Sprinklers that have operated cannot be reassembled or re-used, but must be replaced. When replacement is necessary, use only new sprinklers with identical performance characteristics.

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.
   1. Remove the system from service, drain all water, and relieve all pressure on the piping.
   2. Use the special sprinkler wrench to remove the old sprinkler by turning it counterclockwise to unthread it from the piping.
   3. Install the new sprinkler unit by following the instructions in section 4. INSTALLATION. Care must be taken to ensure that the replacement sprinkler is the proper model and style, with the correct K-Factor, temperature rating, and response characteristics. A fully stocked spare sprinkler cabinet should be provided for this purpose.

E. 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

The Viking Frame Style Spray Nozzles 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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TECHNICAL DATA

RETARD CHAMBER
MODEL C-1

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services 877-384-5464 Fax: 269-945-4495 Email: techsvcs@vikingcorp.com

1. DESCRIPTION

The Viking Model C-1 Retard Chamber is a surge tank used with Viking Alarm Check Valves to reduce the possibility of false alarms due to changes in the water supply pressure.

Features

1. Ductile iron body
2. Self draining
3. Required Accessories:
   a. P/N 01611A - 1/8 inch (3,2 mm) Drain Restriction (included in Viking Alarm Check Valve Trim Sets designed for use with “variable pressure” water supplies).
4. Optional Accessories:
   a. P/N 01973A - Circuit closer vent assembly (Required when an electric Alarm Pressure Switch is installed without a Water Motor Alarm.)
   b. Alarm Devices: A Water Motor Alarm and/or electric Alarm Pressure Switch, with approved connected alarms, are required for a complete system.

2. LISTINGS AND APPROVALS

UL Listed - VPLX
C-UL Listed - VPLX7
FM Approved - Waterflow Alarm Valves
New York City Board of Standards and Appeals - Calendar Number 219-76-SA
VdS Approved - Wet Alarm Valve Stations
LPC Approved

3. TECHNICAL DATA

Specifications:

Water Working Pressure: For UL & C-UL - Rated to 250 PSI (17.2 bar)
For FM & LPC - Rated to 175 PSI (12.1 bar)
Factory tested hydrostatically to: 500 PSI (34.5 bar).
Connections: ½” (15mm) NPT inlet and 3/4” (20mm) NPT outlet.
Capacity: 1 Gallon (4 Liters) Approx.

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.

Material Standards:

Body: Ductile Iron 65-45-12.
Bushings: Cast Iron UNS-F12102
Coating: Viking black E-coat Spec SPF02 W01

Ordering Information:

Part Number - 05904B
Shipping Weight - 22 Lbs. (10 kg.)
Available Since - 1986

4. INSTALLATION

1. The Retard Chamber and associated trim must be installed as shown on the Viking Alarm Check Valve Trim Sheets. The trim size and arrangement shown on Viking Trim Charts is required for proper operation.
2. Circuit Closer Vent Trim must be galvanized steel unless other materials are specified in the Technical Data for the system used.
3. The 1/8 inch Drain Restriction must be installed in the Retard Chamber drain piping. The alarm supply trim piping must be restricted as shown on Viking Alarm Check Valve Trim Charts. Model J-1 Alarm Check Valve trim requires a 7/32” Restricted Orifice (Part No. 06980A).
4. The Retard Chamber must drain automatically to a non-pressurized drain.
5. For the Retard Chamber to properly drain, it must be vented. This is normally accomplished through the Water Motor Alarm connection. However, when the line to the Water Motor is trapped or an electric Alarm Pressure Switch is used without the Water Motor Alarm, Circuit Closer Vent Trim must be installed and kept clean to allow the Retard Chamber to drain.
6. Verify that all system components are rated for the water working pressure of the system.

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TECHNICAL DATA

RETARD CHAMBER
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5. OPERATION

When the clapper of the Alarm Check Valve opens, water flows through the restricted alarm supply piping into the inlet of the Retard Chamber. The Retard Chamber begins to fill while simultaneously draining through the 1/8 inch (3,2mm) Drain Restriction.

During a sustained flow of water, the Retard Chamber fills faster than water can drain through the Drain Restriction. Pressurized water fills the Retard Chamber and pressurizes the Water Motor Alarm and/or Alarm Pressure Switch. Pressure surges insufficient to overcome the volume and drain capacity of the Retard Chamber will not activate an alarm. Two Retard Chambers may be installed in series to combat false alarms from systems subject to excessive pressure surges.

6. INSPECTION, TESTS AND MAINTENANCE

NOTICE: THE OWNER IS RESPONSIBLE FOR MAINTAINING THE FIRE PROTECTION SYSTEM AND DEVICES IN PROPER OPERATING CONDITION. THE VIKING MODEL C-1 RETARD CHAMBER AND ASSOCIATED PIPING MUST BE KEPT FREE OF FOREIGN MATTER, FREEZING CONDITIONS, AND PHYSICAL DAMAGE THAT COULD IMPAIR ITS OPERATION. THE FREQUENCY OF INSPECTIONS MAY VARY DUE TO CONTAMINATED OR CORROSIVE WATER SUPPLIES, CORROSIVE ATMOSPHERES, OR ACTIVITY AROUND THE DEVICE. ALARM DEVICES AND OTHER CONNECTED EQUIPMENT MAY REQUIRE MORE FREQUENT INSPECTIONS. REFER TO APPLICABLE CODES, SYSTEM DESCRIPTION, AND TECHNICAL DATA FOR THE EQUIPMENT USED.

After installation and prior to each Waterflow Alarm Test:

1. Verify that the Alarm Check Valve and Retard Chamber are trimmed exactly as shown on Viking Trim Sheets with no deviations. The trim size and arrangement is required for proper operation.
2. Inspect and clean the 1/8 inch (3,2 mm) Drain Restriction at least annually.

After each operation and Waterflow Alarm Test:

1. Verify that the Retard Chamber and alarm line piping has drained completely and associated alarm equipment has properly reset.
2. Refer to Technical Data for the Water Motor Alarm, Alarm Pressure Switch, and other associated equipment for additional testing and maintenance requirements.

WARNING: ANY SYSTEM MAINTENANCE INVOLVING PLACING A CONTROL VALVE OR ALARM SYSTEM OUT OF SERVICE MAY ELIMINATE THE FIRE PROTECTION CAPABILITIES OF THAT SYSTEM. PRIOR TO PROCEEDING, NOTIFY ALL AUTHORITIES HAVING JURISDICTION. CONSIDERATION SHOULD BE GIVEN TO EMPLOYMENT OF A FIRE PATROL IN THE AFFECTED AREAS.

For minimum maintenance requirements, refer to NFPA 25. In addition, the Authority Having Jurisdiction may have additional maintenance requirements that must be followed.

7. AVAILABILITY

The Viking Retard Chamber is available through a network of domestic and international distributors. See the Viking Corp. Web site for closest distributor or contact The Viking Corporation.

8. GUARANTEES

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

TECHNICAL DATA

RETARD CHAMBER
MODEL C-1

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services 877-384-5464 Fax: 269-945-4495 Email: techsvcs@vikingcorp.com

Figures 1 & 2 Notes

1. Connect alarm line piping to the 3/4" (20 mm) outlet of the Retard Chamber. When using a Water Motor Alarm, a strainer is required. When using an electric Alarm Pressure Switch only, or when the alarm line piping is trapped, Circuit Closer Vent Trim is required.
2. Items marked with * are included in the Viking Circuit Closer Vent Trim sets.

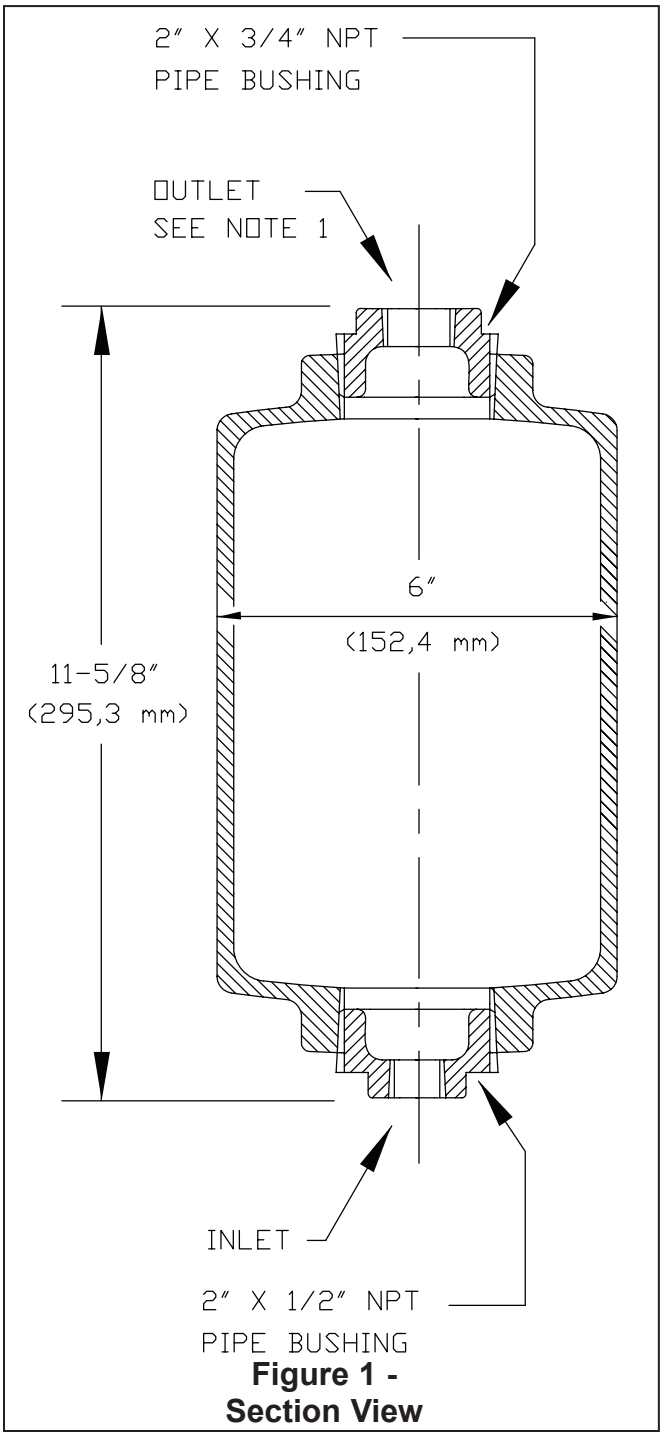

Figure 1 - Section View

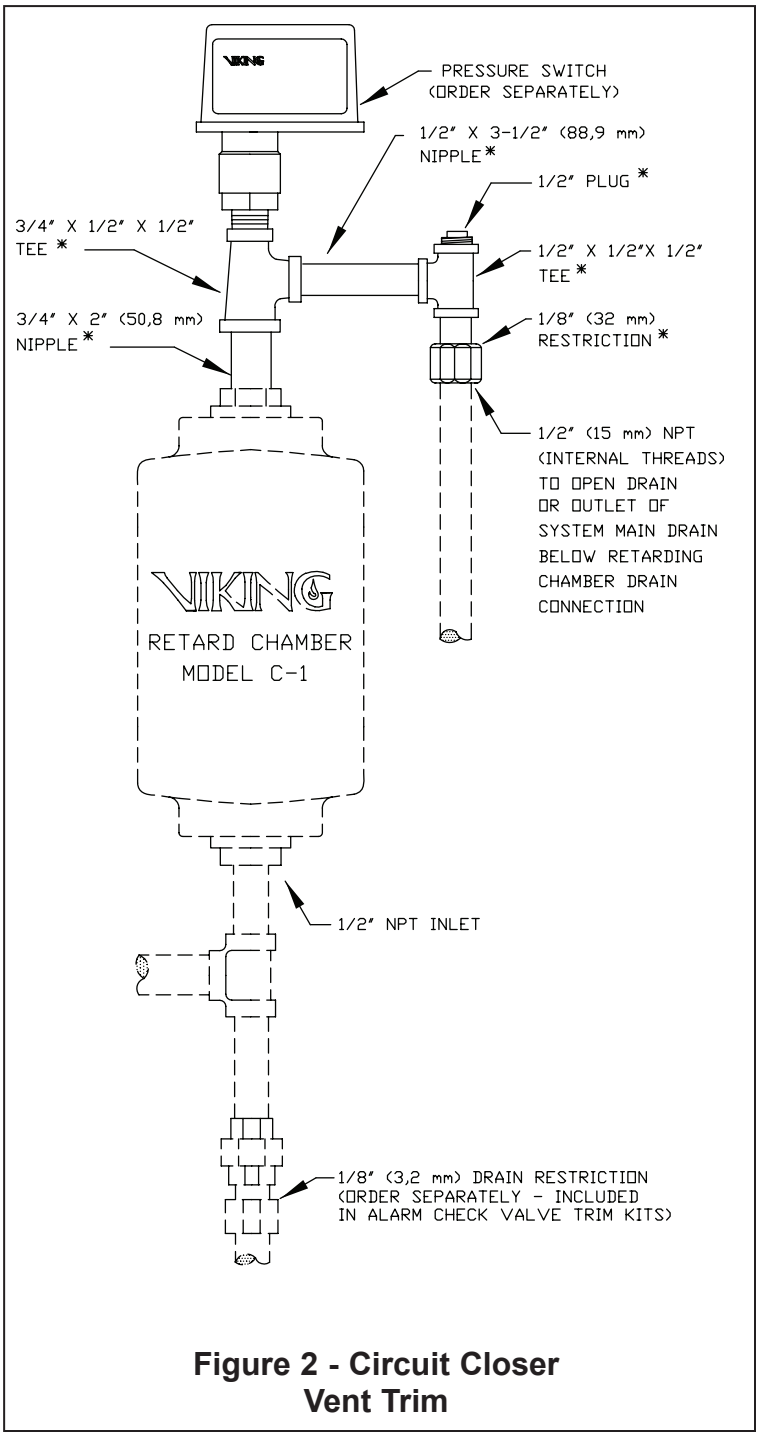

Figure 2 - Circuit Closer Vent Trim

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TECHNICAL DATA

WATER MOTOR ALARMS

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

The Viking water motor alarms are mechanical devices actuated by a flow of water. They are designed to sound a continuous alarm while a sprinkler system operates. An alarm is a required component of every sprinkler system having more than 20 sprinklers.

A. Features

1. The water motor alarms are tapped 3/4" NPT on the inlet and 1" NPT on the drain outlet.
2. The water motor alarm package includes a drive shaft 16-3/4" (425 mm) long for walls 14" (356 mm) thick or less. A special extension shaft is available for walls up to 30-1/4" (768 mm) thick.
3. The package also includes the required 3/4" (20 mm) NPT strainer for installation on the alarm line.
4. Rated water working pressure of Model F-2 is 250 PSI (17.2 bar).

B. Accessories: (order separately)

1. Extension Mounting Cup: Viking Part Number 05957B, Material: 14-Gauge Cold Rolled Steel, UNS-G10080, coated with black E-coat. The extension mounting cup is required when the wall thickness is less than 3" (76.2 mm). Refer to "INSTALLATION" instructions. See Figure 2.
2. Closure Plate: For use with Model F-2 only, Viking Part Number 05820B, Material: 16-Gauge Galvanized Steel, UNS-G10080. The closure plate is required when the Model F-2 Water Motor Alarm gong is mounted on an irregularly surfaced wall. It serves to prevent birds from entering the inside of the gong. The closure plate also serves as a mounting plate for sheet metal walls. Refer to "INSTALLATION" instructions. See Figure 2.
3. Special Extension Shaft: Viking Part Number 03312B, Material: Stainless Steel, UNS-S30400. The extension shaft is required when the F-2 or G-2 Water Motor Alarm is installed on walls from 14" (356 mm) to 30-1/4" (768 mm) thick.

2. LISTINGS AND APPROVALS

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.

Model F-2:

cULus Listed - VPLX
FM Approved - Water Motor Gongs
LPCB Approved
CE - Standard EN 12259-4, EC-certificate of conformity 1725-CPD-H0001
New York City Board of Standards and Appeals - Calendar No. 219-76-SA

Model G-2:

VdS
CE - Standard EN 12259-4, EC-certificate of conformity 1725-CPD-H0001

3. TECHNICAL DATA

Specifications

Available since 1991
Shipping Weight: Model F-2: 11 lbs. (5.0 kg); Model G-2: 13 lbs. (5.9 kg)
Water working pressure: Rated to 175 PSI (12 bar)

Material Standards (See Figure 3)

Viking E-coat Spec: SPF02 W01

Ordering Information

Model F-2, Viking Part No. 07862
Model G-2, Viking Part No. 07868

4. INSTALLATION

Locate the water motor on an exterior wall as close as practical to the valve being monitored for water flow. A 3/4" (20 mm) strainer (included) is required on the alarm line as close as possible to the alarm outlet of the valve being monitored for water flow (or outlet of the retard chamber, if used). The location must be easily accessible for cleaning.

A. Cut a 1-7/16" (36.5 mm) minimum to 1-5/8" (41.3 mm) maximum diameter hole in the building wall to accommodate the 3/4" (20 mm) galvanized spacer pipe. (Note: Spacer pipe is NOT included in Water Motor Alarm Package). The hole through the wall must be level or pitched slightly downward toward the water motor.
B. Measure the wall thickness.

Revised page replaces page 711a-d dated February 26, 2010.
(Replaced the UL logo with cULus and added the LPCB logo.)

TECHNICAL DATA

WATER MOTOR ALARMS

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

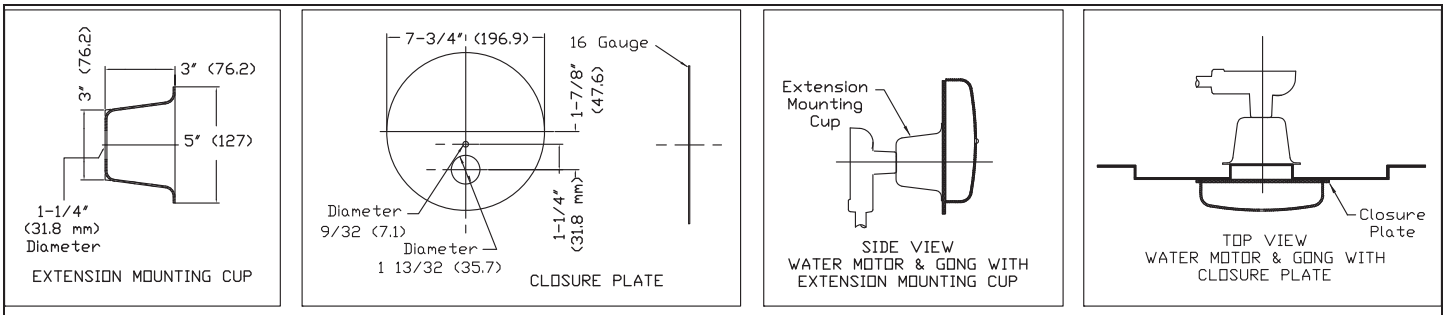


Figure 1: Accessories

C. Cut and thread the spacer pipe to a length equal to: The wall thickness minus 1" (25.4 mm). If the extension mounting cup is used, add an additional 3" (76 mm) to the spacer pipe.
D. Cut the drive shaft (10) to a length equal to: The total wall thickness plus 2-3/4" (70 mm). If extension mounting cup is used, add an additional 3" (76 mm).
E. File the drive shaft to provide a 3/32" (2.4 mm) x 450 chamfer on both corners of both ends. File off all burrs and insert the drive shaft into the hole of the striker arm shaft.
F. Slide the spacer pipe over the shaft and thread the end of the spacer pipe into the gong support assembly coupling (12).
G. Slide the closure plate (if used) over the free end of the spacer pipe, up to the back of the gong. If desired, the closure plate may be fastened to the gong support by using the 9/32" (7.14 mm) diameter hole in the gong support. Use only a flat or round headed fastener that will not interfere with striker arm movement.
H. Position the support assembly on the exterior wall surface by sliding the free threaded end of the spacer pipe into the hole from outside the building.
I. On the inside surface of the wall: Slide the wall plate provided (9), over the free threaded end of the spacer pipe. (If an extension mounting cup is used, place it over the end of the spacer pipe with the flared end toward the wall before sliding the wall plate into position).
J. Remove the plastic thread protectors from the threaded openings in the body of the water motor.
K. Attach the water motor assembly by threading the body (3) onto the free threaded end of the spacer pipe. The chamfered ends of the drive shaft allow it to slide into position as the water motor body is threaded onto the spacer pipe. When the assembly is properly tightened, the water motor should be positioned with the 1" (25 mm) NPT drain outlet facing downward and the

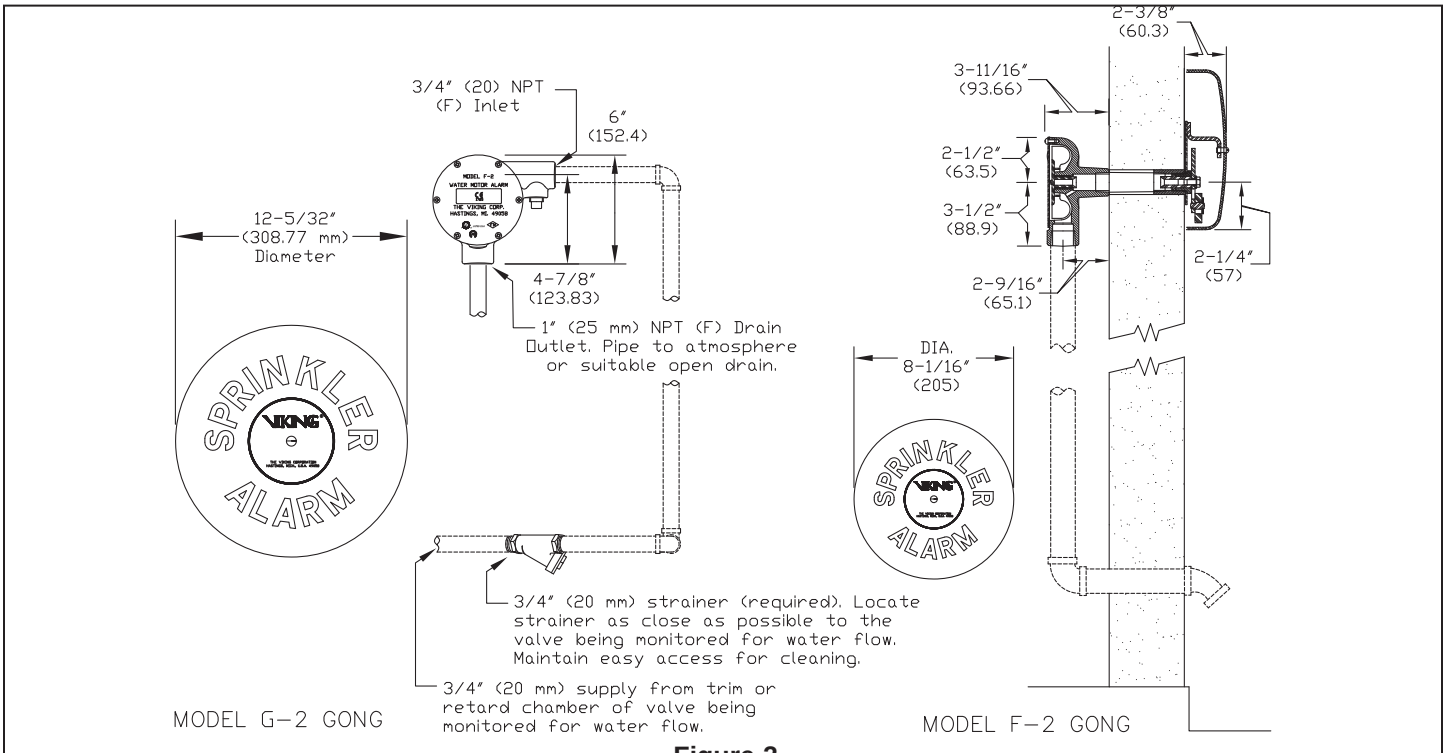


Figure 2

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

3/4" (20 mm) NPT alarm line inlet horizontal. See Figures 1 and 3.

L. Attach the gong, the flat washer, and the gong label (16, 17, and 18) to the gong support installed on the exterior surface of the wall, with the 5/16-18 x 12" (13 mm) screw (19). Note: The flat washer must be installed between the gong and the gong support (17).

M. With galvanized, brass, or other approved corrosion-resistant piping, not less than 3/4" (20 mm) diameter, connect the water motor inlet to the alarm outlet of the waterflow detecting device. A 3/4" (20 mm) strainer (included) is required on the alarm line as close as possible to the alarm outlet of the waterflow detecting device (or outlet of the retard chamber if used). The location must be easily accessible for cleaning.

N. The drain outlet of the impeller housing must discharge to an open drain. Care shall be taken to keep the drain line clean at all times.

O. Note: A water motor drain line that:
   1. Has too many fittings, and/or
   2. Has a very short length of pipe between the 1" (25 mm) outlet and the first elbow in the water motor drain pipe, and/or
   3. Is very long may result in slow drainage and reduced water motor speed. This condition can be remedied by increasing the drain pipe diameter, increasing the length of pipe to the first elbow, and/or pitching the pipe toward the discharge location.

5. OPERATION (See Figure 3)

When a sprinkler system is activated, water flows from the alarm outlet of the valve, through the 3/4" (20 mm) strainer and alarm line piping, into the inlet of the water motor. From the 1/8" inlet orifice, the water flows through a nozzle (4), which restricts the flow into a pressurized stream directed onto the impeller (7). Force from the water stream turns the impeller and drive shaft (10), causing the striker arm (20) to rotate. The striker (25) impacts against the gong (16), producing a continuous alarm. A minimum of 5 PSI (.34 bar) is required at the nozzle to cause a continuous alarm. When properly installed, the Model F-2 Water Motor Alarm produces the required 90 decibel output and the Model G-2 produces 100 decibels. After passing through the water motor, the water is discharged through a 1" (25 mm) drain outlet in the bottom of the impeller housing. The discharged water must be piped through the wall to atmosphere or to a suitable open drain.

6. INSPECTIONS, TESTS AND MAINTENANCE

Weather-resistant materials are used in the construction of the water motor alarm. At regular intervals, examine and test the water motor to ensure that the nozzle and drain line are clean and free of obstruction, and that the alarm functions properly. Also, at regular intervals and before disassembly of the water motor, clean and inspect the alarm line strainer located at the alarm outlet of the waterflow detecting device, or the outlet of the retard chamber, if used. (Note: Some retard chambers may be equipped with a strainer built in). For minimum maintenance and inspection requirements, refer to NFPA 25. In addition, the Authority Having Jurisdiction may have additional maintenance, testing, and inspection requirements that must be followed. Before proceeding with disassembly of the water motor alarm, notify the Authority Having Jurisdiction and occupants of the area covered by the system affected. Take all appropriate precautions. The water motor alarm will be disabled during disassembly.

A. Water Motor Disassembly (See Figure 3)

1. Isolate the water motor alarm by closing the alarm line valve in the trim of the waterflow detecting device. (Refer to appropriate technical data for the system used.)
2. Remove pipe plug (5).
3. Remove all round head machine screws (1) from the water motor cover.
4. Separate the cover (2) and the gasket (6) from the housing (3).
5. Remove the impeller (7).
6. Inspect and, if necessary, carefully clean the nozzle (4) with a wire or pipe cleaner brush.
7. Flush the nozzle way and drain line with water or compressed air.

B. Water Motor Re-Assembly

1. Re-install the pipe plug (5).
2. Re-install the impeller (7).
3. Replace cover gasket (6) and attach cover (2) by using round head machine screws (1).
4. Open the alarm line valve.
5. Test the water motor alarm.
6. When test is complete and water motor alarm operation is satisfactory, place the alarm line valve in the proper "alarm" position. Reset and return the affected systems to service.

7. AVAILABILITY

Viking Water Motor Alarms are available through a network of domestic and international distributors. See the Viking Corp. Web site for closest distributor or contact The Viking Corporation.

8. GUARANTEES

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

TECHNICAL DATA

WATER MOTOR ALARMS

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

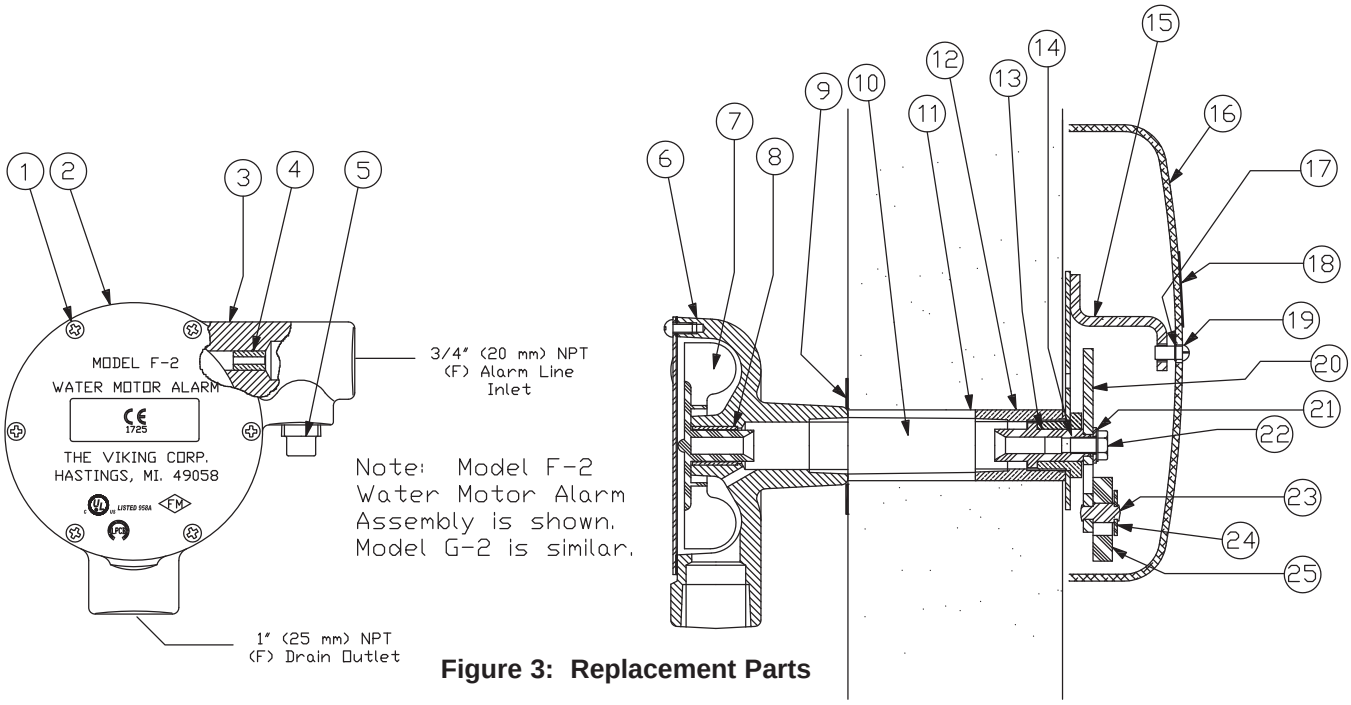


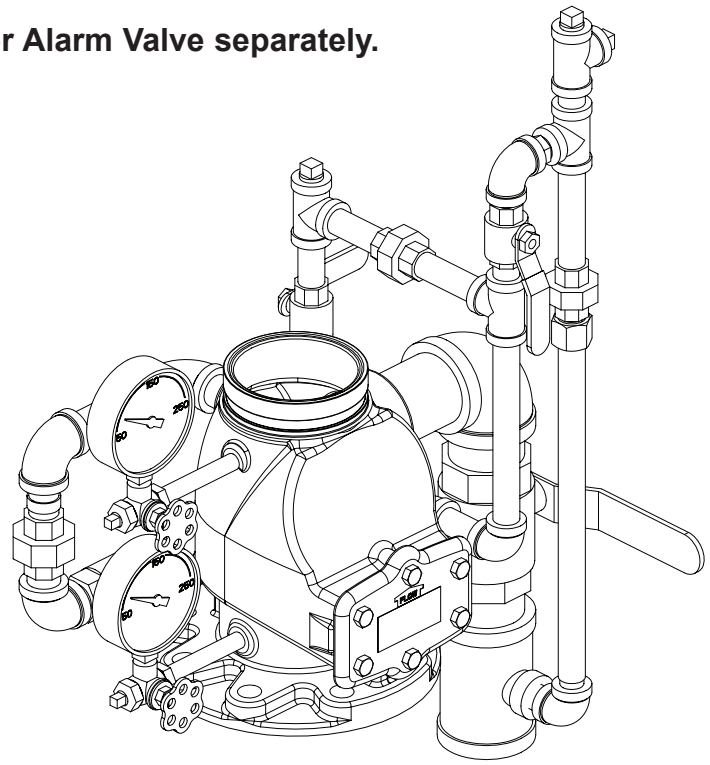
Figure 3: Replacement Parts

ITEM NO.	PART NUMBER		DESCRIPTION	MATERIAL	NO. REQ'D
	F-2	G-2			
1	*	*	Screw, R. H. Self-tap #10-24 x 3/8" lg.	Zinc Plated Steel	6
2	07867	07870	Cover	Steel	1
3	*	*	Housing	Cast Iron	1
4	*	*	Nozzle	Brass	1
5	01925S	01925S	1/2" Pipe Plug	Cast Iron	1
6	02550B	02550B	Cover Gasket	Cellulose/Nitrile/Glass Blend	1
7	02547C	02547C	Impeller	Delrin	1
8	*	*	Bearing	Brass: Sintered Bronze	1
9	05603A	05603A	Wall Plate	Galvanized Steel	1
10	05604B	05604B	Drive Shaft	Stainless Steel	1
11	--	--	3/4" Pipe (C.O.J.) not furnished	Galvanized Steel	1
12	*	*	Coupling	Brass	1
13	02556B	02556B	Striker Arm Shaft	Celcon Glass Filled	1
14	*	*	Bearing	Brass	1
15	*	*	Gong Support	Stainless Steel	1
16	05821C	06508C	Gong	Aluminum	1
17	02766A	02766A	Flat Washer, 11/32" ID x 11/16" ID x 1/16"	Stainless Steel	1
18	05768A	06505C	Gong Label	Aluminum (F-2), Vinyl (G-2)	1
19	--	--	Screw, B.H. Slotted, 5/16-18 x 1/2" lg.	Stainless Steel	1
20	*	*	Striker Arm	Stainless Steel	1
21	--	--	Flat Washer, 11/32" ID x 11/16" OD x 1/16"	Stainless Steel	1
22	--	--	Screw, H.H. Self-tap 5/16-18 x 1/2" lg.	Zinc Plated Steel	1
23	*	*	Striker Pin	Stainless Steel	1
24	*	*	Striker Arm Washer	Stainless Steel	1
25	*	*	Striker	Canvas Phenolic	1
--Indicates replacement part not available					
*Indicates replacement part only available in a Sub-Assembly listed below					
SUB-ASSEMBLIES					
1-8	07863	07869	Motor Assembly		
20, 23-25	02558B	02558B	Striker Arm Assembly		
12-15, 20-25	05606C	06506C	Support Assembly		

TECHNICAL DATA

MODEL J-1
ALARM CHECK VALVE
VERTICAL TRIM

Order Alarm Valve separately.

