Deluge Foam/Water Monitor Nozzle System

Supplied by Bladder Tank

USP Concentrate with Ratio Controller or Wide Range Proportioner

Technical Data Sheet Submittal Package

for the

Viking SFFF USP & ARK Concentrates

TECHNICAL DATA

DELUGE FOAM/WATER SYSTEM SUPPLIED BY BLADDER TANK

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

A Deluge Foam/Water System Supplied by Bladder Tank is a standard deluge system capable of discharging a foam/water solution automatically through open sprinklers, spray nozzles, monitor nozzles, and other discharge devices. This system consists of a standard Viking deluge valve with standard trim, detection and releasing devices as well as a wide range proportioner, a concentrate control valve (CCV), and a bladder tank.

2. LISTINGS AND APPROVALS

No formal approval as a Deluge System. Main component and sub-system approvals below:

- Deluge Valve and Trim
  UL Listed - Guide VLFT
  FM Approved - Automatic Water Control Valves
- Wide Range Proportioner
  FM Approved - Low Expansion Foam Systems
- Model E2, F2, H2 or J2 Halar® Coated Concentrate Control Valve (CCV)
  UL Listed - Guide VLFT
  FM Approved - Automatic Water Control Valve as standard deluge valve. No formal approval available for coating.
- Model VFT Viking Bladder Tank - with ASME Section VIII and/or EN13455 Design Code
  UL Listed - Guide GHXV
  FM Approved - Low Expansion Foam Systems
- Viking ARK (3% AR-SFFF) Foam Concentrate
  FM Approved

3. TECHNICAL DATA

Specifications:

Refer to individual component technical data page.

Material Standards:

Refer to individual component technical data page.

Ordering Information:

Please contact your local Viking office or distributor.

4. INSTALLATION

A. FM Approved Discharge Devices

- Standard Spray Open Sprinklers (refer to water/foam sprinkler data page)

B. General Instructions And Warnings

1. Refer to specific technical data sheets, FM Global Property Loss Prevention Data Sheet 4-12, acceptable installation standards, codes, and Authority Having Jurisdiction for additional installation, operation, and maintenance instructions.
2. Inspections - It is imperative that the system is inspected and tested on a regular basis. See Section 6 - Inspections, Tests, and Maintenance.
3. The valve, trim, and assembly must be installed in an area not subject to freezing temperatures or physical damage.

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C. Design and Installation

The following guidance is given with reference to the general system schematics (Figures) detailed later in this document.

⚠ WARNING

Locate all portions of the foam/water system subject to freezing in a heated area.

⚠ WARNING

Any system maintenance or testing that involves placing a control valve or detection system out of service may eliminate the fire protection of that system. Prior to proceeding, notify all Authorities Having Jurisdiction. Consideration should be given to employment of a fire patrol in the affected area.

NOTICE

Water supply and concentrate piping shall not exceed 65 equivalent feet of pipe. Exceeding this requirement can lead to system failure.

1. Straight piping equal to a minimum of five (5) pipe diameters should be installed upstream and five (5) downstream of the wide range proportioner to help ensure proportioning accuracy.
2. Install the deluge valve and trim (C) in accordance with the relevant Viking technical data page.
3. Install the proportioning device (B) in the system riser in accordance with the wide range proportioner technical data page and Special Notes Section of this document.
4. Install foam solution test valve (16) and system isolation valve (18). These valves are used to conduct foam/water solution tests and are required.
5. Install the CCV (D) and associated trim as indicated or refer to technical data page Form No. F_102321. FM systems require electrical supervision in accordance with FM Global Property Loss Prevention Data Sheet 4-12.
6. Install bladder tank (A) in accordance with the bladder tank operation manual and the following:
   a) Refer to Figure 1 for recommended connections.
   b) Locate the tank as close as practical to the system riser. (See Special Note B on Page 5).
   c) Allow enough room around the tank to perform maintenance on the bladder.
   d) Allow access to the tank for filling from containers of foam concentrate.
   e) All valves and devices should be located for easy access for operation and maintenance.
   f) Install the water supply piping (13) from the riser to the bladder tank as shown in Figure 1.

   NOTE: *To eliminate water hammer effects during system activation, Viking recommends that the bladder tank water supply piping connection for a deluge system should be installed below the deluge valve (C) as shown in Figure 1.*

   g) Install the piping from the tank (A) to the proportioner (B) as straight as possible to limit pressure loss.
   h) Fill bladder tank (A) with foam concentrate in accordance with the bladder tank operation manual and leave isolated from the system.

D. Placing System Into Service & Removing System from Service

1. Placing the System into Service:
   a) Refer to the Special Notes section on page 5.
   b) Verify the following valves are in the closed position: water supply control valve (10), bladder tank water supply control valve (13), foam concentrate shut-off valve (14), foam solution test valve (16) and foam concentrate auxiliary drain valve (12).
   c) Place the deluge valve (C) in service in accordance with the relevant Viking technical data page. The priming line for the CCV (D) is taken directly from the system deluge valve (C) priming line as shown in Figure 1 and in Form No. F_102321. When priming the deluge valve (C), the CCV (D) will also be primed closed. Bleed off any air pressure trapped in the priming line to the CCV (D) by opening the 3-way pressure gauge valve (11). Once air pressure has been relieved, close the 3-way valve and plug outlet. Re-open 3-way valve to maintain pressure on gauge (11). Continue placing the deluge valve in service.
   d) The CCV (D) is closed and set when gauge (11) displays equal pressure to the system supply pressure gauge.

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e) The deluge system's release control system should be in service. To place the bladder tank (A) in service refer to the bladder tank operation manual for the complete start-up procedure.
f) Verify normal valve positions and secure in correct position (see Figure 1).
g) Check for and repair any leaks in the foam/water system pipe network.

2. For System and Riser Piping Service and Maintenance:
   a) Refer to the Special Notes section on page 5.
   b) Close the water supply control valve (10).
   c) Close the bladder tank water supply control valve (13) and foam cocentrate shut-off valve (14).
   d) Leave the foam system isolation valve (18) open.
   e) Refer to instructions for removing the preaction valve (C) from service in the relevant Viking technical data page.
   f) Open the main drain(s) on deluge valve (C).
   g) Perform required service and maintenance on system devices or piping network.
   h) Refer to instructions for returning the deluge valve (C) to service in the relevant Viking technical data page. The CCV (D) will also be primed close as described in Section D.1.C above.
   i) Verify the CCV (D) is closed by checking water pressure gauge (11) to ensure that it is the same as or higher than the system pressure.
   j) Open bladder tank water supply valve (13) and foam cocentrate shut-off valve (14).
   k) Verify normal valve positions and secure in correct position (as detailed in Figure 1).

3. For Total System Service and Maintenance:
   a) Refer to the Special Notes section on page 5.
   b) Close the bladder tank water supply control valve (13) and foam cocentrate shut-off valve (14).
   c) Refer to instructions for removing the bladder tank (A) from service in the bladder tank operation manual.
   d) Leave the foam system isolation valve (18) open.
   e) Refer to instructions for removing the deluge valve (C) from service in the relevant Viking technical data page.
   f) Open the main drain(s) on deluge valve (C).
   g) Perform required service and maintenance on system devices or piping network.
   h) Refer to instructions for removing the bladder tank (A) from service in the bladder tank operation manual.
   i) Perform required service and maintenance on bladder tank (A) in accordance with the bladder tank operation manual.
   j) To return the system into service, follow steps 1b through 1g in Section D above.

4. For Bladder Tank Service and Maintenance - While Leaving System in Service:
   a) Refer to the Special Notes section on page 5.
   b) Close the bladder tank water supply control valve (13) and foam cocentrate shut-off valve (14).
   c) Refer to instructions for removing the bladder tank (A) from service in the bladder tank operation manual.
   d) Perform required service and maintenance on bladder tank (A) in accordance with the bladder tank operation manual.
   e) To place the bladder tank (A) in service refer to the bladder tank operation manual.

NOTICE
In accordance with the bladder tank operation manual, ensure that CCV (D) is closed, bladder tank is vented of air and shut-off valves (14) and (13) are opened slowly.

   f) Verify normal valve positions and secure in correct position (as detailed in Figure 1).

E. Troubleshooting

1. For operating and maintenance instructions pertaining to Viking manufactured products, refer to the appropriate Viking documentation.
2. For operating and maintenance instructions pertaining to foam equipment manufactured for Viking, refer to the appropriate manufacturer's documenation.
3. For operation and maintenance instructions for all other equipment, refer to appropriate manufacturer's documentation.

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F. Emergency Instructions

1. During and after a fire:
   a) Make sure the fire is OUT! Make a complete inspection of all areas covered by this system, including areas not involved in the fire. Place a fire watch in the entire area until the system is back in service.
   b) Close the system water supply control valve (10) and the bladder tank water supply valve (13). Post a person at the valve ready to turn them back on, should the fire rekindle.
   c) Open the flow test valve, system drain valve and all auxillary drain valves. Close drain valves once the system has completely drained.
   d) Replace any fused sprinklers in the pilot line (if so equipped), with the same type and temperature rating as were removed. Check all releases and/or detectors in the fire area for damage.
   e) Isolate the bladder tank (A) by closing the foam cocentrate shut-off valve (14), and verify that the bladder tank water supply control valve (13) is closed.
   f) Check the level of foam concentrate and refill the foam concentrate bladder tank (A) in accordance with the bladder tank operation manual. Always replace the foam concentrate with the same brand and type as that being used currently.
   NOTE: *Never intermix different types or brands of foam concentrate, as this could cause them to gel or solidify, and render the concentrate useless.*
   g) Return the complete system to service by following the procedure listed in Section 4-D, Steps 1a through 1g.
   h) Perform quarterly test.
   i) Fire can damage piping and supports, so call your Viking representative for assistance in obtaining a complete inspection and additional replacement sprinklers. For additional details, see technical data sheets for specific device.
   NOTE: *If replacement foam concentrate is not immediately available, the deluge portion of the system can remain in service independent of the foam portion if desired.*

2. For emergency shut down of the complete system:
   a) Close main water supply valve (10).
   b) Close foam cocentrate shut-off valve (14) to eliminate the flowing of the foam concentrate to the CCV (D) and the wide range proportioner (B).
   c) Close bladder tank water supply control valve (13) to reduce the pressure on the bladder tank (A).
   d) Open main drain.
   e) Completely drain system.
   f) Repair the damaged portion of the discharge system, or perform emergency maintenance as required.
   g) Return the riser and foam system to service by following the procedure listed in Section 4-D, Steps 1a through 1g.

3. If the foam concentrate pipe system is damaged:
   a) Close the foam cocentrate shut-off valve (14) to eliminate the flowing of the foam concentrate to the CCV (D) and the wide range proportioner (B).
   b) Close the bladder tank water supply control valve (13) to reduce the pressure on the bladder tank (A).
   c) Verify that the CCV (D) is closed by observing water pressure gauge (11). If the water pressure gauge reads the same or higher than the system water pressure gauge located on the deluge valve (C), the CCV (D) is closed.
   d) Repair the damaged portion of the foam concentrate piping system.
   e) Return the foam concentrate system to service, by following the procedure as described above in Section 4.D, Steps 4a through 4f.
   NOTE: *If there are no damaged sections of the distribution system, the deluge portion of the sprinkler system may be kept in service for protection, while repairs to the foam concentrate system are performed.*

5. OPERATION

Actuation of the release line (pneumatic, hydraulic or electric) relieves the pressure in the priming chamber of both the Viking deluge valve (C) and the CCV (D). This allows the clapper to open on both valves (C) and (D) If fitted, the priming line pressure switch (19) will signal the CCV's activation. The system piping is filled with water, activating connected alarms and pressurizing the bladder tank (A) by the water supply piping. System water pressure in the space between the flexible bladder and the inside surface of the steel tank causes the bladder to collapse, forcing the foam concentrate out through the foam discharge piping, CCV (D), and the proportioner (B). The foam concentrate is proportioned with the main water supply sending foam solution to the sprinklers.

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6. INSPECTION, TESTS, AND MAINTENANCE

⚠ WARNING

Any system maintenance or testing that involves placing a control valve or detection system out of service may eliminate the fire protection of that system. Prior to proceeding, notify all Authorities Having Jurisdiction. Consideration should be given to employment of a fire patrol in the affected area.

NOTICE

The owner is responsible for maintaining the fire protection system and devices in proper operating condition. For minimum maintenance and inspection requirements, refer to recognized standards such as those produced by NFPA, FM Global Property Loss Prevention Data Sheet 4-12, LPC and VdS, which describe care and maintenance of sprinkler systems. In addition, the Authority Having Jurisdiction may have additional maintenance, testing, and inspection requirements that must be followed.

It is imperative that the system be inspected and tested on a regular basis. The following recommendations are minimum requirements. The frequency of the inspections may vary due to contaminated or corrosive water supplies and corrosive atmospheres. In addition, the alarm devices or other connected equipment may require more frequent inspections. Refer to the technical data, system description, applicable codes and Authority Having Jurisdiction for minimum requirements. Prior to testing the equipment, notify appropriate personnel.

7. AVAILABILITY

The Deluge Foam/Water System Supplied by Bladder Tank is available through a network of domestic and international distributors. See the Viking web site for closest distributor or contact Viking.

8. GUARANTEE

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

SPECIAL NOTES

⚠ WARNING

If the outlet to the foam solution test valve is located closer than 5 pipe diameters, there may be turbulence at high flow rates.

A. Provide a minimum of 5 pipe diameters of straight pipe on the inlet and outlet of the ratio controller (B) to minimize turbulence inside the wide range proportioner.

B. The combined total equivalent length of pipe, fittings and valves in both the water supply inlet piping and the foam concentrate discharge piping, must not exceed 65 equivalent feet (19.8 meters). This will allow both pipes to be the same size as the foam liquid inlet to the ratio controller.

C. The CCV (D) and swing check valve (15) must be connected adjacent to the wide range proportioner using pipe nipples as short as possible.

D. Figures 1 is a general schematic of the required piping arrangement. Refer to the appropriate technical data page for specific information regarding the valve, tank, and related trim and devices.

E. The technical information, statements, and recommendations contained in this manual are based on information and tests that, to the best of our knowledge, we believe to be dependable. It represents general guidelines only, and the accuracy or completeness thereof, are not guaranteed since conditions of handling and usage are outside our control. The purchaser should determine the suitability of the product for its intended use and assumes all risks and liability whatsoever in connection therewith.

F. The CCV (D) does not require any trim, except for a ½" priming line and water pressure gauge and 3-way valve (11) from the main deluge valve (C) to the priming chamber of valve (D). Plug all the remaining valve trim outlets. Connect the CCV (D) priming line to deluge valve (C) as shown on Figure 1. Refer to the Valves section of the website to find the correct trim kit part number for the corresponding size of CCV (D) required.

G. A strainer is not required in the foam concentrate discharge piping of bladder tank systems per NFPA Standards.

H. FM Global Property Loss Prevention Data Sheet 4-12 requires that the activation of the CCV must be supervised.

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A. Foam Concentrate Bladder Tank

1. Water Vent Valve – NORMALLY CLOSED
2. Safety Thermal Relief Valve
3. Foam Concentrate Vent Valve – NORMALLY CLOSED
4. Filling Vent Valve (Optional)
5. Filling Pressure Gauge (Optional)
6. Water filling/drain valve –NORMALLY CLOSED
7. Foam concentrate filling/drain valve – NORMALLY CLOSED
8. Concentrate level sight tube drain valve – NORMALLY CLOSED
9. Concentrate level sight tube

B. Proportioning Device – Wide Range Proportioner

C. Type of System – DELUGE

C.1 Deluge (Each item below sold separately)

- Deluge Valve (Straight through or angle style)
- Conventional Trim (Vertical or Horizontal)
- Release Trim (Electric or Pneumatic)
- Release Device (Solenoid valve or Pneumatic Actuator)

10. Water Supply Control Valve – NORMALLY OPEN

D. Concentrate Control Valve (CCV)
(Hydraulically activated Halar® coated straight through deluge valve)

11. CCV Priming pressure gauge
12. ½" Foam concentrate auxiliary drain valve

Accessory Trim – (Each item below sold separately)

13. Bladder tank water supply control valve – NORMALLY OPEN
14. Foam concentrate shut-off valve – NORMALLY OPEN*
15. Foam concentrate swing check valve
16. Foam solution test valve – NORMALLY CLOSED
17. Foam solution test header
18. Foam system Isolation valve – NORMALLY OPEN
19. Prime line supervision switch

***Full port bronze body with 316 stainless steel trim and ball valve**

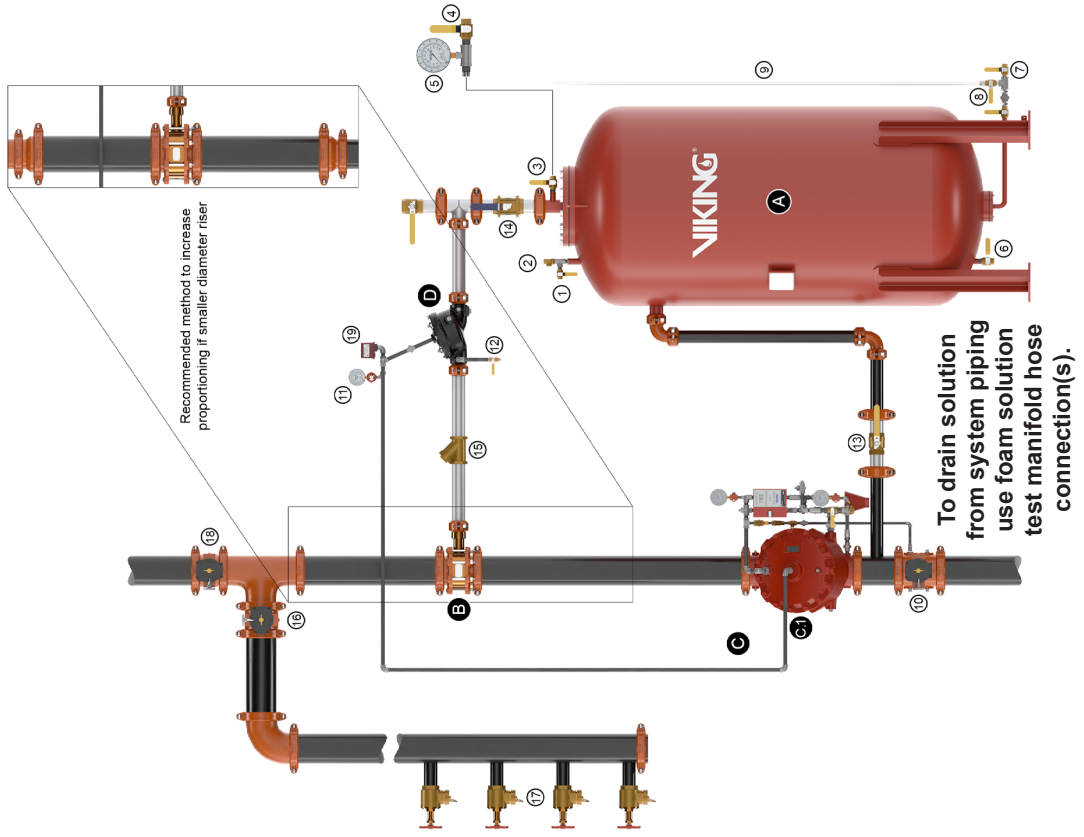

Figure 1

TECHNICAL DATA

DELUGE FOAM/WATER SYSTEM SUPPLIED BY BLADDER TANK

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ORDERING INSTRUCTIONS:

For complete Deluge Foam/Water System Supplied by a Bladder Tank, select 1 each of the following as well as all desired Accessories from the tables below:

- Deluge Valve and Trim
- Release Trim
- Foam Concentrate Control Valve and Trim,
- Foam Concentrate
- Wide Range Proportioner
- Bladder Tank

