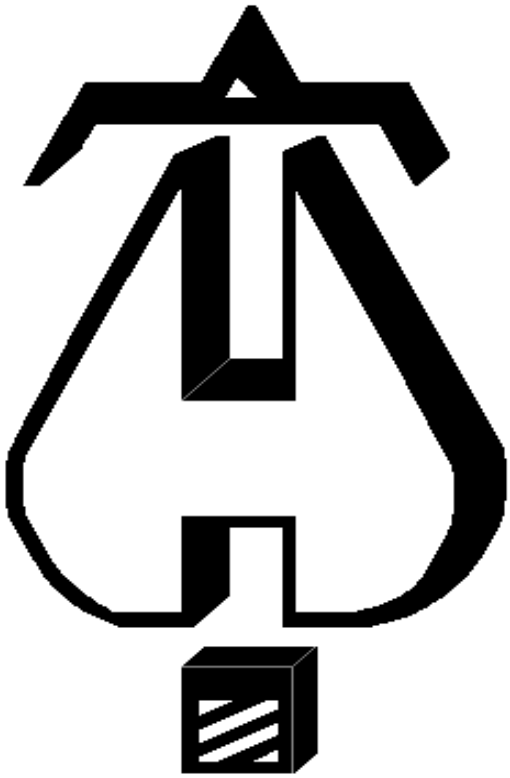
Fire Sprinkler Hydraulic Data
and
Product Data

Advanced Auto Parts
Store #7659
8900 Walker Mill Road
Capital Heights, MD 20743
04/12/2015

KLEMPNER SERVICES
FIRE PROTECTION SOLUTIONS

2205 Leroy Ave, Gastonia, NC 28054 Phone: 980-422-1157



. . . Fire Protection by Computer Design

Klempner Services
2205 Leroy Ave
Gastonia, NC 28054
980.422.1157

Job Name : Advanced Auto Parts - Capital Heights, MD
Building : FP2
Location : 8900 WALKER MILL ROAD, CAPITAL HEIGHTS, MD 20743
System : 1
Contract :
Data File : AAP Capital Heights, MD Area-1.WXF

HYDRAULIC CALCULATIONS
for

Project name: Advanced Auto Parts #7659
Location: 8900 WALKER MILL ROAD, CAPITAL HEIGHTS, MD 20743
Drawing no: FP2
Date: 04/10/2015

Design

Remote area number: 1
Remote area location: SALES
Occupancy classification: ORDINARY GROUP II
Density: .20 - Gpm/SqFt
Area of application: 1177.76 - SqFt
Coverage per sprinkler: 123.702 - SqFt
Type of sprinklers calculated: VIKING VK350 Q.R.
No. of sprinklers calculated: 10
In-rack demand: N/A - GPM
Hose streams: 250 - GPM
Total water required (including hose streams): 532.877 - GPM @ 44.8505 - Psi
Type of system: WET
Volume of dry or preaction system: N/A - Gal

Water supply information

Date: 4/16/2014
Location: 8800 WALKER MILL ROAD
Source: WASHINGTON SUBURBAN SANITARY COMMISSION

Name of contractor: Klempner Services
Address: 2205 Leroy Ave, Gastonia, NC 28054
Phone number: 980.422.1157
Name of designer: Derk R. Beutler
Authority having jurisdiction: PRINCE GEORGE'S COUNTY
Notes: (Include peaking information or gridded systems here.)
AREA REDUCTION APPLIED FOR 18'-2.5" CEILING HEIGHTS
27.685% REDUCTION
MINIMUM REMOTE AREA = 1,084.725 SQ.FT.

WASHINGTON SUBURBAN SANITARY COMMISSION

HYDRAULIC INFORMATION SHEET

ON-SITE NO.: 15 OS 1582 200' SHEET NO.: 202SE08

PART 1 – INFORMATION PROVIDED BY THE APPLICANT

LOCATION OF WORK

PROPOSED ADVANCE AUTO

The information provided by the WSSC represents the normal operating conditions expected in the water system. A specific flow and pressure are not guaranteed to be delivered.

LOT	BLOCK	SUBDIVISION	TOWN
P.59		STEEPLECHASE BUSINESS PARK	CAPITOL HEIGHTS

BUILDING ADDRESS (HOUSE NO., STREET NAME)	NO. OF STORIES	ZIP
8900 WALKER MILL ROAD	1	20743

TYPE STRUCTURE (STORE, DWELLING, ETC.)	SPECIFIC USE	COUNTY
RETAIL	AUTO PART SALES	☑ PG ☐ MONT.

MARK JOHNSTON 10/23/2014
NAME PRINTED DATE

GLW (301) 421-4024
NAME OF COMPANY PHONE

3909 NATIONAL DRIVE
BURTONSVILLE, MD 20866
ADDRESS OF COMPANY

INVERT ELEVATION OF WSSC MAIN*	159.90 ft.
FIRST FLOOR ELEVATION	166.00 ft.
TOP FLOOR ELEVATION	N/A ft.
DOMESTIC FLOW	
PEAK FLOW	20 gpm
FIRE SPRINKLER SYSTEM	
REQUIRED FLOW	est 600 gpm
ELEVATION OF HIGHEST SPRINKLER HEAD	184.2 ft.
ON-SITE FIRE HYDRANT SYSTEM	
REQUIRED FLOW AT LAST FIRE HYDRANT	1,000 gpm
ELEVATION OF LAST FIRE HYDRANT	163.75 ft.
REQUIRED FLOW AT ADJACENT FIRE HYDRANT	N/A gpm
ELEVATION OF ADJACENT FIRE HYDRANT	N/A ft.
FIRE STANDPIPE SYSTEM	
REQUIRED FLOW	gpm
ELEVATION OF TOP OUTLET	ft.

PART 2 – INFORMATION PROVIDED BY WSSC

LOW DOMESTIC PRESSURE*	52 psi
HIGH PRESSURE*	89 psi
LOW PRESSURE WITH FIRE FLOW OF 1500-GPM*	39 psi
LOW PRESSURE WITH THE REQUESTED SPRINKLER FLOW*	50 psi
LOW PRESSURE WITH THE REQUESTED FIRE STANDPIPE FLOW*	Not requested psi

*AT THE POINT OF CONNECTION

Mrahman March 25, 2015

THIS COMPLETED DOCUMENT SHALL BE DELIVERED TO THE APPROPRIATE COUNTY BUILDING OFFICIAL IN CONJUNCTION WITH THE BUILDING PERMIT APPLICATION.