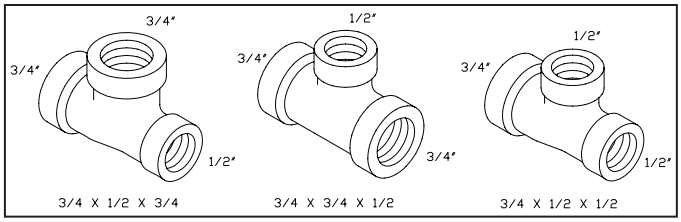


This Trim Chart is for use with the following Viking Trim Sets		
Valve Size	**Galvanized**	**Brass**
3” (DN80)	08633	11428
4” (DN100)	08634	11429
6” (DN150)	08635	11430
8” (DN200)	08636	11431

NOTES: For use with Trim Chart on page 27 b.

General Notes:

- Valve must be trimmed as shown. Any deviation from trim size or arrangement may affect the proper operation of the valve.
- All pipe, 3/4” (20 mm) and smaller, shall be galvanized steel except when other materials are specified in the technical data for the system used. All trim components must be listed for up to 250 PSI (17.2 bar) Water Working Pressure.
- Dimensions in parentheses are millimeter.
- Viking uses ASME fitting designations. Tee’s shall be called out in the following order: 1 - largest outlet on run; 2 - Smaller outlet on run; 3 - Branch size.



Note 1: When using a water motor alarm, a strainer is required. Circuit closer vent trim may be required when an alarm pressure switch is used. (See technical data for the retard chamber.)

Note 2: This location may be used for optional pressure relief valve (not available from Viking). Install 3/4” (20 mm) tee and listed pressure relief valve.

Note 3: To supply an optional excess pressure pump (not available from Viking and not a listed assembly), replace ½” ell marked “A” with a tee. Replace 3/4” ell marked “B” with a tee to connect outlet from excess pressure pump. Do not exceed listed water working pressure rating of system components. Perform hydrostatic tests in accordance with recognized Installation Standards.

Note 4: Location for non-interruptible pressure switch. When waterflow through the alarm valve occurs, supply to this location cannot be shut off until water flow through the alarm valve stops. **Caution -** Non-interuptable alarm port may only be used on systems with constant pressure. A retard chamber may not be installed on the non-interuptable alarm port.

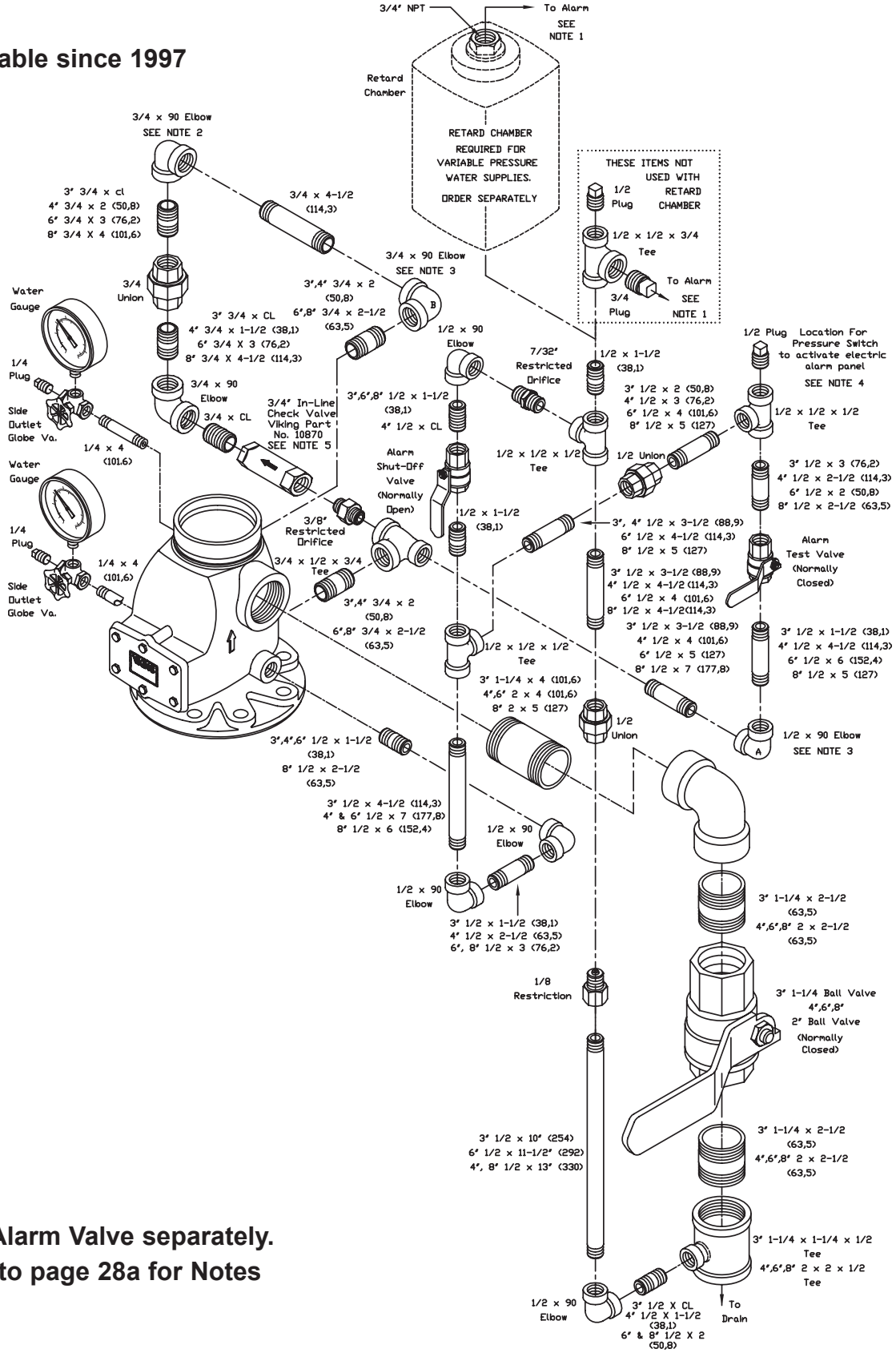
Note 5: Component specified is included in Viking trim sets; do not substitute. Use of components other than specified will void any listings and approvals and may affect operation of the valve.

Note 6: 300 PSI (20.7 bar) water pressure gauges are provided with trim. 600 PSI (41.4 bar) water pressure gauges are available. Order separately when needed*. Refer to current Viking Price Book.

TECHNICAL DATA

MODEL J-1
ALARM CHECK VALVE
VERTICAL TRIM

Available since 1997

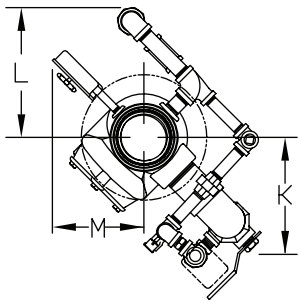


Order Alarm Valve separately.

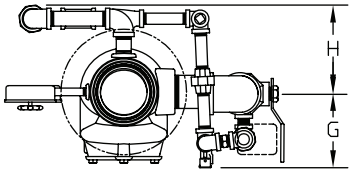
Refer to page 28a for Notes

TECHNICAL DATA

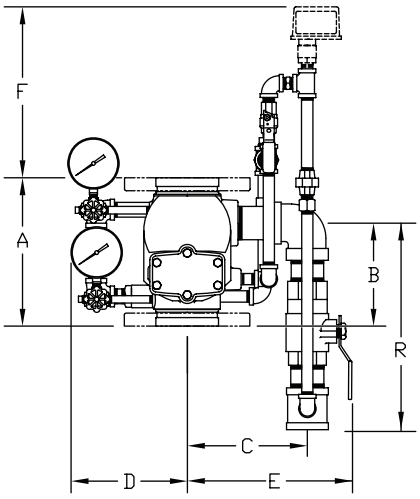
MODEL J-1
ALARM CHECK VALVE
VERTICAL TRIM



Model J-1 Alarm Check Valve Vertical Trim, and Pressure Switches Must be Ordered Separately Refer to Technical Data.



All dimensions are approximations. Dimensions in parentheses are millimeter.

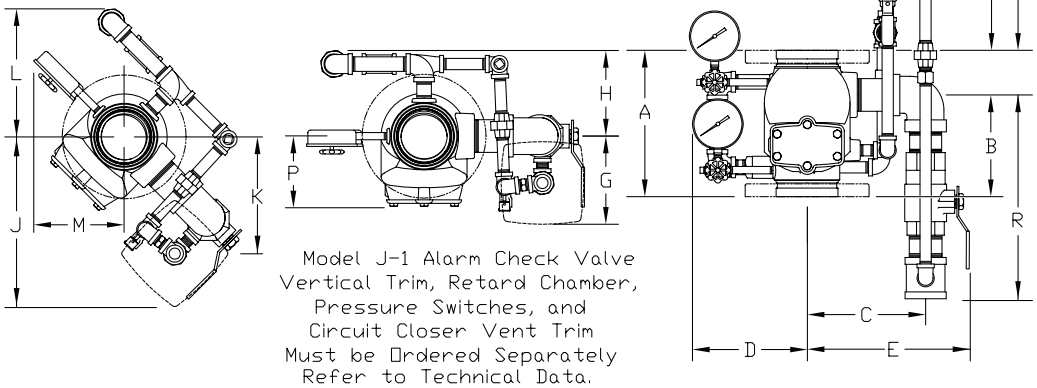


SIZE	A	B	C	D	E	F	G	H	K	L	M	R
3" (DN80)	10-1/8 (257)	7-1/4 (184)	7-3/4 (197)	7-3/4 (197)	10-1/8 (257)	11-3/4 (298)	5 (127)	6-1/2 (165)	7-1/4 (184)	10 (254)	5-1/2 (140)	11 (279)
4" (DN100)	10-5/8 (270)	7-1/2 (191)	9 (229)	9 (229)	12-1/4 (311)	12-3/8 (314)	5-1/2 (140)	6-1/4 (159)	8-3/4 (222)	10 (254)	6-1/2 (165)	12-1/2 (318)
6" (DN150)	13-3/8 (340)	10-1/4 (260)	9-3/4 (248)	9-3/4 (248)	13 (330)	11-1/4 (286)	6 (153))	8-3/4 (222)	9-1/4 (235)	11 (279)	7 (178)	12-1/2 (318)
8" (DN200)	17 (432)	8-1/4 (210)	11 (279)	10-1/2 (267)	14-1/4 (362)	6-3/4 (171)	6-1/2 (165)	10 (254)	10-7/8 (276)	12 (305)	7-1/2 (191)	12-1/2 (318)

MODEL J-1 ALARM CHECK VALVE WITH VERTICAL TRIM FOR CONSTANT PRESSURE WATER SUPPLY

All dimensions are approximations. Dimensions in parentheses are millimeter.

SIZE	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	R
3" (DN80)	10-1/8 (257)	7-1/4 (184)	7-3/4 (197)	7-3/4 (197)	10-1/8 (257)	20 (508)	6-1/4 (159)	6-1/2 (165)	11-3/4 (299)	7-1/4 (184)	10 (254)	5-1/2 (140)	5-7/8 (149)	28-1/8 (714)	4-3/4 (121)	11 (279)
4" (DN100)	10-5/8 (270)	7-1/2 (191)	9 (229)	9 (229)	12-1/4 (311)	20-1/2 (521)	6-1/2 (165)	6-1/4 (159)	13-3/8 (340)	8-3/4 (222)	10 (254)	6-1/2 (165)	5-7/8 (149)	28-5/8 (733)	5-1/4 (134)	12-1/2 (318)
6" (DN150)	13-3/8 (340)	10-1/4 (260)	9-3/4 (248)	9-3/4 (248)	13 (330)	19-1/4 (489)	6-3/4 (171)	8-3/4 (222)	14-1/8 (359)	9-1/4 (235)	11 (279)	7 (178)	5-7/8 (149)	28 (711)	7 (178)	12-1/2 (318)
8" (DN200)	17 (432)	8-1/4 (210)	11 (279)	10-1/2 (267)	14-1/4 (362)	13-1/2 (343)	7-1/2 (191)	10 (254)	16-1/4 (413)	10-7/8 (276)	12 (305)	7-1/2 (191)	5-7/8 (149)	23-5/8 (600)	9 (229)	12-1/2 (318)



Model J-1 Alarm Check Valve Vertical Trim, Retard Chamber, Pressure Switches, and Circuit Closer Vent Trim Must be Ordered Separately Refer to Technical Data.

J-1 ALARM CHECK VALVE WITH VERTICAL TRIM, RETARD CHAMBER, AND PRESSURE SWITCH FOR VARIABLE PRESSURE WATER SUPPLY

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TECHNICAL DATA

ALARM CHECK VALVE
MODEL J-1

The Viking Corporation, 210 N Industrial Park Road, Hastings MI 49058
Telephone: 269-945-9501 Technical Services 877-384-5464 Fax: 269-945-4495 Email: techsvcs@vikingcorp.com

1. DESCRIPTION

The Viking Model J-1 Alarm Check Valve serves as a check valve by trapping pressurized water above the clapper and preventing reverse flow from sprinkler piping.
The valve is designed to initiate an alarm during a sustained flow of water (such as the flow required by an open sprinkler) by operating an optional water motor alarm and/or alarm pressure switch. The valve is made suitable for use on variable pressure water supplies by adding the optional retard chamber to the standard trim.
The valve is available with a flanged inlet and flanged outlet, with a flanged inlet and grooved outlet, or with a grooved inlet and grooved outlet.

Features

1. Ductile iron body for less weight and extra strength.
2. Rubber-faced clapper hinged to access cover for quick removal and easy servicing.
3. All moving parts can be serviced without removing the valve from the installed position.
4. With the cover/clapper assembly removed, clapper rubber replacement requires removal of only one screw.
5. External by-pass trim to minimize clapper movement and false alarm.
6. Trim allows installation of optional non-interruptible pressure switch to activate an electric alarm panel and/or remote alarm.
7. Can be installed on constant or variable pressure water supplies.
8. Can be installed vertically or horizontally, with access cover facing up.
9. Valve housing tapped for inlet and outlet pressure gauges, alarm devices, and system main drain.
10. Trim includes alarm test valve for testing alarms without reducing system pressure.
11. Accessories - The valve is listed and/or approved with specific trim for use up to 250 psi (17.2 bar). No substitutions or omissions, in part or in full, are allowed. Additional accessories to the standard trim packages are required for a complete system meeting the requirements of the applicable rules and codes. See appropriate technical data for additional information.
12. Trim Packages - Viking 250 psi (17.2 bar) trim is required to maintain listings and approvals. Trim packages include all necessary nipples, fittings, standard trim accessories and necessary gauges.
    a. 250 psi (17.2 bar) vertical trim* for use when the J-1 Alarm Check Valve is installed vertically.
    b. 250 psi (17.2 bar) horizontal trim* for use when the J-1 Alarm Check Valve is installed horizontally.

*For optional pre-trimmed Model J-1 Alarm check Valves, refer to the current Viking Price List or contact the manufacturer.

13. Order Separately
    a. Retard Chamber: The Viking Retard Chamber is required when the J-1 Alarm Check Valve is installed on systems with a variable pressure water supply to minimize unwanted (false) alarms.
    b. Water Motor Alarm: The J-1 Alarm Check Valve is designed to operate a mechanical alarm during a sustained flow of water (such as the flow required by an open sprinkler). Refer to the water motor alarm technical data.
    c. Alarm Pressure Switch: The J-1 Alarm Check Valve trim allows installation of pressure switches to operate local electric alarms and/ or remote electric alarms during a sustained flow of water (such as the flow required by an open sprinkler). Refer to alarm pressure switch technical data.

Additional accessories are available and may be required for operation or supervision. Refer to the system description for complete operating trim requirements.

2. LISTINGS AND APPROVALS

UL Listed - Guide VPLX
cUL Listed
FM Approved - Waterflow Alarm Valves
NYC Department of Buildings - MEA 89-92-E Vol. XI
LPCB

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.

3. TECHNICAL DATA

Specifications

Friction Loss - Refer to Table 1
Pressure Rating - 250 psi (17.2 bar) water working pressure.
Factory tested hydrostatically to 500 psi (34.5 bar).
The valve may be hydrostatically tested at 300 psi (20.7 bar) and/or 50 psi (3.4 bar) above the normal water working pressure, for limited periods of time (two hours), for the purpose of acceptance by the AHJ. If air testing is required, do not exceed 40 psi (2.8 bar) air pressure.

Material Standards

Refer to Table 1

TECHNICAL DATA

ALARM CHECK VALVE
MODEL J-1

The Viking Corporation, 210 N Industrial Park Road, Hastings MI 49058
Telephone: 269-945-9501 Technical Services 877-384-5464 Fax: 269-945-4495 Email: techsvcs@vikingcorp.com

TABLE 1

	Nominal Size	Part Number	Friction Loss*	Shipping Weight
Flange/Flange				
Flange Drilling	Model J-1			
ANSI	3"	08235	10 ft. (3,1 m)	35 lbs. (16 kg)
ANSI	4"	08238	13 ft. (4,0 m)	47 lbs. (21 kg)
ANSI	6"	08241	20 ft. (6,0 m)	75 lbs. (34 kg)
ANSI	8"	08244	23 ft. (7,0 m)	135 lbs. (61 kg)
PN10/16	DN80	09108	10 ft. (3,1 m)	35 lbs. (16 kg)
PN10/16	DN100	09109	13 ft. (4,0 m)	47 lbs. (21 kg)
PN10/16	DN150	09110	20 ft. (6,0 m)	75 lbs. (34 kg)
PN10	DN200	09111	23 ft. (7,0 m)	135 lbs. (61 kg)
PN16	DN200	12388	23 ft. (7,0 m)	135 lbs. (61 kg)
Table E	DN80	09116	10 ft. (3,1 m)	35 lbs. (16 kg)
Table E	DN100	09117	13 ft. (4,0 m)	47 lbs. (21 kg)
Table E	DN150	09118	20 ft. (6,0 m)	75 lbs. (34 kg)
Table E	DN200	09119	23 ft. (7,0 m)	135 lbs. (61 kg)
* Expressed in equivalent length of Schedule 40 pipe based on Hazen & Williams formula: C=120				

	Nominal Size	Part Number	Friction Loss*	Shipping Weight
Flange/Groove				
Flange Drilling / Pipe O.D.	Model J-1			
ANSI / 89mm	3"	08236	10 ft. (3,1 m)	27 lbs. (12 kg)
ANSI / 114mm	4"	08239	13 ft. (4,0 m)	37 lbs. (17 kg)
ANSI / 168mm	6"	08242	20 ft. (6,0 m)	64 lbs. (29 kg)
ANSI / 219mm	8"	08245	23 ft. (7,0 m)	119 lbs. (54 kg)
PN10/16 / 89mm	DN80	09535	10 ft. (3,1 m)	27 lbs. (12 kg)
PN10/16 / 114mm	DN100	09536	13 ft. (4,0 m)	37 lbs. (17 kg)
PN10/16 / 168mm	DN150	09874	20 ft. (6,0 m)	64 lbs. (29 kg)
PN10 / 219mm	DN200	09877	23 ft. (7,0 m)	119 lbs. (54 kg)
PN16 / 219mm	DN200	12389	23 ft. (7,0 m)	119 lbs. (54 kg)
Groove/Groove				
Pipe O.D.	Model J-1			
89mm	3" / DN80	08237	10 ft. (3,1 m)	20 lbs. (9 kg)
114mm	4" / DN100	08240	13 ft. (4,0 m)	27 lbs. (12 kg)
165mm	DN150	09405	20 ft. (6,0 m)	51 lbs. (23 kg)
168mm	6" / DN150	08243	20 ft. (6,0 m)	51 lbs. (23 kg)
219mm	8" / DN200	08246	23 ft. (7,0 m)	106 lbs. (48 kg)

Systems with water working pressures above 175 psi (12.1 bar) may require extra-heavy pattern fittings. Model J-1 Alarm Valve flanges are Ductile Iron ANSI B16.42 Class 150 with a maximum water working pressure of 250 psi. ANSI B16.42 Class 150 flanges are NOT compatible with ANSI Class 250 or Class 300 flanges. To mate the Model J-1 Alarm Check Valve with ANSI Class 250 or Class 300 flanges, use the grooved-inlet/ grooved-outlet style installed with listed grooved/flanged adapters of the appropriate pressure rating. For piping with grooved connections, the grooved-inlet and/or grooved-outlet Model J-1 Alarm Check Valve may be installed with listed grooved couplings of the appropriate pressure rating.

Ordering Information

Refer to Table 1

4. INSTALLATION

The Model J-1 Alarm Check Valve must be installed in an area not subject to freezing temperatures or physical damage. When corrosive atmospheres and/or contaminated water supplies are present, it is the owner's responsibility to verify compatibility with the Model J-1 Alarm Check Valve, trim, and associated equipment.

Prior to installing the valve, thoroughly flush the water supply piping to verify that no foreign matter is present.

The Model J-1 Alarm Check Valve may be installed in the vertical position with direction of flow up, or in the horizontal position with the access cover up.

1. Verify that the appropriate trim chart and technical data for the Alarm Check Valve and associated equipment are available.
2. Remove all plastic thread protectors from the openings of the Alarm Check Valve.
3. Apply a small amount of pipe-joint compound or tape to the external threads of all pipe connections required. Take care not to allow any compound, tape, or other foreign matter inside any nipples or openings of the valve or trim components.
4. Install the Model J-1 Alarm Check Valve and trim according to current Viking Trim Charts for the valve used. Trim charts are provided with trim package and can be found in the Viking Engineering and Design Data book.
5. Verify that all system components are rated for the water working pressure of the system.

VIKING® TECHNICAL DATA

ALARM CHECK VALVE
MODEL J-1

The Viking Corporation, 210 N Industrial Park Road, Hastings MI 49058
Telephone: 269-945-9501 Technical Services 877-384-5464 Fax: 269-945-4495 Email: techsvcs@vikingcorp.com

Placing the System in Service

When the wet-pipe system is ready to be placed in service, verify that all equipment is adequately heated and protected to prevent freezing and physical damage.

NOTE: FOR PROPER OPERATION OF THE WET SYSTEM AND TO MINIMIZE UNWANTED (FALSE) ALARMS, IT IS IMPORTANT TO REMOVE TRAPPED AIR FROM THE SYSTEM WHEN FILLING IT WITH WATER. AIR TRAPPED IN THE SYSTEM MAY ALSO CAUSE INTERMITTENT OPERATION OF THE WATER MOTOR ALARM DURING A SUSTAINED FLOW OF WATER (SUCH AS THE FLOW REQUIRED BY AN OPEN SPRINKLER OR THE SYSTEM TEST VALVE). CONSIDER INSTALLATION OF AUXILIARY VENTS TO FACILITATE VENTING.

CAUTION: OPENING OF THE WATER SUPPLY MAIN CONTROL VALVE WILL RESULT IN WATER FLOW FROM ANY OPENINGS IN THE SYSTEM.

1. Verify that auxiliary drains are closed and that the system is free of leaks.
2. Open the system test valve (and any auxiliary vents provided to facilitate removal of air from the system) to allow air to escape from the system while it is filling with water.
3. If desired, close the alarm shut-off valve to prevent local alarms from operating while filling the system.

NOTE: ALARMS AND ELECTRIC PANELS CONTROLLED BY AN ALARM PRESSURE SWITCH INSTALLED IN THE "ELECTRIC ALARM PANEL" CONNECTION PROVIDED IN THE TRIM CANNOT BE INTERRUPTED. (SEE TRIM CHART.)

4. Slowly open the water supply main control valve.
5. Allow the system to completely fill with water. Allow water to flow from the system test valve, and any other open vents provided, until all air is exhausted from the system.
6. After all air is exhausted from the system, close the system test valve and all other open vents.
7. The pressure gauge on the system side of the Alarm Check Valve Clapper should indicate water pressure equal to or greater than the water pressure indicated on the gauge located on the supply side of the clapper.
8. OPEN the Alarm Shut-Off Valve in the Alarm Valve trim, and verify that all other valves are in their normal operating position.
9. Secure all valves in their normal operating position.
10. Notify the Authority Having Jurisdiction, remote station alarm monitors, and those in the affected area that the system is in service.

5. OPERATION (Refer to Figure 1)

The Model J-1 Alarm Check Valve is manufactured with a hinged clapper (9) equipped with a torsion spring (6) to assure proper operation when the valve is installed in the horizontal position.

Minor flows, resulting from small surges, travel around the clapper through external by-pass trim to minimize false alarms. Rubber gasket (10) forms a tight seal against brass water seat (13). This seal, and the check valve installed in the external by-pass trim, serve to trap higher pressurized water in the sprinkler piping and prevent reverse flow.

During a sustained flow of water, such as the flow required by an open sprinkler, hinged clapper (9) moves off seat (13) to the open position. Water flows through orifices in grooved seat (13), and enters the alarm port to activate alarm devices connected to the system.

Operation with Retard Chamber:

When the optional retarding chamber is used, water entering the grooved seat alarm port is directed into the retarding chamber. Temporary pressure surges or fluctuations, large enough to move the valve clapper, are automatically drained through the restricted drain.

During a sustained flow of water, such as the flow required by an open sprinkler, the clapper will be held off its seat. The retarding chamber will fill faster than water can drain through the restricted drain of the alarm valve trim. Alarm devices will be pressurized. Refer to technical data describing the Viking Retarding Chamber and alarm devices.

6. INSPECTIONS, TESTS AND MAINTENANCE

NOTICE: THE OWNER IS RESPONSIBLE FOR MAINTAINING THE FIRE-PROTECTION SYSTEM AND DEVICES IN PROPER OPERATING CONDITION.

It is imperative that the system be inspected and tested on a regular basis. The frequency of the inspections may vary due to contaminated water supplies, corrosive water supplies, and corrosive atmospheres. For minimum maintenance and inspection requirements, refer to NFPA 25. In addition, the Authority Having Jurisdiction may have additional maintenance, testing, and inspection requirements that must be followed.

WARNING: ANY SYSTEM MAINTENANCE WHICH INVOLVES PLACING A CONTROL VALVE OR DETECTION SYSTEM OUT OF SERVICE MAY ELIMINATE THE FIRE-PROTECTION CAPABILITIES OF THAT SYSTEM. PRIOR TO PROCEEDING, NOTIFY ALL THE AUTHORITY HAVING JURISDICTION. CONSIDERATION SHOULD BE GIVEN TO EMPLOYMENT OF A FIRE PATROL IN THE AFFECTED AREAS.

VIKING®

TECHNICAL DATA

ALARM CHECK VALVE
MODEL J-1

The Viking Corporation, 210 N Industrial Park Road, Hastings MI 49058
Telephone: 269-945-9501 Technical Services 877-384-5464 Fax: 269-945-4495 Email: techsvcs@vikingcorp.com

INSPECTION

Monthly visual external inspection of Alarm Check Valves is recommended.

1. Verify that pressure gauges indicate normal water supply pressures. It is normal for the gauge on the system side of the clapper to register a higher pressure than the gauge on the supply side of the clapper because pressure surges are trapped above the clapper.
2. Check for signs of mechanical damage and/or corrosive activity. If detected, perform maintenance as required or, if necessary, replace the device.
3. Verify that valve and trim are adequately heated and protected from freezing and physical damage.
4. When equipped with variable pressure trim, verify that there is no unwanted leakage from the restricted drain of the retard chamber. It is normal for drainage to occur during pressure surges that exceed the capacity allowed through the by-pass trim.
5. Verify that the water supply main control valve is open, and that all valves are in their normal operating position and appropriately secured.

QUARTERLY TESTS

Water Flow Alarm Test

Quarterly testing of water flow alarms is recommended and may be required by the Authority Having Jurisdiction and NFPA 25.

1. Notify the Authority Having Jurisdiction, remote station alarm monitors, and those in the area affected by the test.

NOTE: AN ALARM SHUT-OFF VALVE IS PROVIDED TO SILENCE LOCAL ALARMS. NO SHUT-OFF VALVE IS PROVIDED FOR THE PRESSURE SWITCH CONNECTION INTENDED TO ACTIVATE ELECTRIC ALARM PANELS. (REFER TO J-1 ALARM CHECK VALVE TRIM CHART.)

2. To test electric alarms (if provided) and/or mechanical water motor gong (if provided), OPEN the system test valve. If freezing weather or other conditions prohibit use of the system test valve, OPEN the alarm test valve in the alarm check valve trim.

NOTE: USE OF THE ALARM TEST VALVE ALLOWS TESTING OF ALARMS WITHOUT REDUCING THE SYSTEM PRESSURE.

   a. Electric alarm pressure switches should activate.
   b. Electric local alarms should be audible.
   c. The local water motor alarm should be audible.

NOTE: WHEN USING THE SYSTEM TEST VALVE FOR THE WATER FLOW ALARM TEST, INTERMITTENT OPERATION OF THE WATER MOTOR ALARM MAY INDICATE AIR IS TRAPPED IN THE SYSTEM (REFER TO THE PLACING THE SYSTEM IN SERVICE PARAGRAPH OF SECTION 4).

   d. Verify that remote station alarm signals (if provided) were received.
3. When testing is complete, close the test valve used.
4. Verify:
   a. All local alarms stop sounding and electric panels (if provided) reset.
   b. All remote station alarms reset.
   c. Retard chamber and water motor alarm supply piping has drained properly.
5. Verify that the alarm shut-off valve in the Alarm Check Valve trim is OPEN, the alarm test valve is CLOSED, and all valves are in their normal operating position and appropriately secured.
6. Notify the Authority Having Jurisdiction, remote station alarm monitors, and those in the affected area that testing is complete.

Main Drain Test

Semi Annual performance of the Main Drain Test is recommended and may be required by the authority having jurisdiction to verify integrity of the water supply.

1. Notify the authority having jurisdiction, remote station alarm monitors, and those in the area affected by the test.
2. Perform monthly visual inspection.
3. Verify that adequate drainage is provided for full flow from Main Drain outlet.
4. Record pressure reading from the water supply pressure gauge.
5. Fully OPEN the main drain located on the Alarm Check Valve.
6. When a full flow is developed from the main drain, record the residual pressure from the water supply pressure gauge.
7. When the test is complete, SLOWLY CLOSE the main drain.
8. Compare test results with previous flow information. If deterioration of the water supply is detected, take appropriate steps to restore adequate water supply.
9. Verify that normal water supply pressure has been restored, and that all alarm devices and valves are secured in normal operating position.
10. Notify the Authority Having Jurisdiction, remote station alarm monitors, and those in the area affected by the test that the test is complete. Record and/or provide notification of test results as required by the Authority Having Jurisdiction.