DESCRIPTION		NOMINAL SIZE	PART NUMBER
Deluge Valves - Angle Style			
Threaded	**Model & Pipe O.D.**		**Painted Red**
	Model E-3 48 mm	1½" / DN40	09889
	Model E-1 60 mm	2" / DN50	05852C
	Model & Pipe O.D.		**Halar® Coated**
	Model E-4 48 mm	1½" / DN40	09890Q/B
	Model E-2 60 mm	2" / DN50	08361Q/B
Flange/ Flange	**Flange Drilling**	**Model E-1**	**Painted Red**
	ANSI	3"	05912C
	ANSI	4"	05909C
	ANSI	6"	05906C
	ANSI/Japan	6"	07136
	PN10/16	DN80	08626
	PN10/16	DN100	08629
	PN10/16	DN150	08631
	Flange Drilling	**Model E-2**	**Halar® Coated**
	ANSI	3"	08362Q/B
	ANSI	4"	08363Q/B
	ANSI	6"	08364Q/B
	PN10/16	DN80	08862Q/B
	PN10/16	DN100	08863Q/B
	PN10/16	DN150	08864Q/B
Flange/ Groove	**Flange Drilling / Pipe O.D.**	**Model E-1**	**Painted Red**
	ANSI / 89 mm	3"	05835C
	ANSI / 114 mm	4"	05839C
	ANSI / 168 mm	6"	05456C
	PN10/16 / 89 mm	DN80	09539
	PN10/16 / 114 mm	DN100	09540
	PN10/16 / 168 mm	DN150	05456C
	Flange Drilling / Pipe O.D.	**Model E-2**	**Halar® Coated**
	ANSI / 89 mm	3"	11064Q/B
	ANSI / 114 mm	4"	11065Q/B
	ANSI / 168 mm	6"	11001Q/B
	PN10/16 / 168 mm	DN150	11001Q/B

DESCRIPTION		NOMINAL SIZE	PART NUMBER
Deluge Valves - Straight Through			
Threaded	**Pipe O.D.**	**Model F-1**	**Painted Red**
	NPT 48 mm	1½"	12126
	NPT 60 mm	2"	12059
	NPT 65 mm	2½"	12401
	BSP 48 mm	DN40	12682
	BSP 60 mm	DN50	12686
	Pipe O.D.	**Model F-2**	**Halar® Coated**
	NPT 65 mm	2½"	12402Q/B

DESCRIPTION		NOMINAL SIZE	PART NUMBER
Deluge Valves - Straight Through			
Flange/ Flange	**Flange Drilling**	**Model F-1**	**Painted Red**
	ANSI	3"	12014
	ANSI	4"	11953
	ANSI	6"	11955
	ANSI	8"	11991
	ANSI/Japan	6"	11964
	PN10/16	DN80	12026
	PN10/16	DN100	11965
	PN10/16	DN150	11956
	PN10	DN200	11995
	PN16	DN200	11999
	Flange Drilling	**Model F-2**	**Halar® Coated**
	ANSI	3"	12015Q/B
	ANSI	4"	11960Q/B
	ANSI	6"	11962Q/B
	ANSI	8"	11992Q/B
	PN10/16	DN80	12027Q/B
	PN10/16	DN100	11966Q/B
	PN10/16	DN150	11963Q/B
	PN10	DN200	11996Q/B
	PN16	DN200	12000Q/B
Flange/ Groove	**Flange Drilling / Pipe O.D.**	**Model F-1**	**Painted Red**
	ANSI / 89 mm	3"	12018
	ANSI / 114 mm	4"	11952
	ANSI / 168 mm	6"	11954
	PN10/16 / 89 mm	DN80	12030
	PN10/16 / 114 mm	DN100	11958
	PN10/16 / 165 mm	DN150	12640
	PN10/16 / 168 mm	DN150	11954
	Flange Drilling / Pipe O.D.	**Model F-2**	**Halar® Coated**
	ANSI / 89 mm	3"	12019Q/B
	ANSI / 114 mm	4"	11959Q/B
	ANSI / 168 mm	6"	11961Q/B
	PN10/16 / 89 mm	DN80	12644Q/B
	PN10/16 / 114 mm	DN100	12645Q/B
	PN10/16 / 165 mm	DN150	12641Q/B
	PN10/16 / 168 mm	DN150	11961Q/B
Groove/ Groove	**Pipe O.D.**	**Model F-1**	**Painted Red**
	48 mm	1½" / DN40	12125
	60 mm	2" / DN50	12057
	73 mm	2½" / DN65	12403
	76 mm	DN80	12729
	89 mm	3" / DN80	12022
	114 mm	4" / DN100	11513
	165 mm	DN150	11910
	168 mm	6" / DN150	11524
	219 mm	8" / DN200	11018
	Pipe O.D.	**Model F-2**	**Halar® Coated**
	48 mm	1½" / DN40	12127Q/B
	60 mm	2" / DN50	12058Q/B
	73 mm	2½" / DN65	12404Q/B
	76 mm	DN80	12730Q/B
	89 mm	3" / DN80	12023Q/B
	114 mm	4" / DN100	11514Q/B
	165 mm	DN150	11911Q/B
	168 mm	6" / DN150	11525Q/B
	219 mm	8" / DN200	11118Q/B

Table 1

TECHNICAL DATA

DELUGE FOAM/WATER SYSTEM SUPPLIED BY BLADDER TANK

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DESCRIPTION		NOMINAL SIZE	PART NUMBER	
Deluge Valve Trim				
			Galvanized	**Brass**
Use with Angle Style Valves		1½" / DN40	14629-1	14629-2
		2" / DN50	14630-1	14630-2
		3" / DN80	14631-1	14631-2
		4" / DN100	14632-1	14632-2
		6" / DN150	14633-1	14633-2
Use with Straight Through Valves	Horizontal	1½" / DN40	14635-1	14635-2
		2" / DN50		
		2½" / DN65	14637-1	14637-2
		3" / DN80		
		4" / DN100	14638-1	14638-2
		6" / DN150	14640-1	14640-2
		8" / DN200	14643-1	14643-2
	Vertical	1½" / DN40	14634-1	14634-2
		2" / DN50		
		2½" / DN65	14636-1	14636-2
		3" / DN80		
		4" / DN100	14639-1	14639-2
		6" / DN150	14641-1	14641-2
		8" / DN200	14643-1	14643-2

DESCRIPTION	MATERIAL	PART NUMBER
Release Trim Packages		
Use with Angle or Straight Through Valves	Pneumatic Release	
	Galvanized	10809
	Brass	10811
	Electric Release	
	Galvanized	10830
	Brass	10832

DESCRIPTION	NOMINAL SIZE	PART NUMBER
Trimpac®		
Includes Conventional Trim, Release Trim, and Flexible Hose Kit	Pneumatic Release	
	Galvanized	13788B-2
	Brass	13788B-2B
	Electric Release	
	Galvanized	137887B-1
	Brass	13787B-1B
Drain Packages		
Use with TrimPac (above)	1½" / DN40	11894-1
	2" / DN50	11894-2
	2½" / DN65	11894-3
	3" / DN80	11894-3
	4" / DN100	11894-4
	6" / DN150	11894-4
	8" / DN200	11894-4

DESCRIPTION		NOMINAL SIZE	PART NUMBER
Foam Concentrate Control Valves (Halar® Coated)			
Straight Through			
Groove/ Groove	Pipe O.D.	Model F-2	
	48 mm	1½" / DN40	12127Q/B
	60 mm	2" / DN50	12058Q/B
	73 mm	2½" / DN65	12404Q/B
	76 mm	2½" / DN65	12730Q/B
	89 mm	3" / DN80	12023Q/B

DESCRIPTION	NOMINAL SIZE	PART NUMBER
CCV Trims		
Use with Straight Through Valves	Galvanized	
	1½" / DN40	12848-1
	2" / DN50	12848-1
	2½" / DN65	12929-1
	Brass	
	1½" / DN40	12848-2
	2" / DN50	12848-2
	2½" / DN65	12929-2

DESCRIPTION	PRESSURE RATING	TANK SIZE	DESIGN CODE	PART NUMBER
Vertical Bladder Tank	175psi (12bar)	25 to 4000 US Gallon	EN13445	VFTV****GF
Horizontal Bladder Tank	175psi (12bar)	50 to 5250 US Gallon	EN13445	VFTH****GF
Vertical Bladder Tank	232psi (16bar)	25 to 4000 US Gallon	EN13445	VFTV****GF-16
Horizontal Bladder Tank	232psi (16bar)	50 to 5250 US Gallon	EN13445	VFTH****GF-16
Vertical Bladder Tank	175psi (12bar)	25 to 4000 US Gallon	ASME Sec.VIII Div.1	VFTV****GAF
Horizontal Bladder Tank	175psi (12bar)	50 to 5250 US Gallon	ASME Sec.VIII Div.1	VFTH****GAF
Vertical Bladder Tank	232psi (16bar)	25 to 4000 US Gallon	ASME Sec.VIII Div.1	VFTV****GAF-16
Horizontal Bladder Tank	232psi (16bar)	50 to 5250 US Gallon	ASME Sec.VIII Div.1	VFTH****GAF-16
Where **** is the tank size in US Gallon				
(Example1: VFTV0025F = Model VFT Vertical 25 US Gallon Bladder Tank in accordance with EN13445 design code)				
(Example2: VFTH2000AF = Model VFT Horizonal 2000 US Gallon Bladder Tank in accordance with ASME Sec.VIII Div.1 design code)				

TECHNICAL DATA

DELUGE FOAM/WATER SYSTEM SUPPLIED BY BLADDER TANK

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
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For complete Wet Pipe Low Flow Foam Water System, select alarm valve and trim, Retard Chamber and Circuit Closer Vent Trim, Pilot Operated Pressure Control Valve, Foam Concentrate Control Valve and Trim, Foam Concentrate, Ratio Flow Controller, Bladder Tank and accessories.

Accessories		
DESCRIPTION	NOMINAL SIZE	PART NUMBER
Foam Concentrate Swing Check Valve		
	1½" / DN40	99S-0150
	2" / DN50	99S-0200
	2½" / DN65	05497C
Foam Solution Test Valve		
Grooved Butterfly Valve	2½" / DN65	01G-0250
	3" / DN80	01G-0300
	4" / DN100	01G-0400
	6" / DN150	01G-0600
	8" / DN200	01G-0800
System Isolation Valve		
Grooved Butterfly Valve	2½" / DN65	01G-0250
	3" / DN80	01G-0300
	4" / DN100	01G-0400
	6" / DN150	01G-0600
	8" / DN200	01G-0800
Water Supply Control Valve		
OS & Y	2½" / DN65	8068A-0250
	3" / DN80	8068A-0300
	4" / DN100	8068A-0400
	6" / DN150	8068A-0600
	8" / DN200	8068A-0800
Foam Concentrate Shut-Off Valve		
Ball Valve	1½" / DN40	T595Y66-0150
	2" / DN50	T595Y66-0200
ACCESSORIES FOR FOAM/WATER SPRINKLER SYSTEMS		
Model D-3 PORV	½" / DN15	16970
1/8" / 3 mm Restricted Orifice	½" / DN15	06555A
Soft Seat Check Valve	½" / DN15	03945A
Y Strainer	½" / DN15	01054A
Ball Valve	½" / DN15	10355
Concentrate Control Valve Priming Connection Pkg.		
Required to connect priming chamber		10985
Bladder Tank Water Supply Control Valve		
Ball Valve	1½" / DN40	WBV-0150
Ball Valve	2" / DN50	WBV-0200
OS & Y	2½" / DN65	8068A-0250
OS & Y	3" / DN80	8068A-0300

Wide Range Proportioner			
Connection		Foam Type	Part Number
"Body Grooved"	"Foam Inlet Grooved"		
6" (150mm)	2.5" (76.1mm)	ARK (3% AR-SFFF)	VNR066P
6" (150mm)	2.5" (73.0mm)		VNR063P
8" (200mm)	2.5" (76.1mm)		VNR086P
8" (200mm)	2.5" (73.0mm)		VNR083P

Foam Concentrate			
Foam Type	Part Number		
	US Gallon		
	6.5	55	265
ARK (3% AR-SFFF)	F24175-6.5	F24175-55	F24175-265
Foam Type	Litres		
	25	200	1000
ARK (3% AR-SFFF)	V-SFFFARK/25	V-SFFFARK/200	V-SFFFARK/1000

TECHNICAL DATA

DELUGE VALVE, MODEL F-1 STRAIGHT THROUGH STYLE

2-1/2" (DN65) - 8" (DN200)

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1. DESCRIPTION

The Viking Model F-1 Deluge Valve is a quick opening, differential diaphragm and flood valve with one moving mechanism. The Deluge Valve is used to control water flow in Deluge and Preaction sprinkler systems. The valve is held closed by system water pressure trapped in the priming chamber; keeping the outlet chamber and system piping dry. In fire conditions, when the releasing system operates, pressure is released from the priming chamber. The Deluge Valve clapper opens to allow water to flow into the system piping.

Features:

1. Field replaceable Diaphragm and Seat Rubbers
2. Designed for installation in the horizontal or vertical position
3. Designed to be reset without opening the valve
4. Compatible with Hydraulic, Pneumatic and/or Electric Release Systems

NOTE: FOR PART NUMBERS OF ACCESSORIES, REFER TO VIKING LIST PRICE SCHEDULE.

2. LISTINGS AND APPROVALS:

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

U.L. Listed - Guide No. VLFT & VLJH
C-UL Listed
FM Approved - Deluge Sprinkler Systems, Preaction Sprinkler Systems, Refrigerated Area Sprinkler Systems
American Bureau of Shipping (ABS) - Certificate No. 15-HS1332725-PDA
NYC Department of Buildings - MEA 89-92-E Vol XXXI
CE - Pressure Equipment Directive 97/23/EC

3. TECHNICAL DATA

Specifications:

Maximum Working Water Pressure: 250 PSI (17.4 bar)
Style: Straight through
Connections: See Table 1.
Factory tested: to 500 psi (34.5 bar)
Valve differential: 2:1 (priming chamber to inlet chamber)
Priming chamber supply restriction (required): 0.0625" (1.6 mm)
Color of Valve: Red
Friction loss: Refer to Table 1.
Cv Factor: Refer to Table 1.

Material Standards:

Refer to Figure 2.

Ordering Information:

Part Numbers - Refer to Table 1
8" - Manufactured since 2002
4" & 6" - Manufactured since 2003
2-1/2" & 3" - Manufactured since 2004

ACCESSORIES:

Refer to Current VIKING PRICE LIST for Part Numbers.

1. A Conventional Trim Trim package for use with the Model F-1 Deluge Valve. The trim package includes the VALVE ACCESSORY PACKAGE and the fittings and nipples shown on the Viking Deluge Valve Conventional Trim Chart Trim Chart for the valve used. Trim Charts are provided in trim packages and the Viking website. For optional factory assembled "modular" trim packages, refer to the Viking list price schedule or contact the manufacturer.
2. A Deluge VALVE ACCESSORY PACKAGE includes required trim components. This package is needed when Viking Trim Packages are not used.
3. Auxiliary Components are required for specific valve functions. For complete operating trim requirements, refer to system data for the system used. System data is provided on the Viking website.

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

VIKING®

TECHNICAL DATA

DELUGE VALVE, MODEL F-1 STRAIGHT THROUGH STYLE

2-1/2" (DN65) - 8" (DN200)

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DESCRIPTION	Nominal Size	Part Number	Friction Loss*	Cv Factor	Shipping Weight
Threaded					
Pipe O.D.					
NPT 65 mm	2½"	12401	12 ft. (3.6 m)	155	67 lbs. (30 kg)
Flange/Flange					
Flange Drilling					
ANSI	3"	12014	12 ft. (3.6 m)	155	82 lbs. (37 kg)
ANSI	4"	11953	21 ft. (6.5 m)	428	146 lbs. (66 kg)
ANSI	6"	11955	39 ft. (11.9 m)	839	271 lbs. (123 kg)
ANSI	8"	11991	57 ft. (17.4 m)	1577	466 lbs. (212 kg)
ANSI/Japan	6"	11964	39 ft. (11.9 m)	839	271 lbs. (123 kg)
PN10/16	DN80	12026	12 ft. (3.6 m)	155	82 lbs. (37 kg)
PN10/16	DN100	11965	21 ft. (6.5 m)	428	127 lbs. (58 kg)
PN10/16	DN150	11956	39 ft. (11.9 m)	839	271 lbs. (123 kg)
PN10	DN200	11995	57 ft. (17.4 m)	1577	418 lbs. (190 kg)
PN16	DN200	11999	57 ft. (17.4 m)	1577	466 lbs. (212 kg)
Flange/Groove					
Flange Drilling / Pipe O.D.					
ANSI / 89 mm	3"	12018	12 ft. (3.6 m)	155	75 lbs. (34 kg)
ANSI / 114 mm	4"	11952	21 ft. (6.5 m)	428	136 lbs, (62 kg)
ANSI / 168 mm	6"	11954	39 ft. (11.9 m)	839	261 lbs. (118 kg)
PN10/16 / 89 mm	DN80	12030	12 ft. (3.6 m)	155	75 lbs. (34 kg)
PN10/16 / 114 mm	DN100	11958	21 ft. (6.5 m)	428	136 lbs. (62 kg)
PN10/16 / 165 mm	DN150	12640	39 ft. (11.9 m)	839	261 lbs. (118 kg)
PN10/16 / 168 mm	DN150	11954	39 ft. (11.9 m)	839	261 lbs. (118 kg)
Groove/Groove					
Pipe O.D.					
73 mm	2½" / DN65	12403	12 ft. (3.6 m)	155	67 lbs. (30 kg)
76 mm	DN80	12729	12 ft. (3.6 m)	155	67 lbs. (30 kg)
89 mm	3" / DN80	12022	12 ft. (3.6 m)	155	64 lbs. (29 kg)
114 mm	4" / DN100	11513	21 ft. (6.5 m)	428	127 lbs. (58 kg)
165 mm	DN150	11910	39 ft. (11.9 m)	839	245 lbs. (111 kg)
168 mm	6" / DN150	11524	39 ft. (11.9 m)	839	245 lbs. (111 kg)
219 mm	8" / DN200	11018	57 ft. (17.4 m)	1577	403 lbs. (183 kg)

*Expressed in equivalent length of Schedule 40 pipe based on Hazen & Williams C=120

$$Q = Cv \sqrt{\frac{\Delta P}{S}}$$

Q= Flow
Cv= Flow Factor (GPM/1 PSI ΔP)
ΔP= Pressure Loss through Valve
S= Specific Gravity of Fluid

Table 1 - Valve Part Numbers and Specifications

4. INSTALLATION (Refer to Figure 1 identification of trim components.)

A. General Instruction

1. Viking Straight Through Deluge Valves may be installed in the horizontal or vertical position.
2. The valve must be installed in an area not subject to freezing temperatures or physical damage.
3. The valve must be trimmed according to current Viking Trim Charts and appropriate instructions for the system used. Trim Charts are printed in the *Viking Engineering and Design Data* book, and are provided with trim packages.
   a. Remove all plastic protectors from the openings of the Deluge Valve.
   b. 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 of the nipples or openings of the valve or trim components.
   c. Viking Model F-1 Deluge Valve Conventional Trim Charts are provided with Trim Packages and in the *Viking Engineering and Design Data* book.
   d. Verify that all system components are rated for the water working pressure of the system.

Hydrostatic Test:

The Model F-1 Deluge Valve is manufactured and listed for use at a maximum Water Working Pressure of 250 PSI (17.2 bar). The valve is factory tested at 500 PSI (34.5 bar). Model F-1 Deluge Valves 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 Authority Having Jurisdiction. If air testing is required, do not exceed 60-PSI (4.1 bar) air pressure.

NOTE: NEVER CONDUCT THE HYDROSTATIC TEST AGAINST THE PRESSURE OPERATED RELIEF VALVE. (P.O.R.V.) TEMPORARILY REMOVE THE P.O.R.V. FROM THE TRIM AND PLUG TRIM OPENINGS WHILE CONDUCTING THE HYDROSTATIC TEST.

TRIM NOTE: DISCHARGE PIPING FROM THE AUXILIARY DRAIN VALVE, THE FLOW TEST VALVE, AND ALL SYSTEM DRAINS SHOULD BE KEPT SEPARATE. DO NOT CONNECT THE OUTLET OF THE DRIP CHECK TO ANY OTHER DRAIN.

4. The priming line must be connected upstream of the system water supply main control valve or to a constant source of water at a pressure equal to the system water supply.