Washington Suburban Sanitary Commission

14501 Sweitzer Lane • Laurel, Maryland 20707-5901

CUSTOMER INFORMATION

FLOW TEST PREPARED FOR:	Fireline Corporation
CONTACT PERSON	Matt Losignor
ADDRESS:	4506 Hollins Ferry Rd, Baltimore, MD 21227
TELE. #	410-247-1422 x323
FAX #	410-242-0779
EMAIL:	Matt Losignor

FIRE FLOW TEST INFORMATION

TEST LOCATION	TEST DATE	TIME OF TEST	200-FT Sht	MAP PAGE	GRID #
8800 Walker Mill Rd	04/16/14	1:10PM	202SE08	P5651	D01

FLOW TEST RESULTS

TEST HYDRANT (S&R) No.	F021
FLOW HYDRANT (FLOW) No.	F022
ELEVATION @S&R HYDRANT (FT)	155
ELEVATION @FLOW HYDRANT (FT)	154
HHG:	365
LHG:	280
STATIC PRESSURE (PSI):	67
RESIDUAL PRESSURE (PSI):	51
PITOT FLOW (GPM)	2164
MAIN LINE SIZE (IN)	10

* Test Results Adjusted to LHG Condition

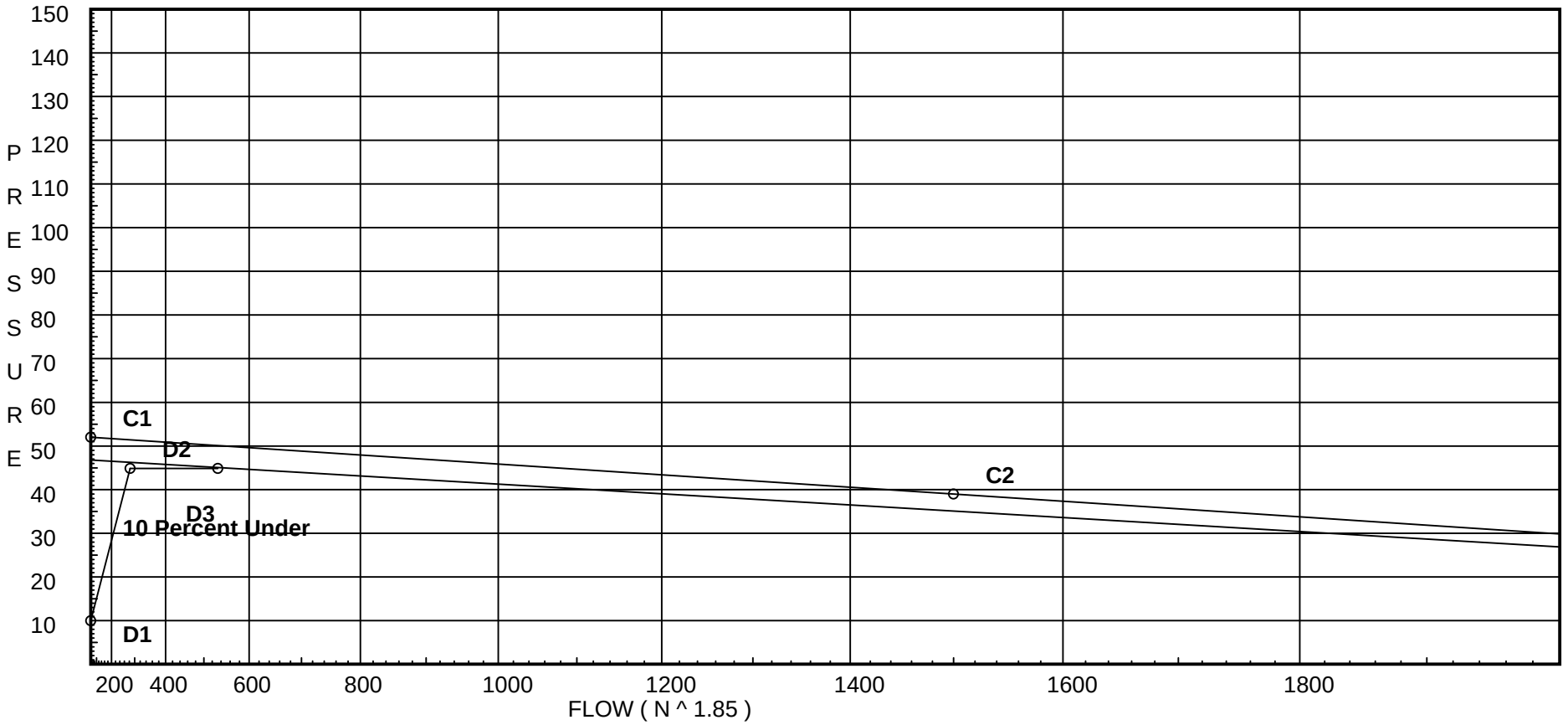
*Adjusted Residual Pressure W/**PITOT FLOW**	38	(PSI)
*Adjusted Residual Pressure W/**1000 GPM**	50	(PSI)
*Adjusted Residual Pressure W/**1500 GPM**	46	(PSI)

TEST CONDUCTED BY:	S. Billingsley & M. Duckworth
REVIEWD BY:	M Duckworth

City Water Supply:
- C1 - Static Pressure : 52
- C2 - Residual Pressure: 39
- C2 - Residual Flow : 1500

Demand:

D1 - Elevation	:	9.961
D2 - System Flow	:	282.877
D2 - System Pressure	:	44.850
Hose (Adj City)	:	
Hose (Demand)	:	250
D3 - System Demand	:	532.877
Safety Margin	:	5.233



Fittings Used Summary

Fitting Legend

Abbrev.	Name	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8	10	12	14	16	18	20	24
E	NFPA 13 90' Standard Elbow	1	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
F	NFPA 13 45' Elbow	1	1	1	1	2	2	3	3	3	4	5	7	9	11	13	17	19	21	24	28
Fsp	Flow Switch Potter VSR	Fitting generates a Fixed Loss Based on Flow																			
G	NFPA 13 Gate Valve	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
T	NFPA 13 90' Flow thru Tee	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121
Zfe	Febco 870V	Fitting generates a Fixed Loss Based on Flow																			

Units Summary

Diameter Units	Inches
Length Units	Feet
Flow Units	US Gallons per Minute
Pressure Units	Pounds per Square Inch

Pressure / Flow Summary - STANDARD

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
1	18.0	8	9.56	na	24.74	0.2	123.702	7.0
2	18.0	8	9.73	na	24.96	0.2	123.702	7.0
3	18.0	8	10.36	na	25.74	0.2	123.702	7.0
4	18.0	8	11.7	na	27.36	0.2	123.702	7.0
5	18.0	8	14.08	na	30.02	0.2	123.702	7.0
21T	18.0		19.21	na				
6	18.0	8	12.23	na	27.98	0.2	123.702	7.0
7	18.0	8	12.45	na	28.22	0.2	123.702	7.0
8	18.0	8	13.23	na	29.1	0.2	123.702	7.0
9	18.0	8	14.91	na	30.9	0.2	123.702	7.0
10	18.0	8	17.9	na	33.85	0.2	123.702	7.0
22T	18.0		18.95	na				
31B	16.0		21.84	na				
32B	16.0		22.03	na				
TOR	16.0		24.8	na				
BOR	5.0		32.73	na				
BFP	5.0		32.74	na				
FLG	1.5		37.75	na				
RED	-3.0		40.08	na				
HOSE	-3.0		40.08	na	250.0			
MTR1	-3.0		40.44	na				
MTR2	-3.0		43.79	na				
TEST	-5.0		44.85	na				