VIKING® **TECHNICAL DATA** **ALARM CHECK VALVE MODEL J-1**

The Viking Corporation, 210 N Industrial Park Road, Hastings MI 49058
Telephone: 269-945-9501 Technical Services 877-384-5464 Fax: 269-945-4495 Email: techsvcs@vikingcorp.com

Five-Year Internal Inspection (Refer to Figure 1.)

Internal inspection of Alarm Check Valves is recommended every five years unless inspections and tests indicate more frequent internal inspections are required.

1. Notify the Authority Having Jurisdiction, remote station alarm monitors, and those in the area affected that the system will be taken out of service. Consideration should be given to employment of a fire patrol in the affected areas.
2. Close the water supply Main Control Valve, placing the system out of service.
3. Open the main drain. If necessary, open the system test valve to vent and completely drain the system.
4. Use appropriate wrench to loosen and remove cover screws (15), and remove Cover/Clapper assembly (2-12).
5. Inspect water seat (13). Wipe away all contaminants, dirt, and mineral deposits. Clean any orifices in the seat that are restricted or plugged by mineral deposits. Do not use solvents or abrasives.
6. Inspect cover/clapper assembly (2-12) and cover gasket (14). Test hinged clapper (9) for freedom of movement and spring (6) for tension retention. Spring (6) tension should engage when the top of hinged clapper (9) is moved from perpendicular to cover (2) toward the open (flow) position. Renew or replace damaged or worn parts as required.

CAUTION: NEVER APPLY ANY LUBRICANT TO SEATS, GASKETS, OR ANY INTERNAL OPERATING PARTS OF THE VALVE. PETROLEUM-BASED GREASE OR OIL WILL DAMAGE RUBBER COMPONENTS AND MAY PREVENT PROPER OPERATION.

7. When internal inspection of the alarm check valve is complete, perform step 6 of the Maintenance paragraph in section 5 to re-install Cover/Clapper Assembly (2-12).
8. Place the wet system back in service, Refer to the Placing the System in Service paragraph in section 4.

Maintenance (Refer to Figure 1)

1. Perform steps 1 through 6 of the Five Year Internal Inspection paragraph in Section 6.
2. To remove clapper rubber (10):
   a. Use the appropriate wrench to loosen and remove the button-head socket screw (12), hex nut (7), sealing washer (8), and rubber retainer (11).
   b. Remove the clapper rubber (10) for inspection. If the clapper rubber shows signs of wear such as cracking, cuts, or excessively deep grooves where the rubber contacts the water seat, replace the rubber.
3. To re-install clapper rubber (10):
   a. Place clapper rubber (10) over the center hub of the rubber retainer (11).
   b. Position the retainer (11) (with rubber in place) against clapper (9) as shown in Figure 1.
   c. Replace and tighten the button-head socket screw (12), sealing washer (8), and hex nut (7), as shown in Figure 1. Do not over- tighten.
4. To remove clapper (9), spring (6), and/or hinge pin (4), remove hinge pin retaining rings (5), to free the hinge pin (4) for removal. After the hinge pin (4) is removed, the clapper (9) and spring (6) can be removed.
5. To re-install clapper (9), spring (6), and/or hinge pin (4):
   a. Verify that the clapper rubber (10) is in good condition and that it is properly installed.
   b. Position the clapper (9) with the elongated hinge holes aligned between the holes of the hinge bracket welded inside cover (2). The system (top) side of the clapper (9) must face the direction indicated by the flow arrow stamped inside the cover (2).
   c. Insert the hinge pin (4) through the holes at one end of the hinge assembly. Before continuing, re-install the spring (6), using care to orient the spring as shown in Figure 1. Continue to push the hinge pin (4) through the holes at the remaining end of the hinge assembly.
   d. Re-install the hinge pin retaining rings (5).
6. To re-install cover/clapper assembly (2-12):
   a. Verify that the cover gasket (14) is in position and that it is in good condition.
   b. Slide the cover/clapper assembly (2-12) into the Alarm Valve so that the clapper rubber (10) contacts the grooved water seat (13).
   c. Replace cover screws (15). Use the appropriate wrench to evenly cross-tighten all screws to the torque values listed in Table 2 for the valve used. Do not over- tighten.
7. To place the wet system back in service, refer to the Placing the System in Service paragraph in section 4.

7. AVAILABILITY

The Viking J-1 Alarm Check Valve is available through a network of domestic and international distributors. See the Viking Corp. Web site for closest distributor or contact The Viking Corporation.

8. GUARANTEES

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

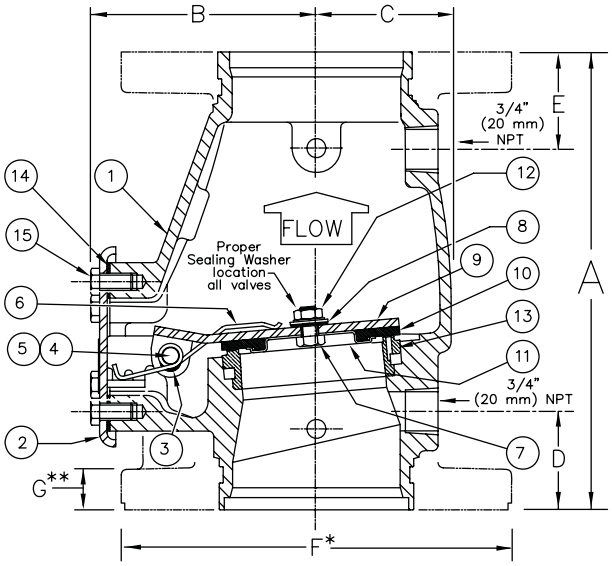
Table 2 - Torque Values for Model J-1 Alarm Valve Cover Screws

Valve Size	Screw Size	Torque Values
3" (DN80)	3/8" - 16 H.H.C	19 ft. lbs. (2,63 kg m)
4" (DN100)	3/8" - 16 H.H.C	19 ft. lbs. (2,63 kg m)
6" (DN150)	½" - 13 H.H.C	45 ft. lbs. (6,23 kg m)
8" (DN200)	5/8" - 11 H.H.C	93 ft. lbs. (12,9 kg m)

TECHNICAL DATA

ALARM CHECK VALVE
MODEL J-1

The Viking Corporation, 210 N Industrial Park Road, Hastings MI 49058
Telephone: 269-945-9501 Technical Services 877-384-5464 Fax: 269-945-4495 Email: techsvcs@vikingcorp.com



SIZE	A	B	C	D	E	F*	G**
3" (DN80)	10–1/8" (257)	4–3/4" (120,7)	2–3/4" (69,9)	1–13/16" (46)	2–1/8" (54)	7–7/8" (200)	3/4" (19,05)
4" (DN100)	10–5/8" (269,9)	5–3/16" (131,8)	3–1/8" (79,4)	1–7/8" (47,6)	2–1/4" (57,2)	9" (228,6)	15/16" (23,81)
6" (DN150)	13–3/8" (340)	6–3/4" (171,5)	4–1/8" (104,8)	2–1/4" (57,2)	2–1/4" (57,2)	11" (279,4)	1" (25,4)
8" (DN200)	17" (431,8)	8–7/8" (225,4)	5" (127)	2–1/4" (57,2)	2–7/8" (73,0)	13–1/2" (342,9)	1–1/8" (28,58)

Dimensions shown in parentheses are millimeters.

* Flanges are optional.
Valve is available Flg X Flg, Flg X Grv, or Grv X Grv.

** 4", 6", and 8" valves are manufactured with sculptured flanges.
Dimension indicates thickness of flange at bolt holes.

Figure 1 - Replacement Parts

ITEM NO.	PART NUMBERS 3" (DN80)	4" (DN100)	6" (DN150)	8" (DN200)	DESCRIPTION	MATERIAL	NO. REQ'D 3"	4"	6"	8"
1	--	--	--	--	Body	Ductile Iron, ASTM A536 (65-45-12)	1	1	1	1
2	--	--	--	--	Cover Assembly	E-Coated HSLA Steel, A715 and Stainless Steel, UNS-S30400	1	1	1	1
3	07576	07576	07576		Bushing	Lubricomp 189 Ryton	2	2	2	
4	05355A	04900A	04991A	05334A	Clapper Hinge Pin	Stainless Steel, UNS-S30400	1	1	1	1
5	05445A	05445A	05445A	05369A	Hinge Pin Retaining Ring	Stainless Steel, UNS-S15700	2	2	2	2
6	06021B	05939B	05940B	05952B	Spring	Stainless Steel, UNS-S30200	1	1	1	1
7	08159	08159			Clapper Hex Nut 3/8"-16 UNC	Stainless Steel, UNS-S30400	1	1		
			08144	08144	Clapper Hex Nut ½"-13 UNC	Stainless Steel, UNS-S30400			1	1
8	08158	08158			Sealing Washer 3/8" x 1" O.D.	EPDM and Stainless Steel	1	1		
			08143	08143	Sealing Washer ½" x 1-1/8" O.D.	EPDM and Stainless Steel			1	1
9	*	*	*	*	Clapper	Teflon® Coated HR Steel UNS-G10180	1	1	1	1
10	*	*	*	*	Clapper Rubber	EPDM	1	1	1	1
11	*	*	*	*	Clapper Rubber Retainer	Stainless Steel, UNS-S30400	1	1	1	1
12	10194	10194			Screw, Button Head, Socket 3/8"-24 x ½" (12,7 mm) lg.	Stainless Steel, UNS-S30400	1	1		
			10308		Screw, Button Head, Socket 1/4"-20 x 3/4" (19,0 mm) lg.	Stainless Steel, UNS-S30400			1	
				10686	Screw, Button Head, Socket 1/4"-20 x 7/8" (22,2 mm) lg.	Stainless Steel, UNS-S30400				1
13	--	--	--	--	Seat	Brass, UNS-C84400	1	1	1	1
14	05354B	04649B	04992B	05339C	Cover Gasket	SBR Rubber	1	1	1	1
15	01517A	01517A			H.H.C. Screw 3/8"-16 x 3/4" (19,0 mm) lg.	Steel, Zinc Plated	4	6		
			04993A		H.H.C. Screw ½"-13 x 7/8" (22,2 mm) lg.	Steel, Zinc Plated			6	
				01922A	H.H.C. Screw 5/8"-11 x 1-1/4" (31,8 mm) lg.	Steel, Zinc Plated				6

-- Indicates replacement part not available

* Indicates replacement part only available in a Sub-Assembly listed below.

SUB-ASSEMBLIES

3, 7-12	08518	08519	08520	08521	Clapper Assembly
7, 8, 10-12, 14	08522	08523	08524	08525	Replacement Rubber Kit

TECHNICAL DATA

MICROMATIC® AND MicromaticHP® STANDARD RESPONSE UPRIGHT AND CONVENTIONAL SPRINKLERS

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 Micromatic® and MicromaticHP® Standard Response Upright and Conventional (Old Style) Sprinklers are small, thermosensitive, glass-bulb spray sprinklers available in several different finishes, temperature ratings, and K-Factors to meet design requirements. The special Polyester, Polytetrafluoroethylene (PTFE), and Electroless Nickel PTFE (ENT) coatings can be used in decorative applications where colors are desired. In addition, these coatings have been investigated for installation in corrosive atmospheres and are listed/approved as corrosion resistant as indicated in the Approval Chart. (Note: **FM Global approves the ENT coating as corrosion resistant.** FM Global has no approval classification for PTFE and Polyester coatings as corrosion resistant.)

Viking standard response sprinklers may be ordered and/or used as open sprinklers (glass bulb and pip cap assembly removed) on deluge systems. Refer to Ordering Instructions on page 11r.

2. LISTINGS AND APPROVALS

cULus Listed: Category VNIV

FM Approved: Classes 2001, 2002, and 2016

NYC Approved: MEA 89-92-E, Volumes 3 and 12

ABS Certified: Certificate 04-HS407984B-PDA

VdS Approved: Certificates G4060055, G4980001, G4980003, G4980004, G4980006, and G4980008

LPC Approved: Ref. No. 096e/06

CE Certified: Standard EN 12259-1, EC-certificate of conformity 0832-CPD-2001, 0832-CPD-2003, 0786-CPD-40137, 0786-CPD-40142, 0786-CPD-40177, and 0786-CPD-40182

MED Certified: Standard EN 12259-1, EC-certificate of conformity 0832-MED-1003 and 0832-MED-1008

NOTE: Other International approval certificates are available upon request.

Refer to Approval Chart 1 and Design Criteria on pages 11t-u for cULus Listing requirements, and refer to Approval Chart 2 and Design Criteria on page 11v for FM Approval requirements that must be followed.

3. TECHNICAL DATA

Specifications:

Available since 1997.

Minimum Operating Pressure: 7 psi (0.5 bar)*

Maximum Working Pressure: Sprinklers VK021 and VK124 are rated for use with water working pressures ranging from the minimum 7 psi (0.5 bar) up to 250 psi (17 bar) for high-pressure systems. High-pressure (HP) sprinklers can be identified by locating "250" stamped on the deflector. All other Part Nos. not mentioned above are rated to a maximum 175 psi (12 bar) wwp.

Factory tested hydrostatically to 500 psi (34.5 bar)

Thread size: Refer to the Approval Charts

Nominal K-Factor: Refer to the Approval Charts

Glass-bulb fluid temperature rated to -65 °F (-55 °C)

Overall Length: Refer to the Approval Charts

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.

*cULus Listing, FM Approval, and NFPA 13 installs require a minimum of 7 psi (0.5 bar). The minimum operating pressure for LPCB and CE Approvals ONLY is 5 psi (0.35 bar).

Material Standards:

Frame Casting: Brass UNS-C84400 or QM Brass for Sprinklers 09993, 12986, 10227, and 10233. Brass UNS-C84400 for all other sprinklers.

Replaces page 11q-v, dated June 11, 2013.
(ENT finish is now approved as corrosion resistant.)

VIKING®

TECHNICAL DATA

MICROMATIC® AND MicromaticHP® STANDARD RESPONSE UPRIGHT AND CONVENTIONAL SPRINKLERS

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

Deflector: Brass UNS-C23000 or Copper UNS-C19500 for Sprinklers 12986 and 12993. Copper UNS-C19500 for Sprinklers 10141, 10169, 10174, 10220, and 10233. Brass UNS-C26000 for all other Sprinklers.
Bushing (for Sprinklers 09995, 10191, 10192, 10218, and 10219): Brass UNS-C36000
Bulb: Glass, nominal 5 mm diameter
Belleville Spring Sealing Assembly: Nickel Alloy, coated on both sides with PTFE Tape
Screw: Brass UNS-C36000
Pip Cap for Sprinkler 09993: Brass UNS-C31400 or UNS-C31600. Pip Cap and Insert Assembly for all other Sprinklers: Copper UNS-C11000 and Stainless Steel UNS-S30400
Pip Cap Attachment (for Sprinklers 09995, 10192, and 10218): Brass UNS-C36000
For PTFE Coated Sprinklers: Belleville Spring-Exposed, Screw-Nickel Plated, Pip Cap-PTFE Coated
For Polyester Coated Sprinklers: Belleville Spring-Exposed
For ENT Coated Sprinklers: Belleville Spring-Exposed, Screw and Pipcap - ENT plated.

Ordering Information: (Also refer to the current Viking price list.)
Order Micromatic® and MicromaticHP® Standard Response Upright and Conventional Sprinklers by first adding the appropriate suffix for the sprinkler finish and then the appropriate suffix for the temperature rating to the sprinkler base part number.
Finish Suffix: Brass = A, Chrome = F, White Polyester = M-/W, Black Polyester = M-/B, and Black PTFE = N, Wax Coated = C, Wax Over Polyester = V-/W, ENT = JN
Temperature Suffix (°F/°C): 135°/68° = A, 155°/68° = B, 175°/79° = D, 200°/93° = E, 212°/100° = M, 286°/141° = G, 360°/182° = H, 500°/260° = L, OPEN = Z (PTFE only).
For example, sprinkler VK100 with a 1/2" thread, Brass finish and a 155 °F/68 °C temperature rating = Part No. 12986AB

Available Finishes And Temperature Ratings: Refer to Table 1.

Accessories: (Also refer to the "Sprinkler Accessories" section of the Viking data book.)

Sprinkler Wrenches:
A. Standard Wrench: Part No. 10896W/B (available since 2000)
B. Wrench for wax-coated sprinklers: Part No. 13577W/B** (available since 2006)
**A ½" ratchet is required (not available from Viking).

Sprinkler Cabinets:
A. Six-head capacity: Part No. 01724A (available since 1971)
B. Twelve-head capacity: Part No. 01725A (available since 1971)

4. INSTALLATION

Refer to appropriate NFPA Installation Standards.

5. OPERATION

During fire conditions, the heat-sensitive liquid in the glass bulb expands, causing the glass to shatter, releasing the pip cap and sealing spring assembly. Water flowing through the sprinkler orifice strikes the sprinkler deflector, forming a uniform spray pattern to extinguish or control the fire.

6. INSPECTIONS, TESTS AND MAINTENANCE

Refer to NFPA 25 for Inspection, Testing and Maintenance requirements.

7. AVAILABILITY

The Viking Micromatic® and MicromaticHP® Standard Response Upright and Conventional Sprinklers 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.

MICROMATIC® AND MicromaticHP® STANDARD RESPONSE UPRIGHT AND CONVENTIONAL SPRINKLERS

TECHNICAL DATA

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

TABLE 1: AVAILABLE SPRINKLER TEMPERATURE RATINGS AND FINISHES

Sprinkler Temperature Classification	Sprinkler Nominal Temperature Rating[1]	Maximum Ambient Ceiling Temperature[2]	Bulb Color
Ordinary	135 °F (57 °C)	100 °F (38 °C)	Orange
Ordinary	155 °F (68 °C)	100 °F (38 °C)	Red
Intermediate	175 °F (79 °C)	150 °F (65 °C)	Yellow
Intermediate	200 °F (93 °C)	150 °F (65 °C)	Green
Intermediate	212 °F (100 °C)	150 °F (65 °C)	Green
High	286 °F (141 °C)	225 °F (107 °C)	Blue
Extra High	360 °F (182 °C)	300 °F (149 °C)	Mauve
Ultra High[3]	500 °F (260 °C)	465 °F (240 °C)	Black

Sprinkler Finishes: Brass, Chrome, White Polyester, Black Polyester, Black PTFE, and ENT

Corrosion-Resistant Coatings[4]: White Polyester, Black Polyester, and Black PTFE in all temperature ratings. ENT in all tempurature ratings except 135 °F (57 °C). Wax-Coated Brass and Wax over Polyester[5] for sprinklers with the following temperature ratings:

135 °F (57 °C) Off-White Wax — 155 °F (68 °C) Lt. Brown Wax — 175 °F (79 °C) Brown Wax

200 °F (93 °C) Brown Wax — 212 °F (100 °C) Dk. Brown Wax[6] — 286 °F (141 °C) Dk. Brown Wax[6]

Footnotes

[1] The sprinkler 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] Sprinklers of Ultra-High temperature rating are intended for use inside ovens, dryers, or similar enclosures with normal operating temperatures above 300 °F (149 °C). Where the ambient temperature around the Ultra-High temperature rated sprinkler is significantly reduced below 300 °F (149 °C), response time may be severely retarded.

[4] The corrosion-resistant coatings have passed the standard corrosion test required by the approving agencies indicated in the Approval Charts. These tests cannot and do not represent all possible corrosive environments. Prior to installation, verify through the end-user that the coatings are compatible with or suitable for the proposed environment. For automatic sprinklers, the coatings indicated are applied to the exposed exterior surfaces only. Note that the spring is exposed on sprinklers with Polyester, ENT, and PTFE coatings. For PTFE coated open sprinklers only, the waterway is coated. For ENT coated sprinklers, the waterway is coated.

[5] Wax Over Polyester is unavailable for Sprinklers VK021 and VK124.

[6] Wax melting point is 170 °F (76 °C) for 212 °F (100 °C) and 286 °F (141 °C) temperature rated sprinklers.

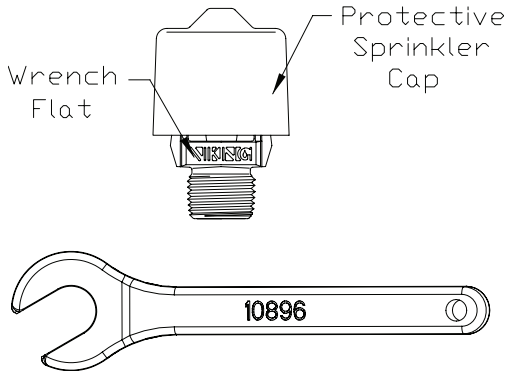


Figure 1:
Standard Sprinkler Wrench 10896W/B

VIKING®

TECHNICAL DATA

MICROMATIC® AND MicromaticHP® STANDARD RESPONSE UPRIGHT AND CONVENTIONAL SPRINKLERS

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

Approval Chart 1 (UL)

Micromatic® and MicromaticHP® Standard Response Upright and Conventional Sprinklers
Maximum 175 PSI (12 bar) WWP

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

Base Part Number[1]	SIN	Thread Size		Nominal K-Factor		Overall Length		Listings and Approvals[3] (Refer also to Design Criteria on page 11u.)					
		NPT	BSP	U.S.	metric[2]	Inches	mm	cULus[4]	NYC[6]	VdS	LPCB	CE[12]	[13]
Upright-Standard Orifice													
12986	VK100	1/2”	15 mm	5.6	80.6	2-3/16	56	A1, B4, C5, D3, F6	See Footnote 7.	--	--	--	--
10233	VK145	1/2”	15 mm	5.6	80.6	2-3/16	56	--	--	A2	A2, B4	A2	E2
10174	VK145	--	15 mm	5.6	80.6	2-3/16	56	--	--	A2	A2, B4	--	--
12993	VK100	--	15 mm	5.6	80.6	2-3/16	56	A1, B4, C5, D3, F6	A1, B4, C5	--	--	--	--
Upright-Large Orifice													
10220[14]	VK200	1/2”	15 mm	8.0	115.2	2-3/8	60	A1, B4, C5, D3, F6	A1, B4	A2	--	E3	E3
10141	VK200	3/4”	20 mm	8.0	115.2	2-5/16	59	A1, B4, C5, D3, F6	A1, B4, C5	A2	A2	E3	E3
10169	VK200	--	20 mm	8.0	115.2	2-5/16	59	A1, B4, C5, D3, F6	--	A2	A2	E3	E3
Upright-Small Orifice[9]													
10218[10]	VK001	1/2”	15 mm	2.8	40.3	2-3/16	56	A1, B4, C5	See Footnote 7.	--	--	--	--
10219[10]	VK002	1/2”	15 mm	4.2	57	2-3/16	56	A1, B4, C5	See Footnote 7.	--	--	--	--
10191[10]	VK002	--	15 mm	4.2	57	2-3/16	56	A1, B4, C5	--	--	--	--	--
10192[10]	VK001	--	15 mm	2.8	40.3	2-3/16	56	A1, B4, C5	--	--	--	--	--
Conventional-Standard Orifice													
10227	VK118	1/2”	15 mm	5.6	80.6	2-3/16	56	A1, B4	A1, B4	A2	A2, B4	A2	E2
10172[11]	VK118	--	15 mm	5.6	80.6	2-3/16	56	A1, B4	--	--	A2, B4	--	--
Conventional-Large Orifice													
10228	VK120	3/4”	20 mm	8.0	115.2	2-5/16	59	A1, B4	A1, B4	A2	A2	E3	E2
10168[11]	VK120	--	20 mm	8.0	115.2	2-5/16	59	A1, B4	--	A2	A2	E3	E3
Maximum 250 PSI (17 bar) WWP **Upright-Standard Orifice**													
09993	VK124	1/2”	15 mm	5.6	80.6	2-1/4	58	A1, D3	See Footnote 7.	--	--	--	--
Upright-Small Orifice[9]													
09995[9]	VK021	1/2”	15 mm	2.8	40.3	2-1/4	58	A1	See Footnote 7.	--	--	--	--

Approved Temperature Ratings

A - 135 °F (57 °C), 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), 286 °F (141 °C), and 360 °F (182 °C)
B - 135 °F (57 °C), 155 °F (68 °C), 175 °F (79 °C), and 200 °F (93 °C)
C - 286 °F (141 °C)
D - 500 °F (260 °C)[8]
E - 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), 286 °F (141 °C), and 360 °F (182 °C)
F - 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), 286 °F (141 °C), 360 °F (182 °C), and 500 °F (260 °C)[8]

Approved Finishes

1 - Brass, Chrome, White Polyester[5], Black Polyester[5], and Black PTFE[5]
2 - Brass, Chrome, White Polyester, and Black Polyester
3 - Brass and Chrome
4 - Wax-Coated Brass and Wax over Polyester[5]
5 - 200 °F (93 °C) High-Temperature Wax Coating (corrosion resistant); maximum ambient temperature allowed at ceiling = 150 °F (65 °C)
6 - ENT[5]

Footnotes

[1] Base part number is shown. For complete part number, refer to Viking’s current price schedule.
[2] Metric K-factor shown is for use when pressure is measured in bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.
[3] This table shows the listings and approvals available at the time of printing. Check with the manufacturer for any additional approvals.
[4] Listed by Underwriters Laboratories Inc. for use in the U.S. and Canada.
[5] cULus Listed as corrosion resistant.
[6] Upright sprinklers Accepted for use, City of New York Department of Buildings, MEA Number 89-92-E, Vol. 12. Conventional sprinklers accepted for use, City of New York Department of Buildings, MEA Number 89-92-E, Vol. 3.
[7] Meets New York City requirements, effective July 1, 2008.
[8] Sprinklers of Ultra-High temperature rating are intended for use inside ovens, dryers, or similar enclosures with normal operating temperatures above 300 °F (149 °C). Where the ambient temperature around the Ultra-High temperature rated sprinkler is significantly reduced below 300 °F (149 °C), the response time of the Ultra-High temperature rated sprinkler may be severely retarded.
[9] Listings and Approvals limited to Light Hazard Occupancies where allowed by the installation standards being applied, with hydraulically calculated wet systems only. **Exception:** 4.2K sprinklers may be installed on hydraulically calculated dry pipe systems where piping is corrosion resistant or internally galvanized.
[10] The sprinkler orifice is bushed.
[11] Sprinklers 10168 and 10172 are available on special order.
[12] CE Certified, Standard EN 12259-1, EC-certificate of conformity 0786-CPD-40137, 0786-CPD-40142, 0786-CPD-40177, 0786-CPD-40182, 0832-CPD-2001, and 0832-CPD-2003.
[13] MED Certified, Standard EN 12259-1, EC-certificate of conformity 0832-MED-1003 and 0832-MED-1008.
[14] The 1/2” NPT Large Orifice Sprinkler is Listed and Approved for retrofit only.

MICROMATIC® AND MicromaticHP® STANDARD RESPONSE UPRIGHT AND CONVENTIONAL SPRINKLERS

TECHNICAL DATA

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

DESIGN CRITERIA - UL

(Also refer to Approval Chart 1 on page 11t)

cULus Listing Requirements:

Micromatic® and MicromaticHP® Standard Response Upright and Conventional Sprinklers are cULus Listed as indicated in the Approval Chart 1 for installation in accordance with the latest edition of NFPA 13 for standard spray sprinklers, or old style (conventional) sprinklers.

- Designed for use in Light, Ordinary, and Extra Hazard occupancies. *(Small orifice sprinklers are limited to Light Hazard where allowed by the installation standards being applied, with hydraulically calculated wet systems only. Exception: 4.2K sprinklers may be installed on hydraulically calculated dry pipe systems where piping is corrosion resistant or internally galvanized.)*
- The sprinkler installation rules contained in NFPA 13 for standard spray upright sprinklers must be followed. For conventional sprinklers, refer to the installation guidelines for old style (conventional) sprinklers.

IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. Also refer to page SR1-3 for general care, installation, and maintenance information. Viking sprinklers are to be installed in accordance with the latest edition of Viking technical data, the appropriate standards of NFPA, LPCB, APSAD, VdS or other similar organizations, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable.

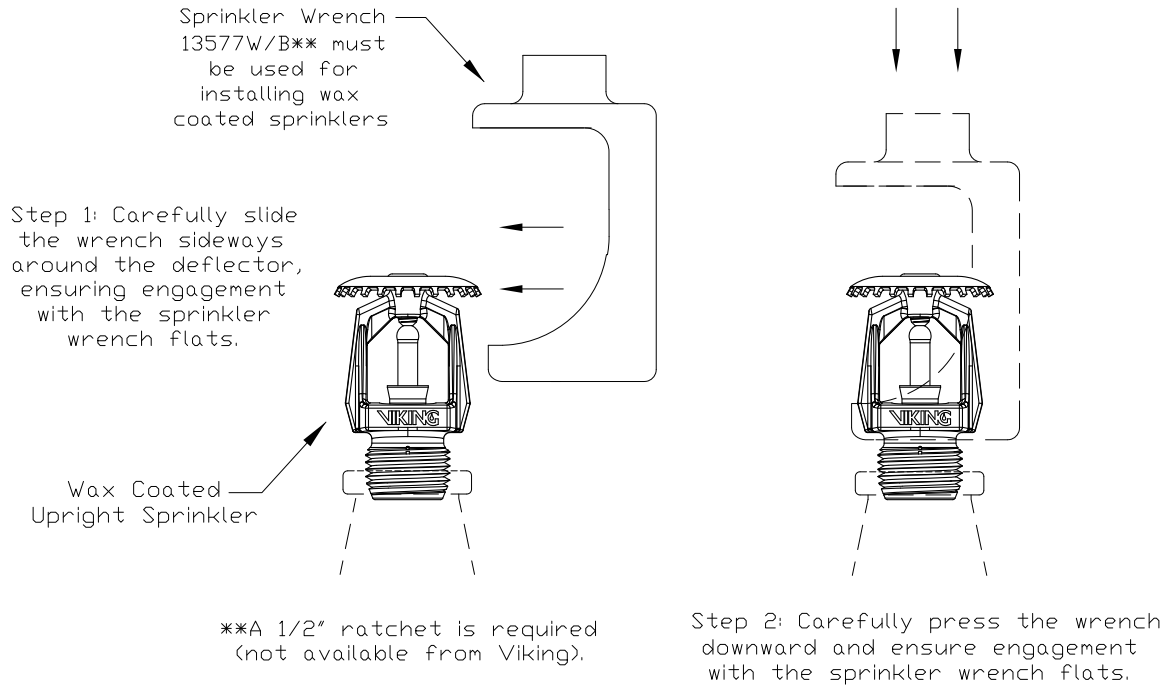


Figure 2: Wrench 13577W/B for Wax Coated Sprinklers

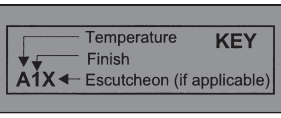
TECHNICAL DATA

MICROMATIC® AND MicromaticHP® STANDARD RESPONSE UPRIGHT AND CONVENTIONAL SPRINKLERS

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

Approval Chart 2 (FM)

Micromatic® Standard Response Upright Sprinklers
Maximum 175 PSI (12 bar) WWP



Base Part Number[1]	SIN	Thread Size		Nominal K-Factor		Overall Length		FM Approvals[3] (Refer also to Design Criteria below.)
		NPT	BSP	U.S.	metric[2]	Inches	mm	
Standard Orifice								
12986	VK100	1/2”	15 mm	5.6	80.6	2-3/16	56	A1, C5, E6, F1, G4, H7
10233	VK145	1/2”	15 mm	5.6	80.6	2-3/16	56	A1, D2, E6, F1
10174	VK145	--	15 mm	5.6	80.6	2-3/16	56	A1, D2, F1
12993	VK100	--	15 mm	5.6	80.6	2-3/16	56	A1, D2, F1, G4, H7
Large Orifice								
10220[7]	VK200	1/2”	15 mm	8.0	115.2	2-3/8	60	B1, D5, F1, H7
10141	VK200	3/4”	20 mm	8.0	115.2	2-5/16	59	B1, D5, F1, H7
10169	VK200	--	20 mm	8.0	115.2	2-5/16	59	B1, D5, F1, H7
Small Orifice[4]								
10218[6]	VK001	1/2”	15 mm	2.8	40.3	2-3/16	56	D3, D5
10192[6]	VK001	--	15 mm	2.8	40.3	2-3/16	56	D3, D5

Approved Temperature Ratings

A - 135 °F (57 °C), 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), 212 °F (100 °C), 286 °F (141 °C), and 360 °F (182 °C)
B - 135 °F (57 °C), 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), 286 °F (141 °C), and 360 °F (182 °C)
C - 135 °F (57 °C), 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), and 212 °F (100 °C)
D - 135 °F (57 °C), 155 °F (68 °C), 175 °F (79 °C), and 200 °F (93 °C)
E - 286 °F (141 °C)
F - 500 °F (260 °C)[5]
G - 155 °F (68 °C)
H - 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), 286 °F (141 °C), 360 °F (182 °C), 500 °F (260 °C)[5]

Approved Finishes

1 - Brass, Chrome, White Polyester, and Black Polyester
2 - White Polyester and Wax-Coated Brass (corrosion resistant)
3 - Brass and Chrome
4 - Wax-Coated Brass and Wax over Polyester
5 - Wax-Coated Brass (corrosion resistant)
6 - 200 °F (93 °C) High-Temperature Wax Coating (corrosion resistant); maximum ambient temperature allowed at ceiling = 150 °F (65 °C)
7 - ENT[8]

Footnotes

[1] Base part number is shown. For complete part number, refer to Viking’s current price schedule.
[2] Metric K-factor shown is for use when pressure is measured in bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.
[3] This table shows the listings and approvals available at the time of printing. Check with the manufacturer for any additional approvals.
[4] FM Approved as standard response **Non-Storage** upright sprinklers. For specific application and installation requirements, reference the latest applicable FM Loss Prevention Data Sheets (including Data Sheet 2-0).
[5] Sprinklers of Ultra-High temperature rating are intended for use inside ovens, dryers, or similar enclosures with normal operating temperatures above 300 °F (149 °C). Where the ambient temperature around the Ultra-High temperature rated sprinkler is significantly reduced below 300 °F (149 °C), the response time of the Ultra-High temperature rated sprinkler may be severely retarded.
[6] The sprinkler orifice is bushed.
[7] The 1/2” NPT Large Orifice Sprinkler is Listed and Approved for retrofit only.
[8] FM approved as corrosion resistant.