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5. After the Deluge Valve is set, operation of the Deluge Valve requires the release of priming water from the priming chamber. This may be by automatic or manual operation of the release system. Viking Deluge Valves are compatible with hydraulic, pneumatic, and electric release systems. For specific Trim arrangements refer to Trim Charts and System Data describing the system being installed. Trim Charts are printed in the *Viking Engineering and Design Data* book, and are provided with trim packages. System Data sheets are printed in the *Viking Engineering and Design Data* book.
   a. Hydraulic Release Systems: See Figures 3-6 for the maximum allowable elevation of hydraulic release piping above the Deluge Valve. If the maximum height of hydraulic release piping exceeds the limit shown in Figures 3-6 for the valve used, use a Pneumatic or Electric Release System.
   b. Pneumatic Release Systems: A Viking Pneumatic Actuator is required between the release system connection provided on deluge valve trim and pneumatic release system piping.
   c. Electric Release Systems: Solenoid Valves, System Control Panels, and Electrical Detectors must be compatible. Consult appropriate listing and/or approval guides.

NOTE: FOR OPERATION AT WATER PRESSURES IN EXCESS OF 175 PSI (12.1 BAR), A 250 PSI (17.2 BAR) RATED SOLENOID VALVE MUST BE USED. REFER TO APPROPRIATE VIKING TECHNICAL DATA PAGE FOR TYPE OF SYSTEM USED.

⚠ CAUTION

Operation of Viking Deluge Valves by pressurizing the priming chamber with air pressure or any other pressurized gas is not recommended or approved.

B. Placing the Valve in Service

For Deluge Valves equipped with Conventional Deluge Valve Trim, follow steps 1 through 10 (and 11 & 12 if applicable) below.

1. Verify:
   a. The system Main Water Supply Control Valve (D.1) is closed and the Deluge Valve is trimmed according to current Viking Trim Charts and schematic drawings for the system used.
   b. The system has been properly drained.
   c. Auxiliary Drain (B.13) is open.
   d. The Emergency Release (B.9) is closed.
   e. The system water supply piping is pressurized up to the closed Main Water Supply Control Valve (D.1) and the priming line is pressurized up to the closed Priming Valve (B.1).
2. For Systems equipped with:
   a. Hydraulic Release Systems:
      i. Verify that all releasing devices are set and that any Inspector's Test Valve and/or auxiliary drain valves are closed.
      ii. Open Priming Valve (B.1).Allow the hydraulic release system to fill. When priming pressure gauge (B.7) indicates that the release piping and priming chamber pressure is equal to system supply pressure, proceed to step 3.
      iii. Proceed to step 3.
   b. Pneumatic Release Systems:
      i. Set the release system.
      ii. Open Priming Valve (B.1).
      iii. Proceed to step 3.
   c. Electric Release Systems:
      i. Open Priming Valve (B.1).
      ii. Set the electric release system.
      iii. Proceed to step 3.
3. Open Flow Test Valve (B.11).
4. Partially open Main Water Supply Control Valve (D.1).
5. When full flow develops from the Flow Test Valve (B.11), close the Flow Test Valve. Verify that there is no flow from the open Auxiliary Drain (B.13).
6. Close Auxiliary Drain (B.13).
7. Fully open and secure the Main Water Supply Control Valve (D.1).
8. Verify that the Alarm Shut-off Valve (B.6) is open and that all other valves are in their normal** operating position.
9. Depress the plunger of Drip Check (B.14). No water should flow from the Drip Check when the plunger is pushed.
10. Check for, and repair all leaks.
11. On new installations, those systems that have been placed out of service, or where new equipment has been installed, trip test the system to verify that all equipment functions properly. Refer to INSPECTION, TESTS AND MAINTENANCE paragraph 6-II-C: ANNUAL Trip Test instructions.

⚠ CAUTION

Performing a trip test results in operation of the Deluge Valve. Water will flow into the sprinkler piping. Take necessary precautions to prevent damage.

TECHNICAL DATA

DELUGE VALVE, MODEL F-1
STRAIGHT THROUGH STYLE
2-1/2" (DN65) - 8" (DN200)

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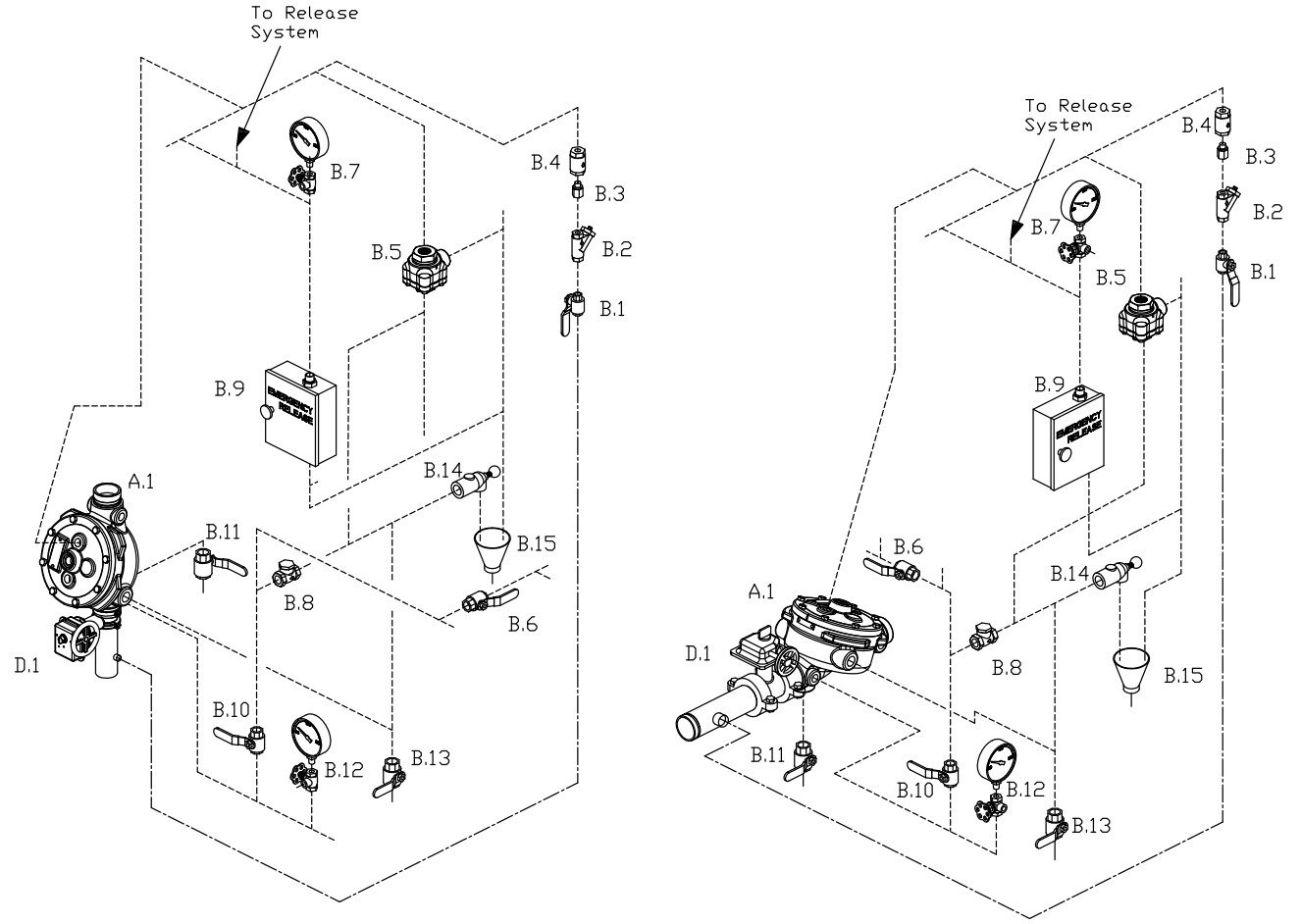

Vertical Valve **Horizontal Valve**

– – – – – Dashed lines indicate nipples and fittings included with trim.
—·—·— Phantom lines indicate piping required, but not included with trim.

Figure 1 - Conventional Trim Components

A.1	Deluge Valve	B.9	Emergency Release
B.1	Priming Valve (Normally Open)	B.10	Alarm Test Valve (Normally Closed)
B.2	Strainer	B.11	Flow Test Valve (Normally Closed)
B.3	1/16" Restricted Orifice	B.12	Water Supply Pressure Water Gauge and Valve
B.4	Spring Loaded Check Valve	B.13	Auxiliary Drain Valve (Normally Closed)
B.5	Pressure Operated Relief Valve (PORV)	B.14	Drip Check Valve
B.6	Alarm Shut Off Valve (Normally Open)	B.15	Drain Cup
B.7	Priming Pressure Water Gauge and Valve	D.1	Water Supply Control Valve
B.8	Drain Check Valve		

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After completing a trip test, perform SEMI-ANNUAL maintenance.

C. Valve Removed From Service

NOTE: WHEN A VALVE HAS BEEN REMOVED FROM SERVICE AND IS SUBJECT TO FREEZING OR WILL BE OUT OF SERVICE FOR AN EXTENDED PERIOD OF TIME, ALL WATER MUST BE REMOVED FROM THE PRIMING CHAMBER, TRIM PIPING, WATER SUPPLY PIPING AND OTHER TRAPPED AREAS.

5. OPERATION (Refer to Figure 2.)

The Viking Model F-1 Deluge Valve has an inlet chamber, an outlet chamber and a priming chamber. The inlet chamber and outlet chamber are separated from the priming chamber by the clapper (5) and diaphragm (6).

In the set condition:

System pressure is supplied to the priming chamber through a restricted priming line (trim) equipped with a check valve. System water supply pressure trapped in the priming chamber holds the clapper (5) on seat (2) due to area differential design. Clapper (5) separates the inlet chamber from the outlet chamber, keeping the outlet chamber and system piping dry.

In fire conditions:

When the release system operates, pressure is released from the priming chamber faster than it is supplied through the restricted priming line. Water supply pressure in the inlet chamber forces the clapper (5) off from seat (2), allowing water to flow through the outlet and into the system and alarm devices.

For Deluge Valves equipped with Conventional Trim:

When the deluge valve operates, the air side of the PORV looses pressure, causing the PORV to operate. When the PORV operates, it continually vents the priming chamber to prevent the deluge valve from resetting even if the open releasing devices close. The deluge valve can only be reset after the system is taken out of service, and the outlet chamber of the deluge valve and associated trim piping is depressurized and drained.

6. INSPECTIONS, TESTS AND MAINTENANCE

I. Inspection

It is imperative that the system is inspected and tested on a regular basis. The frequency of the inspections may vary due to contaminated water supplies, corrosive water supplies or corrosive atmospheres. Also, the alarm devices, detection systems or other connected trim may require a more frequent schedule. 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. The following recommendations are minimum requirements. (For additional information, refer to Viking Trim Charts and System Data describing systems with the release system used.)

A. Weekly:

Weekly visual inspection of the Viking Deluge Valve is recommended.

1. Verify that the Main Water Supply Control Valve (D.1) is open and that all other valves are in their normal** operating position and appropriately secured.
2. Check for signs of mechanical damage, leakage, and/or corrosive activity. If detected, perform maintenance as required. If necessary, replace the device.
3. Verify that the valve and trim are adequately heated and protected from freezing and physical damage.

II. Tests

A. Quarterly Water Flow Alarm Test

1. Notify the Authority Having Jurisdiction and those in the area affected by the test.
2. To test the local electric alarm (if provided) and/or mechanical water motor alarm (if provided), OPEN the alarm test valve (B.10) in the deluge valve trim.
   a. Electric alarm pressure switches (if provided) should activate.
   b. Electric local alarms should be audible.
   c. The local water motor gong should be audible.
   d. If equipped with remote station alarm signaling devices, verify that alarm signals were received.
3. When testing is complete, CLOSE the alarm test valve (B.10).
4. Verify:
   a. All local alarms stop sounding and alarm panels (if provided) reset.
   b. All remote station alarms reset.
   c. Supply piping to water motor alarm properly drains.
5. Verify that the alarm shut-off valve (B.6) is OPEN, and the alarm test valve (B.10) is CLOSED.
6. Verify that the outlet chamber is free of water. No water should flow from the drip check (B.14) when the plunger is pushed.
7. Notify the Authority Having Jurisdiction and those in the affected area that testing is complete.

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B. Quarterly Main Drain Test

1. Notify the Authority Having Jurisdiction and those in the area affected by the test.
2. Record pressure reading from the water supply pressure gauge (B.12).
3. Verify that the outlet chamber of the deluge valve is free of water. No water should flow from the drip check (B.7) when the plunger is pushed.
4. Fully OPEN the flow test valve (B.11).
5. When a full flow is developed from the flow test valve (B.11), record the residual pressure from the water supply pressure gauge (B.12).
6. When the test is complete, SLOWLY CLOSE the flow test valve (B.11).
7. Compare test results with previous flow information. If deterioration of the water supply is detected, take appropriate steps to restore adequate water supply.
8. Verify:
   a. Normal water supply pressure has been restored to the inlet chamber, the priming chamber, and the release system. The pressure on the priming chamber water pressure gauge should equal the system water supply pressure.
   b. All alarm devices, and valves are secured in normal** operating position.
9. Notify the Authority Having Jurisdiction that the test is complete. Record and/or provide notification of test results as required by the Authority Having Jurisdiction.

** For normal operating position, refer to Figure 1 and/or Trim Charts and System Data for the system used.

C. Annual Trip Test:

⚠ CAUTION

Performing this test results in operation of the Deluge Valve. Water will flow into the sprinkler piping and from any open sprinklers and/or nozzles. Take necessary precautions to prevent damage.

1. Notify the Authority Having Jurisdiction and those in the area affected by the test.
2. Fully open the flow test valve (B.11) to flush away any accumulation of foreign material.
3. Close the flow test valve (B.11).
4. Trip the system by operating the release system. Allow a full flow to pass through the deluge valve. Water flow alarms should operate.
5. When test is complete:
   a. Close the main water supply control valve (D.1).
   b. Close the priming valve (B.1).
   c. Open the auxiliary drain valve (B.13).
   d. Open all system main drains and auxiliary drains. Allow the system to drain completely.
6. Perform SEMI-ANNUAL maintenance. Refer to paragraph 6.III.B SEMI-ANNUAL MAINTENANCE.
7. Place the system in service. Refer to Item 4.B, INSTALLATION: PLACING THE VALVE IN SERVICE.

NOTE: DELUGE VALVES SUPPLIED BY BRACKISH WATER, SALT WATER, FOAM, FOAM/WATER SOLUTION, OR ANY OTHER CORROSIVE WATER SUPPLY, SHOULD BE FLUSHED WITH GOOD QUALITY FRESH WATER BEFORE BEING RETURNED TO SERVICE.

8. Notify the Authority Having Jurisdiction that the test is complete. Record and/or provide notification of test results as required by the Authority Having Jurisdiction.

III. Maintenance

NOTICE

The owner is responsible for maintaining the fire protection system and devices in proper operating condition. The Deluge Valve must be kept from freezing conditions and physical damage that could impair its operation.

⚠ 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 Authorities Having Jurisdiction. Consideration should be given to employment of a Fire Patrol in the affected areas.

Where difficulty in performance is experienced, the valve manufacturer or authorized representative shall be contacted if any field adjustment is to be made.

A. After Each Operation:

1. 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.
2. Deluge Valves and trim that have been subjected to brackish water, salt water, foam, foam/water solution, or any other corrosive water supply should be flushed with good quality fresh water before being returned to service.
3. Perform SEMI-ANNUAL maintenance after every operation.

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B. Semi-Annual Maintenance:

1. Remove the system from service. (Refer to Deluge or Preaction System Data that describes systems with the release system used for additional information.)
   a. Close the Main Water Supply Control Valve (D.1) and Priming Valve (B.1).
   b. Open the Auxiliary Drain Valve (B.13).
   c. Relieve pressure in the priming chamber by opening the Emergency Release Valve (B.9).
4. Inspect all trim for signs of corrosion and/or blockage. Clean and/or replace as required.
5. Clean and/or replace all strainer screens (including B.2).
6. Refer to Item 4-B, INSTALLATION: PLACING THE VALVE IN SERVICE.

C. Every Fifth Year

1. Internal inspection of Deluge Valves is recommended every five years unless inspections and tests indicate more frequent internal inspections are required. Refer to DISASSEMBLY instructions provided below.
2. Internal inspection of strainers and restricted orifices is recommended every five years unless inspections and tests indicate more frequent internal inspections are required.
3. Record and provide notification of inspection results as required by the Authority Having Jurisdiction.

D. Valve Disassembly (Refer to Figure 2)

1. Remove the valve from service (see the release system description and Technical Data for additional information). Close the main control valve and open the main drain valve. Release the pressure in the priming chamber by opening the Emergency Release Valve.
2. Remove trim as required to allow removal of cover (4).
3. Remove screws (9).
4. Lift cover (4) from body (1).
5. Remove clapper assembly (No. 3, 5, 6, 7, 9, 10, 11) by lifting it from the body (1).
6. Inspect seat (2). If replacement is necessary, remove screws (12). Remove old seat (2) and o-ring (13). Replace with new seat (2) and o-ring (13). Replace screws (12).
7. To replace the diaphragm rubber (6), remove the circle of screws (10). Remove the clamp ring (3) and remove the diaphragm rubber (6).
8. To replace the seat rubber assembly (7), clapper assembly (3, 5, 6, 7, 9, 10, 11) must be removed from the valve. Remove the circle of screws (12). Seat rubber assembly (7) can be removed.

NOTE: PRIOR TO INSTALLING A NEW CLAPPER RUBBER (6) OR SEAT RUBBER ASSEMBLY (7), MAKE CERTAIN THAT ALL SURFACES ARE CLEAN AND FREE OF FOREIGN MATTER. THE PLATED SEAT (2) MUST BE SMOOTH AND FREE OF NICKS, BURRS OR INDENTATIONS.

E. Valve Reassembly

1. Prior to reassembly, flush the valve of all foreign matter.
2. To reassemble, reverse disassembly procedure.

7. AVAILABILITY

The Viking Model F-1 Deluge 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.

TECHNICAL DATA

DELUGE VALVE, MODEL F-1 STRAIGHT THROUGH STYLE

2-1/2" (DN65) - 8" (DN200)

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.