The maximum velocity is 21.67 and it occurs in the pipe between nodes 10 and 22T

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
1	24.74	1.682		0.0	8.830	9.564		K Factor = 8.00
to		120.0		0.0	0.0	0.0		
2	24.74	0.0194		0.0	8.830	0.171		Vel = 3.57
2	24.96	1.682		0.0	8.830	9.735		K Factor = 8.00
to		120.0		0.0	0.0	0.0		
3	49.7	0.0703		0.0	8.830	0.621		Vel = 7.18
3	25.75	1.682		0.0	8.830	10.356		K Factor = 8.00
to		120.0		0.0	0.0	0.0		
4	75.45	0.1522		0.0	8.830	1.344		Vel = 10.89
4	27.36	1.682		0.0	8.830	11.700		K Factor = 8.00
to		120.0		0.0	0.0	0.0		
5	102.81	0.2699		0.0	8.830	2.383		Vel = 14.84
5	30.02	1.682	1T	9.9	1.920	14.083		K Factor = 8.00
to		120.0		0.0	9.900	0.0		
21T	132.83	0.4335		0.0	11.820	5.124		Vel = 19.18
21T	0.0	2.157	1T	12.307	1.420	19.207		
to		120.0		0.0	12.307	0.866		
31B	132.83	0.1291		0.0	13.727	1.772		Vel = 11.66
	0.0							
	132.83					21.845		K Factor = 28.42
6	27.98	1.682		0.0	8.830	12.233		K Factor = 8.00
to		120.0		0.0	0.0	0.0		
7	27.98	0.0243		0.0	8.830	0.215		Vel = 4.04
7	28.23	1.682		0.0	8.830	12.448		K Factor = 8.00
to		120.0		0.0	0.0	0.0		
8	56.21	0.0882		0.0	8.830	0.779		Vel = 8.12
8	29.09	1.682		0.0	8.830	13.227		K Factor = 8.00
to		120.0		0.0	0.0	0.0		
9	85.3	0.1911		0.0	8.830	1.687		Vel = 12.32
9	30.90	1.682		0.0	8.830	14.914		K Factor = 8.00
to		120.0		0.0	0.0	0.0		
10	116.2	0.3385		0.0	8.830	2.989		Vel = 16.78
10	33.85	1.682		0.0	1.920	17.903		K Factor = 8.00
to		120.0		0.0	0.0	0.0		
22T	150.05	0.5432		0.0	1.920	1.043		Vel = 21.67
22T	0.0	2.157	1T	12.307	1.420	18.946		
to		120.0		0.0	12.307	0.866		
32B	150.05	0.1617		0.0	13.727	2.220		Vel = 13.17
	0.0							
	150.05					22.032		K Factor = 31.97
31B	132.83	4.26	1T	26.334	13.500	21.845		
to		120.0		0.0	26.334	0.0		
32B	132.83	0.0047		0.0	39.834	0.187		Vel = 2.99
32B	150.05	4.26	3E	39.501	106.000	22.032		
to		120.0		0.0	39.501	0.0		
TOR	282.88	0.0190		0.0	145.501	2.765		Vel = 6.37

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	******* Notes ******
TOR	0.0	4.26	1Fsp	0.0	8.750	24.797		
to		120.0		0.0	0.0	7.764		* Fixed loss = 3
BOR	282.88	0.0191		0.0	8.750	0.167		Vel = 6.37
BOR	0.0	4.26		0.0	0.500	32.728		
to		120.0		0.0	0.0	0.0		
BFP	282.88	0.0180		0.0	0.500	0.009		Vel = 6.37
BFP	0.0	4.26	1Zfe	0.0	0.500	32.737		
to		120.0		0.0	0.0	5.003		* Fixed loss = 3.487
FLG	282.88	0.0200		0.0	0.500	0.010		Vel = 6.37
FLG	0.0	6.16	2F	20.084	121.000	37.750		
to		140.0	1E	20.084	40.168	1.949		
RED	282.88	0.0024		0.0	161.168	0.382		Vel = 3.05
RED	0.0	8.27		0.0	7.000	40.081		
to		140.0		0.0	0.0	0.0		
HOSE	282.88	0.0006		0.0	7.000	0.004		Vel = 1.69
HOSE	250.00	8.27	2F	28.468	168.000	40.085		Qa = 250
to		140.0		0.0	28.468	0.0		
MTR1	532.88	0.0018		0.0	196.468	0.358		Vel = 3.18
MTR1	0.0	6.16		0.0	45.000	40.443		
to		140.0		0.0	0.0	3.000		* Fixed loss = 3
MTR2	532.88	0.0077		0.0	45.000	0.345		Vel = 5.74
MTR2	0.0	8.27	1F	14.234	32.000	43.788		
to		140.0	1T	55.354	75.914	0.866		
TEST	532.88	0.0018	1G	6.326	107.914	0.196		Vel = 3.18
	0.0							
	532.88					44.850		K Factor = 79.57

SPECIFICATION SHEET

FEBCO®

MASTER series®

LEAD FREE*

MasterSeries® LF870V

Double Check Backflow Prevention Assembly

Size: 2½" - 8" (65mm - 200mm)

The FEBCO MasterSeries LF870V Double Check Assembly is specifically designed to protect against possible backpressure and backsiphonage conditions for non-health hazard (i.e., pollutant) application in accordance with Local Governing Water Utility Code. This Backflow Assembly is primarily used on potable drinking water systems where Local Governing Code mandates protection from non-potable quality water being pumped or siphoned back into the potable water system.

The LF870V features Lead Free* construction to comply with low lead installation requirements. The Lead Free* Double Check Assembly shall comply with state codes and standards, where applicable, requiring reduced lead content.

Features

- Inline Serviceable Assembly
- Horizontal "N-Pattern" Installations
- Vertical-Up "Z-Pattern" Installations
- No Special Tools Required for Servicing
- Captured Modular Spring Assembly
- Reversible & Replaceable Discs
- Field Replaceable Seats
- Ductile Iron Valve Body Design
- Stainless Steel Check Components
- Winterization feature with disc retainers and valve body drain ports
- Clapper Check Assembly
- Commonality between 1st & 2nd Check Components
- Captured O-ring Design

MODEL LF870V DOUBLE CHECK ASSEMBLY
(Shown in standard orientation)

Specifications

The FEBCO MasterSeries LF870V Double Check Valve Assembly shall be installed on the potable water supply and at each point of cross-connection to protect against possible backpressure and backsiphonage conditions for non-health hazard (i.e., pollutant) applications. The assembly shall consist of a main line valve body composed of two (2) independently acting approved clapper style check modules with replaceable seats and disc rubbers. Servicing of both check modules does not require any special tools and are accessed through independently top entry covers. This assembly shall be fitted with AWWA Compliant inlet/outlet resilient seated shutoff valves; when used on a Fire-Sprinkler application, the assembly shall be fitted with approved UL/FM inlet/outlet resilient seated shutoff valves and contain four (4) properly located resilient seated test cocks as specified by AWWA Standard C510. The assembly shall be approved for horizontal and/or vertical-up installations while meeting the requirements of AWWA Standard C510 flow and pressure loss performance parameters.

NOTICE

Inquire with governing authorities for local installation requirements

⚠ WARNING

It is illegal to use this product in any plumbing system providing water for human consumption, such as drinking or dishwashing, in the United States. Before installing standard material product, consult your local water authority, building and plumbing codes.