DESIGN CRITERIA - FM

(Also refer to Approval Chart 2 above.)

FM Approval Requirements:

The sprinklers indicated in Approval Chart 2 are FM Approved as standard response **Non-Storage** upright sprinklers as indicated in the FM Approval Guide. For specific application and installation requirements, reference the latest applicable FM Loss Prevention Data Sheets (including Data Sheet 2-0). FM Global Loss Prevention Data Sheets contain guidelines relating to, but not limited to: minimum water supply requirements, hydraulic design, ceiling slope and obstructions, minimum and maximum allowable spacing, and deflector distance below the ceiling.

NOTE: The FM installation guidelines may differ from cULus and/or NFPA criteria.

IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. Also refer to page SR1-3 for general care, installation, and maintenance information. Viking sprinklers are to be installed in accordance with the latest edition of Viking technical data, the appropriate 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.

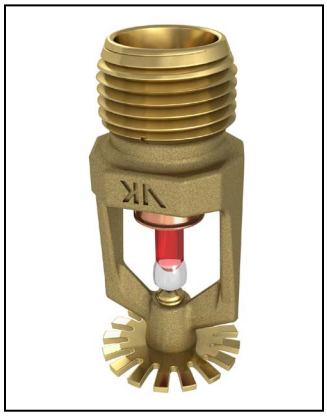
Replaces page 11q-v, dated June 11, 2013.
(ENT finish is now approved as corrosion resistant.)

MICROMATIC® STANDARD RESPONSE PENDENT SPRINKLER VK102 (K5.6)

TECHNICAL DATA

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
Visit the Viking website for the latest edition of this technical data page www.vikinggroupinc.com

1. DESCRIPTION



The Viking Micromatic® Standard Response Pendent VK102 Sprinkler is a small, thermosensitive, glass-bulb spray sprinkler available in several different finishes and temperature ratings to meet design requirements. The special Polyester, and Electroless Nickel PTFE (ENT) coatings can be used in decorative applications where colors are desired. In addition, these coatings have been investigated for installation in corrosive atmospheres and are listed/approved as corrosion resistant as indicated in the Approval Charts. (Note: **FM Global approves the ENT coating as corrosion resistant.** FM Global has no approval classification for Polyester coatings as corrosion resistant.)

Viking standard response sprinklers may be ordered and/or used as open sprinklers (glass bulb and pip cap assembly removed) on deluge systems. Refer to Ordering Instructions.

2. LISTINGS AND APPROVALS

cULus Listed: Category VNIV

FM Approved: Class Series 2000

VdS Approved: Certificate G414006 & G414004

LPCB Approved

CE Certified: Standard EN 12259-1, EC-certificate of conformity 0832-CPD-2021

CCCF Approved: Approved by the China Certification Center for Fire Products (CCCF)

NOTE: Other International approval certificates are available upon request.

Refer to Approval Charts and Design Criteria for listing and approval requirements that must be followed.

3. TECHNICAL DATA

Specifications:

Minimum Operating Pressure: 7 psi (0.5 bar)†
Maximum Working Pressure: 175 psi (12 bar) wwp
Factory tested hydrostatically to 500 psi (34.5 bar)
Thread size: 1/2” NPT, 15 mm BSP
Nominal K-Factor: 5.6 U.S. (80.6 metric**)
Glass-bulb fluid temperature rated to -65 °F (-55 °C)
Overall Length: 2-1/4” (57 mm)

† cULus Listing, FM Approval, and NFPA 13 installs require a minimum of 7 psi (0.5 bar). The minimum operating pressure for LPCB and CE Approvals ONLY is 5 psi (0.35 bar).

Material Standards:

Frame Casting: Brass UNS-C84400 or QM Brass
Deflector: Phosphor Bronze UNS-C51000†† or Copper UNS-C19500
Bulb: Glass, nominal 5 mm diameter
Belleville Spring Sealing Assembly: Nickel Alloy, coated on both sides with PTFE Tape
Screw: Brass UNS-C36000
Pip Cap and Insert Assembly: Copper UNS-C11000 and Stainless Steel UNS-S30400
For Polyester Coated Sprinklers: Belleville Spring-Exposed
For ENT coated Sprinklers: Belleville Spring - Exposed, Screw and Pipcap - ENT plated.

††Not for FM Approval.

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

Order Micromatic® Standard Response Pendent VK102 by first adding the appropriate suffix for the sprinkler finish and then the appropriate suffix for the temperature rating to the sprinkler base part number.

Finish Suffix: Brass = A, Chrome = F, White Polyester = M-/W, Black Polyester = M-/B, Wax Coated = C, Wax Over Polyester = V-/W, ENT = JN

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
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Temperature Suffix: 135 °F (57 °C) = A, 155 °F (68 °C) = B, 175 °F (79 °C) = D, 200 °F (93 °C) = E, 212 °F (100 °C) = M, 286 °F (141 °C) = G, 360 °F (182 °C) = H, 500 °F (260 °C) = L.

For example, sprinkler VK102 with a 1/2" thread, Brass finish and a 155 °F (68 °C) temperature rating = Part No. 12987AB

Available Finishes And Temperature Ratings: Refer to Table 1.

Accessories: (Also refer to the Viking website.)

Sprinkler Wrenches:

A. Standard Wrench: Part No. 21475M/B (available since 2017).
B. Standard Wrench for Wax Coated Sprinklers: Part No. 10896W/B (available since 2000)
C. Socket Wrench for Recessed Pendent Sprinklers: Part No. 13655W/B* (available since 2006)
D. Optional Protective Sprinkler Cap Remover/Escutcheon Installer Tool** Part No. 15915 (available since 2010.)
E. Socket Wrench for Wax Coated Sprinklers: Part No. 13577W/B* (available since 2006)

*A ½" ratchet is required (not available from Viking).

**Allows use from the floor by attaching a length of 1" diameter CPVC tubing to the tool. Ideal for sprinkler cabinets. Refer to Bulletin F_051808.

Sprinkler Cabinets:

A. Six-head capacity: Part No. 01724A (available since 1971)
B. Twelve-head capacity: Part No. 01725A (available since 1971)

4. INSTALLATION

Refer to appropriate NFPA Installation Standards.

5. OPERATION

During fire conditions, the heat-sensitive liquid in the glass bulb expands, causing the glass to shatter, releasing the pip cap and sealing spring assembly. Water flowing through the sprinkler orifice strikes the sprinkler deflector, forming a uniform spray pattern to extinguish or control the fire.

6. INSPECTIONS, TESTS AND MAINTENANCE

Refer to NFPA 25 for Inspection, Testing and Maintenance requirements.

7. AVAILABILITY

The Viking Micromatic® Standard Response Pendent Sprinkler VK102 is 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.

VIKING®

TECHNICAL DATA

MICROMATIC® STANDARD RESPONSE PENDENT SPRINKLER VK102 (K5.6)

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
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TABLE 1: AVAILABLE SPRINKLER TEMPERATURE RATINGS AND FINISHES

Sprinkler Temperature Classification	Sprinkler Nominal Temperature Rating[1]	Maximum Ambient Ceiling Temperature[2]	Bulb Color
Ordinary	135 °F (57 °C)	100 °F (38 °C)	Orange
Ordinary	155 °F (68 °C)	100 °F (38 °C)	Red
Intermediate	175 °F (79 °C)	150 °F (65 °C)	Yellow
Intermediate	200 °F (93 °C)	150 °F (65 °C)	Green
High	286 °F (141 °C)	225 °F (107 °C)	Blue
Extra High	360 °F (182 °C)	300 °F (149 °C)	Mauve
Ultra High[3]	500 °F (260 °C)	465 °F (240 °C)	Black

Sprinkler Finishes: Brass, Chrome, White Polyester, Black Polyester, and ENT

Corrosion-Resistant Coatings[4]: White Polyester and Black Polyester in all temperature ratings. ENT in all temperature ratings except 135 °F (57 °C). Wax-Coated Brass and Wax over Polyester[5] for sprinklers with the following temperature ratings:

155 °F (68 °C) Lt. Brown Wax 175 °F (79 °C) Brown Wax 200 °F (93 °C) Brown Wax

212 °F (100 °C) Dk. Brown Wax[5] 286 °F (141 °C) Dk. Brown Wax[5]

Footnotes

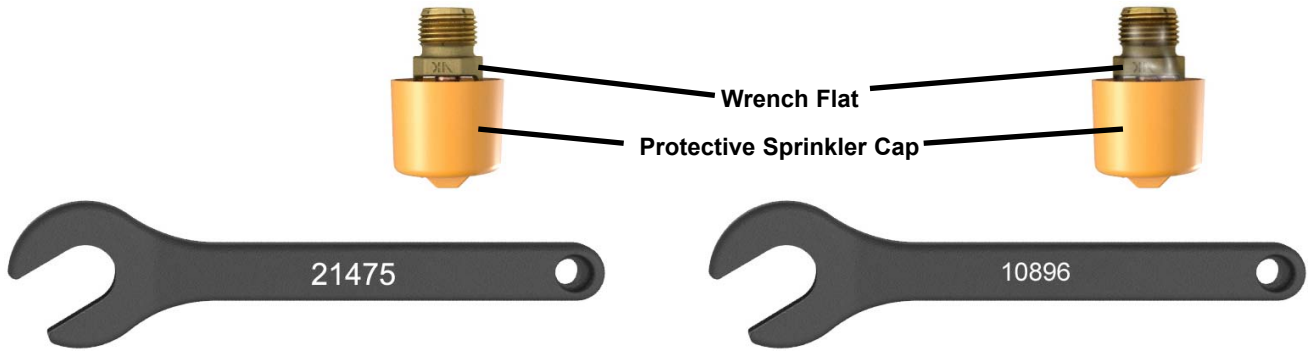
[1] The sprinkler temperature rating is stamped on the deflector.

[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] Sprinklers of Ultra-High temperature rating are intended for use inside ovens, dryers, or similar enclosures with normal operating temperatures above 300 °F (149 °C). Where the ambient temperature around the Ultra-High temperature rated sprinkler is significantly reduced below 300 °F (149 °C), response time may be severely retarded.

[4] The corrosion-resistant coatings have passed the standard corrosion test required by the approving agencies indicated in the Approval Charts. These tests cannot and do not represent all possible corrosive environments. Prior to installation, verify through the end-user that the coatings are compatible with or suitable for the proposed environment. For automatic sprinklers, the coatings indicated are applied to the exposed exterior surfaces only. Note that the spring is exposed on sprinklers with Polyester and ENT coatings. For ENT coated automatic sprinklers, the waterway is coated.

[5] Wax melting point is 170 °F (76 °C) for 212 °F (100 °C) and 286 °F (141 °C) temperature rated sprinklers.



Standard Sprinkler Wrench 21475M/B

Standard Sprinkler Wrench for Wax Coated Sprinklers 10896W/B

Figure 1:
Standard Sprinkler Wrenches

TECHNICAL DATA

MICROMATIC® STANDARD RESPONSE PENDENT SPRINKLER VK102 (K5.6)

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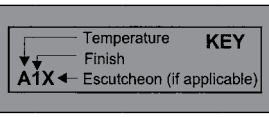
Approval Chart 1 (UL)

Micromatic® Standard Response Pendent Sprinkler VK102
Maximum 175 PSI (12 bar) WWP



Sprinkler Base Part Number[1]	SIN	Thread Size		Nominal K-Factor		Overall Length		Listings and Approvals[3] (Refer also to UL Design Criteria.)					
		NPT	BSP	U.S.	metric[2]	Inches	mm	cULus[4]	VdS	LPCB	CE[8]		
Standard Orifice													
12987	VK102	1/2"	15 mm	5.6	80.6	2-1/4"	57	A1, B4, B1Y, C5, D3, E6, G6Z	A2	A2, B4, B2Y	F2, G2Y	--	--
12989	VK102	--	15 mm	5.6	80.6	2-1/4"	57	A1, B4, B1Y, C5, D3, E6, G6Z	A2	A2, B4, B2Y	F2, G2Y	--	--
19776	VK102	1/2"	--	5.6	80.6	2-1/4"	57	--	--	--	--	--	E7
20229	VK102	--	15 mm	5.6	80.6	2-1/4"	57	--	--	--	--	--	E7
NOTICE - Product Below - Limited Availability (Contact Local Viking Office)													
10139	VK102	1/2"	15 mm	5.6	80.6	2-1/4"	57	A1, B4, B1Y, C5, D3, E6, G6Z	--	--	--	--	--
10173	VK102	--	15 mm	5.6	80.6	2-1/4"	57	A1, B4, B1Y, C5, D3, E6, G6Z	A2	A2, B4, B2Y	--	--	--
18020	VK102	1/2"	15 mm	5.6	80.6	2-1/4"	57	A1, B4, B1Y, C5, D3, E6, G6Z	A2	A2, B4, B2Y	F2, G2X	F2[9, 10]	--

Approved Temperature Ratings

A - 135 °F (57 °C), 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), 286 °F (141 °C), and 360 °F (182 °C)

B - 135 °F (57 °C), 155 °F (68 °C), 175 °F (79 °C), and 200 °F (93 °C)

C - 286 °F (141 °C)

D - 500 °F (260 °C)[7]

E - 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), 286 °F (141 °C), 360 °F (182 °C), and 500 °F (260 °C)[7]

F - 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), 286 °F (141 °C), and 360 °F (182 °C)

G - 155 °F (68 °C), 175 °F (79 °C), and 200 °F (93 °C)

Approved Finishes

1 - Brass, Chrome, White Polyester[5,6], and Black Polyester[5,6]

2 - Brass, Chrome, White Polyester[6], and Black Polyester[6]

3 - Brass and Chrome

4 - Wax-Coated Brass and Wax Over Polyester[5]

5 - High Temperature 200 °F (93 °C) Wax Coating (corrosion resistant); maximum ambient temperature allowed at ceiling = 150 °F (65 °C)

6 - ENT[5]

7 - Chrome

Approved Escutcheons

X - Recessed with the Viking Micromatic® Model E-1, E-2, or E-3 Recessed Escutcheon

Y - Standard surface-mounted escutcheon or the Viking Microfast® Model F-1 Adjustable Escutcheon or recessed with the Viking Micromatic® Model E-1, E-2, or E-3 Recessed Escutcheon

Z - Standard surface-mounted escutcheon or recessed with the Viking Micromatic® Model E-1

Footnotes

[1] Base part number is shown. For complete part number, refer to Viking's current price schedule.

[2] Metric K-factor shown is for use when pressure is measured in bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.

[3] This table shows the listings and approvals available at the time of printing. Check with the manufacturer for any additional approvals.

[4] Listed by Underwriters Laboratories Inc. for use in the U.S. and Canada.

[5] cULus Listed as corrosion resistant.

[6] Other colors are available on request with the same Listings and Approvals as the standard colors.

[7] Sprinklers of Ultra-High temperature rating are intended for use inside ovens, dryers, or similar enclosures with normal operating temperatures above 300 °F (149 °C). Where the ambient temperature around the Ultra-High temperature rated sprinkler is significantly reduced below 300 °F (149 °C), the response time of the Ultra-High temperature rated sprinkler may be severely retarded.

[8] CE Certified, Standard EN 12259-1, EC-certificate of conformity 0832-CPD-0021.

[9] MED Certified, Standard EN 12259-1, EC-certificate of conformity 0832-MED-1003 and 0832-MED-1008.

[10] MED Certified, RINA Certificate No. MED497705C5.

DESIGN CRITERIA - UL

(Also refer to Approval Chart 1.)

cULus Listing Requirements:

The Viking Micromatic® Standard Response Pendent Sprinkler VK102 is cULus Listed as indicated in Approval Chart 1 for installation in accordance with the latest edition of NFPA 13 for standard spray sprinklers.

- Designed for use in Light, Ordinary, and Extra Hazard occupancies.
- The sprinkler installation rules contained in NFPA 13 for standard spray pendent sprinklers must be followed.

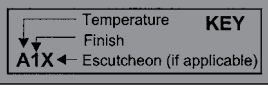
IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. Also refer to page F_080614 for general care, installation, and maintenance information. Viking sprinklers are to be installed in accordance with the latest edition of Viking technical data, the appropriate standards of NFPA, LPCB, APSAD, VdS or other similar organizations, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable.

VIKING®	TECHNICAL DATA	MICROMATIC® STANDARD RESPONSE PENDENT SPRINKLER VK102 (K5.6)

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
Visit the Viking website for the latest edition of this technical data page www.vikinggroupinc.com

Approval Chart 2 (FM)

Micromatic® Standard Response Pendent Sprinkler VK102
Maximum 175 PSI (12 bar) WWP



Sprinkler Base Part Number[1]	SIN	Thread Size		Nominal K-Factor		Overall Length		FM Approvals[3] (Refer also to Design Criteria below.)
		NPT	BSP	U.S.	metric[2]	Inches	mm	
Standard Orifice								
12987	VK102	1/2”	15 mm	5.6	80.6	2-1/4”	57	A1, B2, C3, D1, E4, G1Y, G4Z
12989	VK102	--	15 mm	5.6	80.6	2-1/4”	57	A1, B2, C3, D1, E4, G1Y, G4Z
NOTICE - Product Below - Limited Availability (Contact Local Viking Office)								
10139	VK102	1/2”	15 mm	5.6	80.6	2-1/4”	57	A1, B2, C3, D1, E4, G1Y, G4Z
10173	VK102	--	15 mm	5.6	80.6	2-1/4”	57	A1, B2, C3, D1, E4, G1Y, G4Z
18020	VK102	1/2”	15 mm	5.6	80.6	2-1/4”	57	A1, B2, C3, D1, G1Y

Approved Temperature Ratings

A - 135 °F (57 °C), 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), 212 °F (100 °C), 286 °F (141 °C), and 360 °F (182 °C)

B - 135 °F (57 °C), 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), and 212 °F (100 °C)

C - 286 °F (141 °C)

D - 500 °F (260 °C)[5]

E - 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), 286 °F (141 °C), 360 °F (182 °C), and 500 °F (260 °C)[5]

F - 135 °F (57 °C), 155 °F (68 °C), 175 °F (79 °C), and 200 °F (93 °C)

G - 155 °F (68 °C), 175 °F (79 °C), and 200 °F (93 °C)

Approved Finishes

1 - Brass, Chrome, White Polyester[4], and Black Polyester[4]

2 - Wax-Coated Brass (corrosion resistant)

3 - High Temperature 200 °F (93 °C) Wax Coating (corrosion resistant); maximum ambient temperature allowed at the ceiling = 150 °F (65 °C)

4- ENT[6]

Approved Escutcheons

Y - Standard surface-mounted escutcheon or the Viking Microfast® Model F-1 Adjustable Escutcheon or recessed with the Viking Micromatic® Model E-1, E-2, or E-3 Recessed Escutcheon

Z - Standard surface-mounted escutcheon or re- cessed with the Viking Micromatic® Model E-1

Footnotes

[1] Base part number is shown. For complete part number, refer to Viking’s current price schedule.

[2] Metric K-factor shown is for use when pressure is measured in bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.

[3] This table shows the listings and approvals available at the time of printing. Check with the manufacturer for any additional approvals.

[4] Other colors are available on request with the same Approvals as the standard colors.

[5] Sprinklers of Ultra-High temperature rating are intended for use inside ovens, dryers, or similar enclosures with normal operating temperatures above 300 °F (149 °C). Where the ambient temperature around the Ultra-High temperature rated sprinkler is significantly reduced below 300 °F (149 °C), the response time of the Ultra-High temperature rated sprinkler may be severely retarded.

[6] FM approved as corrosion resistant.

DESIGN CRITERIA - FM

(Also refer to Approval Chart 2.)

FM Approval Requirements:

The Viking Micromatic® Standard Response Pendent Sprinkler VK102 is is FM Approved as standard response **Non-Storage** pendent sprinkler as indicated in the FM Approval Guide. For specific application and installation requirements, reference the latest applicable FM Loss Prevention Data Sheets (including Data Sheet 2-0). FM Global Loss Prevention Data Sheets contain guidelines relating to, but not limited to: minimum water supply requirements, hydraulic design, ceiling slope and obstructions, minimum and maximum allowable spacing, and deflector distance below the ceiling.

NOTE: The FM installation guidelines may differ from cULus and/or NFPA criteria.

IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. Also refer to page F_080614 for general care, installation, and maintenance information. Viking sprinklers are to be installed in accordance with the latest edition of Viking technical data, the appropriate 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.

VIKING®	TECHNICAL DATA	MICROMATIC® STANDARD RESPONSE PENDENT SPRINKLER VK102 (K5.6)

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
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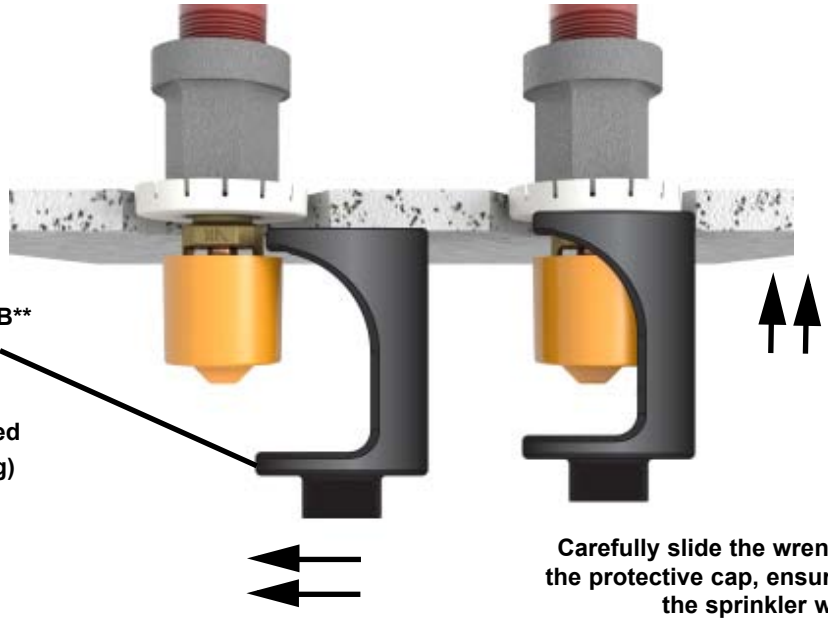
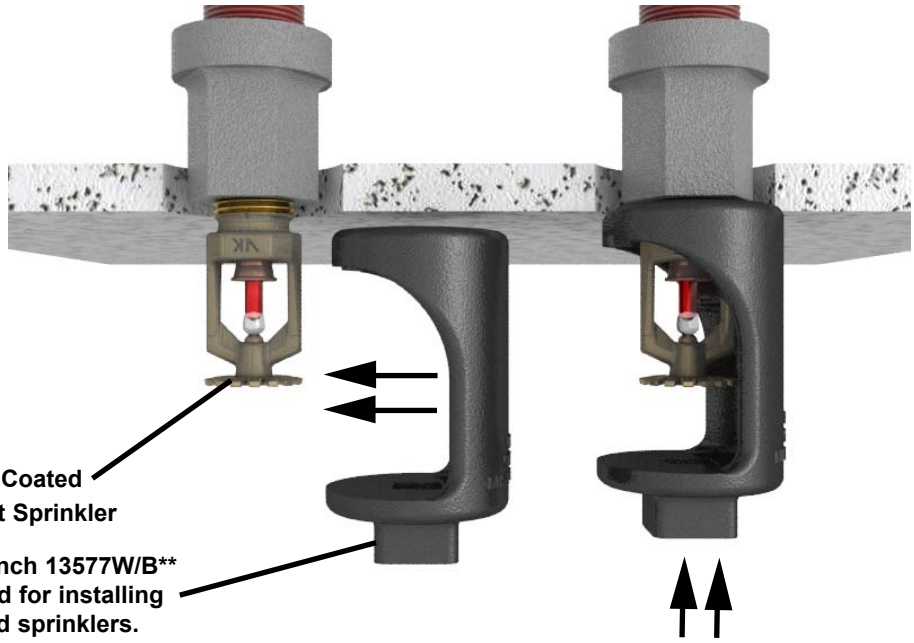


Sprinkler wrench 13655W/B** for recessed pendent sprinklers

** A 1/2" ratchet is required (not available from Viking)

Carefully slide the wrench sideways around the protective cap, ensuring engagement with the sprinkler wrench flats

Figure 2: Wrench 13655W/B for Recessed Pendent Sprinklers



Step 1: Carefully slide the wrench sideways around the deflector, ensuring engagement with the sprinklger wrench flats.

Wax Coated Pendent Sprinkler

Sprinkler wrench 13577W/B** must be used for installing wax coated sprinklers.

** A 1/2" ratchet is required (not available from Viking)

Step 2: Carefully press the wrench upward and ensure engagement with the sprinkler wrench flats.

Figure 3: Socket Wrench for Wax Coated Sprinklers 13577W/B

VIKING®

TECHNICAL DATA

MICROMATIC® STANDARD RESPONSE PENDENT SPRINKLER VK102 (K5.6)

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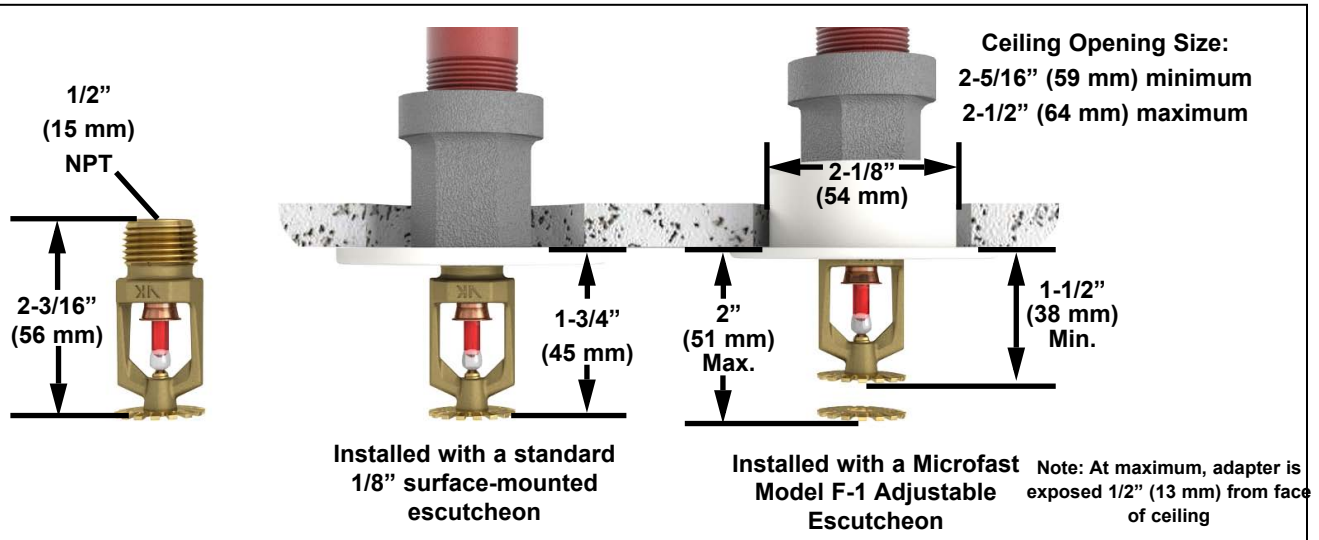

Figure 4: Sprinkler Dimensions with a Standard Escutcheon and the Model F-1 Adjustable Escutcheon

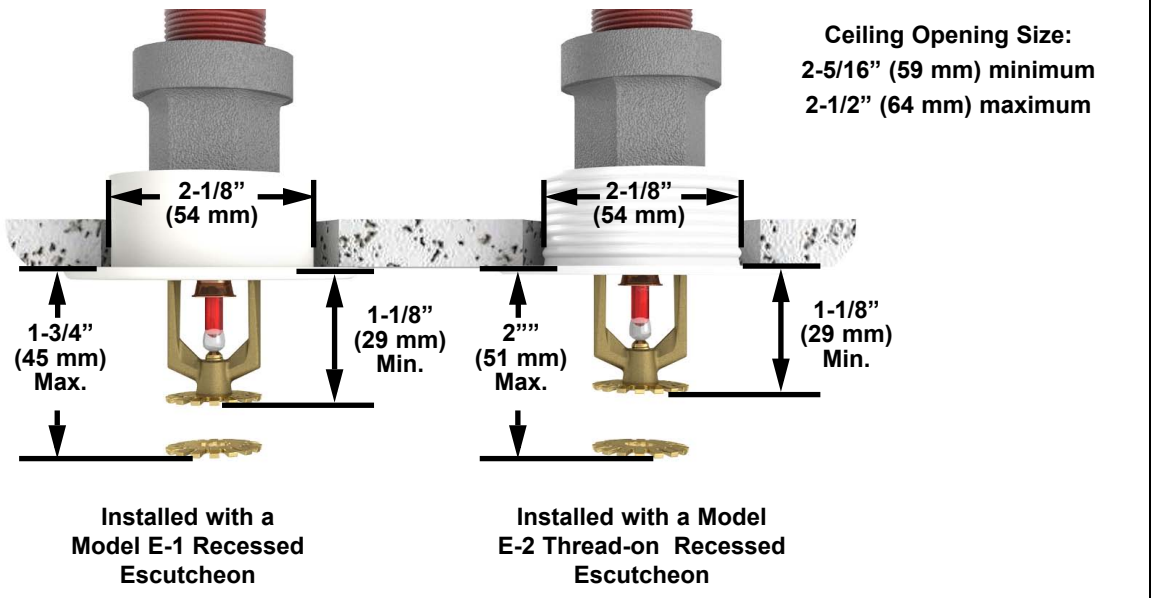

Figure 5: Sprinkler Dimensions with the Model E-1 and E-2 Recessed Escutcheons

MICROMATIC® STANDARD RESPONSE HORIZONTAL SIDEWALL SPRINKLER VK104 (K5.6)

TECHNICAL DATA

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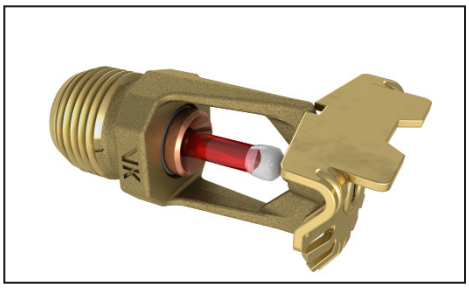
1. DESCRIPTION

The Micromatic® Viking Standard Response Horizontal Sidewall Sprinkler VK104 is a small thermosensitive glass bulb spray sprinkler available with various finishes and temperature ratings to meet design requirements. The special Polyester and PTFE coatings can be used in decorative applications where colors are desired. In addition, these coatings have been investigated for installation in corrosive atmospheres and are cULus listed as corrosion resistant as indicated in the Approval Chart. (Note: FM Global has no approval classification for PTFE and Polyester coatings as corrosion resistant.)



Horizontal Sidewall

For Light Hazard Occupancies Only

2. LISTINGS AND APPROVALS

cULus Listed: Category VNIV

FM Approved: Class Series 2000

LPCB Approved: Certificate 096e/06

CE Certified: Standard EN 12259-1, EC-certificate of constancy of performance 0832-CPR-S0021, EC-Certificate of Conformmity 0832-CPD-2001

CCCF Approved: Approved by the China Certification Center for Fire Products (CCCF)

MED Certified: Standard EN 12259-1, EC-certificate 0832-MED-1003

NOTE: Other international approval certificates are available upon reqeust.

Refer to Approval Charts and Design Criteria in this data page for Listing and Approval requirements that must be followed.