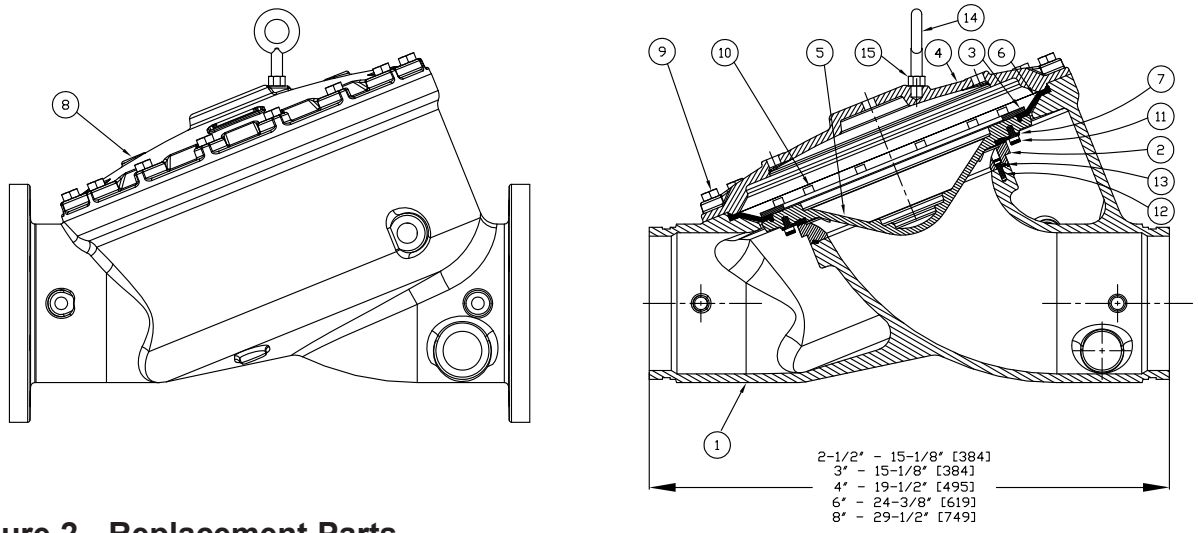


Figure 2 - Replacement Parts

ITEM NO.	PART NUMBER				DESCRIPTION	MATERIAL	NO. REQ'D.			
	2-1/2" (DN65) & 3" (DN80)	4" (DN100)	6" (DN150)	8" (DN200)			2-1/2" (DN65) & 3" (DN80)	4" (DN100)	6" (DN150)	8" (DN200)
1	--	--	--	--	Body	Ductile Iron	1	1	1	1
2	*	*	*	*	Seat	Brass	1	1	1	1
3	02493B	02378B	05704B	10514	Ring Clamp, Upper Diaphragm	Brass Casting	1	1	1	1
4	--	--	--	--	Cover	Ductile Iron 65-45-12	1	1	1	1
5	08846N	08844N	08570N	10518N/B	Clapper	Ductile Iron 65-45-12, PTFE Powder Coated	1	1	1	1
6	12012	11560	11561	10510	Upper Diaphragm	EPDM - ASTM D-2000	1	1	1	1
7	02497B	02382B	02176B	10512	Rubber Seat Assembly	EPDM - ASTM D-2000	1	1	1	1
8	--	--	--	--	Data Plate	Aluminum Etched	1	1	1	1
9	02169A				Screw, H.H.C.[1], 1/2-13 x 1-1/4 (32)	Steel, SAE-Grade 5, ASTM A449	10			
		02200A			Screw, H.H.C[1]., 1/2-13 x 1 1/2 (38)	Steel, SAE-Grade 5, ASTM A307-90		12		
			05707A	05707A	Screw, H.H.C[1]., 5/8-11 x 1 3/4 (44)	Steel, SAE Grade 5, ASTM A307-90			15	16
10	02496A				Screw, R.H.[3]., 10-24 x 3/8 (9.5)	Stainless Steel UNS-S30200	6			
		02383A			Screw, H.H.C[1]., 5/16-18 x 1/2 (13)	Stainless Steel UNS-S30400		8		
			07932		Screw, H.H.C[1]., 3/8-16 x 1/2 (13)	Stainless Steel UNS-S30400			12	
				11022	Screw, S.H.C[2]., 3/8-16 x 3/4 (19.1)	Stainless Steel UNS-S31600				12
11	02494A				Screw, R.H.[3]., 10-24 x 1/2 (12.7)	Stainless Steel UNS-S30200	6			
		02383A			Screw, H.H.C[1]., 5/16-18 x 1/2 (13)	Stainless Steel UNS-S30400		6		
			02454A		Screw, H.H.C[1]., 3/8-16 x 5/8 (16)	Stainless Steel UNS-S30400			12	
				11021	Screw, S.H.C[2]., 3/8-16 x 1/2 (12.7)	Stainless Steel UNS-S30400				12
12	*				Screw, R.H.[3]., 10-24 x 5/8 (16)	Stainless Steel UNS-S30200	4			
		*			Screw, H.H.C[1]., 5/16-18 x 1/2 (13)	Stainless Steel UNS-S30400		8		
			*	*	Screw, S.H.C[2]., 1/4-20 x 3/4 (19.1)	Stainless Steel UNS-S31600			8	6
13	*	*	*	*	O-Ring	EPDM	1	1	1	1
14	--	--	--	11570	Eye Bolt, 5/8-11-UNC	Carbon Steel				1
15				F01256	Nut, 5/8-11-UNC	Stainless Steel				1
-- Indicates replacement part not available										
* Indicates part available only in sub-assembly listed below										
SUB-ASSEMBLY										
2, 12, 13	14711-3	14711-4	14711-6	14711-8	Seat Replacement Kit*					
3, 5-7, 9-11	13488	13490	13492	13484	Clapper Assembly Kit					

***Note:** Includes o-ring lubricant to be added to ring groove in seat.

[1] Hex Head Cap Screw [2] Socket Head Cap Screw, (8" Valve - #10 & 11 must be S.H.C. for clearance with seat) [3] Round Head, Phillips Drive Screw

VIKING®

TECHNICAL DATA

DELUGE VALVE, MODEL F-1 STRAIGHT THROUGH STYLE

2-1/2" (DN65) - 8" (DN200)

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.

Maximum Allowable Pilot Heights for Select Equivalent Lengths of Hydraulic Release Piping.
For valves with 1/16" (1.6 mm) Restricted Orifice
Graphs are based on 1/2" (15 mm) pilot sprinklers installed on 1/2" (15 mm) Schedule 40 galvanized released piping.
If the maximum height of hydraulic release piping exceeds the limits shown on the graph, use pneumatic or electric release system

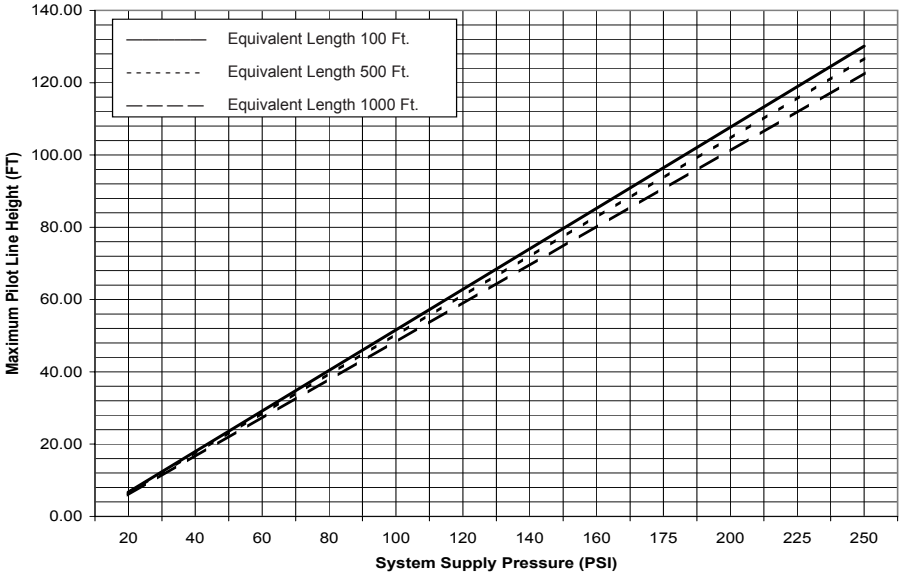


Figure 3 - 2-1/2" (DN65) & 3" (DN80) Model F-1 Deluge Valves

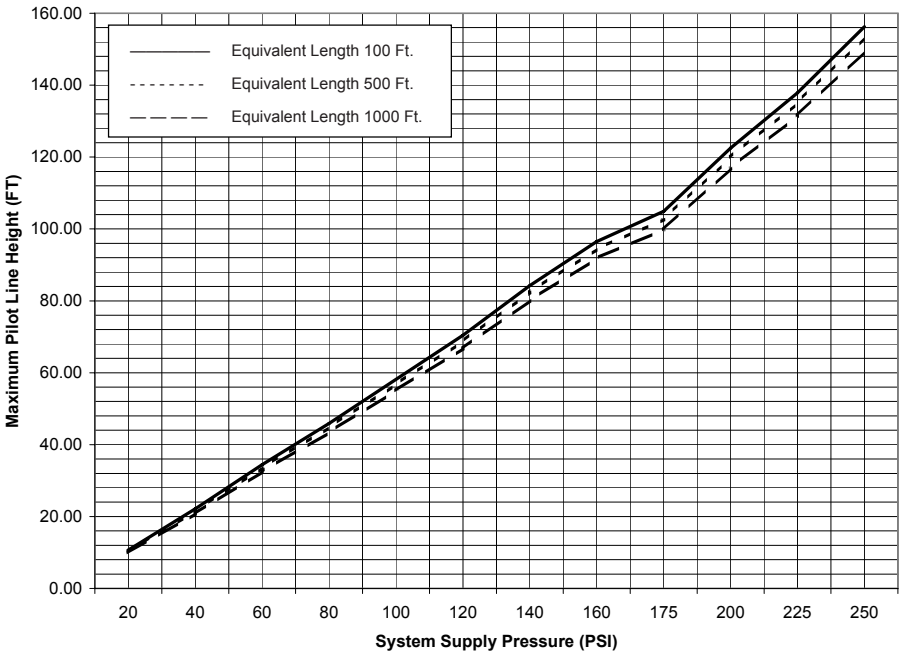


Figure 4 - 4" (DN100) Model F-1 Deluge Valves

VIKING®

TECHNICAL DATA

DELUGE VALVE, MODEL F-1 STRAIGHT THROUGH STYLE

2-1/2" (DN65) - 8" (DN200)

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.

Maximum Allowable Pilot Heights for Select Equivalent Lengths of Hydraulic Release Piping.

For valves with 1/16" (1.6 mm) Restricted Orifice

Graphs are based on 1/2" (15 mm) pilot sprinklers installed on 1/2" (15 mm) Schedule 40 galvanized released piping.

If the maximum height of hydraulic release piping exceeds the limits shown on the graph, use pneumatic or electric release system

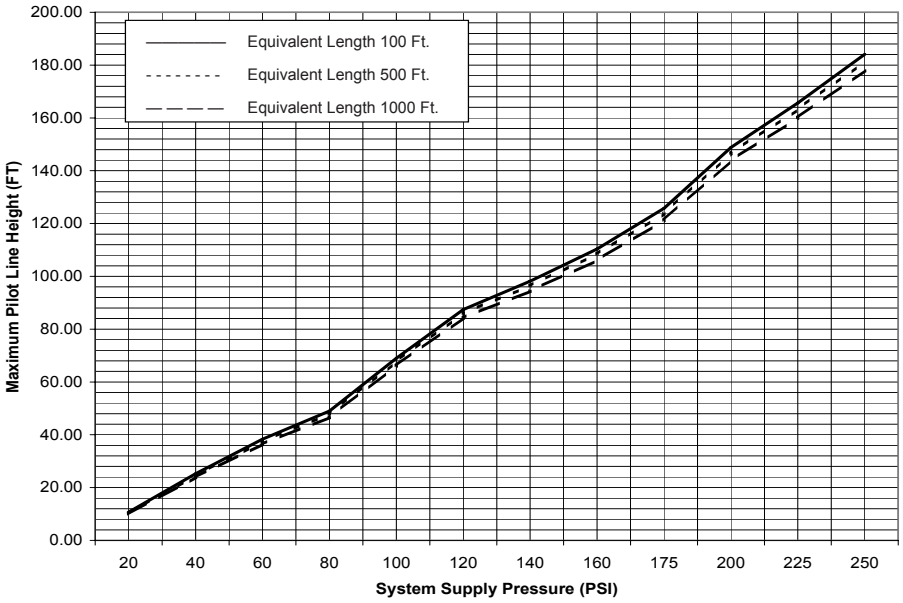


Figure 5 - 6" (DN150)
Model F-1 Deluge Valves

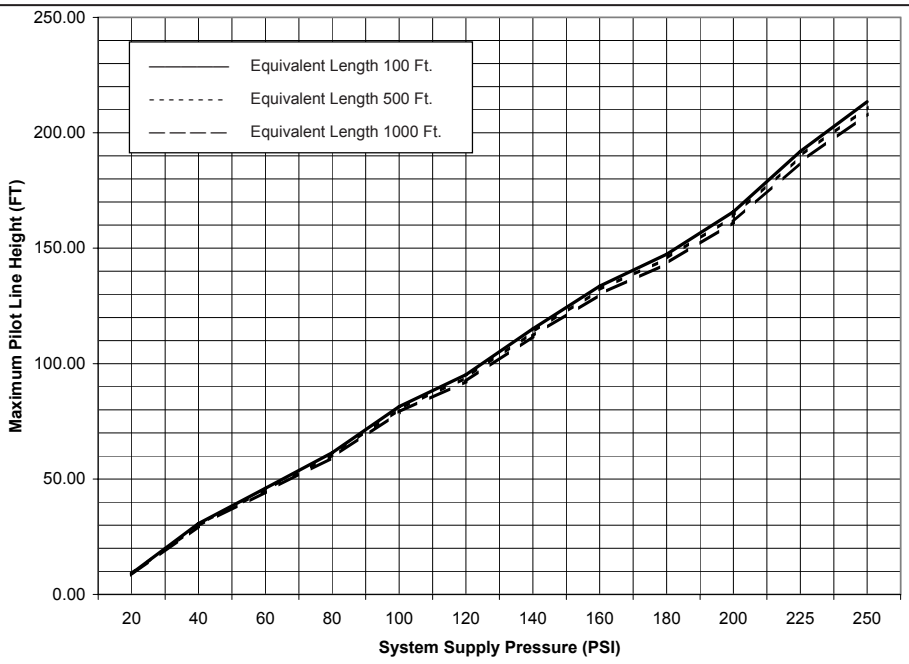


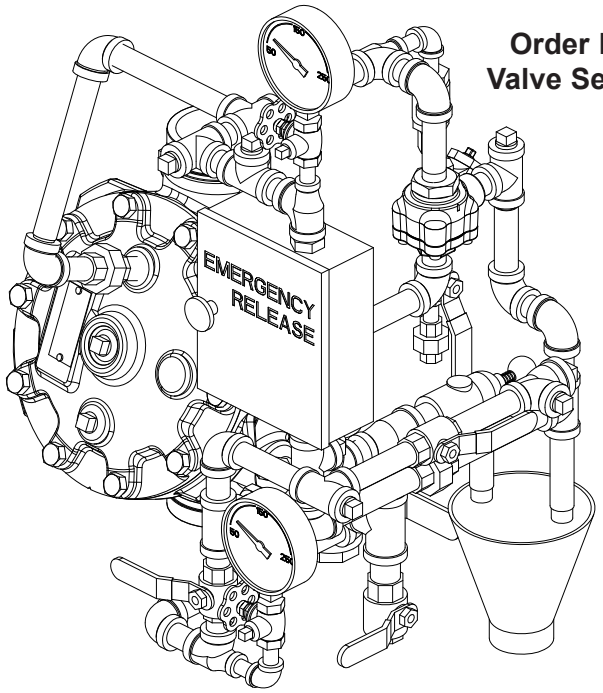
Figure 6 - 8" (DN200)
Model F-1 Deluge Valves

TECHNICAL DATA

2-1/2” & 3” (DN65 & DN80) MODEL F DELUGE VALVE VERTICAL CONVENTIONAL TRIM CHART

Maximum 250 PSI Water Working Pressure

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



Order Deluge Valve Separately

Figure 1

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

This Trim Chart is for use with the following Viking Trim Sets		
Valve Size	**Galvanized Trim Part No.**	**Brass Trim Part No.**
2-1/2” (DN65) & 3” (DN80)	14636-1	14636-2

This Trim is for use with the following Release Module Trim Kits		
Release Type	**Galvanized***	**Brass****
Pneumatic	10809	10811
Electric	10830	10832
Electric/ Pneumatic	12661-1	12661-2
Pneumatic/ Pneumatic	12662-1	12662-2

* Standard Trim sets for Model F Deluge Valves consist of galvanized nipples and fittings.

**Refer to Technical Data describing the Halar® Coated Deluge Valve and the *Viking Foam Systems Engineering and Design Data* book for applications where brass trim is recommended.

Note: Nipple lengths for brass trim may vary from those shown on this Trim Chart.

Notes: For use with Trim Chart on Page 239a

Note: When viewing this data page online, blue text represents hyperlinks and will open the appropriate data page when clicked.

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 and fittings shall be galvanized or brass except when other materials are specified in the Technical Data for the Halar® Coated Deluge Valve.
- Gauges are brass as furnished with trim.
- When Model F Deluge Valves are used on pre-mixed Foam Systems, trim piping must be of copper pipe with brass fittings unless otherwise specified in the Technical Data for the Halar® Coated Deluge Valve or the *Viking Foam Systems Engineering and Design Data* book.
- Dimensions in parentheses are millimeter and may be approximations.

Note 1: 1/2” (15 mm) NPT plugged outlet provided for connecting certain optional components and associated trim.

Note 2: Release System connection. Viking Deluge and Flow Control Valves are compatible with hydraulic, pneumatic, and electric release systems. A Pneumatic Actuator is required on all Viking Deluge Valves and Flow Control Valves equipped with Pneumatic Release Systems.

Note 3: Alarm Connections: Connect alarm line piping to 3/4” (20 mm) NPT outlet. When using a Water Motor Alarm, a strainer is required. 1/2” (15 mm) NPT outlet is for electric Alarm Pressure Switch.

Note 4: Optional non-interruptible connection for Alarm Pressure Switch to activate electric alarm panel. Note: After the Deluge Valve trips, this location cannot be shut off. Alarms may operate until the outlet chamber of the deluge valve is de-pressurized below the set point of the Alarm Pressure Switch.

Note 5: Viking Drain Check Valve is manufactured with a 0.067“ (1.7 mm) orifice to allow alarm line to drain. DO NOT substitute. Check label for proper orientation.

Note 6: Inlet side of PORV is connected to the top chamber of the deluge valve. Inlet of PORV should be facing up. Outlet goes to open drain.

Replaces Form No. F_121703 Rev April 15, 2011
(Added P65 Warning.)

Form No. F_121703 18.10.25 P65

TECHNICAL DATA

2-1/2" & 3" (DN65 & DN80) MODEL F DELUGE VALVE VERTICAL CONVENTIONAL TRIM CHART

Maximum 250 PSI Water Working Pressure

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

Refer to page 239a for General Notes and Notes 1 through 6.