***The wetted surface of this product contacted by consumable water contains less than 0.25% of lead by weight.**

Job Name _____ Contractor _____

Job Location _____ Approval _____

Engineer _____ Contractor's P.O. No. _____

Approval _____ Representative _____

Options - Suffix

OSY: UL/FM Approved OS&Y Gate Valves [ANSI/AWWA C515 Compliant]

NRS: Non-Rising Stem Gate Valves [ANSI/AWWA C509 Compliant]

LG: Less Shut-off valves; This is NOT an APPROVED ASSEMBLY

Example Ordering Description:

4" LF870V-OSY - Valve Assembly fitted with OS&Y Shutoff Valves

Available Components

Wye Strainer: FDA Approved [ASME B16.1 Class 125 & AWWA Class D Flange]

Series 611 Valve Setter: MJ x MJ - Mechanical Joint x Mechanical Joint [AWWA C111/A21.11]

MJ x FL - Mechanical Joint x Flange [AWWA C111/A21.11; ASME B16.1 Class 125/ AWWA Class D Flange]

FL x FL – Flange x Flange [ASME B16.1 Class 125 & AWWA Class D Flange]

Assembly Flow Orientation:

Horizontal (N-Pattern 2½" – 8") - Approved by FCCCHR-USC, ASSE, cULus, FM, IAPMO

Vertical Up (Z-Pattern 2½" – 8") - Approved by FCCCHR-USC, ASSE, cULus, FM, IAPMO

Materials

Below is a general materials list of the Model LF870V. All assemblies size 2½" through 8" is similar in materials and construction. Please contact your local FEBCO Representative if you require further information.

Main Valve Body:	Ductile iron Grade 65-45-12
Coating:	Fusion epoxy coated internal and external AWWA C550-90
Shutoff Valves:	NRS resilient wedge gate valve AWWA C509 (Standard)
	OSY resilient wedge gate valve AWWA C515 (UL/FM)
Check Seats:	Stainless Steel
Disc Holder:	Stainless Steel
Elastomer Disc:	Silicone
Spring:	Stainless Steel
Clamp:	AWWA C606

Approvals – Standards:

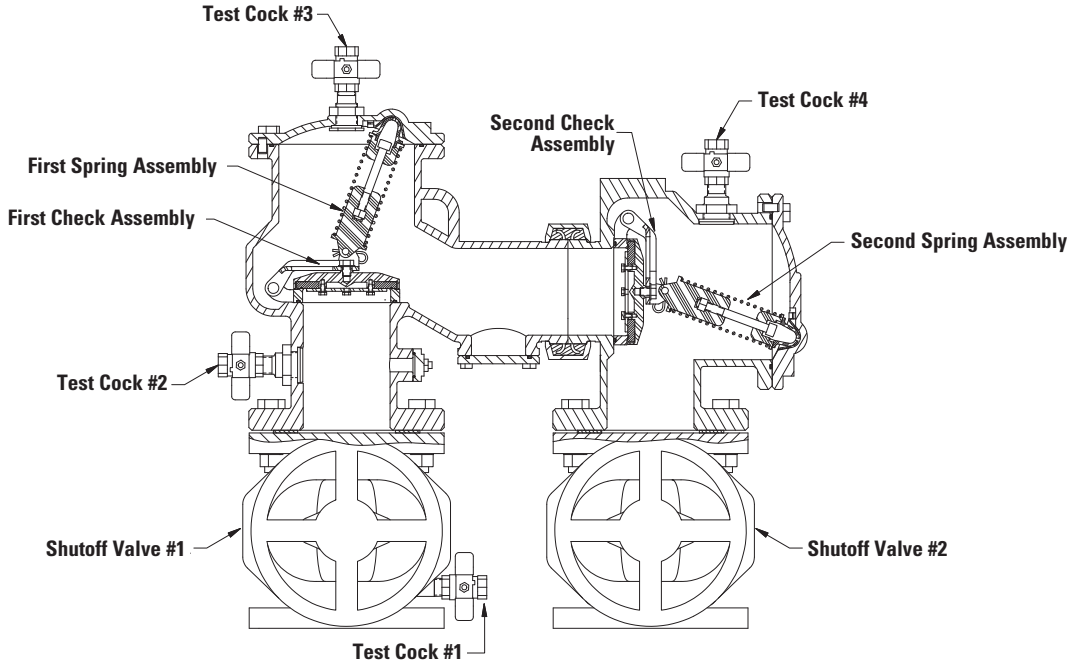
- Approved by the Foundation for Cross-Connection Control and Hydraulic Research at The University of Southern California [FCCCHR-USC]
- ASSE 1015 Listed
- **UL Classified [US & Canada]
- **FM Approved
- IAPMO
- AWWA Standard C510 Compliant
- End Connections: Compliant to ASME B16.1 Class 125 & AWWA Class D Flange

**Assembly configured with UL/FM Approved OS&Y RW Gate Valves. Less gate valve assemblies are not UL/FM approved configurations.

1015

Pressure - Temperature

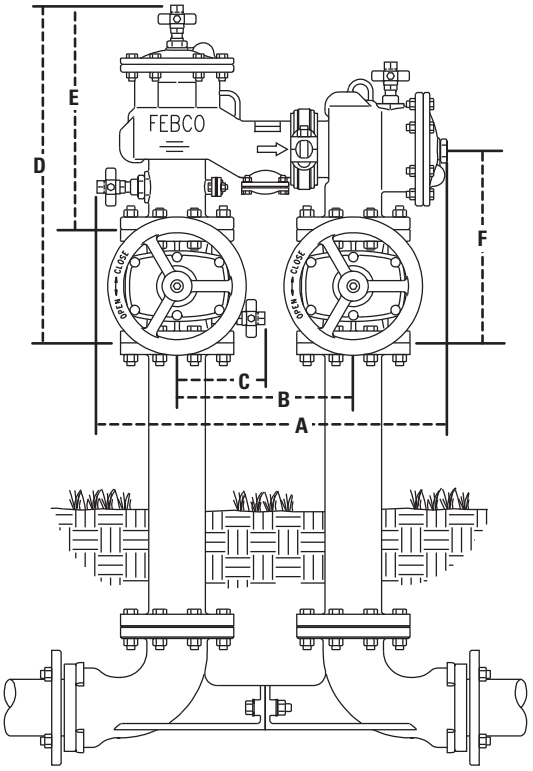
Max. Working Pressure:	175 psi (12.1 bar)
Min. Working Pressure:	10 psi (0.7 bar)
Hydrostatic Test Pressure:	350 psi (24.1 bar)
Hydrostatic Safety Pressure:	700 psi (48.3 bar)
Temperature Range:	33°F - 140°F (0.5°C- 60°C) Continuous