3. TECHNICAL DATA

Specifications:

Minimum Operating Pressure: 7 psi (0.5 bar)
Rated to 175 psi (12 bar) water working pressure
Factory tested hydrostatically to 500 psi (34.5 bar)
Nominal K-Factor: 5.6 U.S. (80.6 metric*)

* Metric K-factor measurement shown is when pressure is measured in Bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.

Glass-bulb fluid temperature rated to -65 °F (-55 °C)
Overall Length: 2-1/2” (64 mm)

Material Standards:

Frame Casting: Brass UNS-C84400 or QM Brass
Deflector: Copper UNS-C19500
Bulb: Glass, nominal 5 mm diameter
Belleville Spring Sealing Assembly: Nickel Alloy, coated on both sides with PTFE Tape
Screw: Brass UNS-C36000
Pip Cap and Insert Assembly: Copper UNS-C11000 and Stainless Steel UNS-S30400.
For PTFE Coated Sprinklers: Belleville Spring-Exposed, Screw-Nickel Plated, Pip Cap-PTFE Coated
For Polyester Coated Sprinklers: Belleville Spring-Exposed

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

Order Standard Response Sidewall Sprinklers by first adding the appropriate suffix for the sprinkler finish and then the appropriate suffix for the temperature rating to the sprinkler base part number.

Finish Suffix: Brass = A, Chrome = F, White Polyester = M-/W, Black Polyester = M-/B, and Black PTFE = N, Wax Coated = C, Wax Over Polyester = V-/W

Temperature Suffix: 135 °F / 57 °C = A, 155 °F / 68 °C = B, 175 °F / 79 °C = D, 200 °F / 93 °C = E, 286 °F / 141 °F = G, 360 °F / 182 °C = H

For example, sprinkler VK104 with a 1/2” thread, Brass finish and a 155 °F / 68 °C temperature rating = Part No. 12995AB

VIKING®	TECHNICAL DATA	MICROMATIC® STANDARD RESPONSE HORIZONTAL SIDEWALL SPRINKLER VK104 (K5.6)

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Available Finishes And Temperature Ratings: Refer to Table 1.

Accessories: (Also refer to the Viking website.)

Sprinkler Wrenches:

A. Standard Wrench: Part No. 10896W/B (available since 2000).
B. Wrench for recessed sprinklers with protective shields: Part No. 13655W/B** (available since 2003)
C. Wrench for wax coated sprinklers: Part No. 13577W/B** (available since 2006)
**A ½" ratchet is required (not available from Viking).

Sprinkler Cabinets:

A. Six-head capacity: Part No. 01724A (available since 1971)
B. Twelve-head capacity: Part No. 01725A (available since 1971)

4. INSTALLATION

Refer to appropriate NFPA Installation Standards.

5. OPERATION

During fire conditions, the heat-sensitive liquid in the glass bulb expands, causing the glass to shatter, releasing the pip cap and sealing spring assembly. Water flowing through the sprinkler orifice strikes the sprinkler deflector, forming a uniform spray pattern to extinguish or control the fire.

6. INSPECTIONS, TESTS AND MAINTENANCE

Refer to NFPA 25 for Inspection, Testing and Maintenance requirements.

7. AVAILABILITY

The Micromatic® Viking Standard Response Horizontal Sidewall Sprinkler VK104 is 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.

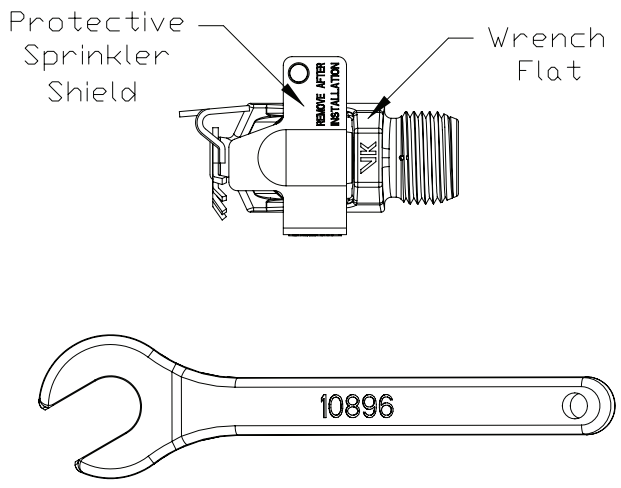

Figure 1:
Standard Sprinkler Wrench 10896W/B

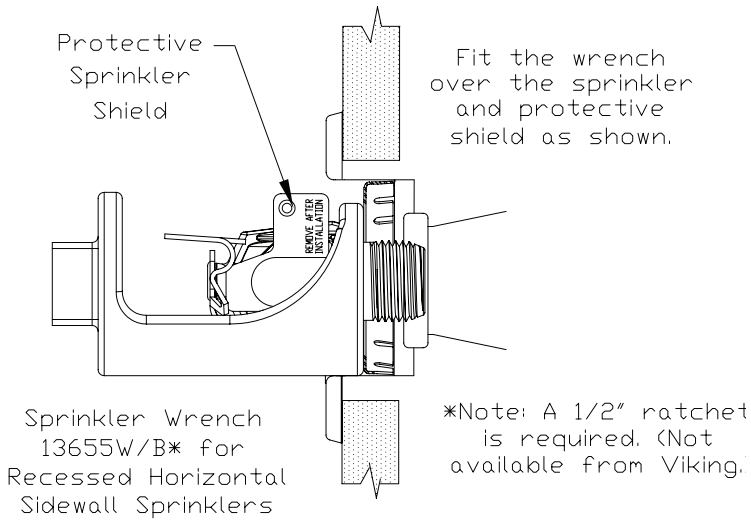

Figure 2:
Wrench 13655W/B for Recessed Horizontal Sidewall Sprinklers

VIKING®

TECHNICAL DATA

MICROMATIC® STANDARD RESPONSE HORIZONTAL SIDEWALL SPRINKLER VK104 (K5.6)

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TABLE 1: AVAILABLE SPRINKLER TEMPERATURE RATINGS AND FINISHES

Sprinkler Temperature Classification	Sprinkler Nominal Temperature Rating[1]	Maximum Ambient Ceiling Temperature[2]	Bulb Color
Ordinary	135 °F (57 °C)	100 °F (38 °C)	Orange
Ordinary	155 °F (68 °C)	100 °F (38 °C)	Red
Intermediate	175 °F (79 °C)	150 °F (65 °C)	Yellow
Intermediate	200 °F (93 °C)	150 °F (65 °C)	Green
High	286 °F (141 °C)	225 °F (107 °C)	Blue
Extra High	360 °F (182 °C)	300 °F (149 °C)	Mauve

Sprinkler Finishes: Brass, Chrome, White Polyester, Black Polyester, and Black PTFE

Corrosion-Resistant Coatings[3]: White Polyester, Black Polyester, and Black PTFE in all temperature ratings. Wax-Coated Brass and Wax over Polyester for sprinklers with the following temperature ratings:

- 155 °F (68 °C) Lt. Brown Wax
- 175 °F (79 °C) Brown Wax
- 200 °F (93 °C) Brown Wax
- 286 °F (141 °C) Dk. Brown Wax[4]

Footnotes

[1] The sprinkler 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] The corrosion-resistant coatings have passed the standard corrosion test required by the approving agencies indicated in the Approval Chart. These tests cannot and do not represent all possible corrosive environments. Prior to installation, verify through the end-user that the coatings are compatible with or suitable for the proposed environment. For automatic sprinklers, the coatings indicated are applied to the exposed exterior surfaces only. Note that the spring is exposed on sprinklers with Polyester and PTFE coatings. For PTFE coated open sprinklers only, the waterway is coated.

[4] Wax melting point is 170 °F (76 °C) for 286 °F (141 °C) temperature rated sprinklers.

VIKING®

TECHNICAL DATA

MICROMATIC® STANDARD RESPONSE HORIZONTAL SIDEWALL SPRINKLER VK104 (K5.6)

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Approval Chart 1 (UL)

Micromatic® Viking Standard Response Horizontal Sidewall Sprinkler VK104
For Light Hazard Occupancies Only
Maximum 175 PSI (12 Bar) WWP

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

Base Part Number[1]	SIN	Sprinkler Style	Thread Size		Nominal K-Factor		Overall Length		Listings and Approvals[3] (Refer also to Design Criteria.)				
			NPT	BSP	U.S.	metric[2]	Inches	mm	cULus[4,5]	LPCB	CE	[9]	
Horizontal Sidewall													
12995	VK104	HSW	1/2”	15 mm	5.6	80.6	2-1/2	64	A1Y, B1X, B2X	A3Z, B2Z	C3Z[8]	C3U[9]	--
12988	VK104	HSW	--	15 mm	5.6	80.6	2-1/2	64	A1Y, B1X, B2X	A3Z, B2Z	C3Z[8]	C3U[9]	--
19777	VK104	HSW	1/2”	--	5.6	80.6	2-1/2	64	--	--	--	--	D4
20230	VK104	HSW	--	15 mm	5.6	80.6	2-1/2	64	--	--	--	--	D4
NOTICE - Product Below - Limited Availability (Contact Local Viking Office)													
10224	VK104	HSW	1/2”	15 mm	5.6	80.6	2-1/2	64	B2W, B1W, A1X	A3Z	C3Z[8]	C3U[9]	C3Z
10171	VK104	HSW	--	15 mm	5.6	80.6	2-1/2	64	B2W, B1W, A1X	A3Z	C3Z[8]	C3U[9]	C3Z

Approved Temperature Ratings

A - 135 °F (57 °C), 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), 286 °F (141 °C), and 360 °F (182 °C)
B - 135 °F (57 °C), 155 °F (68 °C), 175 °F (79 °C), and 200 °F (93 °C)
C - 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), 286 °F (141 °C), and 360 °F (182 °C)
D - 155 °F (68 °C)

Approved Finishes

1 - Brass, Chrome, White Polyester[6,7], Black Polyester[6,7], and Black PTFE[6]
2 - Wax-Coated Brass and Wax Over Polyester (corrosion resistant)
3 - Brass, Chrome, White Polyester[6], and Black Polyester[6]
4 - Chrome

Approved Escutcheons

U - Installed with the Viking Microfast Model F-1 Adjustable Escutcheon only.
W - Installed with standard surface-mounted escutcheons or the Viking Microfast® Model F-1 Adjustable Escutcheon, **or** recessed with the Viking Micromatic® Model E-1, E-2, E-3, or Model G-1 Recessed Escutcheon
X - Installed with standard surface-mounted escutcheons, the Viking Microfast® Model F-1 Adjustable Escutcheon, **or** recessed with the Viking Micromatic® Model E-1, E-2, or E-3 Recessed Escutcheon
Y - Installed with standard surface-mounted escutcheons or the Viking Microfast® Model F-1 Adjustable Escutcheon
Z - Installed with standard surface-mounted escutcheons only.

Footnotes

[1] Base part number shown. For complete part number, refer to Viking’s current price schedule.
[2] Metric K-factor measurement shown is when pressure is measured in Bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.
[3] This table shows the listings and approvals available at the time of printing. Other approvals may be in process.
[4] Listings and Approvals are limited to Light Hazard Occupancies where allowed by the installation standards being applied.
[5] Listed by Underwriters Laboratories Inc. for use in the U.S. and Canada.
[6] cULus Listed as corrosion-resistant.
[7] Other colors are available on request with the same Listings and Approvals as the standard colors.
[8] Certified, Standard EN 12259-1, EC-certificate of constancy of performance 0832-CPR-S0021, and EC-Certificate of Conformity 0832-CPD-2001
[9] MED Certified, Standard EN 12259-1; EC-certificate 0832-MED-1003.

VIKING®	TECHNICAL DATA	MICROMATIC® STANDARD RESPONSE HORIZONTAL SIDEWALL SPRINKLER VK104 (K5.6)

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DESIGN CRITERIA - UL

(Also refer to Approval Chart 1 above.)

cULus Listing Requirements:

The Micromatic® Viking Standard Response Horizontal Sidewall Sprinkler VK104 is cULus Listed as indicated in the Approval Chart for installation in accordance with the latest edition of NFPA 13 for sidewall standard spray sprinklers.

- For use in Light Hazard occupancies only where allowed by the installation standards being applied.
- Locate the deflector 4" to 12" (102 mm to 305 mm) below the ceiling.
- Protection areas and maximum spacing shall be in accordance with the tables provided in NFPA 13.
- Minimum spacing allowed is 6 ft. (1.8 m).
- Align the top of the deflector parallel with the ceiling.
- Locate no less than 4" (102 mm) from end walls.
- Maximum distance from end walls shall be no more than one-half of the allowable distance between sprinklers. The distance shall be measured perpendicular to the wall.
- The sprinkler installation and obstruction rules contained in NFPA 13 for sidewall standard spray sprinklers must be followed.

IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. Also refer to Form No. F_080614 for general care, installation, and maintenance information. Viking sprinklers are to be installed in accordance with the latest edition of Viking technical data, the appropriate standards of NFPA, LPCB, APSAD, VdS or other similar organizations, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable.

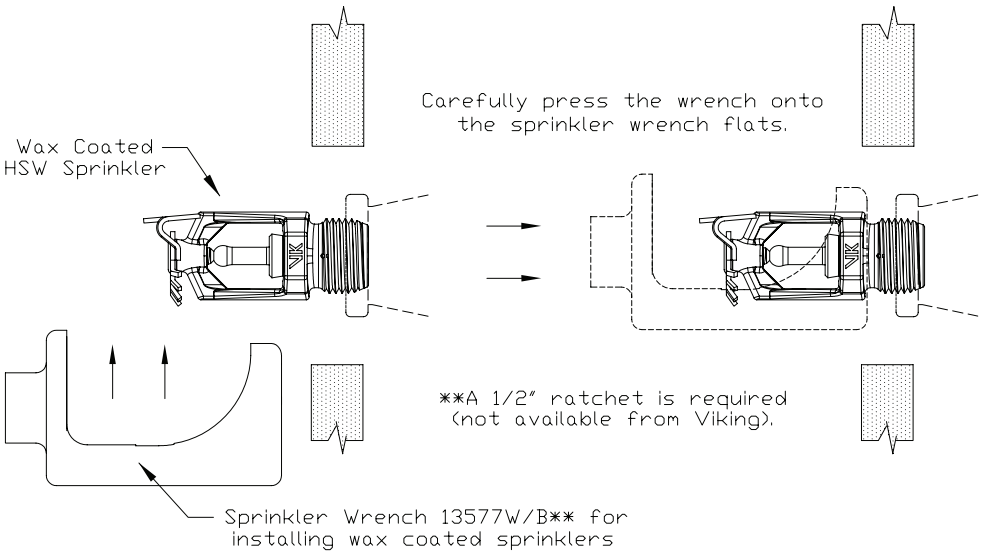

Figure 3: Wrench 13577W/B for Wax Coated Sprinklers

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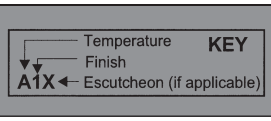
Approval Chart 2 (FM)

Micromatic® Viking Standard Response Horizontal Sidewall Sprinkler VK104
Maximum 175 PSI (12 Bar) WWP



Base Part Number[1]	SIN	Sprinkler Style	Thread Size		Nominal K-Factor		Overall Length		FM Approvals[3,4] (Refer also to Design Criteria.)
			NPT	BSP	U.S.	metric[2]	Inches	mm	
Horizontal Sidewall									
12995	VK104	HSW	1/2"	15 mm	5.6	80.6	2-1/2	64	A1Y, B1X
12988	VK104	HSW	--	15 mm	5.6	80.6	2-1/2	64	A1Y, B1X
NOTICE - Product Below - Limited Availability (Contact Local Viking Office)									
10224	VK104	HSW	1/2"	15 mm	5.6	80.6	2-1/2	64	A1Y, B1X
10171	VK104	HSW	--	15 mm	5.6	80.6	2-1/2	64	A1Y, B1X

Approved Temperature Ratings

A - 135 °F (57 °C), 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), and 286 °F (141 °C)
B - 135 °F (57 °C), 155 °F (68 °C), 175 °F (79 °C), and 200 °F (93 °C)

Approved Finishes

1 - Brass and Chrome

Approved Escutcheons

X - Installed with standard surface-mounted escutcheons, the Viking Microfast® Model F-1 Adjustable Escutcheon, **or** recessed with the Viking Micromatic® Model E-1, E-2, E-3, or G-1 Recessed Escutcheon
Y - Installed with standard surface-mounted escutcheons or the Viking Microfast® Model F-1 Adjustable Escutcheon

Footnotes

[1] Base part number shown. For complete part number, refer to Viking's current price schedule.

[2] Metric K-factor measurement shown is when pressure is measured in Bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.

[3] This table shows the FM Approvals available at the time of printing. Other approvals may be in process.

DESIGN CRITERIA - FM

(Also refer to Approval Chart 2 above.)

FM Approval Requirements:

The Micromatic® Viking Standard Response Horizontal Sidewall Sprinkler VK104 is FM Approved as standard response sidewall **Non-Storage** sprinklers, as indicated in the FM Approval Guide. For specific application and installation requirements, reference the latest applicable FM Loss Prevention Data Sheets (including 2-0) and Technical Advisory Bulletins. FM Global Loss Prevention Data Sheets and Technical Advisory Bulletins contain guidelines relating to, but not limited to: minimum water supply requirements, hydraulic design, ceiling slope and obstructions, minimum and maximum allowable spacing, and deflector distance below the ceiling.

NOTE: The FM installation guidelines may differ from cULus and/or NFPA criteria.

IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. Also refer to Form No. F_080614 for general care, installation, and maintenance information. Viking sprinklers are to be installed in accordance with the latest edition of Viking technical data, the appropriate 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.

MICROMATIC® STANDARD RESPONSE HORIZONTAL SIDEWALL SPRINKLER VK104 (K5.6)

TECHNICAL DATA

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
Visit the Viking website for the latest edition of this technical data page www.vikinggroupinc.com

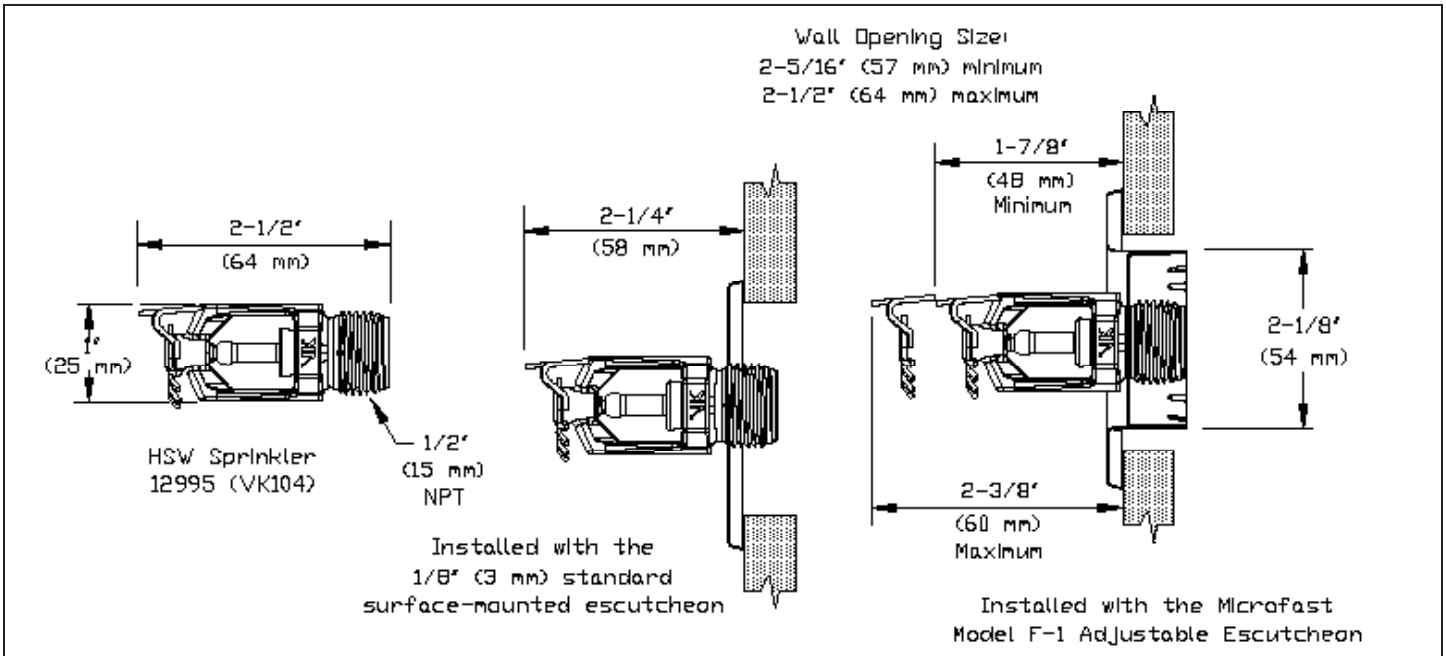


Figure 4: Horizontal Sidewall Sprinkler Dimensions with a Standard Escutcheon and the Model F-1 Adjustable Escutcheon

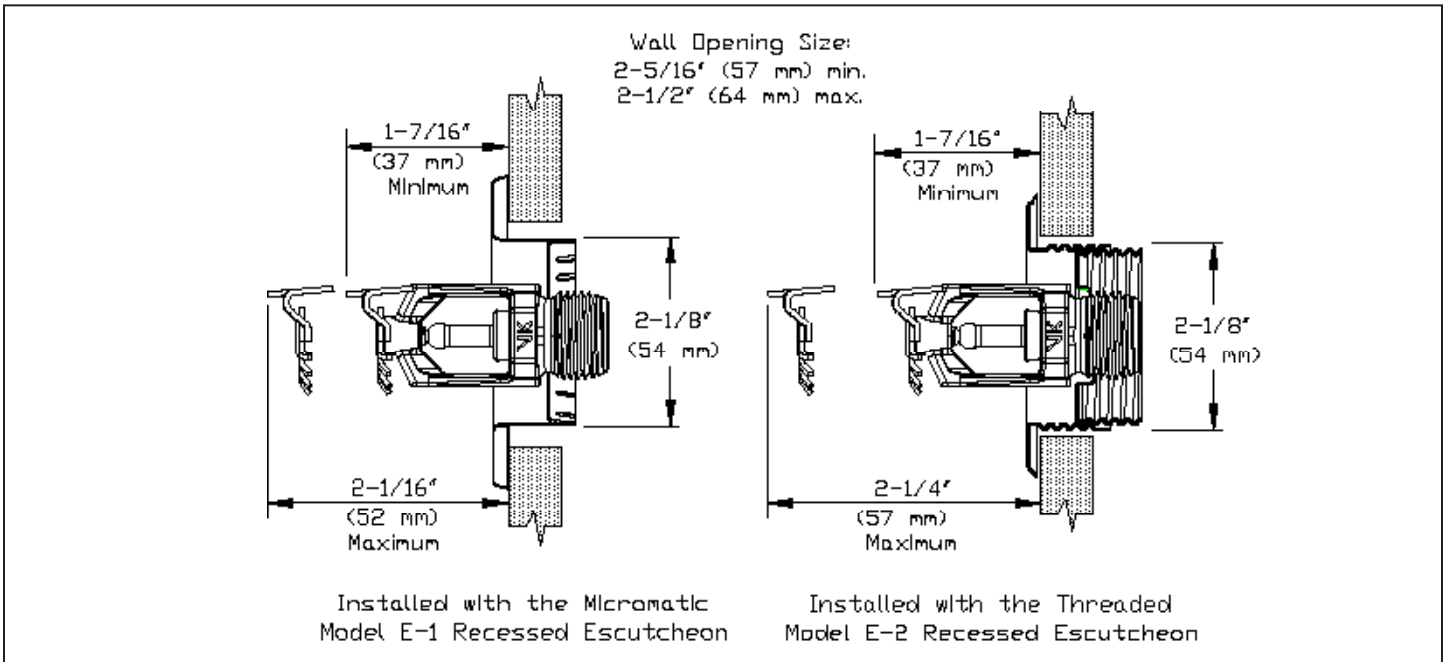


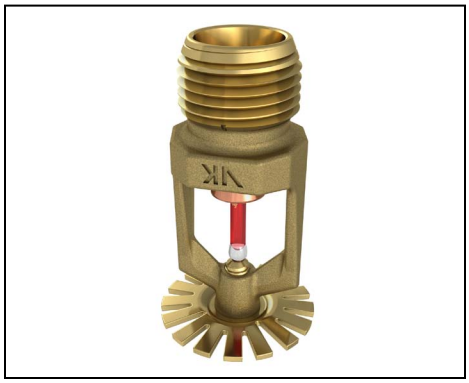
Figure 5: Horizontal Sidewall Sprinkler Dimensions with the Model E-1 and E-2 Recessed Escutcheons

TECHNICAL DATA

MICROFAST® QUICK RESPONSE PENDENT SPRINKLER VK302 (K5.6)

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
Visit the Viking website for the latest edition of this technical data page: www.vikinggroupinc.com

1. DESCRIPTION



The Viking Microfast® Quick Response Pendent Sprinkler VK302 is a small thermo-sensitive glass bulb spray sprinkler available with various finishes and temperature ratings to meet design requirements. The special Polyester and Electroless Nickel PTFE (ENT) coatings can be used in decorative applications where colors are desired. In addition, these coatings have been investigated for installation in corrosive atmospheres and are listed/approved as corrosion resistant as indicated in the Approval Charts. (Note: **FM Global approves ENT finish as corrosion resistant.** FM Global has no approval classification for Polyester coatings as corrosion resistant.)

2. LISTINGS AND APPROVALS

cULus Listed: Category VNIV

FM Approved: Class Series 2000

VdS Approved: Certificates G414009 and G414010

LPCB Approved

CE Certified: Standard EN 12259-1:1999, A3:2006 Certificate of Constancy of Performance 0832-CPR-S0021

CCCF Approved: Approved by the China Certification Center for Fire Products (CCCF)

Refer to Approval Charts and Design Criteria for listing and approval requirements that must be followed.

3. TECHNICAL DATA

Specifications:

Minimum Operating Pressure: 7 psi (0.5 bar)
Rated to 175 psi (12 bar) water working pressure
Factory tested hydrostatically to 500 psi (34.5 bar)
Thread size: 1/2” NPT, 15 mm BSP
Nominal K-Factor: 5.6 U.S. (80.6 metric**)
Glass-bulb fluid temperature rated to -65 °F (-55 °C)
Overall Length: 2-1/4” (58 mm)

*cULus Listing, FM Approval, and NFPA 13 installs require a minimum of 7 psi (0.5 bar). The minimum operating pressure for LPCB and CE Approvals ONLY is 5 psi (0.35 bar).

Material Standards:

Frame Casting: Brass UNS-C84400 or QM Brass
Deflector: Phosphor Bronze UNS-C51000 or Copper UNS-C19500
Bulb: Glass, nominal 3 mm diameter
Belleville Spring Sealing Assembly: Nickel Alloy, coated on both sides with PTFE Tape
Screw: Brass UNS-C36000
Pip Cap and Insert Assembly: Copper UNS-C11000 and Stainless Steel UNS-S30400
For Polyester Coated Sprinklers: Belleville Spring-Exposed
For ENT Coated Sprinklers: Belleville Spring-Exposed, Screw and Pipcap - ENT plated.

Ordering Information: (Also refer to the current Viking price list.)
Order Quick Response Pendent Sprinklers by first adding the appropriate suffix for the sprinkler finish and then the appropriate suffix for the temperature rating to the sprinkler base part number.
Finish Suffix: Brass = A, Chrome = F, White Polyester = M-/W, Black Polyester = M-/B, and ENT = JN
Temperature Suffix: 135 °F (57 °C) = A, 155 °F (68 °C) = B, 175 °F (79 °C) = D, 200 °F (93 °C) = E, 286 °F (141 °C) = G
For example, sprinkler VK302 with a Brass finish and a 155 °F (68 °C) temperature rating = Part No. 12979AB
Available Finishes And Temperature Ratings: Refer to Table 1.
Accessories: (Also refer to the current Viking price list.)

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
Visit the Viking website for the latest edition of this technical data page: www.vikinggroupinc.com

Sprinkler Wrenches:

A. Standard Wrench: Part No. 21475M/B (available since 2017).
B. Wrench for Recessed Pendent Sprinklers: Part No. 13655W/B** (available since 2006)
C. Optional Protective Sprinkler Cap Remover/Escutcheon Installer Tool*** Part No. 15915 (available since 2010)

**A ½" ratchet is required (not available from Viking).

***Allows use from the floor by attaching a length of 1" diameter CPVC tubing to the tool. Ideal for sprinkler cabinets. Refer to Bulletin F_051808.

Sprinkler Cabinets:

A. Six-head capacity: Part No. 01724A (available since 1971)
B. Twelve-head capacity: Part No. 01725A (available since 1971)

4. INSTALLATION

Refer to appropriate NFPA Installation Standards.

5. OPERATION

During fire conditions, the heat-sensitive liquid in the glass bulb expands, causing the glass to shatter, releasing the pip cap and sealing spring assembly. Water flowing through the sprinkler orifice strikes the sprinkler deflector, forming a uniform spray pattern to extinguish or control the fire.

6. INSPECTIONS, TESTS AND MAINTENANCE

Refer to NFPA 25 for Inspection, Testing and Maintenance requirements.

7. AVAILABILITY

The Viking Microfast® Quick Response Pendent Sprinkler VK302 is 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.

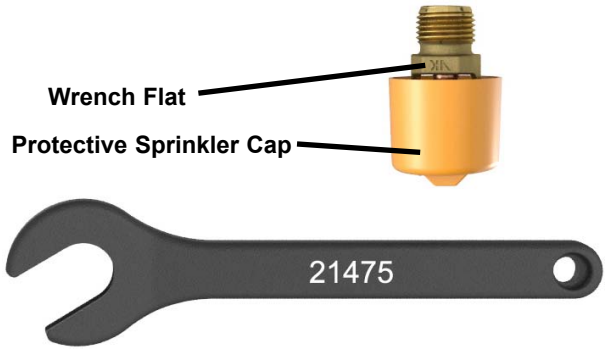


Figure 1:
Standard Sprinkler Wrench 21475M/B

VIKING®

TECHNICAL DATA

MICROFAST® QUICK RESPONSE PENDENT SPRINKLER VK302 (K5.6)

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
Visit the Viking website for the latest edition of this technical data page: www.vikinggroupinc.com

TABLE 1: AVAILABLE SPRINKLER TEMPERATURE RATINGS AND FINISHES

Sprinkler Temperature Classification	Sprinkler Nominal Temperature Rating[1]	Maximum Ambient Ceiling Temperature[2]	Bulb Color
Ordinary	135 °F (57 °C)	100 °F (38 °C)	Orange
Ordinary	155 °F (68 °C)	100 °F (38 °C)	Red
Intermediate	175 °F (79 °C)	150 °F (65 °C)	Yellow
Intermediate	200 °F (93 °C)	150 °F (65 °C)	Green
High	286 °F (141 °C)	225 °F (107 °C)	Blue

Sprinkler Finishes: Brass, Chrome, White Polyester, Black Polyester, and ENT

Corrosion-Resistant Coatings[3]: White Polyester, and Black Polyester. ENT in all temperature ratings except 135 °F (57 °C)

Footnotes

[1] The sprinkler 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] The corrosion-resistant coatings have passed the standard corrosion test required by the approving agencies indicated in the Approval Charts. These tests cannot and do not represent all possible corrosive environments. Prior to installation, verify through the end-user that the coatings are compatible with or suitable for the proposed environment. For automatic sprinklers, the coatings indicated are applied to the exposed exterior surfaces only. Note that the spring is exposed on sprinklers with Polyester and ENT coatings. For ENT coated automatic sprinklers, the waterway is coated.