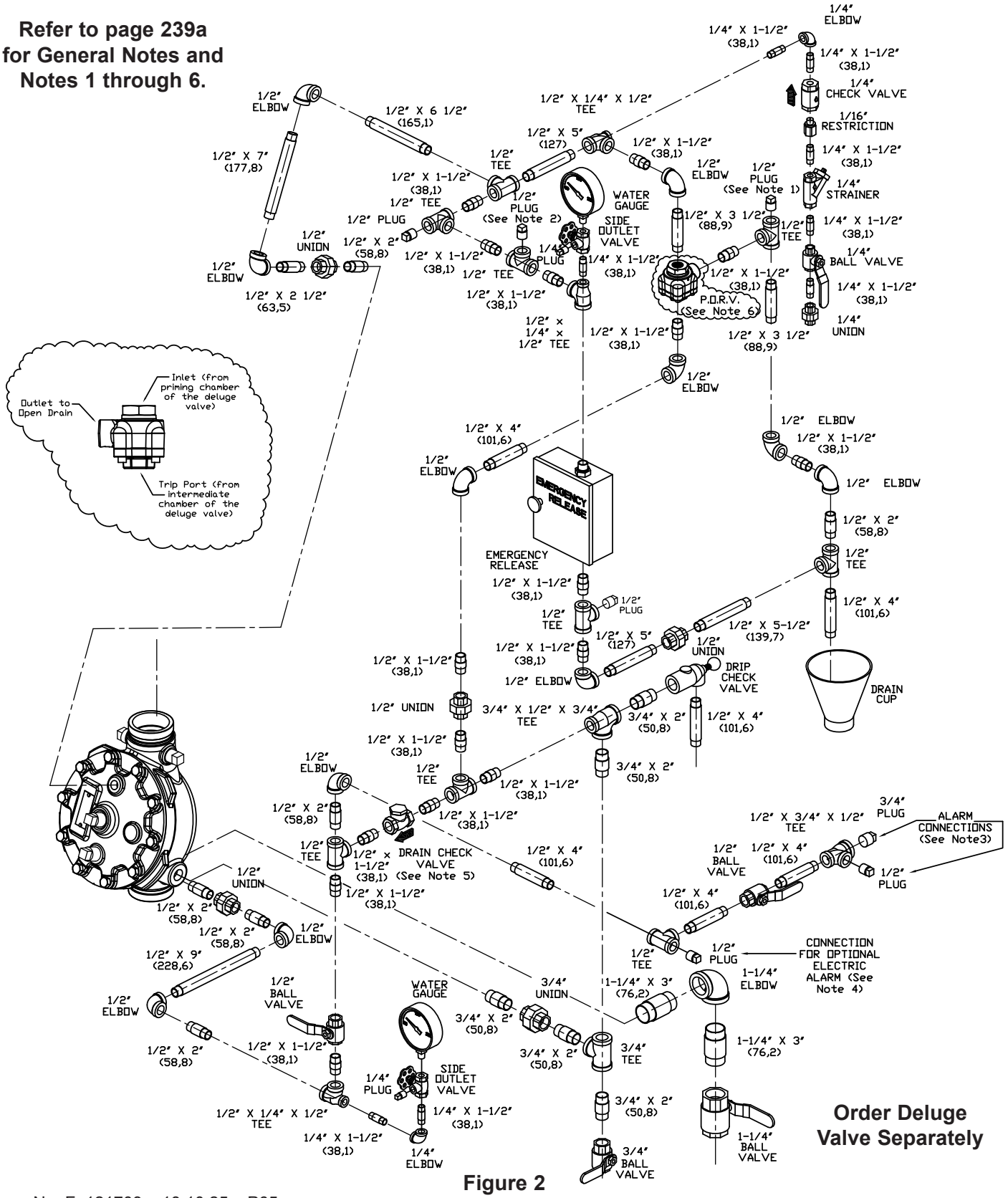


Figure 2

TECHNICAL DATA

2-1/2” & 3” (DN65 & DN80) MODEL F DELUGE VALVE VERTICAL CONVENTIONAL TRIM CHART

Maximum 250 PSI Water Working Pressure

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

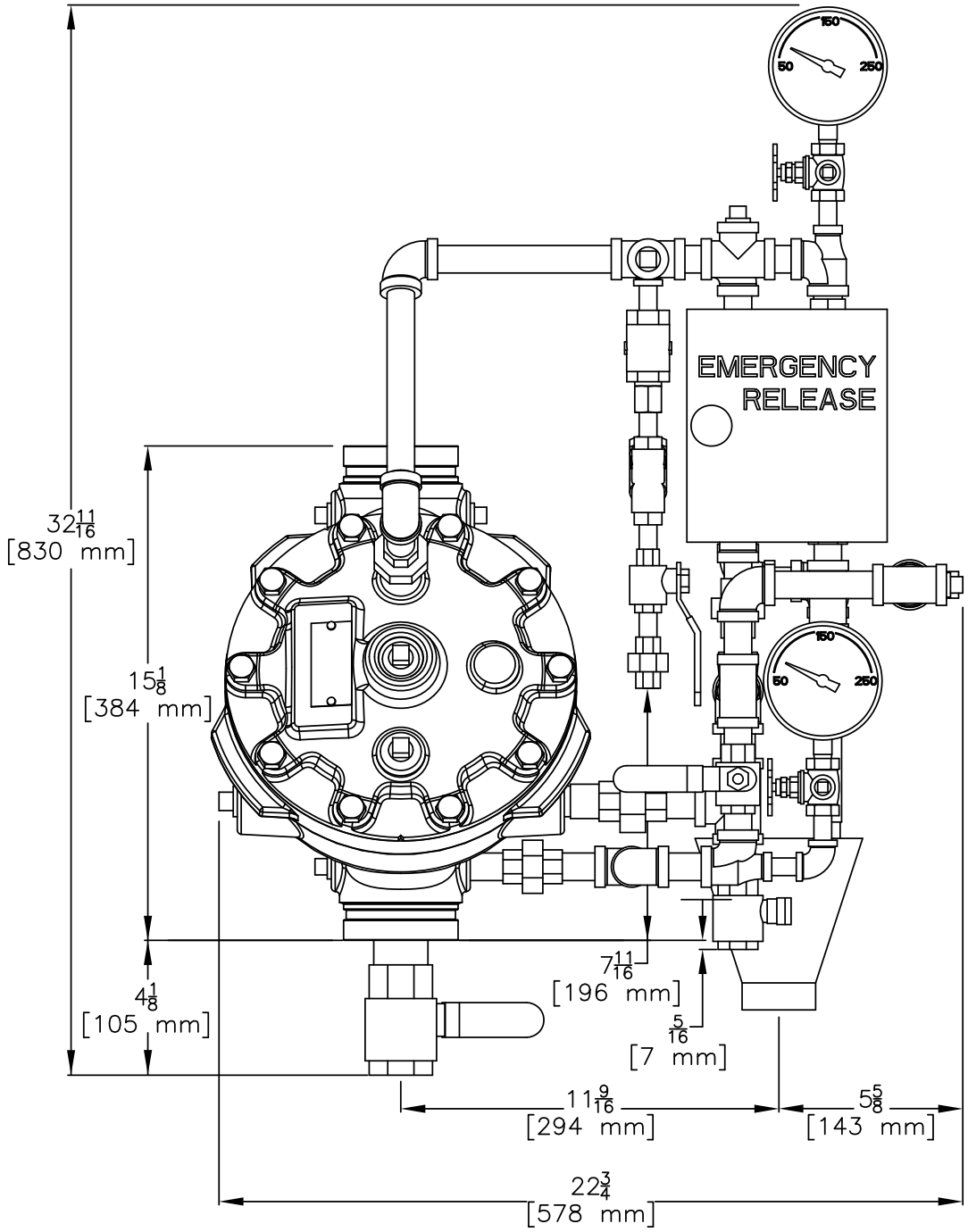


Figure 3a: Installation Dimensions

TECHNICAL DATA

2-1/2" & 3" (DN65 & DN80) MODEL F DELUGE VALVE VERTICAL CONVENTIONAL TRIM CHART

Maximum 250 PSI Water Working Pressure

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

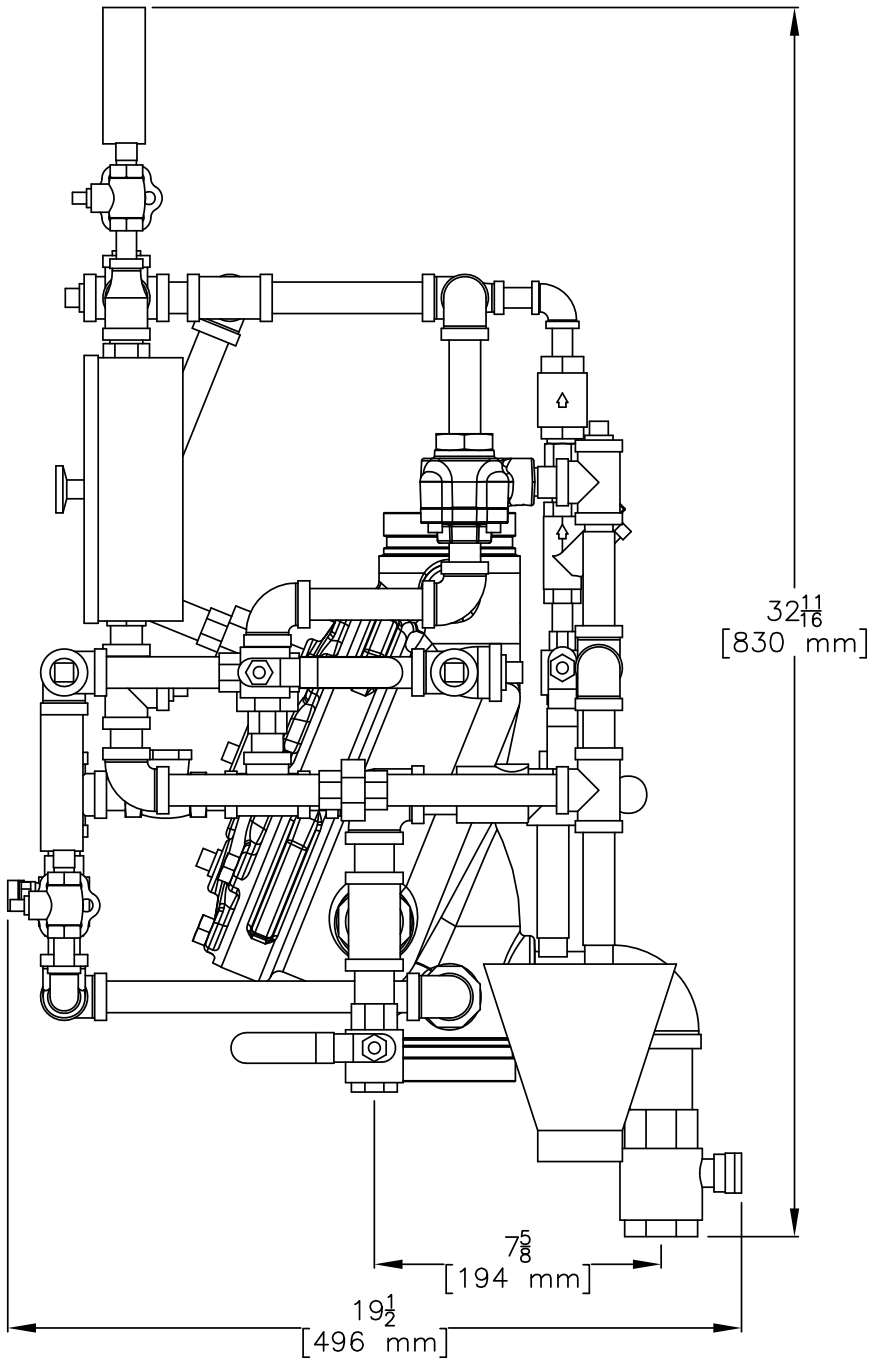


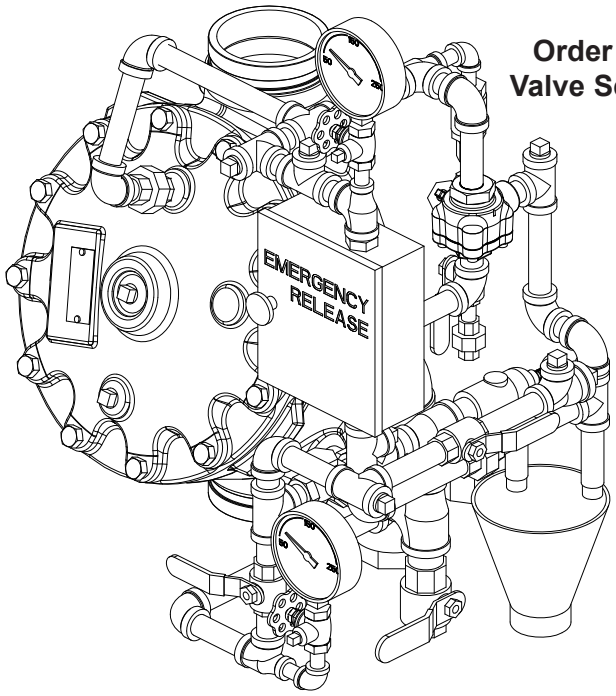
Figure 3b: Installation Dimensions

Replaces Form F_121703 Rev April 15, 2011
(Added P65 Warning.)

TECHNICAL DATA

4” (DN100) MODEL F-1 STRAIGHT THROUGH DELUGE VALVE VERTICAL CONVENTIONAL TRIM CHART Maximum 250 PSI WWP

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



Order Deluge Valve Separately

Figure 1

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

This Trim Chart is for use with the following Viking Trim Sets		
Valve Size	**Galvanized Trim Part No.**	**Brass Trim Part No.**
4” (DN80)	14639-1	14639-2
This Trim is for use with the following Release Module Trim Kits		
Release Type	**Galvanized***	**Brass****
Pneumatic	10809	10811
Electric	10830	10832
Electric/ Pneumatic	12661-1	12661-2
Pneumatic/ Pneumatic	12662-1	12662-2

* Standard Trim sets for Model F Deluge Valves consist of galvanized nipples and fittings.

**Refer to Technical Data describing the Halar® Coated Deluge Valve and the *Viking Foam Systems Engineering Design Data* book for applications where brass trim is recommended.

Note: Nipple lengths for brass trim may vary from those shown on this Trim Chart.

Notes: For use with Trim Chart on Page 240f

Note: When viewing this data page online, blue text represents hyperlinks and will open the appropriate data page when clicked.

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 Halar® Coated Deluge Valve or when other materials are specified in the *Viking Foam Systems Engineering and Design Data* book.
- When Model F Deluge Valves are used on pre-mixed Foam Systems, trim piping must be of copper pipe with brass fittings unless otherwise specified in the Technical Data for the Halar® Coated Deluge Valve or the *Viking Foam Systems Engineering and Design Data* book.
- Dimensions in parentheses are millimeter and may be approximations.

Note 1: 1/2” (15 mm) NPT plugged outlet provided for connecting certain optional components and associated trim.

Note 2: Release System connection. Viking Deluge and Flow Control Valves are compatible with hydraulic, pneumatic, and electric release systems. A Pneumatic Actuator is required on all Viking Deluge Valves and Flow Control Valves equipped with Pneumatic Release Systems.

Note 3: Alarm Connections: Connect alarm line piping to 3/4” (20 mm) NPT outlet. When using a Water Motor Alarm, a strainer is required. 1/2” (15 mm) NPT outlet is for electric Alarm Pressure Switch.

Note 4: Optional non-interruptible connection for Alarm Pressure Switch to activate electric alarm panel. Note: After the Deluge Valve trips, this location cannot be shut off. Alarms may operate until the outlet chamber of the deluge valve is de-pressurized below the set point of the Alarm Pressure Switch.

Note 5: Viking Drain Check Valve is manufactured with a 0.067“ (1.7 mm) orifice to allow alarm line to drain. Do not substitute. Check label for proper orientation.

Note 6: Inlet side of PORV is connected to the top chamber of the deluge valve. Inlet of PORV should be facing up. Outlet goes to open drain.

TECHNICAL DATA

4" (DN100) MODEL F-1 STRAIGHT THROUGH DELUGE VALVE VERTICAL CONVENTIONAL TRIM CHART Maximum 250 PSI WWP

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

Refer to page 240e for General Notes and Notes 1 through 6.