Dimensions – Weights

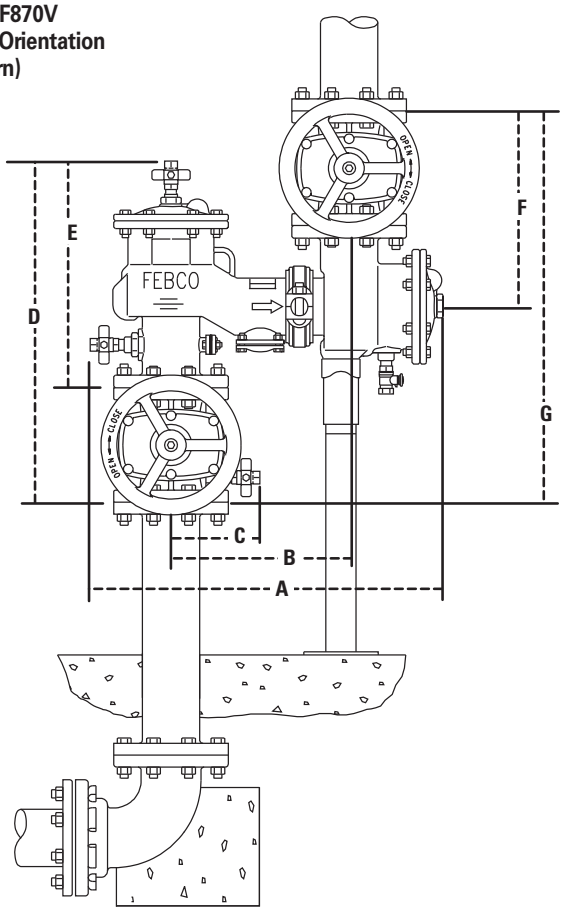
Below are the nominal dimensions and physical weights for the Model LF870V size 2½" through 8". Allowances must be made for normal manufacturing tolerances. Please visit our website to download a copy of this product's installation instructions, or contact your local FEBCO Representative for more information.

Model LF870V
Standard Orientation
(N-Pattern)

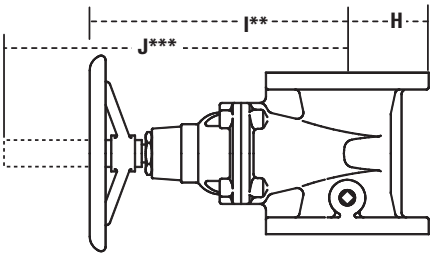


Note: The Model LF870V is shipped in the standard (N-Pattern) orientation as shown above.

Model LF870V
Vertical Orientation
(Z-Pattern)



Gate Valve Side View Clearance



LF870V

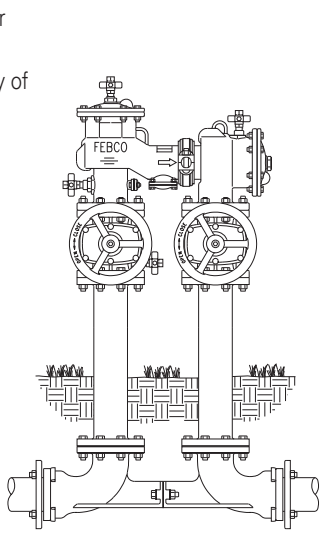
SIZE (DN)		DIMENSIONS																				WEIGHT****			
		A		B		C		D		E		F		G		H		I**		J***		NRS		OSY	
in.	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*lbs.*	*kg.*	*lbs.*	*kg.*
2½	65	25¾	654	12½	318	6¼	159	24¼	616	16⅝	422	13⅝	346	27¼	692	3½	89	12⅝	321	16⅜	416	197	89	201	91
3	80	25¾	654	12½	318	6¼	159	24¼	629	16⅝	422	14⅛	359	28¼	718	3¾	95	12⅞	327	22¼	565	223	101	227	103
4	100	27⅞	708	14	356	7	178	26¾	680	17¾	451	15½	394	31	787	4½	114	14⅜	365	23¼	591	320	145	332	151
6	150	32¼	819	16	406	8	203	32¼	819	21⅝	548	18⅝	473	37¼	946	5½	140	18⅞	479	30⅛	765	492	223	512	232
8	200	37½	953	18½	470	9¼	235	36⅜	324	24⅞	632	20¾	527	41½	1054	6¾	172	23½	597	37¾	959	782	355	810	367

Notes:
** Indicates nominal dimensions with NRS Gate Valves
*** Indicates nominal dimensions with OSY Gate Valves (Full Open Position)
**** Indicates weight of complete Backflow Assemblies with specified Gate Valves

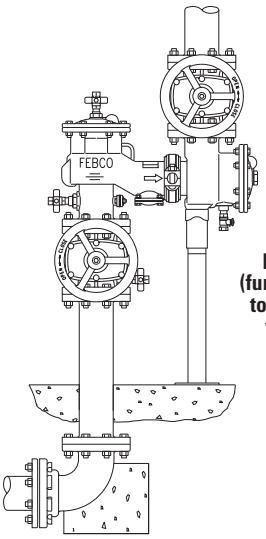
Performance

Flow capacity chart identifies valve performance based upon rated water Velocity up to 20fps

- Maximum service flow rate is determined by maximum rated Velocity of 7.5fps.
- AWWA Manual M-22 (Appendix C) recommends that the maximum water Velocity in the services be not more than 10fps.
- UL flow rate is determined by typically rated Velocity of 15 feet/sec.



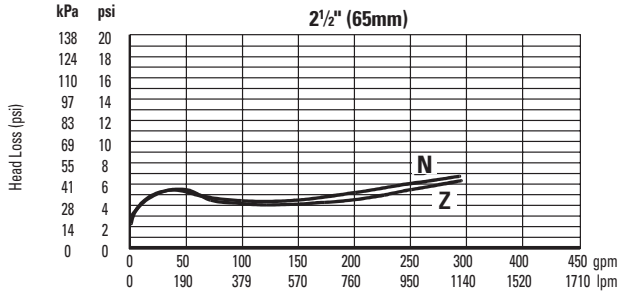
Standard orientation (N Pattern)
Flow Curve N

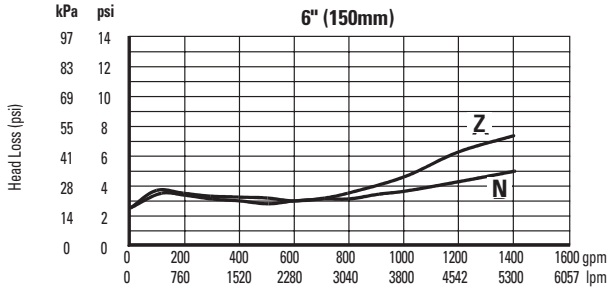


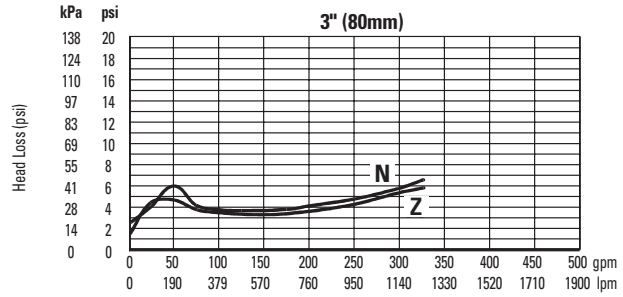
Vertical orientation (Z Pattern)
Flow Curve Z

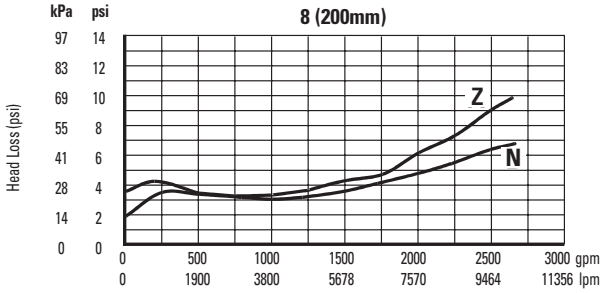
Pipe Support (furnished by customer) for valve weight only.