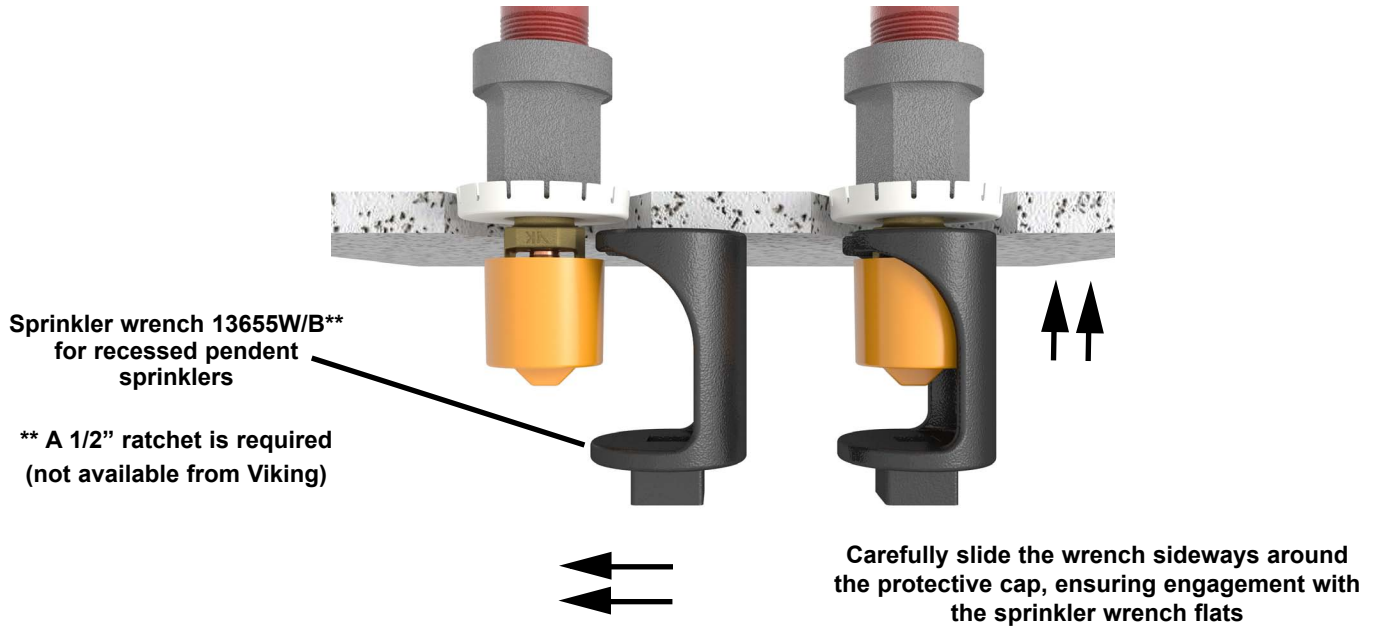


Figure 2: Wrench 13655W/B for Recessed Pendent Sprinklers

TECHNICAL DATA

MICROFAST® QUICK RESPONSE PENDENT SPRINKLER VK302 (K5.6)

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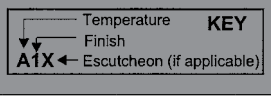
Approval Chart 1 (UL)

The Viking Microfast® Quick Response Pendent Sprinkler VK302
Maximum 175 PSI (12 Bar) WWP



Base Part Number[1]	SIN	Sprinkler Style	Thread Size		Nominal K-Factor		Overall Length		Listings and Approvals[3] (Refer also to Design Criteria.)					
			NPT	BSP	U.S.	metric[2]	Inches	mm	cULus[4]	VdS	LPCB	CE[7]		
12979	VK302	Pendent	1/2”	15 mm	5.6	80.6	2-1/4	58	A1Z, B1Y, D2, C2X	A1	A1Z, B1Y	D1Z, C1Y	--	--
19780	VK302	Pendent	1/2”	--	5.6	80.6	2-1/4	58	--	--	--	--	--	D3
21354	VK302	Pendent	--	15 mm	5.6	80.6	2-1/4	58	--	--	--	--	--	D3
NOTICE - Product Below - Limited Availability (Contact Local Viking Office)														
06662B	VK302	Pendent	1/2”	15 mm	5.6	80.6	2-1/4	58	A1Z, B1Y, D2, C2X	--	--	--	--	--
18021	VK302	Pendent	1/2”	15 mm	5.6	80.6	2-1/4	58	A1X, B1Y	A1	A1X, B1Y	D1X, C1Y[8]	D1X, C1Y[9]	--

Approved Temperature Ratings

A - 135 °F (57 °C), 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), 286 °F (141 °C)
B - 135 °F (57 °C), 155 °F (68 °C), 175 °F (79 °C), and 200 °F (93 °C)
C - 155 °F (68 °C), 175 °F (79 °C), and 200 °F (93 °C)
D - 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), 286 °F (141 °C)

Approved Finishes

1 - Brass, Chrome, White Polyester[5,6], Black Polyester[5,6]
2 - ENT[5]
3 - Chrome

Approved Escutcheons

X - Standard surface-mounted escutcheon or the Viking Micromatic® Model E-1 Recessed Escutcheon
Y - Standard surface-mounted escutcheon or the Viking Microfast® Model F-1 Adjustable Escutcheon, or recessed with the Viking Micromatic® Model E-1, E-2, or E-3 Recessed Escutcheon
Z - Standard surface-mounted escutcheon or the Viking Microfast® Model F-1 Adjustable Escutcheon

Footnotes

[1] Base part number shown. For complete part number, refer to Viking’s current price schedule.
[2] Metric K-factor measurement shown is when pressure is measured in Bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.
[3] This table shows the listings and approvals available at the time of printing. Other approvals may be in process.
[4] Listed by Underwriters Laboratories Inc. for use in the U.S. and Canada.
[5] cULus Listed as corrosion-resistant.
[6] Other colors are available on request with the same Listings and Approvals as the standard colors.
[7] CE Certified, Standard EN 12259-1, EC-certificate of conformity 0832-CPD-2001.
[8] CE Certified, Standard EN 12259-1, EC-certificates of conformity 0832-CPD-2001 and 0832-CPD-2003.
[9] MED Certified, Standard EN 12259-1, EC-certificates of conformity 0832-MED-1003 and 0832-MED-1008.

DESIGN CRITERIA - UL

(Also refer to Approval Chart 1 above.)

cULus Listing Requirements:

The Viking Microfast® Quick Response Pendent Sprinkler VK302 is cULus Listed as indicated in the Approval Chart for installation in accordance with the latest edition of NFPA 13 for standard spray sprinklers.

- Designed for use in Light and Ordinary occupancies.
- The sprinkler installation rules contained in NFPA 13 for standard spray pendent sprinklers must be followed.

IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. Also refer to Form No. F_080614 for general care, installation, and maintenance information. Viking sprinklers are to be installed in accordance with the latest edition of Viking technical data, the appropriate standards of NFPA, LPCB, APSAD, VdS or other similar organizations, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable.

VIKING®

TECHNICAL DATA

MICROFAST® QUICK RESPONSE PENDENT SPRINKLER VK302 (K5.6)

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
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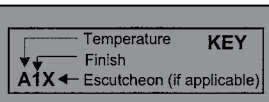
Approval Chart 2 (FM)

The Viking Microfast® Quick Response Pendent Sprinkler VK302
Maximum 175 PSI (12 Bar) WWP



Base Part Number[1]	SIN	Sprinkler Style	Thread Size		Nominal K-Factor		Overall Length		FM Approvals[3] (Refer also to Design Criteria.)
			NPT	BSP	U.S.	metric[2]	Inches	mm	
12979	VK302	Pendent	1/2”	15 mm	5.6	80.6	2-1/4	58	A1Z, B1Y, D2X, C2
NOTICE - Product Below - Limited Availability (Contact Local Viking Office)									
06662B	VK302	Pendent	1/2”	15 mm	5.6	80.6	2-1/4	58	A1Z, B1Y, D2X, C2
18021	VK302	Pendent	1/2”	15 mm	5.6	80.6	2-1/4	58	A1Z, B1Y

Approved Temperature Ratings

A - 135 °F (57 °C), 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), 286 °F (141 °C)
B - 135 °F (57 °C), 155 °F (68 °C), 175 °F (79 °C), and 200 °F (93 °C)
C - 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), 286 °F (141 °C)
D - 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C)

Approved Finishes

1 - Brass, Chrome, White Polyester[4], and Black Polyester[4]
2 - ENT[5]

Approved Escutcheons

X - Standard surface-mounted escutcheon or the Viking Micromatic® Model E-1 Recessed Escutcheon
Y - Standard surface-mounted escutcheon or the Viking Microfast® Model F-1 Adjustable Escutcheon, or recessed with the Viking Micromatic® Model E-1 or E-2 Recessed Escutcheon
Z - Standard surface-mounted escutcheon or the Viking Microfast® Model F-1 Adjustable Escutcheon

Footnotes

[1] Base part number shown. For complete part number, refer to Viking’s current price schedule.

[2] Metric K-factor measurement shown is when pressure is measured in Bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.

[3] This table shows the FM Approvals available at the time of printing. Other approvals may be in process.

[4] Other colors are available on request with the same Approvals as the standard colors.

[5] FM approved as corrosion resistant.

DESIGN CRITERIA - FM

(Also refer to Approval Chart 2 above.)

FM Approval Requirements:

The Viking Microfast® Quick Response Pendent Sprinkler VK302 is FM Approved as quick response **Non-storage** pendent sprinklers as indicated in the FM Approval Guide. For specific application and installation requirements, reference the latest applicable FM Loss Prevention Data Sheets (including Data Sheet 2-0). FM Global Loss Prevention Data Sheets contain guidelines relating to, but not limited to: minimum water supply requirements, hydraulic design, ceiling slope and obstructions, minimum and maximum allowable spacing, and deflector distance below the ceiling.

NOTE: The FM installation guidelines may differ from cULus and/or NFPA criteria.

IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. Also refer to page F_080614 for general care, installation, and maintenance information. Viking sprinklers are to be installed in accordance with the latest edition of Viking technical data, the appropriate 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.

VIKING®

TECHNICAL DATA

MICROFAST® QUICK RESPONSE PENDENT SPRINKLER VK302 (K5.6)

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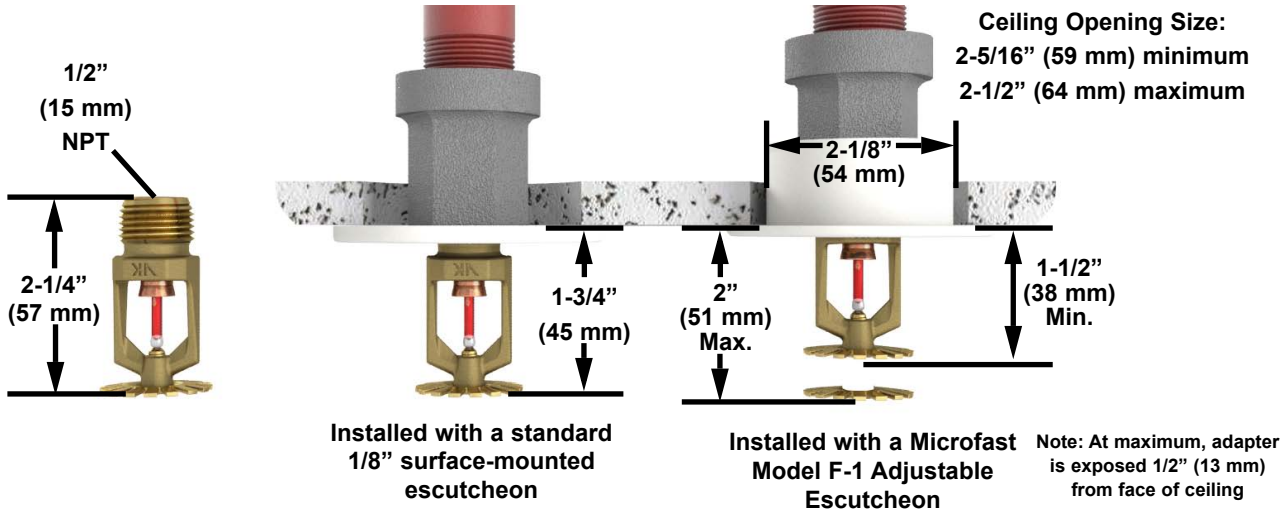


Figure 3: Sprinkler Dimensions with a Standard Escutcheon and the Model F-1 Adjustable Escutcheon

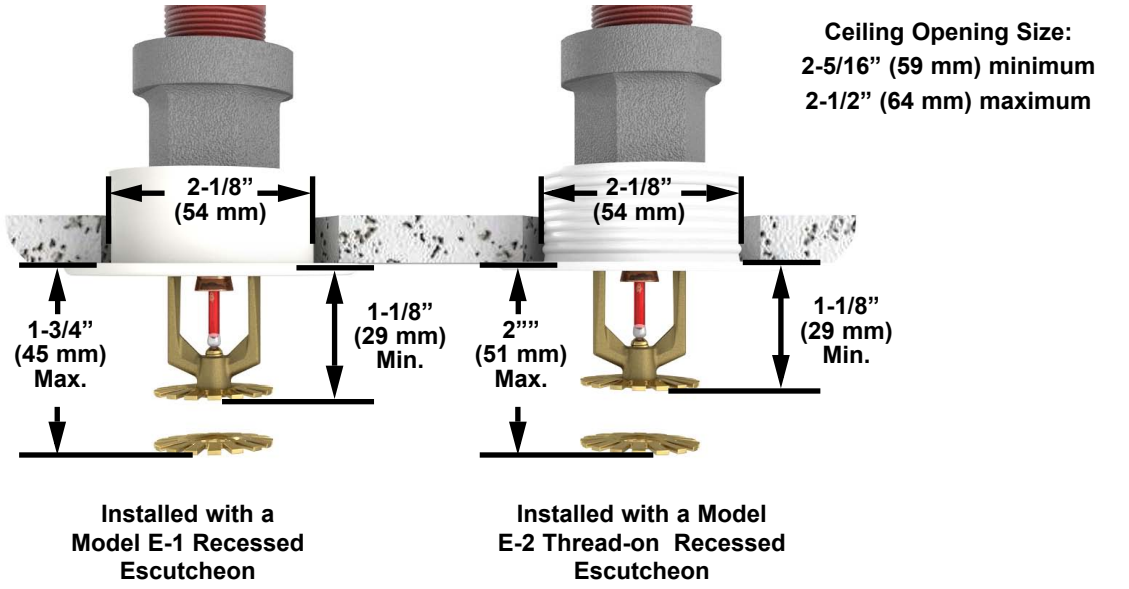
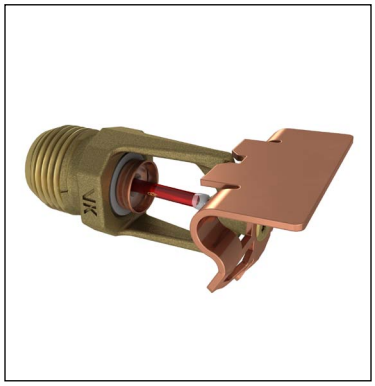


Figure 4: Sprinkler Dimensions with the Model E-1 and E-2 Recessed Escutcheons

VIKING	TECHNICAL DATA	MICROFAST® QUICK RESPONSE HORIZONTAL SIDEWALL SPRINKLER VK305 (K5.6)

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
Visit the Viking website for the latest edition of this technical data page: www.vikinggroupinc.com

1. DESCRIPTION



The Viking Microfast® Quick Response Horizontal Sidewall Sprinkler VK305 is a small thermosensitive glass bulb spray sprinkler available with various finishes and temperature ratings to meet design requirements. The special Polyester and Electroless Nickel PTFE (ENT) coatings can be used in decorative applications where colors are desired. In addition, these coatings have been investigated for installation in corrosive atmospheres and are listed/approved as corrosion resistant as indicated in Approval Charts.

2. LISTINGS AND APPROVALS

cULus Listed: Category VNIV

FM Approved: Class 2020

CCCF Approved: Approved by the China Certification Center for Fire Products (CCCF)

Refer to Approval Charts and Design Criteria for listing and approval requirements that must be followed.

3. TECHNICAL DATA

Specifications:

Minimum Operating Pressure: 7 psi (0.5 bar)
Rated to 175 psi (12 bar) water working pressure
Factory tested hydrostatically to 500 psi (34.5 bar)
Nominal K-Factor: 5.6 U.S. (80.6 metric*)
* Metric K-factor measurement shown is when pressure is measured in Bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.
Overall Length: 2-3/4" (68 mm)

Material Standards:

Frame Casting: Brass UNS-C84400 or QM Brass
Deflector: Copper UNS-C19500
Bulb: Glass, nominal 3 mm diameter
Belleville Spring Sealing Assembly: Nickel Alloy, coated on both sides with PTFE Tape
Screw: Brass UNS-C36000
Pip Cap and Insert Assembly: Copper UNS-C11000 and Stainless Steel UNS-S30400
For Polyester Coated Sprinklers: Belleville Spring-Exposed
For ENT Coated Sprinklers: Belleville Spring - Exposed, Screw and Pip cap - ENT plated.

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

Order Viking Microfast® Quick Response Horizontal Sidewall Sprinkler VK305 by first adding the appropriate suffix for the sprinkler finish and then the appropriate suffix for the temperature rating to the sprinkler base part number.
Finish Suffix: Brass = A, Chrome = F, White Polyester = M-/W, Black Polyester = M-/B, and ENT = JN
Temperature Suffix: 135 °F / 57 °C = A, 155 °F / 68 °C = B, 175 °F / 79 °C = D, 200 °F / 93 °C = E, and 286 °F / 141 °C = G
For example, sprinkler 12997 with a Brass finish and a 155 °F / 68 °C temperature rating = Part No. 12997AB

Available Finishes And Temperature Ratings: Refer to Table 1.

Accessories: (Also refer to the Viking website.)

Sprinkler Wrenches:

A. Standard Wrench: Part No. 21475M/B (available since 2017).
B. Wrench for recessed and/or wax coated sprinklers: Part No. 13655W/B** (available since 2006)
**A ½" ratchet is required (not available from Viking).

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
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Visit the Viking website for the latest edition of this technical data page: www.vikinggroupinc.com

Sprinkler Cabinets:

A. Six-head capacity: Part No. 01724A (available since 1971)
B. Twelve-head capacity: Part No. 01725A (available since 1971)

4. INSTALLATION

Refer to appropriate NFPA Installation Standards.

5. OPERATION

During fire conditions, the heat-sensitive fusible link disengages, the pip cap and spring are released, and the waterway is opened. Water flowing through the sprinkler orifice strikes the sprinkler deflector, forming a uniform spray pattern to extinguish or control the fire.

6. INSPECTIONS, TESTS AND MAINTENANCE

Refer to NFPA 25 for Inspection, Testing and Maintenance requirements.

7. AVAILABILITY

Viking Microfast® Quick Response Horizontal Sidewall Sprinkler VK305 is 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.

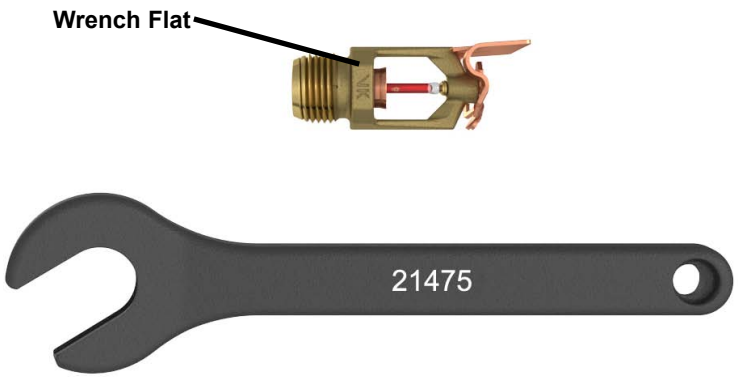

Figure 1:
Standard Sprinkler Wrench 21475M/B

VIKING	TECHNICAL DATA	MICROFAST® QUICK RESPONSE HORIZONTAL SIDEWALL SPRINKLER VK305 (K5.6)

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
Visit the Viking website for the latest edition of this technical data page: www.vikinggroupinc.com

TABLE 1: AVAILABLE SPRINKLER TEMPERATURE RATINGS AND FINISHES

Sprinkler Temperature Classification	Sprinkler Nominal Temperature Rating[1]	Maximum Ambient Ceiling Temperature[2]	Bulb Color
Ordinary	135 °F (57 °C)	100 °F (38 °C)	Orange
Ordinary	155 °F (68 °C)	100 °F (38 °C)	Red
Intermediate	175 °F (79 °C)	150 °F (65 °C)	Yellow
Intermediate	200 °F (93 °C)	150 °F (65 °C)	Green
High	286 °F (141 °C)	225 °F (107 °C)	Blue

Sprinkler Finishes: Brass, Chrome, White Polyester, Black Polyester, and ENT

Corrosion-Resistant Coatings[3]: White Polyester, Black Polyester, and ENT

Footnotes

[1] The sprinkler 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] The corrosion-resistant coatings have passed the standard corrosion test required by the approving agencies indicated in the Approval Charts. These tests cannot and do not represent all possible corrosive environments. Prior to installation, verify through the end-user that the coatings are compatible with or suitable for the proposed environment. For automatic sprinklers, the coatings indicated are applied to the exposed exterior surfaces only. For ENT coated sprinklers, the waterway is coated. Note that the spring is exposed on sprinklers with Polyester, and ENT coatings.

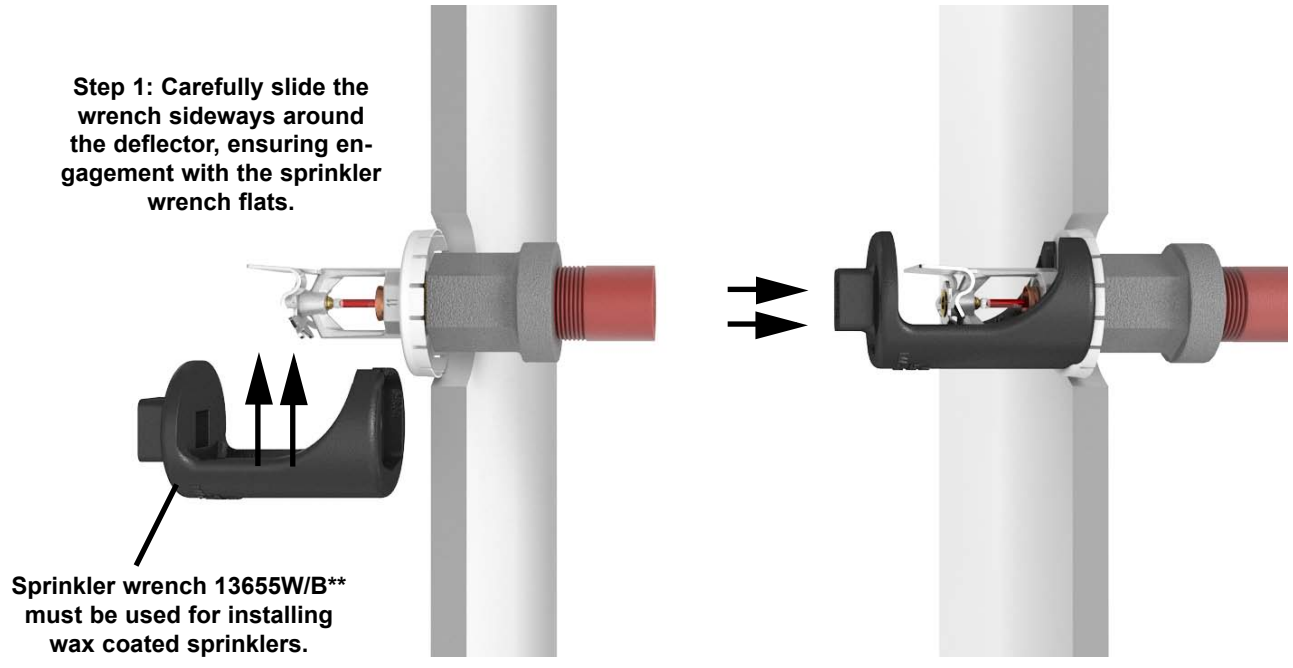

Figure 2: Wrench 13655W/B for Recessed Sprinklers

VIKING	TECHNICAL DATA	MICROFAST® QUICK RESPONSE HORIZONTAL SIDEWALL SPRINKLER VK305 (K5.6)

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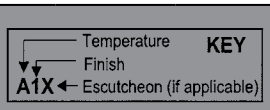
Approval Chart 1 (UL)

Microfast® Quick Response Horizontal Sidewall Sprinkler VK305
For Light or Ordinary Hazard Occupancies
Maximum 175 PSI (12 Bar) WWP
Deflector must be located 4" to 12" (102 mm to 305 mm) below the ceiling.



Base Part Number[1]	SIN	Sprinkler Style	Thread Size		Nominal K-Factor		Overall Length		Listings and Approvals[3] (Refer also to Design Criteria on page 43x.)			
			NPT	BSP	U.S.	metric[2]	Inches	mm	cULus[4]	LPCB	CE	RCM
12997	VK305	HSW	1/2"	15 mm	5.6	80.6	2-11/16	68	A1Y, B1X, C2W, D2Z	--	--	--
19782	VK305	HSW	1/2"	--	5.6	80.6	2-11/16	68	--	--	--	E3
NOTICE - Product Below - Limited Availability (Contact Local Viking Office)												
12121	VK305	HSW	1/2"	15 mm	5.6	80.6	1-11/16	68	A1Y, B1X, C2W, D2Z	--	--	--

Approved Temperature Ratings

A - 135 °F (57 °C), 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), and 286 °F (141 °C)
B - 135 °F (57 °C), 155 °F (68 °C), 175 °F (79 °C), and 200 °F (93 °C)
C - 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), and 286 °F (141 °C)
D - 155 °F (68 °C), 175 °F (79 °C), and 200 °F (93 °C)
E - 155 °F (68 °C)

Approved Finishes

1 - Brass, Chrome, White Poly-ester[5,6], and Black Polyester[5,6]
2 - ENT[5]
3 - Chrome

Approved Escutcheons

W - Installed with standard surface-mounted escutcheons
X - Installed with standard surface-mounted escutcheons or the Viking Microfast® Model F-1 Adjustable Escutcheon, **or** recessed with the Viking Micromatic® Model E-1, E-2, or G-1 Recessed Escutcheon
Y - Installed with standard surface-mounted escutcheons or the Viking Microfast® Model F-1 Adjustable Escutcheon
Z - Installed with standard surface-mounted escutcheons or recessed with the Viking Micromatic Model E-1

Footnotes

[1] Base part number shown. For complete part number, refer to Viking's current price schedule.
[2] Metric K-factor measurement shown is when pressure is measured in Bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.
[3] This table shows the listings and approvals available at the time of printing. Other approvals may be in process.
[4] Listed by Underwriters Laboratories Inc. for use in the U.S. and Canada.
[5] cULus Listed as corrosion-resistant.
[6] Other colors are available on request with the same Listings and Approvals as the standard colors.

DESIGN CRITERIA - UL

(Also refer to Approval Chart 1.)

cULus Listing Requirements:

Quick Response Horizontal Sprinkler VK305 is cULus Listed as indicated in Approval Chart 1 for installation in accordance with the latest edition of NFPA 13 for sidewall standard spray sprinklers.

- Designed for use in Light and Ordinary Hazard occupancies.
- Locate with the deflector 4" to 12" (102 mm to 305 mm) below the ceiling.
- Protection areas and maximum spacing shall be in accordance with the tables provided in NFPA 13.
- Minimum spacing allowed is 6 ft. (1.8 m).
- Align the top of the deflector parallel with the ceiling.
- Locate no less than 4" (102 mm) from end walls.
- Maximum distance from end walls shall be no more than one-half of the allowable distance between sprinklers. The distance shall be measured perpendicular to the wall.
- The sprinkler installation and obstruction rules contained in NFPA 13 for sidewall standard spray sprinklers must be followed.

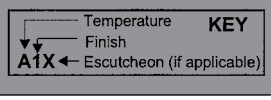
IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. Also refer to Bulletin Form No. F_080614 for general care, installation, and maintenance information. Viking sprinklers are to be installed in accordance with the latest edition of Viking technical data, the appropriate standards of NFPA, LPCB, APSAD, VdS or other similar organizations, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable.

VIKING	TECHNICAL DATA	MICROFAST® QUICK RESPONSE HORIZONTAL SIDEWALL SPRINKLER VK305 (K5.6)

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
Visit the Viking website for the latest edition of this technical data page: www.vikinggroupinc.com

Approval Chart 2 (FM)

Quick Response Sidewall Sprinklers
Maximum 175 PSI WWP



Base Part Number[1]	SIN	Thread Size		Nominal K-Factor		Overall Length		FM Approvals[3,4] (Refer also to Design Criteria below.)
		NPT	BSP	U.S.	metric[2]	Inches	mm	
12997	VK305	1/2"	15 mm	5.6	80.6	2-11/16	68	A1Y, B1X
NOTICE - Product Below - Limited Availability (Contact Local Viking Office)								
12121	VK305	1/2"	15 mm	5.6	80.6	2-11/16	68	A1Y, B1X

Approved Temperature Ratings

A - 135 °F (57 °C), 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), and 286 °F (141 °C)
B - 135 °F (57 °C), 155 °F (68 °C), 175 °F (79 °C), and 200 °F (93 °C)

Approved Finishes

1 - Brass

Approved Escutcheons

X - Installed with standard surface-mounted escutcheons or the Viking Microfast® Model F-1 Adjustable Escutcheon, **or** recessed with the Viking Micromatic® Model E-1, E-2, E-3, or G-1 Recessed Escutcheon
Y - Installed with standard surface-mounted escutcheons or the Viking Microfast® Model F-1 Adjustable Escutcheon

Footnotes

[1] Base part number shown. For complete part number, refer to Viking's current price schedule.
[2] Metric K-factor measurement shown is when pressure is measured in Bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.
[3] This table shows the FM Approvals available at the time of printing. Other approvals may be in process.
[4] Viking vertical sidewall sprinklers may be installed pendent or upright.

DESIGN CRITERIA - FM

(Also refer to Approval Chart 2 above.)

FM Approval Requirements:

Horizontal Sidewall Sprinkler VK305 is FM Approved as a quick response **Non-Storage** sidewall sprinkler as indicated in the FM Approval Guide. For specific application and installation requirements, reference the latest applicable FM Loss Prevention Data Sheets (including Data Sheet 2-0). FM Global Loss Prevention Data Sheets contain guidelines relating to, but not limited to: minimum water supply requirements, hydraulic design, ceiling slope and obstructions, minimum and maximum allowable spacing, and deflector distance below the ceiling.

NOTE: The FM installation guidelines may differ from cULus and/or NFPA criteria.

IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. Also refer to Bulletin Form No. F_080614 for general care, installation, and maintenance information. Viking sprinklers are to be installed in accordance with the latest edition of Viking technical data, the appropriate 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.