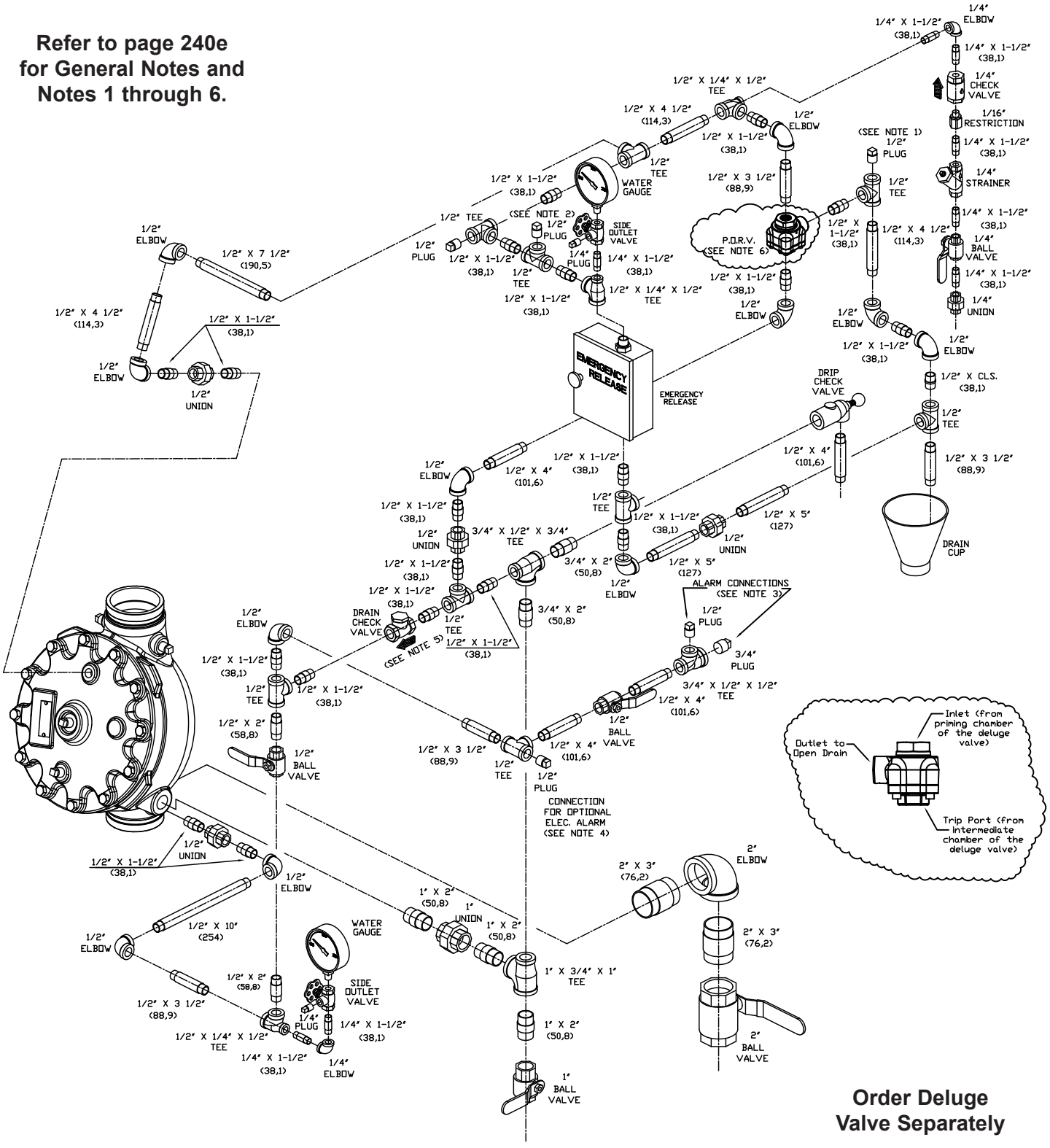


Figure 2

VIKING®

TECHNICAL DATA

4” (DN100) MODEL F-1 STRAIGHT THROUGH DELUGE VALVE VERTICAL CONVENTIONAL TRIM CHART Maximum 250 PSI WWP

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

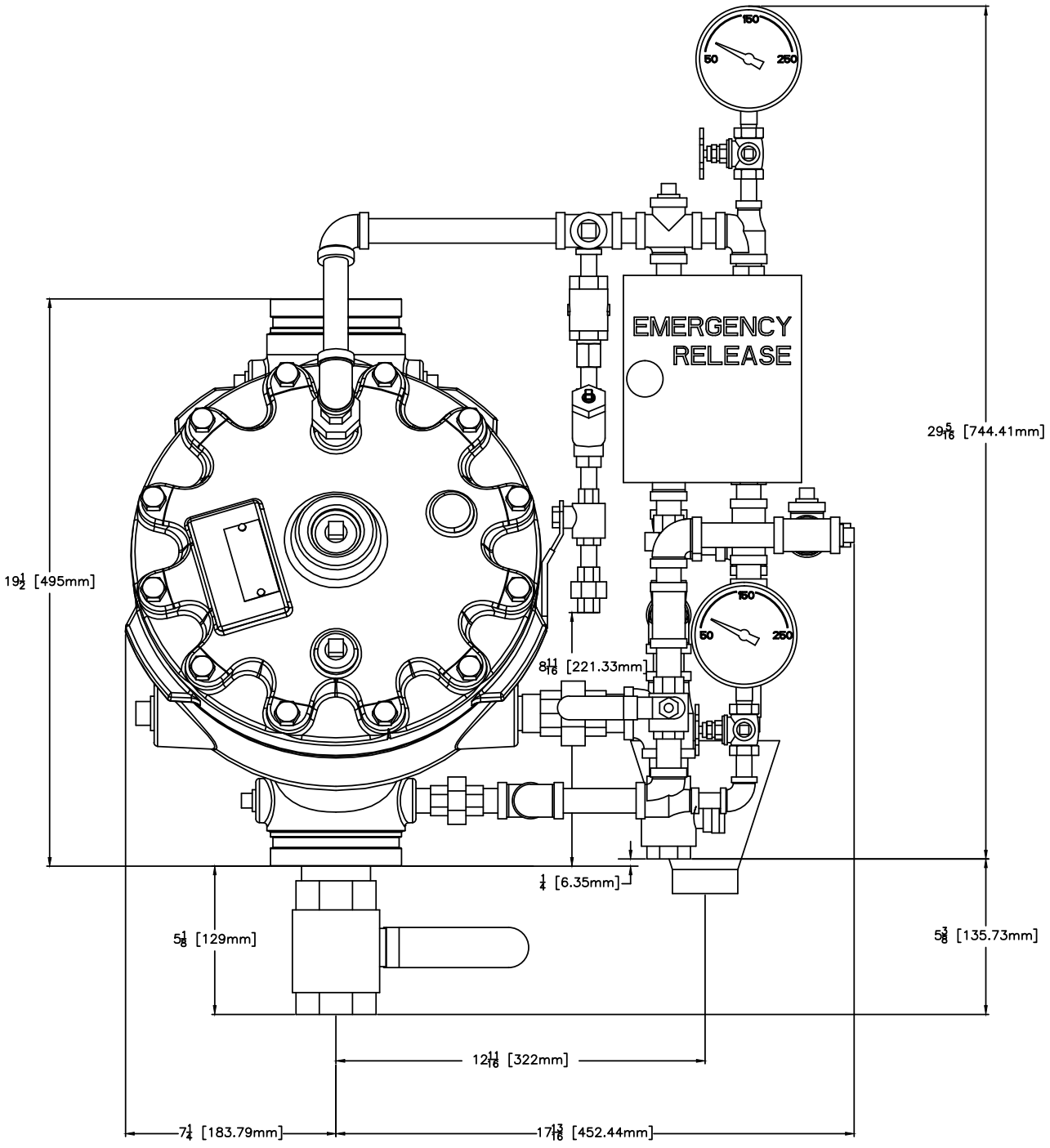


Figure 3a: Installation Dimensions

VIKING®

TECHNICAL DATA

4” (DN100) MODEL F-1 STRAIGHT THROUGH DELUGE VALVE VERTICAL CONVENTIONAL TRIM CHART Maximum 250 PSI WWP

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

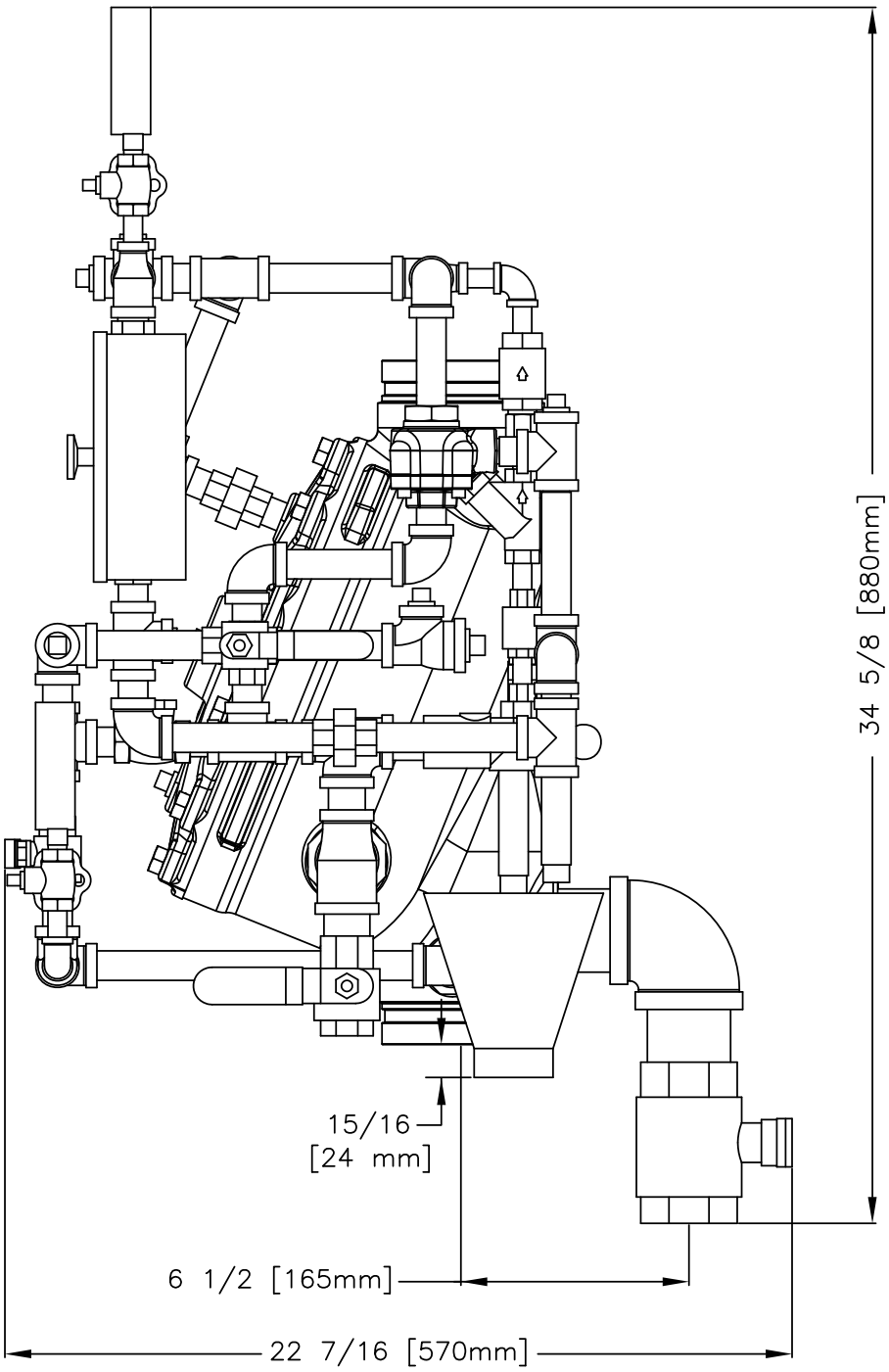


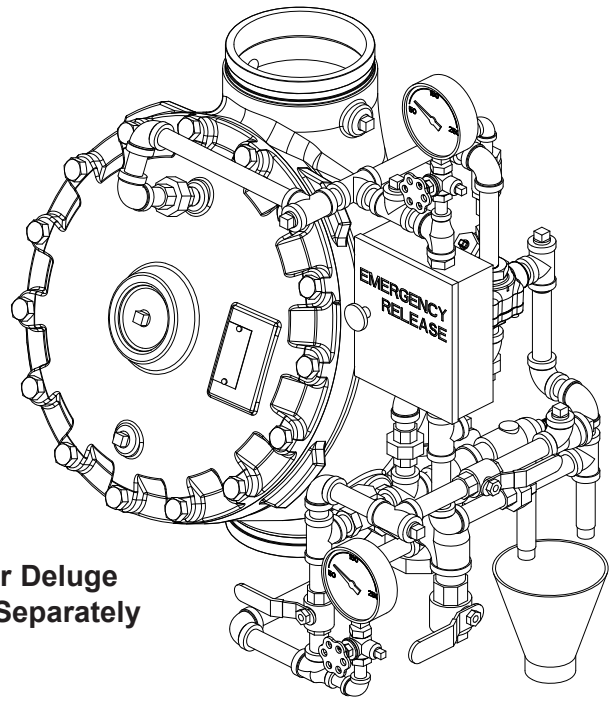
Figure 3b: Installation Dimensions

Replaces Form No. F_051402 Rev May 7, 2014
(Added P65 Warning.)

TECHNICAL DATA

DELUGE TRIM
6” (DN150) MODEL F-1
STRAIGHT THROUGH VERTICAL VALVE

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



Order Deluge Valve Separately

Figure 1

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

This Trim Chart is for use with the following Viking Trim Sets		
Valve Size	**Galvanized Trim Part No.**	**Brass Trim Part No.**
6” (DN150)	14641-1	14641-2
This Trim is for use with the following Release Module Trim Kits		
Release Type	**Galvanized***	**Brass****
Pneumatic	10809	10811
Electric	10830	10832
Electric/ Pneumatic	12661-1	12661-2
Pneumatic/ Pneumatic	12662-1	12662-2

* Standard Trim sets for Model F Deluge Valves consist of galvanized nipples and fittings.
**Refer to Technical Data describing the Halar® Coated Deluge Valve and the *Viking Foam Systems Engineering Design Data* book for applications where brass trim is recommended.
Note: Nipple lengths for brass trim may vary from those shown on this Trim Chart.

Notes: For use with Trim Chart on Page 241f

Note: When viewing this data page online, blue text represents hyperlinks and will open the appropriate data page when clicked.

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 Halar® Coated Deluge Valve or when other materials are specified in the *Viking Foam Systems Engineering and Design Data* book.
- When Model F Deluge Valves are used on pre-mixed Foam Systems, trim piping must be of copper pipe with brass fittings unless otherwise specified in the Technical Data for the Halar® Coated Deluge Valve or the *Viking Foam Systems Engineering and Design Data* book.
- Dimensions in parentheses are millimeter and may be approximations.

Note 1: 1/2” (15 mm) NPT plugged outlet provided for connecting certain optional components and associated trim.

Note 2: Release System connection. Viking Deluge and Flow Control Valves are compatible with hydraulic, pneumatic, and electric release systems. A Pneumatic Actuator is required on all Viking Deluge Valves and Flow Control Valves equipped with Pneumatic Release Systems.

Note 3: Alarm Connections: Connect alarm line piping to 3/4” (20 mm) NPT outlet. When using a Water Motor Alarm, a strainer is required. 1/2” (15 mm) NPT outlet is for electric Alarm Pressure Switch.

Note 4: Optional non-interruptible connection for Alarm Pressure Switch to activate electric alarm panel. Note: After the Deluge Valve trips, this location cannot be shut off. Alarms may operate until the outlet chamber of the deluge valve is de-pressurized below the set point of the Alarm Pressure Switch.

Note 5: Viking Drain Check Valve is manufactured with a 0.067“ (1.7 mm) orifice to allow alarm line to drain. DO NOT substitute. Check label for proper orientation.

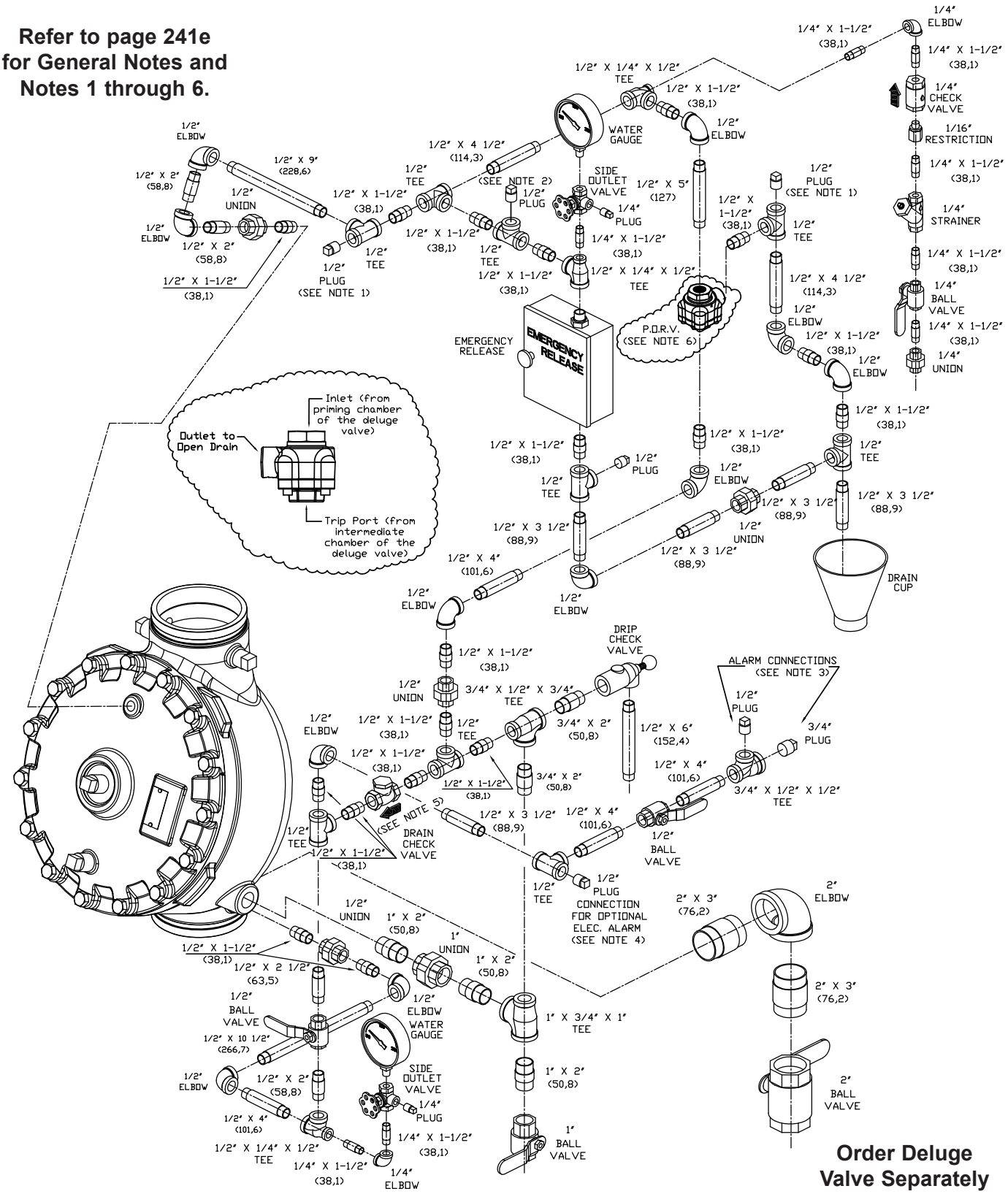
Note 6: Inlet side of PORV is connected to the top chamber of the deluge valve. Inlet of PORV should be facing up. Outlet goes to open drain.

TECHNICAL DATA

DELUGE TRIM
6" (DN150) MODEL F-1
STRAIGHT THROUGH VERTICAL VALVE

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

Refer to page 241e for General Notes and Notes 1 through 6.



Order Deluge Valve Separately

Figure 2

TECHNICAL DATA

DELUGE TRIM
6" (DN150) MODEL F-1
STRAIGHT THROUGH VERTICAL VALVE

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

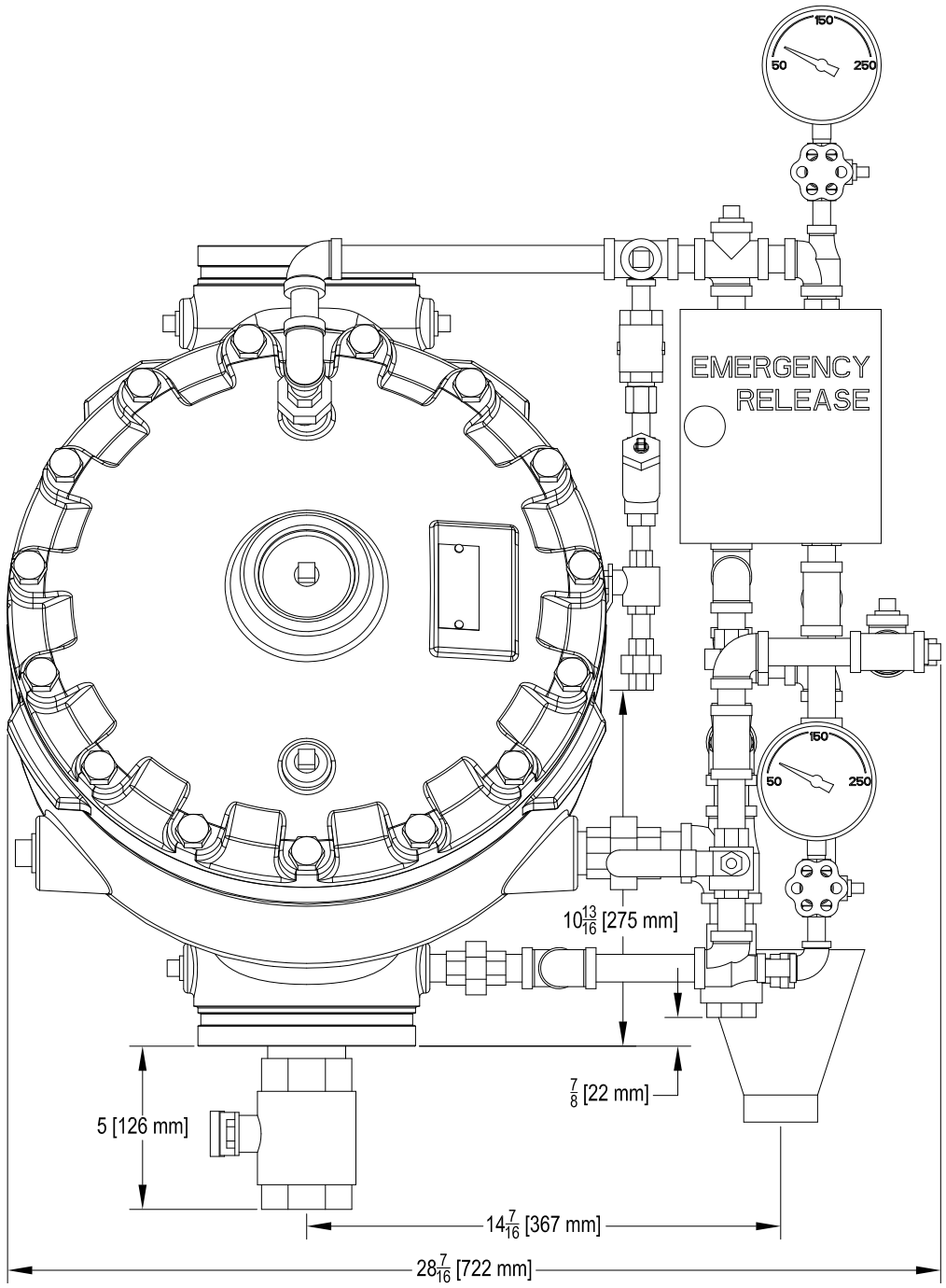


Figure 3a: Installation Dimensions

TECHNICAL DATA

DELUGE TRIM
6" (DN150) MODEL F-1
STRAIGHT THROUGH VERTICAL VALVE

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

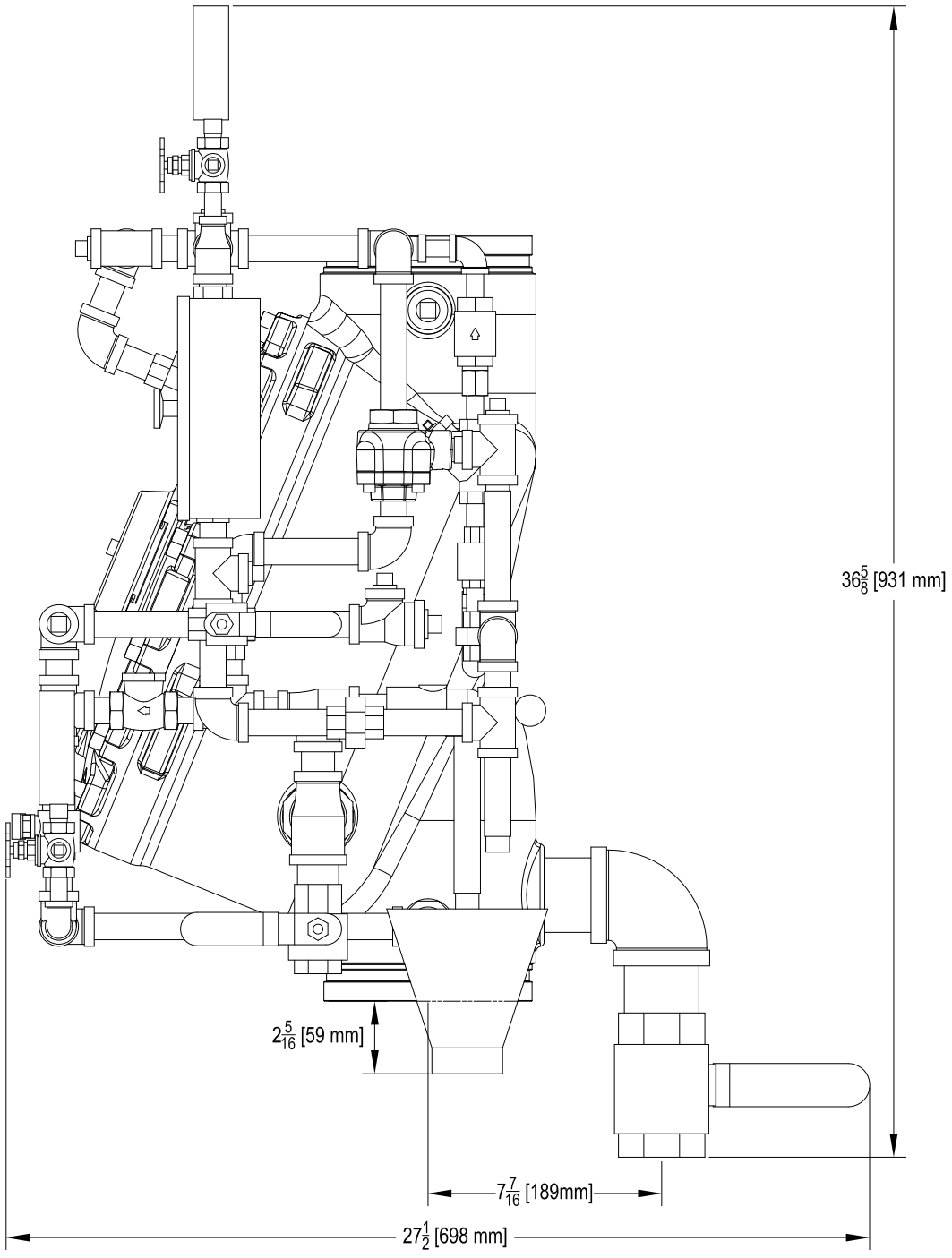


Figure 3b: Installation Dimensions

Replaces Form F_051502 Rev April 15, 2011
(Added P65 Warning.)