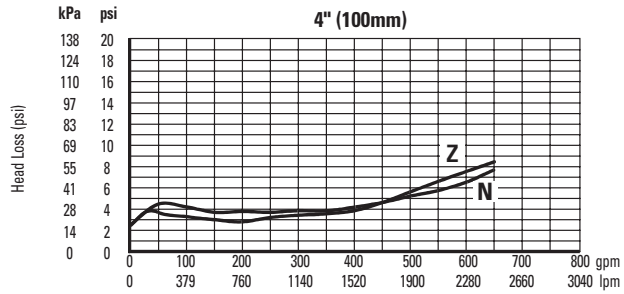
Capacity









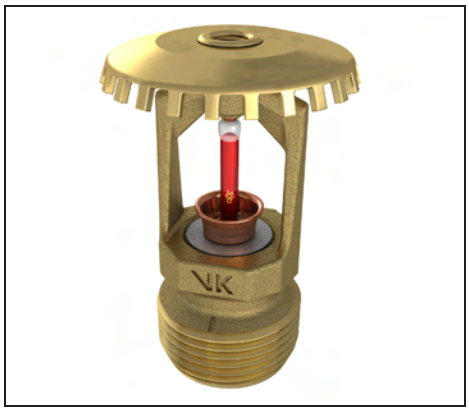


The 6" curves (N-standard orientation) include the FEBCO valve setter Series 611.

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

1. DESCRIPTION



The Viking Microfast® Quick Response Upright Sprinkler VK350 is a small, thermosensitive, glass-bulb spray sprinkler 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 Charts. (Note: **FM Global approves the ENT coating as corrosion resistant.** FM Global has no approval classification for PTFE and Polyester coatings as corrosion resistant.)

2. LISTINGS AND APPROVALS

cULus Listed: Category VNIV

FM Approved: Class Series 2000

VdS Approved: Certificates G414017 and G414018

LPCB Approved

CE Certified: Standard EN 12259-1, EC-certificate of conformity 0832-CPD-2001 and 0786-CPD-40278

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).

Viking Technical Data may be found on The Viking Corporation’s Web site at http://www.vikinggroupinc.com. The Web site may include a more recent edition of this Technical Data Page.

Material Standards:

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 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 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 Black PTFE = N, 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

Available Finishes And Temperature Ratings: Refer to Table 1.

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

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

Sprinkler Cabinets:

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

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, Black PTFE, and ENT

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

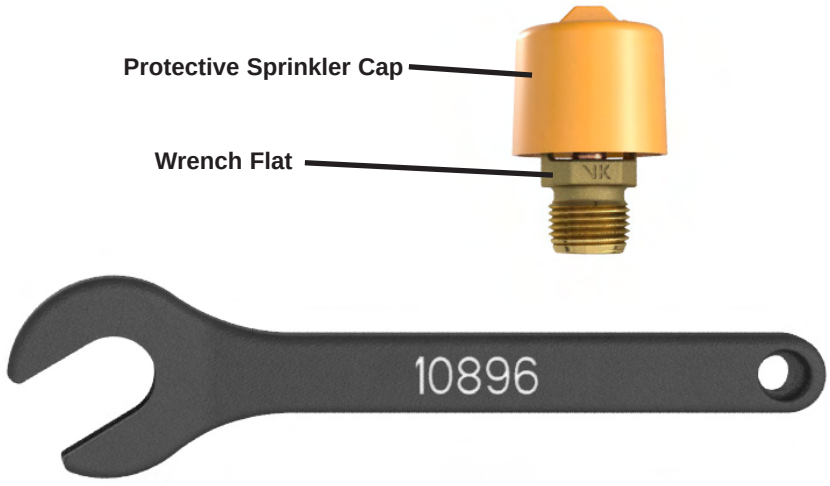


Figure 1:
Standard Sprinkler Wrench 10896W/B

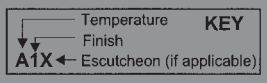
TECHNICAL DATA

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

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
18257	VK350	3/4"	--	8.0	115.2	2-5/16	59	A1, B2	A1	A1	B1[7]
18278	VK350	--	20 mm	8.0	115.2	2-5/16	59	A1, B2	A1	A1	B1[7]
18259[9]	VK350	1/2"	15 mm	8.0	115.2	2-5/16	59	A1, B2	A1	--	B1[8]
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]
14817	VK350	--	20 mm	8.0	115.2	2-5/16	59	A1, B2	A1	A1	B1[7]
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)

Approved Finishes

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

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 conformity 0832-CPD-2001 and 0832-CPD-2003.
[8] CE Certified, Standard EN 12259-1, 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.

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.

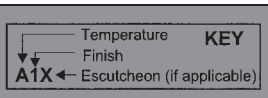
IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. Also refer to page QR1-3 for general care, installation, and maintenance information. Viking sprinklers are to be installed in accordance with the latest edition of Viking technical data, the appropriate standards of NFPA, LPCB, APSAD, VdS or other similar organizations, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable.

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

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 resistant.

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 page QR1-3 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.

TECHNICAL DATA

MICROFAST® AND MicrofastHP® QUICK RESPONSE PENDENT 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 Microfast® and MicrofastHP® Quick Response Pendent Sprinklers are small, thermosensitive, glass-bulb spray sprinklers available in several different finishes and 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 Charts. (Note: **FM Global approves ENT finish as corrosion resistant.** FM Global has no approval classification for PTFE and Polyester coatings as corrosion resistant.)

PN 12979 **PN 06666B**

2. LISTINGS AND APPROVALS

cULus Listed: Category VNIV
FM Approved: Classes 2001, 2002, 2015, and 2017
NYC Approved: Calendar Number 219-76-SA and MEA 89-92-E, Volume 16
ABS Certified: Certificate 04-HS407984C-PDA
VdS Approved: Certificates G4040095, G4040097, G4060056, G4060057, G4880045, G4930038, and G4980021
LPC Approved: Ref. Nos. 096e/03 and 096e/04
CE Certified: Standard EN 12259-1, EC-certificates of conformity 0786-CPD-40130, 0786-CPD-40170 and 0786-CPD-40279, 0832-CPD-2001, and 0832-CPD-2003
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 page 41d for cULus Listing requirements and refer to Approval Chart 2 and Design Criteria on page 41f for FM Approval requirements that must be followed.

3. TECHNICAL DATA

Specifications:
Available since 1987.
Minimum Operating Pressure: 7 psi (0.5 bar)*
Maximum Working Pressure: Sprinklers 12282 and 12290 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 12979 and 12282. Brass UNS-C84400 for all other sprinklers.
Deflector: Phosphor Bronze UNS-C51000 or Copper UNS-C19500 for Sprinklers 12979, 06666B, and 06765B. Copper UNS-C19500 for Sprinkler 12282. Phosphor Bronze UNS-C51000, Copper UNS-C19500 or Brass UNS-C26000 for Sprinkler 06720B. Brass UNS-C26000 for all other Sprinklers.
Bushing (for Sprinklers 06718B, 06720B, and 12290): Brass UNS-C36000
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 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 coated.

Replaces page 41a-f, dated June 28, 2013.
(Changed 06932B to VK3311.)