VIKING	TECHNICAL DATA	MICROFAST® QUICK RESPONSE HORIZONTAL SIDEWALL SPRINKLER VK305 (K5.6)

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
Visit the Viking website for the latest edition of this technical data page: www.vikinggroupinc.com

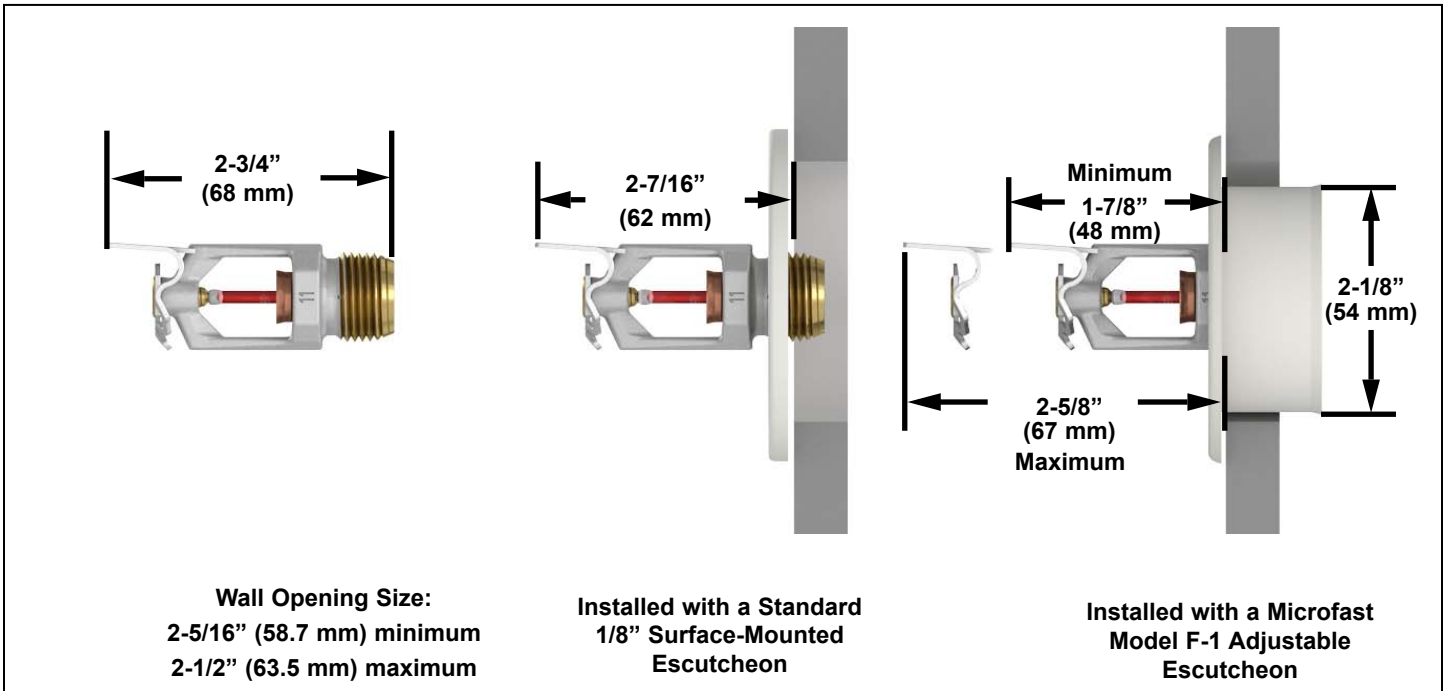


Figure 3: Sidewall Sprinkler Dimensions with a Standard Escutcheon and the Model F-1 Adjustable Escutcheon

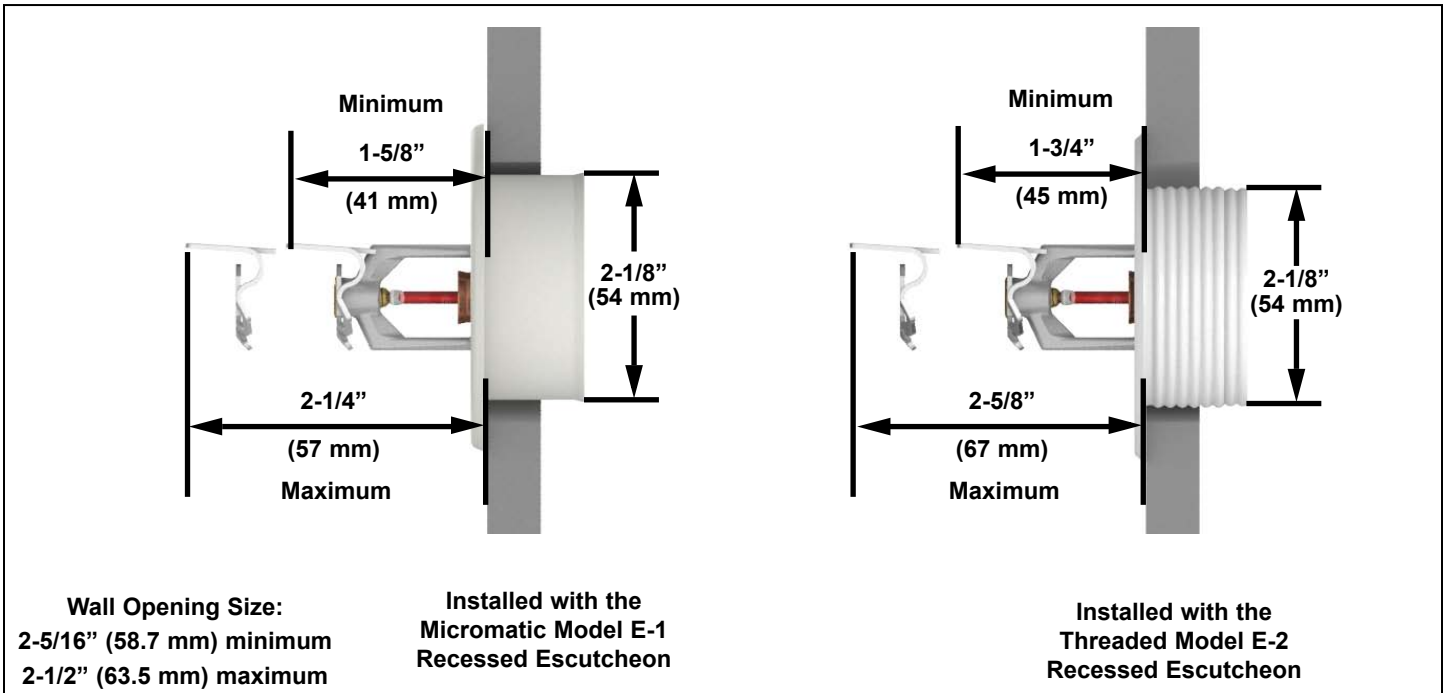


Figure 4: Sidewall Sprinkler VK305 Dimensions with the Model E-1 and E-2 Recessed Escutcheons

VIKING®

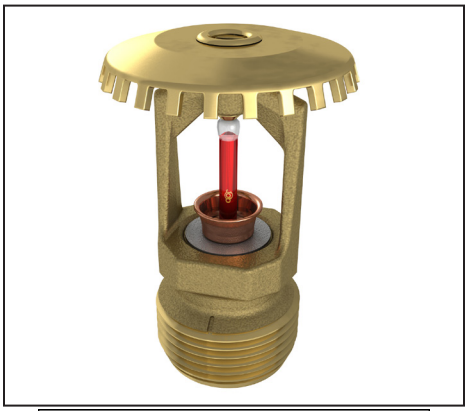
TECHNICAL DATA

MICROFAST® QUICK RESPONSE UPRIGHT SPRINKLER VK350 (K8.0)

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
Visit the Viking website for the latest edition of this technical data page: www.vikinggroupinc.com

1. DESCRIPTION

The Viking Microfast® Quick Response Upright Sprinkler VK350 is a small, thermo-sensitive, glass-bulb spray sprinkler available in several different finishes, temperature ratings, and K-Factors to meet design requirements. The special Polyester, and Electroless Nickel PTFE (ENT) coatings can be used in decorative applications where colors are desired. In addition, these coatings have been investigated for installation in corrosive environments and are listed/approved as as indicated in the Approval Charts.



WARNING: Cancer and Reproductive Harm- www.P65Warnings.ca.gov

2. LISTINGS AND APPROVALS

cULus Listed: Category VNIV

FM Approved: Class Series 2000

VdS Approved: Certificates G414017, G414018, G4980020, and G4060054

LPCB Approved: Certificate 096e/03

CE Certified: Standard EN 12259-1, EC-certificate of constancy of performance 0832-CPR-S0021 and EC-certificate of conformity 0786-CPD-40278

CCCF Approved: Approved by the China Certification Center for Fire Products (CCCF)

MED Certified: Standard EN 12259-1, EC-certificate of conformity 0832-MED-1003

NOTE: Other International approval certificates are available upon request.

Refer to Approval Chart 1 and Design Criteria cULus Listing requirements, and refer to Approval Chart 2 and Design Criteria FM Approval requirements that must be followed.

3. TECHNICAL DATA

Specifications:

Minimum Operating Pressure: 7 psi (0.5 bar)*
Maximum Working Pressure: 175 psi (12 bar) wwp.
Factory tested hydrostatically to 500 psi (34.5 bar)
Testing: U.S.A. Patent No. 4,831,870
Thread size: 1/2” NPT, 15 mm BSP, 3/4” NPT, 20 mm BSP
Nominal K-Factor: 8.0 U.S. (115.2 metric**)
Glass-bulb fluid temperature rated to -65 °F (-55 °C)
Overall Length: 2-5/16” (59 mm)

*cULus Listing, FM Approval, and NFPA 13 installs require a minimum of 7 psi (0.5 bar). The minimum operating pressure for LPCB and CE Approvals ONLY is 5 psi (0.35 bar).

Material Standards:

Frame Casting: Brass UNS-C84400
Deflector: Copper UNS-C19500
Bulb: Glass, nominal 3 mm diameter
Belleville Spring Sealing Assembly: Nickel Alloy, coated on both sides with PTFE Tape
Screw: Brass UNS-C36000
Pip Cap and Insert Assembly: Copper UNS-C11000 and Stainless Steel UNS-S30400
For Polyester Coated Sprinklers: Belleville Spring-Exposed
For ENT Coated Sprinklers: Belleville Spring-Exposed, Screw and Pipcap - ENT plated.

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

Order Viking Microfast® Quick Response Upright Sprinkler VK350 by first adding the appropriate suffix for the sprinkler finish and then the appropriate suffix for the temperature rating to the sprinkler base part number.
Finish Suffix: Brass = A, Chrome = F, White Polyester = M-/W, Black Polyester = M-/B, and ENT = JN
Temperature Suffix (°F/°C): 135°/57° = A, 155°/68° = B, 175°/79° = D, 200°/93° = E, and 286°/141° = G
For example, sprinkler VK350 with a 1/2” thread, Brass finish and a 155 °F/68 °C temperature rating = Part No. 18259AB

VIKING®	TECHNICAL DATA	MICROFAST® QUICK RESPONSE UPRIGHT SPRINKLER VK350 (K8.0)

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Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com
Visit the Viking website for the latest edition of this technical data page: www.vikinggroupinc.com

Available Finishes And Temperature Ratings: Refer to Table 1.
Accessories: (Also refer to the Viking website.)
Sprinkler Wrench: Standard Wrench: Part No. 21475M/B (available since 2017)
Sprinkler Cabinets:
A. Six-head capacity: Part No. 01724A (available since 1971)
B. Twelve-head capacity: Part No. 01725A (available since 1971)

4. INSTALLATION
Refer to appropriate NFPA Installation Standards.

5. OPERATION
During fire conditions, the heat-sensitive liquid in the glass bulb expands, causing the glass to shatter, releasing the pip cap and sealing spring assembly. Water flowing through the sprinkler orifice strikes the sprinkler deflector, forming a uniform spray pattern to extinguish or control the fire.

6. INSPECTIONS, TESTS AND MAINTENANCE
Refer to NFPA 25 for Inspection, Testing and Maintenance requirements.

7. AVAILABILITY
The Viking Microfast® Quick Response Upright Sprinkler VK350 is 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.

TABLE 1: AVAILABLE SPRINKLER TEMPERATURE RATINGS AND FINISHES

Sprinkler Temperature Classification	Sprinkler Nominal Temperature Rating[1]	Maximum Ambient Ceiling Temperature[2]	Bulb Color
Ordinary	135 °F (57 °C)	100 °F (38 °C)	Orange
Ordinary	155 °F (68 °C)	100 °F (38 °C)	Red
Intermediate	175 °F (79 °C)	150 °F (65 °C)	Yellow
Intermediate	200 °F (93 °C)	150 °F (65 °C)	Green
High	286 °F (141 °C)	225 °F (107 °C)	Blue

Sprinkler Finishes: Brass, Chrome, White Polyester, Black Polyester, and ENT
Corrosion-Resistant Coatings[3]: White Polyester, Black Polyester and ENT. ENT in all temperature ratings except 135 °F (57 °C)

Footnotes

[1] The sprinkler 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] The corrosion-resistant coatings have passed the standard corrosion test required by the approving agencies indicated on pages 51c-e. These tests cannot and do not represent all possible corrosive environments. Prior to installation, verify through the end-user that the coatings are compatible with or suitable for the proposed environment. For automatic sprinklers, the coatings indicated are applied to the exposed exterior surfaces only. Note that the spring is exposed on sprinklers with Polyester, ENT, and PTFE coatings. For ENT coated automatic sprinklers, the waterway is coated.

Figure 1: Sprinkler Wrench

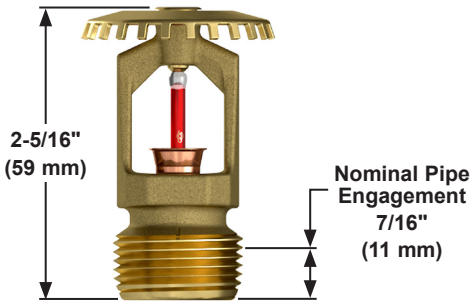

Figure 2: Sprinkler Dimensions

VIKING®

TECHNICAL DATA

MICROFAST® QUICK RESPONSE UPRIGHT SPRINKLER VK350 (K8.0)

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
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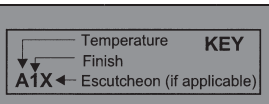
Approval Chart 1 (UL)

Microfast® Quick Response Upright Sprinkler VK350
Maximum 175 PSI (12 bar) WWP



Base Part Number[1]	SIN	Thread Size		Nominal K-Factor		Overall Length		Listings and Approvals[3] (Refer also to Design Criteria.)					
		NPT	BSP	U.S.	metric[2]	Inches	mm	cULus[4]	VdS	LPCB	CE	10	
18257	VK350	3/4”	--	8.0	115.2	2-5/16	59	A1, B2	A1	A1	B1[7]	B1	
18278	VK350	--	20 mm	8.0	115.2	2-5/16	59	A1, B2	A1	A1	B1[7]	B1	
18259[9]	VK350	1/2”	15 mm	8.0	115.2	2-5/16	59	A1, B2	A1	--	B1[8]	--	
20382	VK350	3/4”	--	8.0	115.2	2-5/16	59	--	--	--	--	--	C3
20237	VK350	--	20 mm	8.0	115.2	2-5/16	59	--	--	--	--	--	C3
NOTICE - Product Below - Limited Availability (Contact Local Viking Office)													
06665B	VK350	3/4”	--	8.0	115.2	2-5/16	59	A1, B2	A1	A1	B1[7]	B1	--
14817	VK350	--	20 mm	8.0	115.2	2-5/16	59	A1, B2	A1	A1	B1[7]	B1	--
06764B[9]	VK350	1/2”	15 mm	8.0	115.2	2-5/16	59	A1, B2	A1	--	A1[8]	--	--

Approved Temperature Ratings

A - 135 °F (57 °C), 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), and 286 °F (141°C)
B - 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), and 286 °F (141°C)
C - 155 °F (68 °C)

Approved Finishes

1 - Brass, Chrome, White Polyester[5,6], and Black Polyester[5,6]
2 - ENT[5]
3 - Chrome

Footnotes

[1] Base part number is shown. For complete part number, refer to Viking’s current price schedule.
[2] Metric K-factor measurement shown is when pressure is measured in Bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.
[3] This table shows the listings and approvals available at the time of printing. Check with the manufacturer for any additional approvals.
[4] Listed by Underwriters Laboratories Inc. for use in the U.S. and Canada.
[5] cULus Listed as corrosion resistant.
[6] Other colors are available on request with the same Listings and Approvals as the standard colors.
[7] CE Certified, Standard EN 12259-1, EC-certificate of constancy of performance 0832-CPR-S0021 and EC-certificate of conformity 0786-CPD-40278.
[9] The 1/2” NPT Large Orifice Sprinkler is listed and approved for retrofit only when installed in accordance with NFPA 13.
[10] MED Certified, Standard EN 12259-1, EC-certificate 0832-MED-1003.

DESIGN CRITERIA - UL

(Also refer to Approval Chart 1)

cULus Listing Requirements:

The Microfast® Quick Response Upright Sprinkler VK350 is cULus Listed as indicated in Approval Chart 1 for installation in accordance with the latest edition of NFPA 13 for standard spray sprinklers.

- Designed for use in Light and Ordinary Hazard occupancies.
- The sprinkler installation rules contained in NFPA 13 for standard spray upright sprinklers must be followed.

IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. Also refer to Bulletin Form No. F_080614 for general care, installation, and maintenance information. Viking sprinklers are to be installed in accordance with the latest edition of Viking technical data, the appropriate standards of NFPA, LPCB, APSAD, VdS or other similar organizations, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable.

VIKING®

TECHNICAL DATA

MICROFAST® QUICK RESPONSE UPRIGHT SPRINKLER VK350 (K8.0)

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
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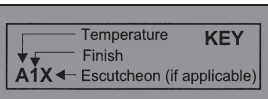
Visit the Viking website for the latest edition of this technical data page: www.vikinggroupinc.com

Approval Chart 2 (FM)

Microfast® Quick Response Upright Sprinkler VK350
Maximum 175 PSI (12 bar) WWP



Base Part Number[1]	SIN	Thread Size		Nominal K-Factor		Overall Length		FM Approvals[3] (Refer also to Design Criteria below.)
		NPT	BSP	U.S.	metric[2]	Inches	mm	
18257	VK350	3/4”	--	8.0	115.2	2-5/16	59	A1, B2
18278	VK350	--	20 mm	8.0	115.2	2-5/16	59	A1, B2
18259[5]	VK350	1/2”	15 mm	8.0	115.2	2-5/16	59	A1, B2
NOTICE - Product Below - Limited Availability (Contact Local Viking Office)								
06665B	VK350	3/4”	--	8.0	115.2	2-5/16	59	A1, B2
14817	VK350	--	20 mm	8.0	115.2	2-5/16	59	A1, B2
06764B[5]	VK350	1/2”	15 mm	8.0	115.2	2-5/16	59	A1, B2

Approved Temperature Ratings

A - 135 °F (57 °C), 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), and 286 °F (141°C)
B - 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), and 286 °F (141°C)

Approved Finishes

1 - Brass, Chrome, White Polyester[4], and Black Polyester[4]
2 - ENT[6]

Footnotes

[1] Base part number is shown. For complete part number, refer to Viking’s current price schedule.

[2] Metric K-factor measurement shown is when pressure is measured in Bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.

[3] This table shows the FM Approvals available at the time of printing. Check with the manufacturer for any additional approvals.

[4] Other colors are available on request with the same Approvals as the standard colors.

[5] The 1/2” NPT Large Orifice Sprinkler is listed and approved for retrofit only when installed in accordance with NFPA 13.

[6] FM approved as corrosion proofing for corrosive environments.

DESIGN CRITERIA - FM

(Also refer to Approval Chart 2 above.)

FM Approval Requirements:

The Microfast® Quick Response Upright Sprinkler VK350 is FM Approved as a quick response **Non-Storage** upright sprinkler as indicated in the FM Approval Guide. For specific application and installation requirements, reference the latest applicable FM Loss Prevention Data Sheets (including Data Sheet 2-0). FM Global Loss Prevention Data Sheets contain guidelines relating to, but not limited to: minimum water supply requirements, hydraulic design, ceiling slope and obstructions, minimum and maximum allowable spacing, and deflector distance below the ceiling.

NOTE: The FM installation guidelines may differ from cULus and/or NFPA criteria.

IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. Also refer to Bulletin Form No. F_080614 for general care, installation, and maintenance information. Viking sprinklers are to be installed in accordance with the latest edition of Viking technical data, the appropriate 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.

Non-Storage / Special Protection / Storage Sprinklers

General Information

Automatic sprinkler protection is recommended for industrial and other buildings having combustible construction or combustible occupancies.

When selecting a specific type of sprinkler, refer to the FM Global Property Loss Prevention Data Sheets to ensure that the sprinkler selected is capable of providing adequate fire protection for the intended occupancy. Projects that are specific to FM Global insured clients, working plans of proposed layouts, showing all details with respect to location of sprinklers and piping, description of the occupancy and details of construction, should be sent to the local FM Global engineering office for review and acceptance before the materials are fabricated. The plans will be accepted or changes will be recommended to assure that the work will be done according to the best practice and to avoid the possibility of later requests for changes.

Nominal thread sizes are expressed using American National Standard Taper Pipe Threads (NPT). Sprinklers intended for sale outside the United States shall have threads which are in compliance with other national or international standards as permitted at the sole discretion of FM Approvals.
Unless otherwise noted, automatic sprinklers have a rated working pressure of 175 psi (12.1 bar).

Sprinkler Categories

There are three categories of FM Approved automatic sprinklers: Storage, Non-Storage and Special Protection sprinklers based on the type of occupancy hazard they are intended to protect. Within these three categories are various different types of orientations (such as pendent, upright, horizontal sidewall, vertical sidewall, flush, recessed, concealed, dry pendent, dry upright, etc.), thermal response ratings (i.e. quick response or standard response), nominal temperature ratings (see table below), K-factors (see table below) and spacings (i.e. standard or extended coverage).

Nominal K-Factors of Sprinklers

The sprinkler nominal discharge coefficient (K-factor) is expressed in US customary units of gal/min/$(psi)^{0.5}$. See the table below for nominal K-factor values of currently Approved sprinklers.

Nominal K-Factors of Approved Sprinklers

Nominal K-Factor, gpm/$(psi)^{1/2}$	*Metric K-Factor, lpm/$(bar)^{1/2}$*
2.8	40
5.6	80
8.0	115
11.2	160
14.0	200
16.8	240
19.6	280
22.4	320
25.2	360

The following table provides the nominal K-factor values of currently Approved Special Protection (Residential) sprinklers.

Nominal K-Factors of Approved Special Protection (Residential) Sprinklers

Nominal K-Factor, gpm/$(psi)^{1/2}$	*Metric K-Factor, lpm/$(bar)^{1/2}$*
3.8	55
5.8	85
6.9	100

Nominal Temperature Rating of Sprinklers

A sprinkler operates automatically when the heat-actuated element is heated to, or above, its thermal rating. Selection of the proper temperature rating for automatic sprinklers is important as it provides a factor of safety designed to prevent premature operation. See the table below as well as the occupancy-specific FM Global data sheet to ensure the proper nominal temperature rating for the sprinkler is chosen based on the hazard being protected as well as the expected ambient temperature conditions. Factory coated, plated and painted sprinklers rated above 165°F (74°C) have the standard temperature color code either on the frame arms or on the compression screws, except in the case of bulb type decorative coated sprinklers in which the bulb fluid color indicates the temperature rating per the following table:

Nominal Temperature Ratings of Sprinklers Based on Maximum Ambient Temperature at Sprinkler Level

*Nominal Temperature Rating of Sprinkler**	*Maximum Ambient Temperature at Sprinkler Level*	*Temperature Range of Nominal Rating***	*Temperature Classification of Sprinkler*	*Color of Sprinkler Frame*	*Color and Temperature of Sprinkler Glass Bulb*
135°F (55°C)	100°F (38°C)	135°F (57°C)	Ordinary	Unpainted	Orange, 135°F (57°C)
160°F (70°C)	100°F (38°C)	155°F - 165°F (68°C - 74°C)	Ordinary	Unpainted	Red, 155°F (68°C)
175°F (80°C)	150°F (66°C)	175°F (79°C)	Intermediate	White	Yellow, 175°F (79°C)
212°F (100°C)	150°F (66°C)	200°F - 220°F (93°C - 104°C)	Intermediate	White	Green, 200°F & 225°F (93°C & 107°C)
280°F (140°C)	225°F (107°C)	280°F - 286°F (138°C - 141°C)	High	Blue	Blue, 250°F & 286°F (121°C & 141°C)
350°F (175°C)	300°F (149°C)	325°F -375°F (163°C - 191°C)	Extra High	Red	Mauve, 325°F & 360°F (162°C & 182°C)
425°F (220°C)	375°F (191°C)	400°F -475°F (204°C - 246°C)	Very Extra High	Green	Black, 400°F - 650°F (204°C – 343°C)
525°F (275°C)	475°F (246°C)	500°F -575°F (260°C - 302°C)	Ultra High	Orange	Black, 400°F - 650°F (204°C – 343°C)
650°F (345°C)	625°F (329°C)	650°F (343°C)	Ultra High	Orange	Black, 400°F - 650°F (204°C – 343°C)

*The values indicated for nominal temperature ratings of sprinkler in this table are based on values indicated in FM Global data sheets

**The values indicated are based on the actual (marked or marked nominal) temperature ratings of currently Approved sprinklers

Sprinklers of "very extra high" and "ultra high" ratings are primarily used for internal protection of chambers such as ovens and dryers having working temperatures above 300°F (149°C). When the sprinklers are normally heated to the working temperature of the oven or dryer, under fire conditions they will operate fast enough for proper protection. However, when the sprinklers are initially at the same temperature as a cold oven or dryer, operation may be so severely retarded that the oven or dryer is virtually without internal sprinkler protection.

Nominal Response Rating of Sprinklers

Approved sprinklers are listed in one of three ways for response ratings: fast response (FR), quick response (QR) or standard response (SR) and are reflective of the response of the entire sprinkler to thermal exposure, not just the thermal sensing element of the sprinkler. Note that fast response (FR) sprinklers are a subset of quick response sprinklers for listing purposes.

The thermal sensing elements of the sprinkler are identified as either Fusible or, in the case of bulb type elements, nominal bulb diameter in millimeters (e.g., 2.5 mm, 3 mm, etc.).

Finishes and Coatings of Sprinklers

Approved sprinklers are also available with factory-applied special coatings for resistance to corrosive environments; such sprinklers are listed under the Special Protection sprinkler category. For corrosion resistance, wax is satisfactory except in extreme atmospheres. Wax has too low a melting point for high temperate rated sprinklers, whereas a bituminous coating affords some protection. A lead coating protects against certain mild corrosive atmospheres. Wax-over-lead provides good sprinkler protection. Corrosion resistant sprinklers such as those manufactured from stainless steel or other corrosion resistant materials currently afford the best available protection. See the FM Global occupancy-specific data sheet to determine when a corrosion resistant sprinkler is needed and, if so, which type offers the best resistance for the environmental conditions.

FM Approved sprinklers are available with common decorative finishes such as factory-applied bright brass, chrome, paint, or polyester coating. Note that these finishes are for decorative purposes only and are not FM Approved specifically for corrosive environments.

Finishes of currently Approved Storage and Non-Storage sprinklers are included in the following table.

Factory-Applied Finishes of Approved Storage and Non-Storage Sprinklers

Finish	*Description*
Black Plated	*Black Plated*
Brass	*Unfinished, Plain Brass or Bronze*
Bright Brass	*Bright Brass Plated*
Chrome	*Chrome Plated*
Painted	*Painted (any color)*
Polyester	*Polyester Coated (any color)*
Zinc	*Zinc Plated*

Finishes of currently Approved Special Protection (Corrosive Environment) sprinklers are included in the following table. Note that FM Approved Special Protection (Corrosive Environment) sprinklers are also acceptable for use as Non-Storage sprinklers, unless indicated otherwise by the occupancy-specific FM Global data sheet.

Finishes of Approved Special Protection (Corrosive Environment) Sprinklers

Finish	*Description*
Lead	*Lead Coated (for extra corrosion protection in some atmospheres)*
NICOTEF	*Nickel-Teflon Coating (for extra corrosion protection in some atmospheres)*
Stainless Steel	*Stainless Steel Alloy (for extra corrosion protection in some atmospheres)*
Wax	*Wax Coated (for extra corrosion protection in some atmospheres)*
Wax Over Brass	*Wax Over Brass Coated (for extra corrosion protection in some atmospheres)*
Wax Over Lead	*Wax Over Lead Coated (for extra corrosion protection in some atmospheres)*
Wax Over Polyester	*Wax Over Polyester Coated (for extra corrosion protection in some atmospheres)*

Only sprinklers supplied by the listed manufacturers are FM Approved. Any change in the device after it leaves the manufacturer voids the Approval.

Note that Approved Special Protection (Corrosive Environment) sprinklers can also be installed in applications acceptable for both Approved Non-Storage and Storage sprinklers having the same K-factor, orientation, RTI, nominal temperature rating and sprinkler spacing.

Non-Storage Sprinklers and Storage Sprinklers

Orientation

Adjustable Concealed Pendent

Adjustable concealed pendent sprinklers incorporate a cover plate which is heat activated and can be manually removed to prevent over-painting of the cover plate. They are intended for use with concealed sprinkler piping where attractive appearance under a ceiling is desired; such occupancies may include offices, hotel lobbies, dining rooms, clubs and similar properties. FM Approved adjustable concealed pendent sprinklers are limited to a maximum temperature rating of 225°F (107°C) and to protection of hazard occupancies as outlined in the occupancy-specific FM Global Property Loss Prevention Data Sheet. They should not be installed in corrosive environments. Unless indicated otherwise by the occupancy-specific FM Global Property Loss Prevention Data Sheet, these sprinklers are FM Approved only for use in wet systems as well as pre-action systems that qualify as a wet system.

Dry Adjustable Horizontal Sidewall

A dry-type sprinkler consists of a sprinkler permanently attached to an extension nipple which has a closure at the inlet end to prevent system water from entering the nipple until the sprinkler operates.

Adjustable dry horizontal sidewall sprinklers are dry-type sprinklers in which the sprinklers attached to the nipple extension are of the horizontal sidewall orientation. They are intended for installation near a wall/ceiling interface and are equipped with a special deflector which discharges most of the water in a horizontal plane so that the water is directed onto adjacent walls as well as the protected area. These types of sprinklers are typically used to protect areas subject to freezing and are connected to water-filled sprinkler piping located adjacent to the protected area in a location not susceptible to freezing. They are also sometimes used on dry type sprinkler systems where the installed sprinkler must be of the sidewall orientation. The sprinklers are generally intended for locations such as offices, hotel lobbies and dining rooms, where the installation of Non-Storage pendent or upright sprinklers with the usual ceiling spacing and pipe location may be objectionable because of appearance. They are also installed for special circumstances where their directional properties are desirable.

Dry Adjustable Pendent

A dry-type sprinkler consists of a sprinkler permanently attached to an extension nipple which has a closure at the inlet end to prevent system water from entering the nipple until the sprinkler operates.

Adjustable dry pendent sprinklers are dry-type sprinklers in which the sprinkler attached to the nipple extension is of the pendent orientation. These types of sprinklers are typically used to protect areas subject to freezing and are connected to water-filled sprinkler piping located above the protected area in a location not susceptible to freezing. They are also sometimes used on dry type sprinkler systems where the installed sprinkler must be of the pendent orientation.

Adjustable Recessed Pendent

Adjustable recessed pendent sprinklers consist of a pendent sprinkler installed in a decorative recessed cup which reduces the protrusion of the sprinkler from the ceiling. They are intended for use with concealed sprinkler piping where attractive appearance under a ceiling is desired; such occupancies may include offices, hotel lobbies, dining rooms, clubs and similar properties. FM Approved adjustable recessed pendent sprinklers are limited to a maximum temperature rating of 225°F (107°C) and to protection of hazard occupancies as outlined in the occupancy-specific FM Global Property Loss Prevention Data Sheet. Unless indicated otherwise by the occupancy-specific FM Global Property Loss Prevention Data Sheet, these sprinklers are FM Approved only for use in wet systems as well as pre-action systems that qualify as a wet system.

Concealed Pendent

Concealed pendent sprinklers incorporate a cover plate which is heat activated and can be manually removed to prevent over-painting of the cover plate. They are intended for use with concealed sprinkler piping where attractive appearance under a ceiling is desired; such occupancies may include offices, hotel lobbies, dining rooms, clubs and similar properties. FM Approved concealed pendent sprinklers are limited to a maximum temperature rating of 225°F (107°C) and to protection of hazard occupancies as outlined in the occupancy-specific FM Global Property Loss Prevention Data Sheet. They should not be installed in corrosive environments. Unless indicated otherwise by the occupancy-specific FM Global Property Loss Prevention Data Sheet, these sprinklers are FM Approved only for use in wet systems as well as pre-action systems that qualify as a wet system.

Dry Concealed Pendent

A dry-type sprinkler consists of a sprinkler permanently attached to an extension nipple which has a closure at the inlet end to prevent system water from entering the nipple until the sprinkler operates.

Dry concealed pendent sprinklers are dry-type sprinklers in which the sprinklers attached to the nipple extension are of the pendent orientation. Dry concealed pendent sprinklers incorporate a cover plate which is heat activated and can be manually removed to prevent over-painting of the cover plate. These types of sprinklers are typically used to protect areas subject to freezing and are connected to water-filled sprinkler piping located adjacent to the protected area in a location not susceptible to freezing. They are also sometimes used on dry type sprinkler systems where the installed sprinkler must be of the pendent orientation. The sprinklers are generally intended for use with concealed sprinkler piping where attractive appearance under a ceiling is desired; such occupancies

may include offices, hotel lobbies, dining rooms, clubs and similar properties. They should not be installed in corrosive environments. FM Approved dry concealed pendent sprinklers are limited to a maximum temperature rating of 225°F (107°C) and to protection of hazard occupancies as outlined in the occupancy-specific FM Global Property Loss Prevention Data Sheet.

Dry Horizontal Sidewall

A dry-type sprinkler consists of a sprinkler permanently attached to an extension nipple which has a closure at the inlet end to prevent system water from entering the nipple until the sprinkler operates.

Dry horizontal sidewall sprinklers are dry-type sprinklers in which the sprinklers attached to the nipple extension are of the horizontal sidewall orientation. They are intended for installation near a wall/ceiling interface and are equipped with a special deflector which discharges most of the water in a horizontal plane so that the water is directed onto adjacent walls as well as the protected area. These types of sprinklers are typically used to protect areas subject to freezing and are connected to water-filled sprinkler piping located adjacent to the protected area in a location not susceptible to freezing. They are also sometimes used on dry type sprinkler systems where the installed sprinkler must be of the sidewall orientation. The sprinklers are generally intended for locations such as offices, hotel lobbies and dining rooms, where the installation of Non-Storage pendent or upright sprinklers with the usual ceiling spacing and pipe location may be objectionable because of appearance. They are also installed for special circumstances where their directional properties are desirable.

Dry Pendent

A dry-type sprinkler consists of a sprinkler permanently attached to an extension nipple which has a closure at the inlet end to prevent system water from entering the nipple until the sprinkler operates.

Dry pendent sprinklers are dry-type sprinklers in which the sprinkler attached to the nipple extension is of the pendent orientation. These types of sprinklers are typically used to protect areas subject to freezing and are connected to water-filled sprinkler piping located above the protected area in a location not susceptible to freezing. They are also sometimes used on dry type sprinkler systems where the installed sprinkler must be of the pendent orientation.

Dry Recessed Horizontal Sidewall

A dry-type sprinkler consists of a sprinkler permanently attached to an extension nipple which has a closure at the inlet end to prevent system water from entering the nipple until the sprinkler operates.