TECHNICAL DATA

DELUGE TRIM
8” (DN200) MODEL F-1
STRAIGHT THROUGH VERTICAL VALVE

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.

Order Deluge Valve Separately

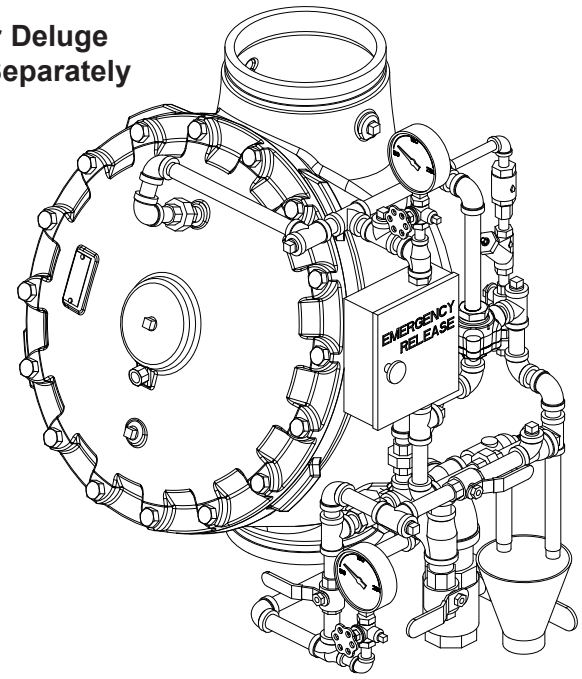


Figure 1

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

This Trim Chart is for use with the following Viking Trim Sets		
Valve Size	**Galvanized Trim Part No.**	**Brass Trim Part No.**
8” (DN200)	14642-1	14642-2
This Trim is for use with the following Release Module Trim Kits		
Release Type	**Galvanized***	**Brass****
Pneumatic	10809	10811
Electric	10830	10832
Electric/ Pneumatic	12661-1	12661-2
Pneumatic/ Pneumatic	12662-1	12662-2

* Standard Trim sets for Model F Deluge Valves consist of galvanized nipples and fittings.
**Refer to Technical Data describing the Halar® Coated Deluge Valve and the Viking Website for applications where brass trim is recommended.
Note: Nipple lengths for brass trim may vary from those shown on this Trim Chart.

Notes: For use with Trim Chart on Page 2

Note: When viewing this data page online, blue text represents hyperlinks and will open the appropriate data page when clicked.

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 Halar® Coated Deluge Valve or when other materials are specified on the Viking website.
- When Model F Deluge Valves are used on pre-mixed Foam Systems, trim piping must be black steel pipe with cast iron or malleable iron fittings unless otherwise specified in the Technical Data for the Halar® Coated Deluge Valve or the Viking website.
- Dimensions in parentheses are millimeter and may be approximations.

Note 1: 1/2” (15 mm) NPT plugged outlet provided for connecting certain optional components and associated trim.

Note 2: Release System connection. Viking Deluge and Flow Control Valves are compatible with hydraulic, pneumatic, and electric release systems. A Pneumatic Actuator is required on all Viking Deluge Valves and Flow Control Valves equipped with Pneumatic Release Systems.

Note 3: Alarm Connections: Connect alarm line piping to 3/4” (20 mm) NPT outlet. When using a Water Motor Alarm, a strainer is required. 1/2” (15 mm) NPT outlet is for electric Alarm Pressure Switch.

Note 4: Optional non-interruptible connection for Alarm Pressure Switch to activate electric alarm panel. Note: After the Deluge Valve trips, this location cannot be shut off. Alarms may operate until the outlet chamber of the deluge valve is de-pressurized below the set point of the Alarm Pressure Switch.

Note 5: Viking Drain Check Valve is manufactured with a 0.067“ (1.7 mm) orifice to allow alarm line to drain. DO NOT substitute. Check label for proper orientation.

Note 6: Inlet side of PORV is connected to the top chamber of the deluge valve. Inlet of PORV should be facing up. Outlet goes to open drain.

TECHNICAL DATA

DELUGE TRIM
8" (DN200) MODEL F-1
STRAIGHT THROUGH VERTICAL VALVE

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Refer to page 242e for General Notes and Notes 1 through 6.

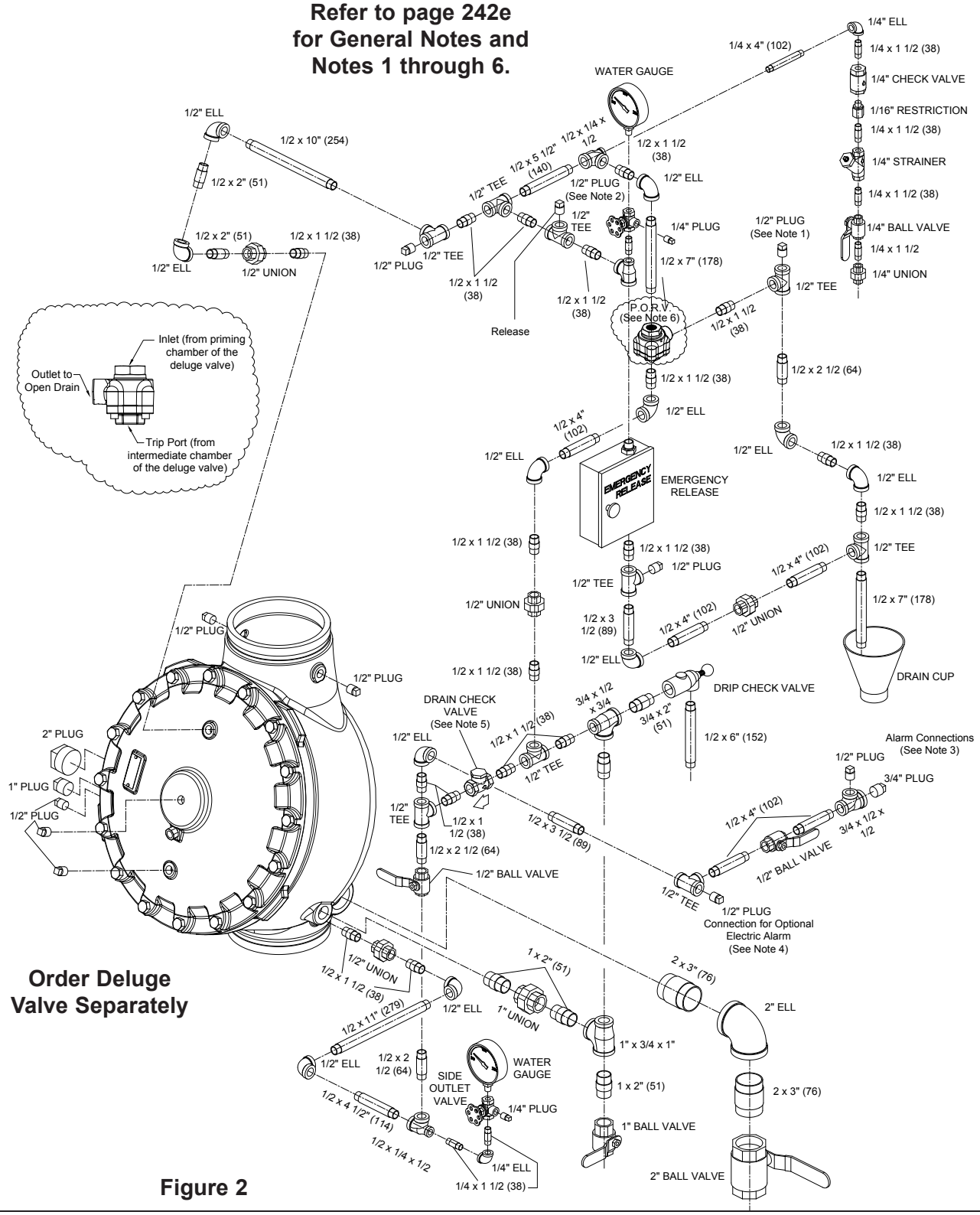

Figure 2

TECHNICAL DATA

DELUGE TRIM
8" (DN200) MODEL F-1
STRAIGHT THROUGH VERTICAL VALVE

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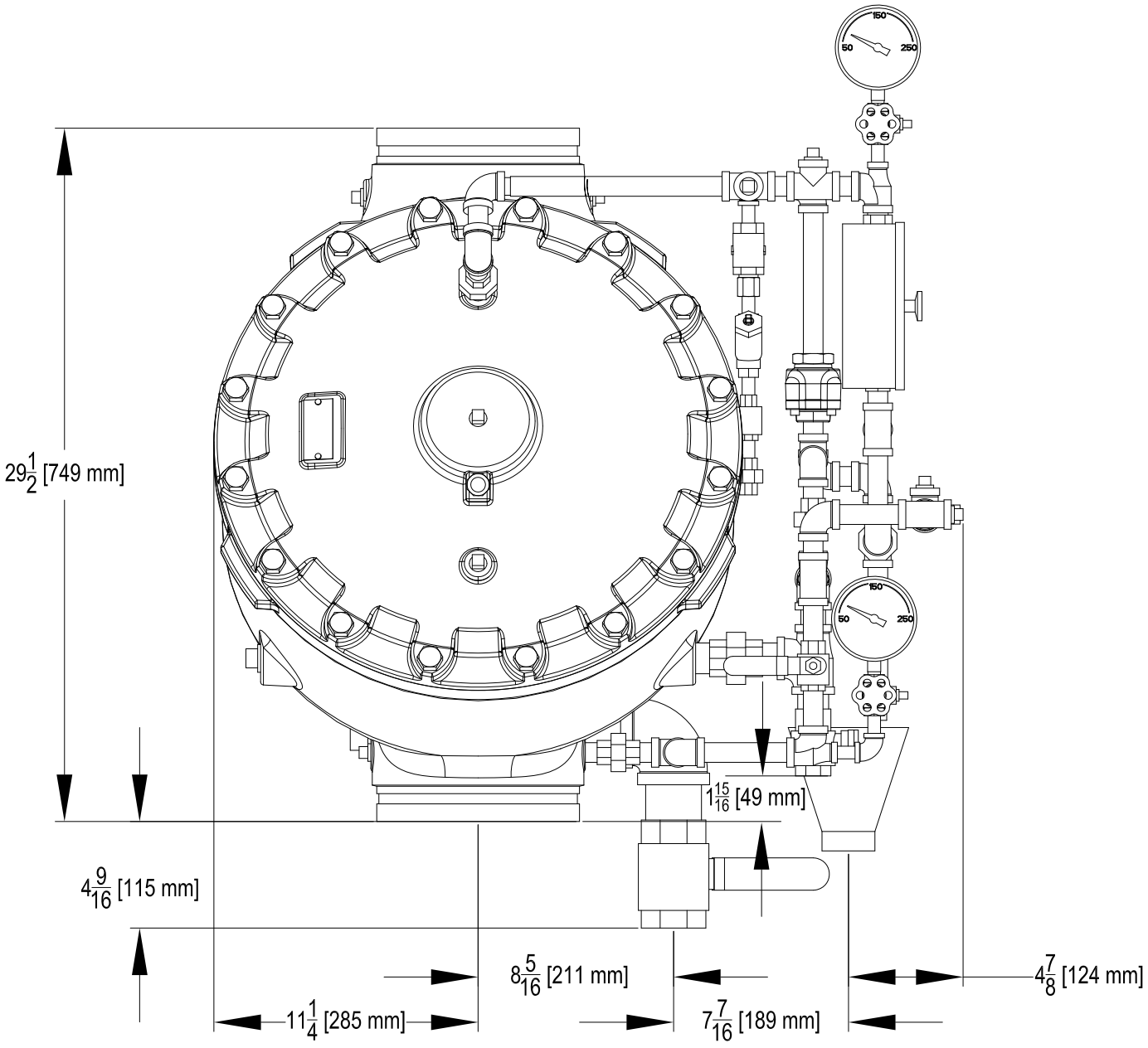

Figure 3a: Installation Dimensions

TECHNICAL DATA

DELUGE TRIM
8" (DN200) MODEL F-1
STRAIGHT THROUGH VERTICAL VALVE

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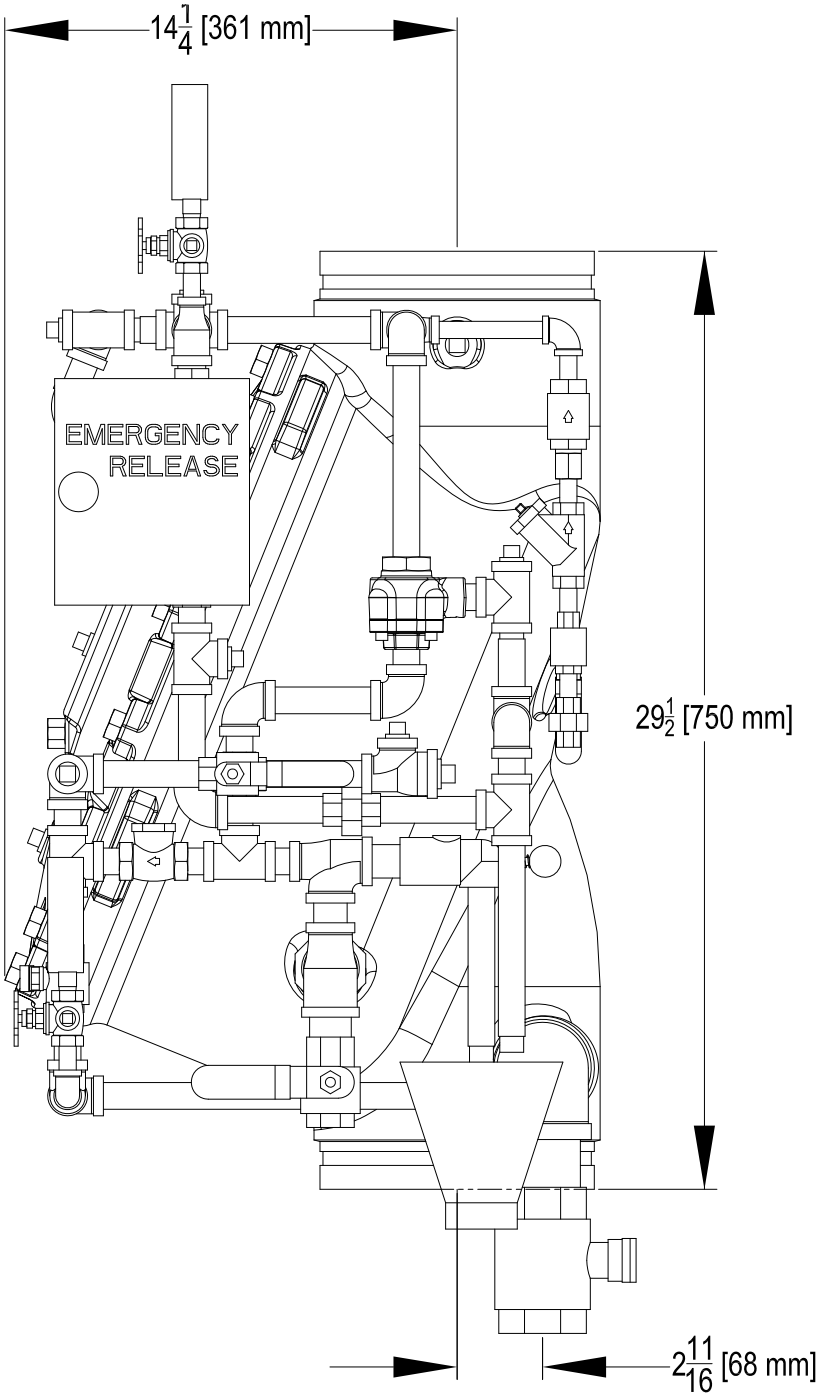

Figure 3b: Installation Dimensions

TECHNICAL DATA

SOLENOID VALVES
RATED TO 250 PSI (17.2 BAR)

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Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com
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1. DESCRIPTION

The high pressure solenoid valve is a two-way type with one inlet and one outlet. It is a packless, internal pilot operated valve, suitable for use in releasing water pressure from the priming chamber of Viking Model E, F, G and VXD Series Deluge Valves and Viking Model H and J Series Flow Control Valves. The solenoid valve has floating diaphragm construction, which requires a minimum pressure drop across the valve to operate properly. The valves are available with a voltage rating of 24V DC in a normally closed or normally open configuration. These solenoid valves are for use with system control units that are listed and/or approved for releasing service for water based fire protection systems.

Features
- Normally Closed or Normally Open
- 24 VDC
- Easy to clean
- Body Style: Straight through
- NEMA 1 through 9. (See Table 1)
- Required Accessories: A 50 mesh strainer must be installed on the inlet side of the valve at the priming line connection. This strainer is included as part of the Model E, F, G and VXD Deluge Valve Trim and Model H or J Flow Control Valve Trim.

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

AVERTISSEMENT: Cancérigène et toxique pour la reproduction - www.P65Warning.ca.gov

2. LISTINGS AND APPROVALS (see table 1 for specific model approvals)

- UL Listed
- FM Approved
- CSA Certified
- CE Directives Applicable

3. TECHNICAL DATA

Specifications

Coil:
- Class F for Part Numbers 11601, 11602 and 13215.
- Class H for Part Numbers 13843 and 13844, Continuous Duty

Maximum Operating Pressure:
- 250 psi (17.2 bar) for Part Numbers 11601, 11602 and 13215.
- 300 psi (20.6 bar) for Part Numbers 13843 and 13844.

See Table 1 for enclosure descriptions and recommended ambient temperatures.

Material Standards

Body: Brass with ½" (15 mm) NPT connections
Seals and Discs: Buna N
Core Tube: 305 Stainless Steel
Core and Plugnut: 430F Stainless Steel
Springs: 302 Stainless Steel

Table 1 - Part Numbers and Specifications

Description	Model	Part Number	For Viking System	Orifice	Wattage	DC Current	Max. Ambient Temp.	Cv Factor	Listings & Approvals				
									UL	CSA	FM	LPCB	CE
Normally Closed NEMA 1,2,3,3S,4,4X [1]	24 VDC	11601	Deluge & Preaction, SureFire	3/4"	9.0 DC	338 mA	130 °F (54 °C)	4.0	Yes[2]	Yes[6]	Yes[9]	Yes[9]	Yes[10]
Normally Closed Explosion Proof NEMA 3,3S,4,4X,6,6P,7,9 [1]	24 VDC	11602		3/4"	9.0 DC	338 mA	130 °F (54 °C)	4.0	Yes[3]	Yes[7]	Yes[9]	Yes[9]	--
Normally Open NEMA 1,2,3,3S,4,4X [1]	24 VDC	13215	Surefire	3/4"	9.0 DC	338 mA	130 °F (54 °C)	4.0	Yes[4]	Yes[6]	Yes[9]	Yes[9]	Yes[10]
Normally Closed NEMA 1,2,3,3S,4,4X [1]	24 VDC	13843	Deluge & Preaction	5/8"	1.5 DC	140 mA	140 °F (60 °C)	4.0	Yes[5]	Yes[8]	Yes[9]	--	Yes[10]
Normally Closed Explosion Proof NEMA 3,3S,4,4X [1]	24 VDC	13844		5/8"	1.5 DC	140 mA	140 °F (60 °C)	4.0	Yes[5]	Yes[8]	Yes[9]	--	--

Footnotes

1. Enclosure types: 1 - General Purpose, 2 - Drip-Proof, 3 and 3s - Rain Tight, 4 and 4X - Water Tight, 6 and 6P - Submersible, 7 - Explosion Proof Class I Groups A, B, C and D, 9 - Dust Ignition Proof Class II Groups E, F & G.
2. UL Listed – VLTR file MP618 Ordinary, under ASCO, L.P. HV274060007
3. UL Listed – YTSX file E25549 Hazardous, under ASCO, L.P. HV274060008
4. UL Listed – YIOZ file MP618 Ordinary, under ASCO, L.P. HV283852001
5. UL Listed - VLTR EX1130
6. cCSAus Certified - file 10381, Ordinary, under ASCO, L.P. HV274060007 and HV283852001
7. cCSAus Certified - file 13976, Hazardous, under ASCO, L.P. HV274060008
8. cCSAus Certified
9. FM and LPCB Approved - as part of Viking Deluge Valves
10. CE Directives Applicable (EMC 2014/30/EU)

Replaces Form No. F_020101 Rev 19.1 (Updated Wattage/DC Current and Fig 1 dimensions on 13843 & 13844, added G and VXD valve reference)

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4. INSTALLATION

1. Check nameplate for correct unit, including voltage and mode of operation. Follow all installation and maintenance instructions enclosed with the valve.
2. Standard solenoids may be mounted in any position. However, for optimum life and performance, solenoids should be mounted vertically and upright with the coil upright.
3. A 50 mesh strainer is required on the inlet side of the valve at the priming line connection. This strainer is included as part of the Model E, F, G and VXD Deluge Valve Trim and Model H or J Flow Control Valve Trim. Install the strainer as indicated on Viking's trim drawing. Install the solenoid according to markings on the valve body. Apply pipe-joint compound sparingly to male pipe threads only. If applied to valve threads, it may enter the valve and cause operation difficulty or leakage. Avoid putting pipe compound on first two male threads as well.
4. The unit must be wired in accordance with local and national electrical codes. For valves equipped with water tight enclosures, the electrical fittings must be approved for use in the hazardous location.
5. Upon completing the installation, the entire system must be tested for proper operation. See system description and testing instructions for additional information.