TECHNICAL DATA

MICROFAST® AND MicrofastHP® QUICK RESPONSE PENDENT 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

Ordering Information: (Also refer to the current Viking price list.)
Order Microfast® and MicrofastHP® 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, Black PTFE = N, 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 VK302 with a 1/2" thread, 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 "Sprinkler Accessories" section of the Viking data book.)

Sprinkler Wrenches:

A. Standard Wrench: Part No. 10896W/B (available since 2000).
B. Wrench for Recessed Pendent Sprinklers: Part No. 16036W/B* (available since 2011)
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® and MicrofastHP® Quick Response Pendent 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.

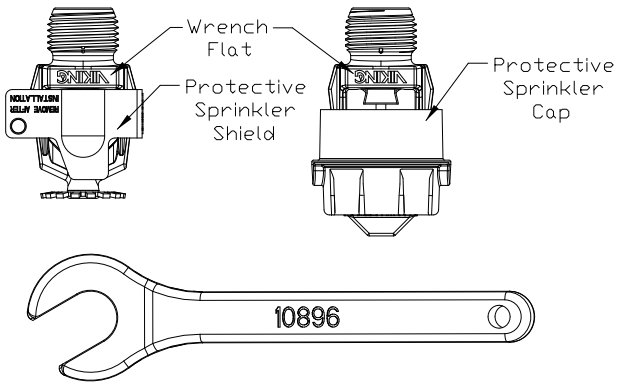


Figure 1: Standard Sprinkler Wrench 10896W/B

MICROFAST® AND MicrofastHP® QUICK RESPONSE PENDENT 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
High	286 °F (141 °C)	225 °F (107 °C)	Blue

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

Corrosion-Resistant Coatings[3]: White Polyester, Black Polyester, and Black PTFE. 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, PTFE, and ENT coatings. For ENT coated automatic sprinklers, the waterway is coated.

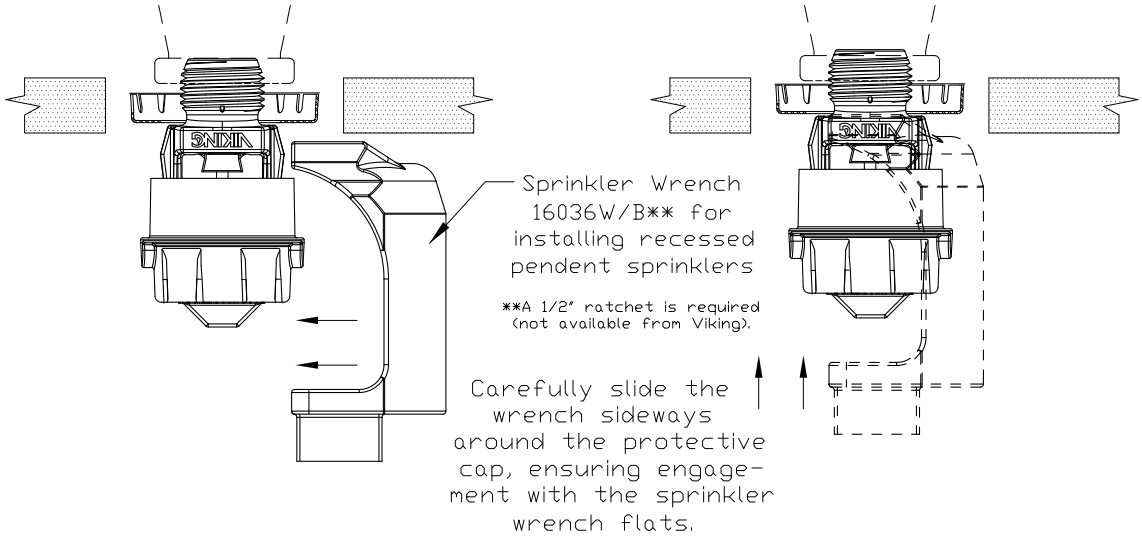


Figure 2: Wrench 16036W/B for Recessed Pendent Sprinklers

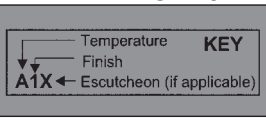
TECHNICAL DATA

MICROFAST® AND MicrofastHP® QUICK RESPONSE PENDENT 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)

Microfast® and MicrofastHP® Quick Response Pendent Sprinklers
Maximum 175 PSI (12 bar) WWP



Sprinkler Base Part No.[1]	SIN	Thread Size		Nominal K-Factor		Overall Length		Listings and Approvals[3] (Refer also to Design Criteria on page 41e.)					
		NPT	BSP	U.S.	metric[2]	Inches	mm	cULus[4]	NYC[5]	VdS	LPCB	CE	
Standard Orifice													
12979	VK302	1/2”	15 mm	5.6	80.6	2-1/4”	57	A1X, B1Y, C4, E4Z	A1X, B1Y	--	--	--	--
18021	VK302	1/2”	15 mm	5.6	80.6	2-1/4”	58	A1X, B1Y	A1X, B1Y	A2	A2X, B2Y	C2X, E2Y[11]	C2X, E2Y[14]
Large Orifice													
06666B	VK352	3/4”	20 mm	8.0	115.2	2-3/8”	60	A1X, B1Y, C4, E4Z	A1X, B1Y	A2	A2X	C2[11]	--
06765B[15]	VK352	1/2”	15 mm	8.0	115.2	2-3/8”	60	A1X, B1Y, C4, E4Z	A1X, B1Y	A2	--	A2[12]	--
Small Orifice[8]													
06718B[9]	VK329	1/2”	15 mm	2.8	40.3	2-3/16”	56	A1X, B1Y	A1X, B1Y	--	--	--	--
06720B[9]	VK331	1/2”	15 mm	4.2	57	2-1/4”	58	A1X, B1Y	A1X, B1Y	--	--	--	--
06932B	VK3311	--	10 mm	4.2	57	2-3/8”	60	--	--	A2	--	G3[13]	--
Maximum 250 PSI (17 bar) WWP Standard Orifice													
Sprinkler Base Part No[1]	**SIN**	**Thread Size**		**Nominal K-Factor**		**Overall Length**		**Listings and Approvals[3] (Refer also to Design Criteria on page 41e.)**					
		NPT	**BSP**	**U.S.**	**metric[2]**	**Inches**	**mm**	**cULus[4]**	**NYC[10]**	**VdS**	**LPCB**	CE	
12282	VK317	1/2”	15 mm	5.6	80.6	2-1/4”	58	A1X, B1Y	A1X	--	--	--	--
Maximum 250 PSI (17 bar) WWP Small Orifice[9]													
12290[10]	VK342	1/2”	15 mm	2.8	40.3	2-3/16”	56	A1X, B1Y	A1X	--	--	--	--

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

Approved Finishes

1 - Brass, Chrome, White Polyester[6,7], Black Polyester[6,7], and Black PTFE[6]
2 - Brass, Chrome, White Polyester[7], and Black Polyester[7]
3 - Brass and Chrome
4 - ENT[6]

Approved Escutcheons

X - Standard surface-mounted escutcheon or the Viking Microfast® Model F-1 Adjustable 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 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] Accepted for use, City of New York Board of Standards and Appeals, Calendar Number 219-76-SA.
[6] cULus Listed as corrosion resistant.
[7] Other colors are available on request with the same Listings and Approvals as the standard colors.
[8] 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.
[9] The sprinkler orifice is bushed.
[10] Accepted for use, City of New York Department of Buildings, MEA Number 89-92-E, Vol. 16.
[11] CE Certified, Standard EN 12259-1, EC-certificates of conformity 0832-CPD-2001 and 0832-CPD-2003.
[12] CE Certified, Standard EN 12259-1, EC-certificate of conformity 0786-CPD-40279.
[13] CE Certified, Standard EN 12259-1, EC-certificate of conformity 0786-CPD-40130 and 0786-CPD-40170.
[14] MED Certified, Standard EN 12259-1, EC-certificates of conformity 0832-MED-1003 and 0832-MED-1008.
[15] The 1/2” NPT Large Orifice Sprinkler is Listed and Approved for retrofit only.