Dry recessed horizontal sidewall sprinklers are dry-type sprinklers in which the sprinklers attached to the nipple extension are of the horizontal sidewall orientation and are installed in a decorative recessed cup which reduces the protrusion of the sprinkler from the wall. These types of sprinklers are typically used to protect areas subject to freezing and are connected to water-filled sprinkler piping located adjacent to the protected area in a location not susceptible to freezing. They are also sometimes used on dry type sprinkler systems where the installed sprinkler must be of the sidewall orientation.

Dry Recessed Pendent

A dry-type sprinkler consists of a sprinkler permanently attached to an extension nipple which has a closure at the inlet end to prevent system water from entering the nipple until the sprinkler operates.

Dry recessed pendent sprinklers are dry-type sprinklers in which the sprinklers attached to the nipple extension are of the pendent orientation and are installed in a decorative recessed cup which reduces the protrusion of the sprinkler from the ceiling. These types of sprinklers are typically used to protect areas subject to freezing and are connected to water-filled sprinkler piping located above the protected area in a location not susceptible to freezing. They are also sometimes used on dry type sprinkler systems where the installed sprinkler must be of the pendent orientation.

Dry Upright

A dry-type sprinkler consists of a sprinkler permanently attached to an extension nipple which has a closure at the inlet end to prevent system water from entering the nipple until the sprinkler operates.

Dry upright sprinklers are dry-type sprinklers in which the sprinklers attached to the nipple extension are of the upright orientation. These types of sprinklers are typically used to protect areas subject to freezing and are connected to water-filled sprinkler piping located below the protected area in a location not susceptible to freezing.

Flush Pendent

Flush pendent sprinklers are constructed with an operating element which extends a short distance below the ceiling. Upon actuation, the sprinkler deflector drops below the ceiling level to provide a proper water distribution. They are intended for use with concealed sprinkler piping where attractive appearance under a ceiling is desired; such occupancies may include offices, hotel lobbies, dining rooms, clubs and similar properties. They should not be installed in corrosive environments. FM Approved flush pendent sprinklers are limited to a maximum temperature rating of 225°F (107°C) and to protection of hazard occupancies as outlined in the occupancy-specific FM Global Property Loss Prevention Data Sheet. Unless indicated otherwise by the occupancy-specific FM Global Property Loss Prevention Data Sheet, these sprinklers are FM Approved only for use in wet systems as well as pre-action systems that qualify as a wet system.

Horizontal Sidewall

Sidewall sprinklers are sprinklers that are intended for installation near a wall/ceiling interface. They are equipped with a special deflector which discharges most of the water in a horizontal plane so that the water is directed onto adjacent walls as well as the protected area. The sprinklers are generally intended for locations such as offices, hotel lobbies and dining rooms, where the installation of Non-Storage pendent or upright sprinklers with the usual ceiling spacing and pipe location may be objectionable because of appearance. They are also installed for special circumstances where their directional properties are desirable.

Horizontal sidewall automatic sprinklers are sidewall-type sprinklers in which the axis of the sprinkler orifice is oriented horizontally.

Pendent

Pendent automatic sprinklers are sprinklers designed such that the water discharge from the sprinkler orifice is directed downward towards the deflector which in turn directs the water downward toward the protected area. The sprinkler is designed such that the deflector is located below the pipe to which the sprinkler is connected.

Recessed Horizontal Sidewall

Sidewall sprinklers are sprinklers that are intended for installation near a wall/ceiling interface. They are equipped with a special deflector which discharges most of the water in a horizontal plane so that the water is directed onto adjacent walls as well as the protected area. The sprinklers are generally intended for locations such as offices, hotel lobbies and dining rooms, where the installation of Non-Storage pendent or upright sprinklers with the usual ceiling spacing and pipe location may be objectionable because of appearance. They are also installed for special circumstances where their directional properties are desirable.

Recessed horizontal sidewall sprinklers consist of a horizontal sidewall sprinkler installed in a decorative recessed cup which reduces the protrusion of the sprinkler from the wall. They are intended for use with concealed sprinkler piping where attractive appearance is desired; such occupancies may include offices, hotel lobbies, dining rooms, clubs and similar properties.

Recessed Pendent

Recessed pendent sprinklers consist of a pendent sprinkler installed in a decorative recessed cup which reduces the protrusion of the sprinkler from the ceiling. They are intended for use with concealed sprinkler piping where attractive appearance under a ceiling is desired; such occupancies may include offices, hotel lobbies, dining rooms, clubs and similar properties. FM Approved recessed pendent sprinklers are limited to a maximum temperature rating of 225°F (107°C) and to protection of hazard occupancies as outlined in the occupancy-specific FM Global Property Loss Prevention Data Sheet. Unless indicated otherwise by the occupancy-specific FM Global Property Loss Prevention Data Sheet, these sprinklers are FM Approved only for use in wet systems as well as pre-action systems that qualify as a wet system.

Upright

Upright automatic sprinklers are sprinklers designed such that the water discharge from the sprinkler orifice is directed upward towards the deflector which in turn redirects the water downward toward the protected area. The sprinkler is designed such that the deflector is located above the pipe to which the sprinkler is connected.

Vertical Sidewall

Sidewall sprinklers are sprinklers that are intended for installation near a wall/ceiling interface. They are equipped with a special deflector which discharges most of the water in a horizontal plane so that the water is directed onto adjacent walls as well as the protected area. The sprinklers are generally intended for locations such as office, hotel lobbies, and dining rooms, where the installation of Non-Storage pendent or upright sprinklers with the usual ceiling spacing and pipe location may be objectionable because of appearance. They are also installed for special circumstances where their directional properties are desirable.

Vertical sidewall automatic sprinklers are sidewall-type sprinklers in which the axis of the sprinkler orifice is oriented vertically. They are FM Approved for use in both the upright and pendent positions, except where noted otherwise.

Non-Storage Sprinklers

A Non-Storage automatic sprinkler is a sprinkler that has been categorized by FM Global as acceptable for protecting non-storage-type occupancies and/or other occupancy hazards characterized by low to moderate heat-release rate fires as permitted in a FM Global occupancy-specific Property Loss Prevention Data Sheet.

K5.6 (K80 metric)

Non-Storage automatic sprinklers having a K-factor value of 5.6 (80 metric) are similar to Non-Storage automatic sprinklers having a K-factor value of 2.8 (40 metric), except that they discharge 100% more water at the same discharge pressure and typically do not require the use of individual or system strainers. Pendent sprinklers of this K-factor would, however, require the installation of a return bend if the water supply is fed from an open-body type source. See FM Global Property Loss Prevention Data Sheet 2-0, *Installation Guidelines for Automatic Sprinklers*, for additional details and requirements regarding these sprinklers.

K5.6 (K80 metric) Upright

VK300

Company Name:	The Viking Corporation
Company Address:	210 N Industrial Park Dr, Hastings, Michigan 49058, USA
Company Website:	http://vikingcorp.com
New/Updated Product Listing:	No
Primary Class of Work:	2016-AS, Control Mode, Upright

Listing Country:	United States of America
Sprinkler Category:	Non Storage
K:	5.6
Type:	Upright
Response:	QR - Quick Response
Element:	3 mm
NPT (in.):	1/2
Finish:	Brass, Chrome, NICOTEF Coated, Polyester
Temp. Rating (°F):	135, 155, 175, 200, 286
Temp. Rating (°C):	57, 68, 79, 93, 141
Certification Type:	FM Approved

Certificate of Compliance

This certificate is issued for the following equipment:

Automatic Control Mode Sprinklers for Fire Protection

Model	K	Type	Resp.	Element	NPT (in.)	Finishes	Temperature Ratings °F (°C)
VK302	5.6	Pendent	QR	3 mm	1/2	Brass, Chrome, Polyester, NICOTEF	135, 155, 175, 200, 286 (57, 68, 79, 93, 141)
VK302	5.6	Recessed Pendent	QR	3 mm	1/2	Brass, Chrome, Polyester, NICOTEF	135, 155, 175, 200 (57, 68, 79, 93)

Prepared for: The Viking Corporation, 210 North Industrial Park Drive, Hastings, MI 49058, USA

Manufacturing Location: The Viking Corporation, 210 North Industrial Park Drive, Hastings, MI 49058, USA

or

The Viking Corporation, 11305 James Street, Holland, MI 49424, USA

FM Approvals Class: 2017, 2015
FM Approval Standard: Class Series 2000 (February 2018)

Approval Identification: PR449184 Approval Granted: October 5, 2018

To verify the availability of the Approved product, please refer to www.approvalguide.com

Said Approval is subject to satisfactory field performance, continuing Surveillance Audits, and strict conformity to the constructions as shown in the Approval Guide, an online resource of FM Approvals.

David B. Fuller
VP, Manager – Fire Protection
FM Approvals
1151 Boston-Providence Turnpike
Norwood, MA 02062
USA

Member of the FM Global Group

NOT to be distributed outside of FMGlobal except by CUSTOMER.

APPROVAL REPORT

SAND CAST FRAME, BULB TYPE, PENDENT AND UPRIGHT, STANDARD AND QUICK RESPONSE AUTOMATIC SPRINKLERS (VARIOUS MODELS) WITH NOMINAL DISCHARGE COEFFICIENTS OF 2.8 AND 5.6 GAL/MIN/(PSI)$^{1/2}$ IN PLAIN BRASS, CHROME, AND POLYESTER COATED FINISHES (MODIFICATION)

Prepared for:

The Viking Corporation
210 N. Industrial Park Rd.
Hastings, MI 49058

Project ID: 3020603
Class: 2016
Date of Approval: September 1, 2004
Authorized by:

Roger L. Allard, Assistant Vice President

FM Approvals
1151 Boston-Providence Turnpike
P.O. Box 9102
Norwood, MA 02062

APPROVAL REPORT

MODEL VK305 BULB TYPE CONTROL-MODE (DENSITY/AREA) HORIZONTAL SIDEWALL QUICK RESPONSE AUTOMATIC SPRINKLERS WITH A NOMINAL DISCHARGE COEFFICIENT OF 5.6 GAL/MIN/(PSI)$^{1/2}$

Prepared for:

The Viking Corporation
210 North Industrial Park Road
Hastings, MI 49058

Project ID: 1Z1A2.AH
Class: 2012
Date of Approval: 21 January 2003
Authorized by:

Roger L. Allard, Group Manager - Hydraulics

FM Approvals
1151 Boston-Providence Turnpike
P.O. Box 9102
Norwood, MA 02062

Non-Storage / Special Protection / Storage Sprinklers

General Information

Automatic sprinkler protection is recommended for industrial and other buildings having combustible construction or combustible occupancies.

When selecting a specific type of sprinkler, refer to the FM Global Property Loss Prevention Data Sheets to ensure that the sprinkler selected is capable of providing adequate fire protection for the intended occupancy. Projects that are specific to FM Global insured clients, working plans of proposed layouts, showing all details with respect to location of sprinklers and piping, description of the occupancy and details of construction, should be sent to the local FM Global engineering office for review and acceptance before the materials are fabricated. The plans will be accepted or changes will be recommended to assure that the work will be done according to the best practice and to avoid the possibility of later requests for changes.

Nominal thread sizes are expressed using American National Standard Taper Pipe Threads (NPT). Sprinklers intended for sale outside the United States shall have threads which are in compliance with other national or international standards as permitted at the sole discretion of FM Approvals.
Unless otherwise noted, automatic sprinklers have a rated working pressure of 175 psi (12.1 bar).

Sprinkler Categories

There are three categories of FM Approved automatic sprinklers: Storage, Non-Storage and Special Protection sprinklers based on the type of occupancy hazard they are intended to protect. Within these three categories are various different types of orientations (such as pendent, upright, horizontal sidewall, vertical sidewall, flush, recessed, concealed, dry pendent, dry upright, etc.), thermal response ratings (i.e. quick response or standard response), nominal temperature ratings (see table below), K-factors (see table below) and spacings (i.e. standard or extended coverage).

Nominal K-Factors of Sprinklers

The sprinkler nominal discharge coefficient (K-factor) is expressed in US customary units of gal/min/$(psi)^{0.5}$. See the table below for nominal K-factor values of currently Approved sprinklers.

Nominal K-Factors of Approved Sprinklers

Nominal K-Factor, gpm/$(psi)^{1/2}$	*Metric K-Factor, lpm/$(bar)^{1/2}$*
2.8	40
5.6	80
8.0	115
11.2	160
14.0	200
16.8	240
19.6	280
22.4	320
25.2	360

The following table provides the nominal K-factor values of currently Approved Special Protection (Residential) sprinklers.

Nominal K-Factors of Approved Special Protection (Residential) Sprinklers

Nominal K-Factor, gpm/$(psi)^{1/2}$	*Metric K-Factor, lpm/$(bar)^{1/2}$*
3.8	55
5.8	85
6.9	100

Nominal Temperature Rating of Sprinklers

A sprinkler operates automatically when the heat-actuated element is heated to, or above, its thermal rating. Selection of the proper temperature rating for automatic sprinklers is important as it provides a factor of safety designed to prevent premature operation. See the table below as well as the occupancy-specific FM Global data sheet to ensure the proper nominal temperature rating for the sprinkler is chosen based on the hazard being protected as well as the expected ambient temperature conditions. Factory coated, plated and painted sprinklers rated above 165°F (74°C) have the standard temperature color code either on the frame arms or on the compression screws, except in the case of bulb type decorative coated sprinklers in which the bulb fluid color indicates the temperature rating per the following table:

Nominal Temperature Ratings of Sprinklers Based on Maximum Ambient Temperature at Sprinkler Level

*Nominal Temperature Rating of Sprinkler**	*Maximum Ambient Temperature at Sprinkler Level*	*Temperature Range of Nominal Rating***	*Temperature Classification of Sprinkler*	*Color of Sprinkler Frame*	*Color and Temperature of Sprinkler Glass Bulb*
135°F (55°C)	100°F (38°C)	135°F (57°C)	Ordinary	Unpainted	Orange, 135°F (57°C)
160°F (70°C)	100°F (38°C)	155°F - 165°F (68°C - 74°C)	Ordinary	Unpainted	Red, 155°F (68°C)
175°F (80°C)	150°F (66°C)	175°F (79°C)	Intermediate	White	Yellow, 175°F (79°C)
212°F (100°C)	150°F (66°C)	200°F - 220°F (93°C - 104°C)	Intermediate	White	Green, 200°F & 225°F (93°C & 107°C)
280°F (140°C)	225°F (107°C)	280°F - 286°F (138°C - 141°C)	High	Blue	Blue, 250°F & 286°F (121°C & 141°C)
350°F (175°C)	300°F (149°C)	325°F -375°F (163°C - 191°C)	Extra High	Red	Mauve, 325°F & 360°F (162°C & 182°C)
425°F (220°C)	375°F (191°C)	400°F -475°F (204°C - 246°C)	Very Extra High	Green	Black, 400°F - 650°F (204°C – 343°C)
525°F (275°C)	475°F (246°C)	500°F -575°F (260°C - 302°C)	Ultra High	Orange	Black, 400°F - 650°F (204°C – 343°C)
650°F (345°C)	625°F (329°C)	650°F (343°C)	Ultra High	Orange	Black, 400°F - 650°F (204°C – 343°C)

*The values indicated for nominal temperature ratings of sprinkler in this table are based on values indicated in FM Global data sheets

**The values indicated are based on the actual (marked or marked nominal) temperature ratings of currently Approved sprinklers

Sprinklers of "very extra high" and "ultra high" ratings are primarily used for internal protection of chambers such as ovens and dryers having working temperatures above 300°F (149°C). When the sprinklers are normally heated to the working temperature of the oven or dryer, under fire conditions they will operate fast enough for proper protection. However, when the sprinklers are initially at the same temperature as a cold oven or dryer, operation may be so severely retarded that the oven or dryer is virtually without internal sprinkler protection.

Nominal Response Rating of Sprinklers

Approved sprinklers are listed in one of three ways for response ratings: fast response (FR), quick response (QR) or standard response (SR) and are reflective of the response of the entire sprinkler to thermal exposure, not just the thermal sensing element of the sprinkler. Note that fast response (FR) sprinklers are a subset of quick response sprinklers for listing purposes.

The thermal sensing elements of the sprinkler are identified as either Fusible or, in the case of bulb type elements, nominal bulb diameter in millimeters (e.g., 2.5 mm, 3 mm, etc.).

Finishes and Coatings of Sprinklers

Approved sprinklers are also available with factory-applied special coatings for resistance to corrosive environments; such sprinklers are listed under the Special Protection sprinkler category. For corrosion resistance, wax is satisfactory except in extreme atmospheres. Wax has too low a melting point for high temperate rated sprinklers, whereas a bituminous coating affords some protection. A lead coating protects against certain mild corrosive atmospheres. Wax-over-lead provides good sprinkler protection. Corrosion resistant sprinklers such as those manufactured from stainless steel or other corrosion resistant materials currently afford the best available protection. See the FM Global occupancy-specific data sheet to determine when a corrosion resistant sprinkler is needed and, if so, which type offers the best resistance for the environmental conditions.

FM Approved sprinklers are available with common decorative finishes such as factory-applied bright brass, chrome, paint, or polyester coating. Note that these finishes are for decorative purposes only and are not FM Approved specifically for corrosive environments.

Finishes of currently Approved Storage and Non-Storage sprinklers are included in the following table.

Factory-Applied Finishes of Approved Storage and Non-Storage Sprinklers

Finish	*Description*
Black Plated	*Black Plated*
Brass	*Unfinished, Plain Brass or Bronze*
Bright Brass	*Bright Brass Plated*
Chrome	*Chrome Plated*
Painted	*Painted (any color)*
Polyester	*Polyester Coated (any color)*
Zinc	*Zinc Plated*

Finishes of currently Approved Special Protection (Corrosive Environment) sprinklers are included in the following table. Note that FM Approved Special Protection (Corrosive Environment) sprinklers are also acceptable for use as Non-Storage sprinklers, unless indicated otherwise by the occupancy-specific FM Global data sheet.

Finishes of Approved Special Protection (Corrosive Environment) Sprinklers

Finish	*Description*
Lead	*Lead Coated (for extra corrosion protection in some atmospheres)*
NICOTEF	*Nickel-Teflon Coating (for extra corrosion protection in some atmospheres)*
Stainless Steel	*Stainless Steel Alloy (for extra corrosion protection in some atmospheres)*
Wax	*Wax Coated (for extra corrosion protection in some atmospheres)*
Wax Over Brass	*Wax Over Brass Coated (for extra corrosion protection in some atmospheres)*
Wax Over Lead	*Wax Over Lead Coated (for extra corrosion protection in some atmospheres)*
Wax Over Polyester	*Wax Over Polyester Coated (for extra corrosion protection in some atmospheres)*

Only sprinklers supplied by the listed manufacturers are FM Approved. Any change in the device after it leaves the manufacturer voids the Approval.

Note that Approved Special Protection (Corrosive Environment) sprinklers can also be installed in applications acceptable for both Approved Non-Storage and Storage sprinklers having the same K-factor, orientation, RTI, nominal temperature rating and sprinkler spacing.

Non-Storage Sprinklers and Storage Sprinklers

Orientation

Adjustable Concealed Pendent

Adjustable concealed pendent sprinklers incorporate a cover plate which is heat activated and can be manually removed to prevent over-painting of the cover plate. They are intended for use with concealed sprinkler piping where attractive appearance under a ceiling is desired; such occupancies may include offices, hotel lobbies, dining rooms, clubs and similar properties. FM Approved adjustable concealed pendent sprinklers are limited to a maximum temperature rating of 225°F (107°C) and to protection of hazard occupancies as outlined in the occupancy-specific FM Global Property Loss Prevention Data Sheet. They should not be installed in corrosive environments. Unless indicated otherwise by the occupancy-specific FM Global Property Loss Prevention Data Sheet, these sprinklers are FM Approved only for use in wet systems as well as pre-action systems that qualify as a wet system.

Dry Adjustable Horizontal Sidewall

A dry-type sprinkler consists of a sprinkler permanently attached to an extension nipple which has a closure at the inlet end to prevent system water from entering the nipple until the sprinkler operates.

Adjustable dry horizontal sidewall sprinklers are dry-type sprinklers in which the sprinklers attached to the nipple extension are of the horizontal sidewall orientation. They are intended for installation near a wall/ceiling interface and are equipped with a special deflector which discharges most of the water in a horizontal plane so that the water is directed onto adjacent walls as well as the protected area. These types of sprinklers are typically used to protect areas subject to freezing and are connected to water-filled sprinkler piping located adjacent to the protected area in a location not susceptible to freezing. They are also sometimes used on dry type sprinkler systems where the installed sprinkler must be of the sidewall orientation. The sprinklers are generally intended for locations such as offices, hotel lobbies and dining rooms, where the installation of Non-Storage pendent or upright sprinklers with the usual ceiling spacing and pipe location may be objectionable because of appearance. They are also installed for special circumstances where their directional properties are desirable.

Dry Adjustable Pendent

A dry-type sprinkler consists of a sprinkler permanently attached to an extension nipple which has a closure at the inlet end to prevent system water from entering the nipple until the sprinkler operates.

Adjustable dry pendent sprinklers are dry-type sprinklers in which the sprinkler attached to the nipple extension is of the pendent orientation. These types of sprinklers are typically used to protect areas subject to freezing and are connected to water-filled sprinkler piping located above the protected area in a location not susceptible to freezing. They are also sometimes used on dry type sprinkler systems where the installed sprinkler must be of the pendent orientation.

Adjustable Recessed Pendent

Adjustable recessed pendent sprinklers consist of a pendent sprinkler installed in a decorative recessed cup which reduces the protrusion of the sprinkler from the ceiling. They are intended for use with concealed sprinkler piping where attractive appearance under a ceiling is desired; such occupancies may include offices, hotel lobbies, dining rooms, clubs and similar properties. FM Approved adjustable recessed pendent sprinklers are limited to a maximum temperature rating of 225°F (107°C) and to protection of hazard occupancies as outlined in the occupancy-specific FM Global Property Loss Prevention Data Sheet. Unless indicated otherwise by the occupancy-specific FM Global Property Loss Prevention Data Sheet, these sprinklers are FM Approved only for use in wet systems as well as pre-action systems that qualify as a wet system.

Concealed Pendent

Concealed pendent sprinklers incorporate a cover plate which is heat activated and can be manually removed to prevent over-painting of the cover plate. They are intended for use with concealed sprinkler piping where attractive appearance under a ceiling is desired; such occupancies may include offices, hotel lobbies, dining rooms, clubs and similar properties. FM Approved concealed pendent sprinklers are limited to a maximum temperature rating of 225°F (107°C) and to protection of hazard occupancies as outlined in the occupancy-specific FM Global Property Loss Prevention Data Sheet. They should not be installed in corrosive environments. Unless indicated otherwise by the occupancy-specific FM Global Property Loss Prevention Data Sheet, these sprinklers are FM Approved only for use in wet systems as well as pre-action systems that qualify as a wet system.

Dry Concealed Pendent

A dry-type sprinkler consists of a sprinkler permanently attached to an extension nipple which has a closure at the inlet end to prevent system water from entering the nipple until the sprinkler operates.

Dry concealed pendent sprinklers are dry-type sprinklers in which the sprinklers attached to the nipple extension are of the pendent orientation. Dry concealed pendent sprinklers incorporate a cover plate which is heat activated and can be manually removed to prevent over-painting of the cover plate. These types of sprinklers are typically used to protect areas subject to freezing and are connected to water-filled sprinkler piping located adjacent to the protected area in a location not susceptible to freezing. They are also sometimes used on dry type sprinkler systems where the installed sprinkler must be of the pendent orientation. The sprinklers are generally intended for use with concealed sprinkler piping where attractive appearance under a ceiling is desired; such occupancies

may include offices, hotel lobbies, dining rooms, clubs and similar properties. They should not be installed in corrosive environments. FM Approved dry concealed pendent sprinklers are limited to a maximum temperature rating of 225°F (107°C) and to protection of hazard occupancies as outlined in the occupancy-specific FM Global Property Loss Prevention Data Sheet.

Dry Horizontal Sidewall

A dry-type sprinkler consists of a sprinkler permanently attached to an extension nipple which has a closure at the inlet end to prevent system water from entering the nipple until the sprinkler operates.

Dry horizontal sidewall sprinklers are dry-type sprinklers in which the sprinklers attached to the nipple extension are of the horizontal sidewall orientation. They are intended for installation near a wall/ceiling interface and are equipped with a special deflector which discharges most of the water in a horizontal plane so that the water is directed onto adjacent walls as well as the protected area. These types of sprinklers are typically used to protect areas subject to freezing and are connected to water-filled sprinkler piping located adjacent to the protected area in a location not susceptible to freezing. They are also sometimes used on dry type sprinkler systems where the installed sprinkler must be of the sidewall orientation. The sprinklers are generally intended for locations such as offices, hotel lobbies and dining rooms, where the installation of Non-Storage pendent or upright sprinklers with the usual ceiling spacing and pipe location may be objectionable because of appearance. They are also installed for special circumstances where their directional properties are desirable.

Dry Pendent

A dry-type sprinkler consists of a sprinkler permanently attached to an extension nipple which has a closure at the inlet end to prevent system water from entering the nipple until the sprinkler operates.

Dry pendent sprinklers are dry-type sprinklers in which the sprinkler attached to the nipple extension is of the pendent orientation. These types of sprinklers are typically used to protect areas subject to freezing and are connected to water-filled sprinkler piping located above the protected area in a location not susceptible to freezing. They are also sometimes used on dry type sprinkler systems where the installed sprinkler must be of the pendent orientation.

Dry Recessed Horizontal Sidewall

A dry-type sprinkler consists of a sprinkler permanently attached to an extension nipple which has a closure at the inlet end to prevent system water from entering the nipple until the sprinkler operates.

Dry recessed horizontal sidewall sprinklers are dry-type sprinklers in which the sprinklers attached to the nipple extension are of the horizontal sidewall orientation and are installed in a decorative recessed cup which reduces the protrusion of the sprinkler from the wall. These types of sprinklers are typically used to protect areas subject to freezing and are connected to water-filled sprinkler piping located adjacent to the protected area in a location not susceptible to freezing. They are also sometimes used on dry type sprinkler systems where the installed sprinkler must be of the sidewall orientation.

Dry Recessed Pendent

A dry-type sprinkler consists of a sprinkler permanently attached to an extension nipple which has a closure at the inlet end to prevent system water from entering the nipple until the sprinkler operates.

Dry recessed pendent sprinklers are dry-type sprinklers in which the sprinklers attached to the nipple extension are of the pendent orientation and are installed in a decorative recessed cup which reduces the protrusion of the sprinkler from the ceiling. These types of sprinklers are typically used to protect areas subject to freezing and are connected to water-filled sprinkler piping located above the protected area in a location not susceptible to freezing. They are also sometimes used on dry type sprinkler systems where the installed sprinkler must be of the pendent orientation.

Dry Upright

A dry-type sprinkler consists of a sprinkler permanently attached to an extension nipple which has a closure at the inlet end to prevent system water from entering the nipple until the sprinkler operates.

Dry upright sprinklers are dry-type sprinklers in which the sprinklers attached to the nipple extension are of the upright orientation. These types of sprinklers are typically used to protect areas subject to freezing and are connected to water-filled sprinkler piping located below the protected area in a location not susceptible to freezing.

Flush Pendent

Flush pendent sprinklers are constructed with an operating element which extends a short distance below the ceiling. Upon actuation, the sprinkler deflector drops below the ceiling level to provide a proper water distribution. They are intended for use with concealed sprinkler piping where attractive appearance under a ceiling is desired; such occupancies may include offices, hotel lobbies, dining rooms, clubs and similar properties. They should not be installed in corrosive environments. FM Approved flush pendent sprinklers are limited to a maximum temperature rating of 225°F (107°C) and to protection of hazard occupancies as outlined in the occupancy-specific FM Global Property Loss Prevention Data Sheet. Unless indicated otherwise by the occupancy-specific FM Global Property Loss Prevention Data Sheet, these sprinklers are FM Approved only for use in wet systems as well as pre-action systems that qualify as a wet system.

Horizontal Sidewall

Sidewall sprinklers are sprinklers that are intended for installation near a wall/ceiling interface. They are equipped with a special deflector which discharges most of the water in a horizontal plane so that the water is directed onto adjacent walls as well as the protected area. The sprinklers are generally intended for locations such as offices, hotel lobbies and dining rooms, where the installation of Non-Storage pendent or upright sprinklers with the usual ceiling spacing and pipe location may be objectionable because of appearance. They are also installed for special circumstances where their directional properties are desirable.

Horizontal sidewall automatic sprinklers are sidewall-type sprinklers in which the axis of the sprinkler orifice is oriented horizontally.

Pendent

Pendent automatic sprinklers are sprinklers designed such that the water discharge from the sprinkler orifice is directed downward towards the deflector which in turn directs the water downward toward the protected area. The sprinkler is designed such that the deflector is located below the pipe to which the sprinkler is connected.

Recessed Horizontal Sidewall

Sidewall sprinklers are sprinklers that are intended for installation near a wall/ceiling interface. They are equipped with a special deflector which discharges most of the water in a horizontal plane so that the water is directed onto adjacent walls as well as the protected area. The sprinklers are generally intended for locations such as offices, hotel lobbies and dining rooms, where the installation of Non-Storage pendent or upright sprinklers with the usual ceiling spacing and pipe location may be objectionable because of appearance. They are also installed for special circumstances where their directional properties are desirable.

Recessed horizontal sidewall sprinklers consist of a horizontal sidewall sprinkler installed in a decorative recessed cup which reduces the protrusion of the sprinkler from the wall. They are intended for use with concealed sprinkler piping where attractive appearance is desired; such occupancies may include offices, hotel lobbies, dining rooms, clubs and similar properties.

Recessed Pendent

Recessed pendent sprinklers consist of a pendent sprinkler installed in a decorative recessed cup which reduces the protrusion of the sprinkler from the ceiling. They are intended for use with concealed sprinkler piping where attractive appearance under a ceiling is desired; such occupancies may include offices, hotel lobbies, dining rooms, clubs and similar properties. FM Approved recessed pendent sprinklers are limited to a maximum temperature rating of 225°F (107°C) and to protection of hazard occupancies as outlined in the occupancy-specific FM Global Property Loss Prevention Data Sheet. Unless indicated otherwise by the occupancy-specific FM Global Property Loss Prevention Data Sheet, these sprinklers are FM Approved only for use in wet systems as well as pre-action systems that qualify as a wet system.

Upright

Upright automatic sprinklers are sprinklers designed such that the water discharge from the sprinkler orifice is directed upward towards the deflector which in turn redirects the water downward toward the protected area. The sprinkler is designed such that the deflector is located above the pipe to which the sprinkler is connected.

Vertical Sidewall

Sidewall sprinklers are sprinklers that are intended for installation near a wall/ceiling interface. They are equipped with a special deflector which discharges most of the water in a horizontal plane so that the water is directed onto adjacent walls as well as the protected area. The sprinklers are generally intended for locations such as office, hotel lobbies, and dining rooms, where the installation of Non-Storage pendent or upright sprinklers with the usual ceiling spacing and pipe location may be objectionable because of appearance. They are also installed for special circumstances where their directional properties are desirable.

Vertical sidewall automatic sprinklers are sidewall-type sprinklers in which the axis of the sprinkler orifice is oriented vertically. They are FM Approved for use in both the upright and pendent positions, except where noted otherwise.

Non-Storage Sprinklers

A Non-Storage automatic sprinkler is a sprinkler that has been categorized by FM Global as acceptable for protecting non-storage-type occupancies and/or other occupancy hazards characterized by low to moderate heat-release rate fires as permitted in a FM Global occupancy-specific Property Loss Prevention Data Sheet.

K5.6 (K80 metric)

Non-Storage automatic sprinklers having a K-factor value of 5.6 (80 metric) are similar to Non-Storage automatic sprinklers having a K-factor value of 2.8 (40 metric), except that they discharge 100% more water at the same discharge pressure and typically do not require the use of individual or system strainers. Pendent sprinklers of this K-factor would, however, require the installation of a return bend if the water supply is fed from an open-body type source. See FM Global Property Loss Prevention Data Sheet 2-0, *Installation Guidelines for Automatic Sprinklers*, for additional details and requirements regarding these sprinklers.

K5.6 (K80 metric) Pendent

VK302

Company Name:	The Viking Corporation
Company Address:	210 N Industrial Park Dr, Hastings, Michigan 49058, USA
Company Website:	http://vikingcorp.com
New/Updated Product Listing:	No
Primary Class of Work:	2017-AS, Control Mode, Pendent

Listing Country:	United States of America
Sprinkler Category:	Non Storage
K:	5.6
Type:	Pendent
Response:	QR - Quick Response
Element:	3 mm
NPT (in.):	1/2
Finish:	Brass, Chrome, NICOTEF Coated, Polyester
Temp. Rating (°F):	135, 155, 175, 200, 286
Temp. Rating (°C):	57, 68, 79, 93, 141
Certification Type:	FM Approved