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DESIGN CRITERIA - UL

(Also refer to Approval Chart 1 on page 41d)

cULus Listing Requirements:

Microfast® and MicrofastHP® Quick Response Pendent Sprinklers are 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 Hazard occupancies *(exception: small orifice sprinklers are limited to Light Hazard where allowed by the installation standards being applied, with hydraulically calculated wet systems only).*
- 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 QR1-3 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.

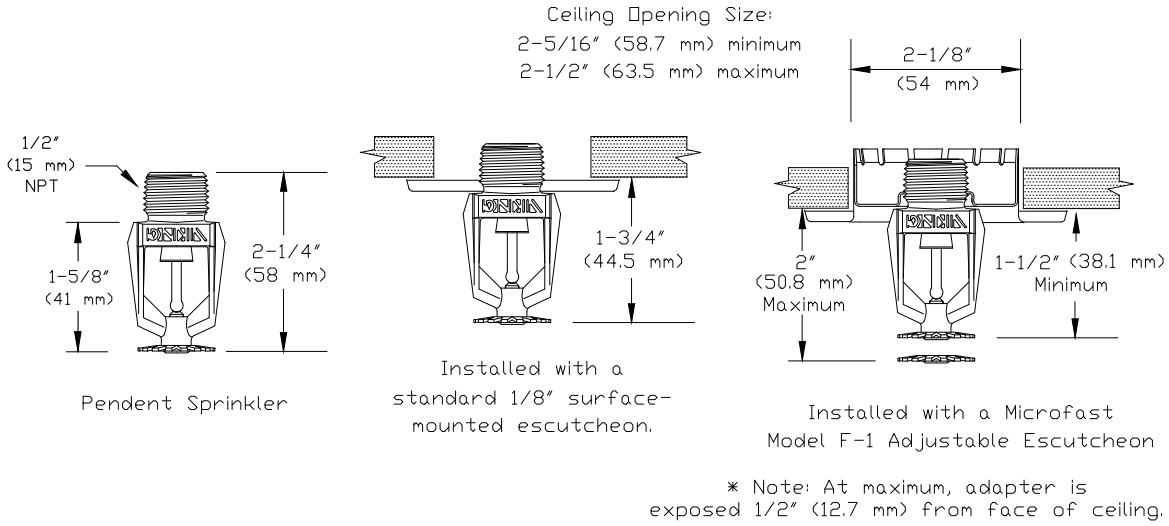

Figure 3: Sprinkler VK302 Dimensions with a Standard Escutcheon and the Model F-1 Adjustable Escutcheon

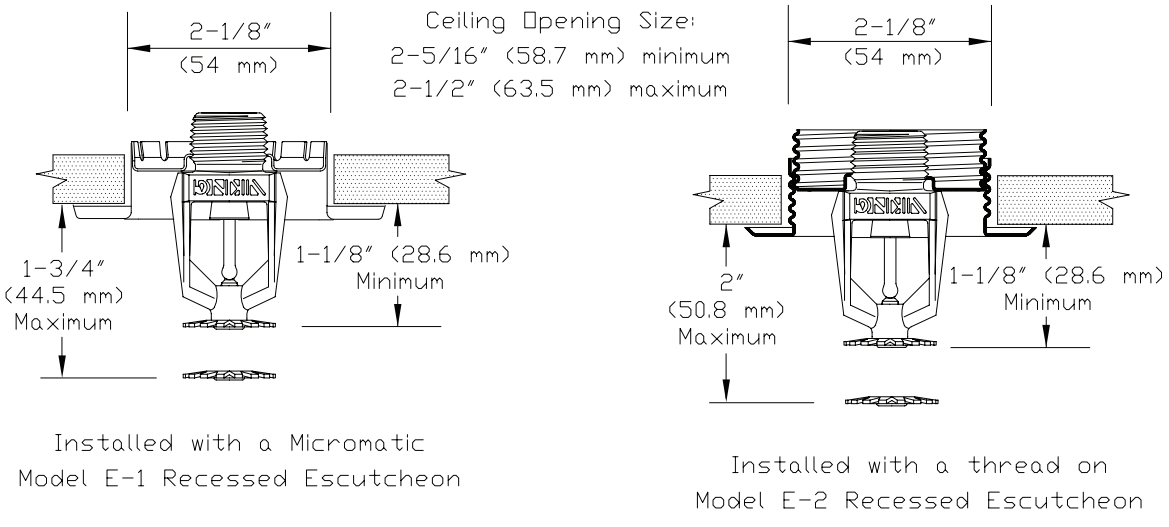

Figure 4: Sprinkler VK302 Dimensions with the Model E-1 and E-2 Recessed Escutcheons

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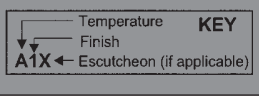
Approval Chart 2 (FM)

Microfast® Quick Response Pendent Sprinklers
Maximum 175 PSI (12 bar) WWP



Sprinkler Base Part No.[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								
12979	VK302	1/2”	15 mm	5.6	80.6	2-1/4”	57	A2X, B2Y, C3, D3Z
18021	VK302	1/2”	15 mm	5.6	80.6	2-1/4”	58	A2X, B2Y
Large Orifice								
06666B	VK352	3/4”	20 mm	8.0	115.2	2-3/8”	60	A2X, B2Y, C3, D3Z
06765B[7]	VK352	1/2”	15 mm	8.0	115.2	2-3/8”	60	A2X, B2Y, C3, D3Z
Small Orifice[4]								
06718B[6]	VK329	1/2”	15 mm	2.8	40.3	2-3/16”	56	A1X

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)

Approved Finishes

1 - Brass and Chrome
2 - Brass, Chrome, White Polyester[5], and Black Polyester[5]
3 - ENT[8]

Approved Escutcheons

X - Standard surface-mounted escutcheon or the Viking Microfast® Model F-1 Adjustable 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 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] FM Approved as quick response control mode standard spray **Non-storage** sprinklers. For specific application and installation requirements, reference the latest applicable FM Loss Prevention Data Sheets (including Data Sheet 2-0).

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

[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 quick response **Non-storage** standard spray 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 Sheets 2-0 and 8-9). 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.

†Sprinklers VK302 and VK352 are also FM Approved as quick response **Rack Storage** standard spray pendent sprinklers. Refer to technical data page 131a-e for Intermediate Level In-Rack Sprinklers.

IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. Also refer to page QR1-3 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.