5. OPERATION

The solenoid valve is an internal pilot operated valve with pilot and bleed orifices utilizing line pressure for operation. Normally closed, de-energized valves open when energized. Power is applied to the solenoid coil, causing the solenoid core to lift, opening the pilot orifice to the outlet side of the valve. This relieves pressure on the top side of the diaphragm and allows the line pressure to open the valve. When de-energized, the solenoid core reseals the pilot orifice, allowing the line pressure to build above the diaphragm, closing the valve.

Normally closed solenoid valves are commonly used as releases for Viking deluge and flow control valves. Opening the solenoid valve allows the deluge or flow control valve to open.

NOTE: When using a normally closed solenoid valve as a release, a system will not operate automatically on total loss of power. For this reason, it is recommended and normally required that an emergency battery back-up, supervised power supply be provided to maintain fire protection during interruptions of the main power system and to meet the requirements of appropriate Authorities Having Jurisdiction.

6. INSPECTIONS, TESTS AND MAINTENANCE

NOTICE

The owner is responsible for maintaining the fire protection system and devices in proper operating condition. For minimum maintenance and inspection requirements, refer to recognized standards such as those produced by NFPA, LPC, and VdS which describe care and maintenance of sprinkler systems. In addition, the Authority Having Jurisdiction (AHJ) may have additional maintenance, testing and inspection requirements which must be followed.

⚠ WARNING

Any system maintenance or testing that involves placing a control valve or detection system out of service may eliminate the fire protection of that system. Prior to proceeding, notify all Authorities Having Jurisdiction. Consideration should be given to employment of a fire patrol in the affected area. Failure to follow these instructions could cause improper system operation, resulting in serious personal injury and/or property damage.

⚠ AVERTISSEMENT

Toute maintenance du système nécessitant la mise hors service d'une vanne de régulation ou d'un système de détection altérera les capacités de protection contre l'incendie de ce système. Avant de poursuivre, les procédures de fonctionnement en mode dégradé appropriées selon la norme NFPA 25 doivent être suivies avec l'information de toutes les autorités compétentes. Il faudrait envisager de faire appel à une patrouille de pompiers dans les zones touchées.

Si ces instructions ne sont pas respectées, cela pourrait entraîner un fonctionnement incorrect du système, entraînant des blessures graves et / ou des dégâts matériels.

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⚠ WARNING

Prior to operating the solenoid valve, be sure to close the system control valve to avoid unintentional operation of the deluge valve.

⚠ AVERTISSEMENT

AVANT D'UTILISER L'ELECTROVANNE, ASSUREZ-VOUS DE FERMER LA VANNE DE CONTRÔLE DU SYSTÈME POUR ÉVITER LE FONCTIONNEMENT NON INTENTIONNEL DE LA VANNE DELUGE.

Inspections:
It is imperative that the system is inspected and tested on a regular basis in accordance with NFPA 25. The frequency of the inspections may vary due to contaminated water supplies, corrosive water supplies, or corrosive atmospheres. In addition, the alarm devices, detection systems, or other connected trim may require a more frequent schedule. Refer to the system description and applicable codes for minimum requirements.

1. The valve must be operated at least monthly. The valve must open and close freely. When open, the water flow must be clear and clean at the proper flow rate. When closed, a total water shut-off must be observed. After the test, the strainer must be cleaned. Prior to cleaning the strainer, the priming line valve must be closed and the priming line depressurized. After the strainer is cleaned, the priming line valve must be reopened.
2. The valve must be inspected at least monthly for cracks, corrosion, leakage, etc., and cleaned, repaired, or replaced as necessary.
3. At least annually, the valve diaphragms and seats must be inspected and, if necessary, repaired or replaced.

⚠ WARNING

Close system control valve, turn off power supply, and depressurize valve before disassembling valve. It is not necessary to remove the valve from the pipe line to make inspections.

⚠ AVERTISSEMENT

FERMEZ LA VANNE DE COMMANDE DU SYSTÈME, COUPEZ L'ALIMENTATION ÉLECTRIQUE ET DÉPRESSURISEZ LA VANNE AVANT DE LA DÉMONTER. IL N'EST PAS NÉCESSAIRE D'ENLEVER LA VANNE DE LA TUYAUTERIE POUR FAIRE DES INSPECTIONS.

4. When lubricating valve components, use a high grade silicone grease (Dow Corning® 111 Compound Lubricant or equal).
5. When reassembling, tighten parts to torque values indicated in ASCO's maintenance instructions (packed with valve).
6. After maintenance is completed, operate the valve a few times to be sure of proper operation. A metallic "click" signifies the solenoid is operating.
7. It is recommended that the valve be replaced at seven-year intervals. Shorter intervals may be required if the valve is subject to corrosive water supplies or atmospheres.
8. All service must be performed by qualified personnel. Upon completion of inspections or replacement of the valve, the entire system must be checked for proper operation. See appropriate system description and testing instructions for additional information.

7. AVAILABILITY

The Viking Solenoid 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. GUARANTEE

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

TECHNICAL DATA

SOLENOID VALVES
RATED TO 250 PSI (17.2 BAR)

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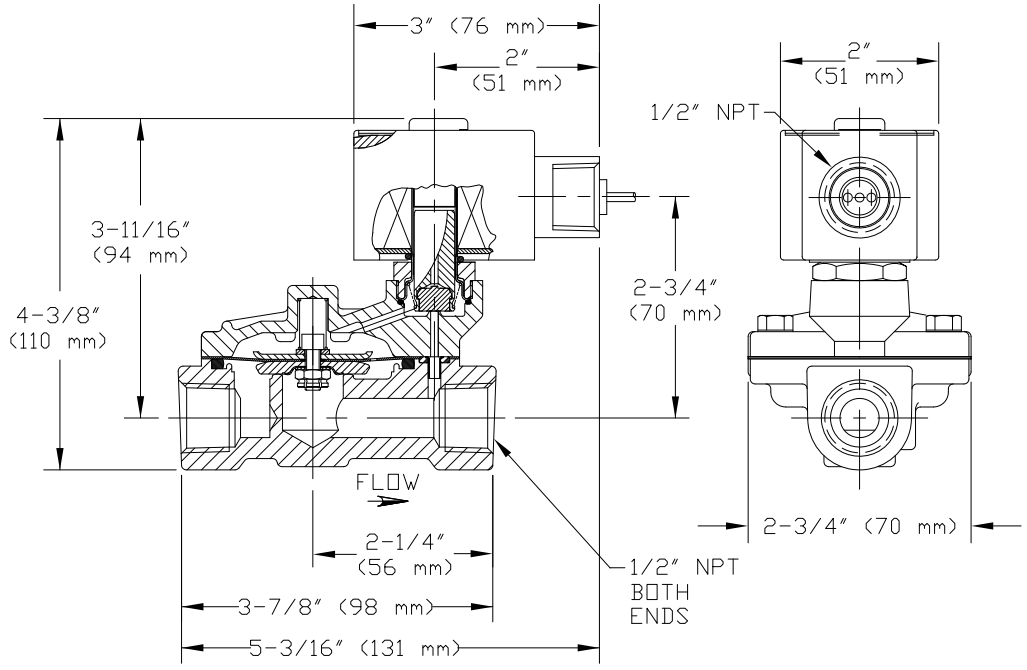


Figure 1
Dimensions for Part Numbers 11601, 11602 and 13215

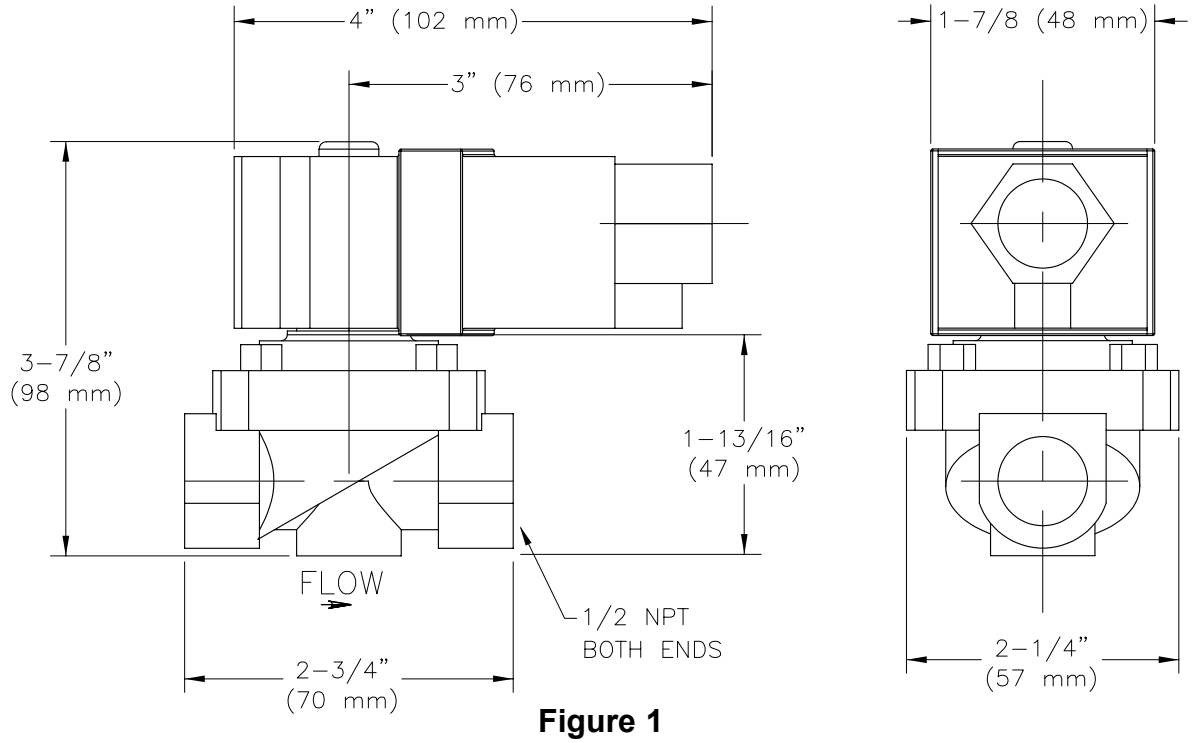


Figure 1
Dimensions for Part Numbers 13843 and 13844

Form No. F_020101 21.03.17 Rev. 21.1

Replaces Form No. F_020101 Rev 19.1 (Updated Wattage/DC Current and Fig 1 dimensions on 13843 & 13844, added G and VXD valve reference)

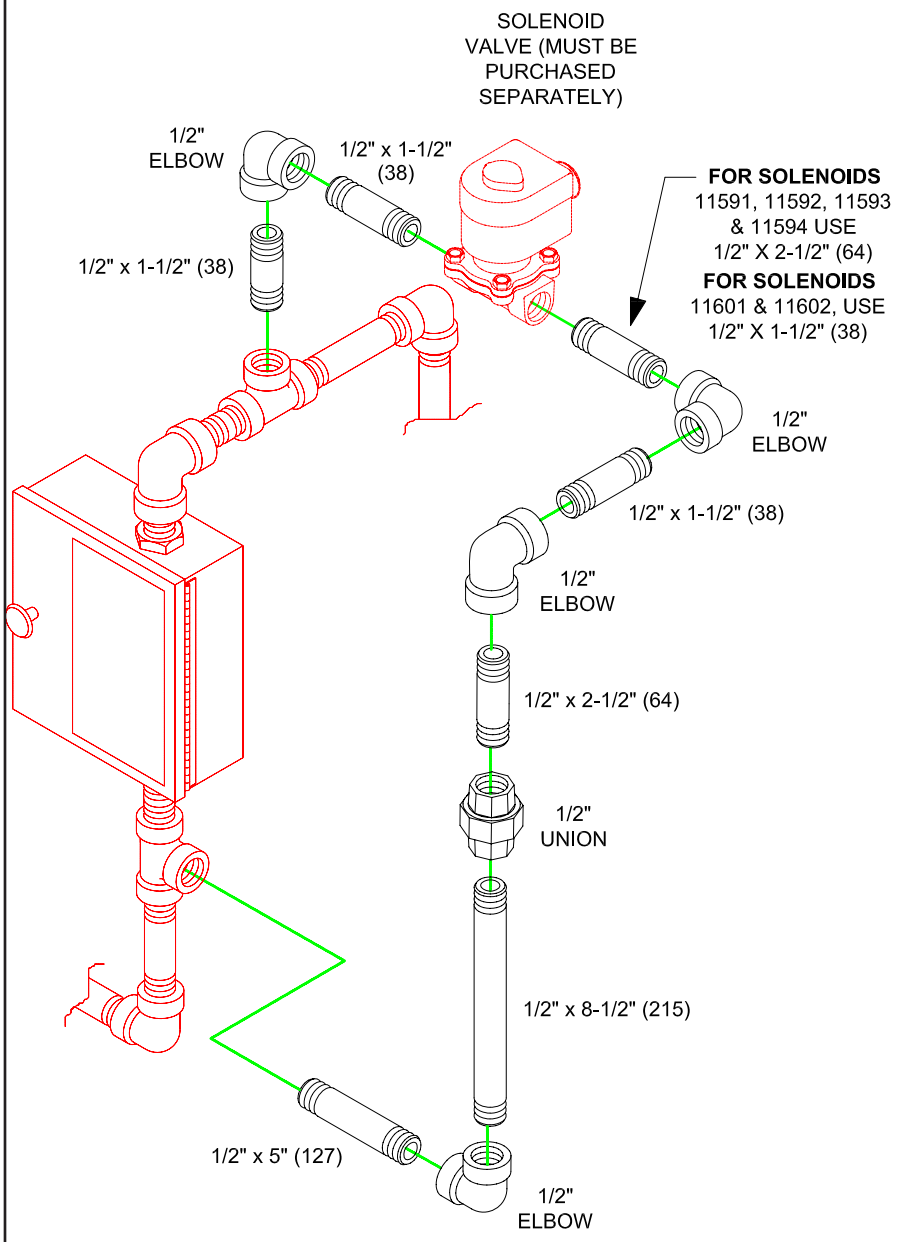
TECHNICAL DATA

ELECTRIC RELEASE MODULE TRIM CHART

Maximum 250 psi Water Working Pressure

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

Available since 1999.



For Use on Standard Trim	For Use on Brass* Trim	For Use on Stainless Steel* Trim
10830	10832	10831

NOTE: Order solenoid valve separately. Electric Release Module is for use with Viking Solenoid Valve Part Nos. 11591, 11592, 11593, 11594, 11601, and 11602.

The Viking Electric Release Module is for use on Viking Deluge and Flow Control valves only. Verify that the valve is trimmed with Conventional Trim installed according to the current Conventional Trim Chart for the valve used. Install the Electric Release Module using the connections provided and as shown in Figure 1 on this page.

*Refer to technical data describing the Halar® Coated Deluge Valve and the *Viking Foam Systems Engineering and Design Data* book for applications where brass and stainless steel trim are recommended.

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

ORDER DELUGE VALVE, TRIM, SOLENOID VALVE, AND RELEASE MODULE TRIM SEPARATELY.

FIGURE 1: ELECTRIC RELEASE MODULE

TECHNICAL DATA

FOAM RATIO CONTROLLER
MODEL VRC

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1. GENERAL DESCRIPTION

The ratio controller accurately proportions foam concentrate into a water stream over a wide range of water flow rates. Ratio controllers are an integral part of an approved foam system. In addition to the ratio controller, the main components of the approved foam system are specific foam concentrates, a foam storage tank, a concentrate control valve and foam discharge devices.
The system must be designed so that the ratio controller can accurately proportion foam over the range of flow rates expected during the system operation.
Intended for use in Wet, Dry, Deluge, Preaction and Refrigerated Area applications.
Please refer to specific system manual(s) for further information. This technical data is intended for trained experts. For further information, please contact the appropriate sales office in Section 5 or refer to the technical documentation.
The contents of this publication are subject to modifications without notice.

2. LISTINGS AND APPROVALS

The ratio controller is FM Approved and UL Listed as part of a fire extinguishing system combining designated foam concentrates, bladder tanks and discharge devices. Approved and Listed system components can be found at www.approvalguide.com and https://iq.ulprospector.com

FM Approved – Low Expansion Foam Systems (FM5130)

UL Listed – GFGV.EX27255, GHXV.EX5002, GLKX.EX27844 (UL162)

Certificated by the Academy of the State Fire Service of the Ministry of Emergency Situations of Russia. 123FL (Russia)

"SFFF compatible" refers to this product as being part of a SFFF Foam system that has been tested to recognized standards. Not all configurations are available. Please consult technical data and/or the Approval/Listing for usage requirements.

Other International approval certificates may be available upon request.

3. TECHNICAL DATA

3.1 Construction Features

- Available Grooved with 2" (DN50), 2.5" (DN65), 3" (DN80), 4" (DN100), 6" (DN150), 8" (DN200) connections and Flanged with 3" (DN80), 4" (DN100), 6" (DN150), 8" (DN200) connections
- Brass construction (Grooved only) or Nickel Aluminium Bronze construction for superior corrosion protection
- Horizontal or Vertical Installation
- Direction of flow indicator on body
- For use with Fresh or Salt Water
- Identification tag plate

Images are for illustration purposes only. Refer to drawings for actual design details.

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SFFF compatible

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3.2 Standard Materials

Table 3.2.1 - Standard Materials	
Nickel Aluminum Bronze Version (Grooved and Flanged connections)	
Body & Nozzle	Nickel Aluminum Bronze UNS C95800 – ASTM B148
Orifice	UNS-C36000 or C46400 or C95800
Snap Ring	Stainless Steel
Brass Version (Grooved only)	
Body & Nozzle	Cast Brass UNS C84400 – ASTM B584
Orifice	Brass UNS C36000
Snap Ring	Stainless Steel
*See notes in **Table 3.4.1** for ordering information*	

3.3 Standard Design Specifications

Table 3.3.1 - Standard Design Specifications	
All Versions	
Design Pressure	250 PSI / 17.2 bar (1.7MPa)
Design Temperature Range	14F to 120F (-10C to 49C)
Operating Temperature Range	35F to 120F (1.7C to 49C)
Minimum Operating Inlet Pressure	30 PSI / 2.1 bar (0.2MPa)
Maximum Operating Inlet Pressure	175 PSI / 12.1 bar (1.2MPa)
Proportioning Range	Refer to ***Table 3.4.1 or 3.4.2***

3.4 Ordering Information

1. Select connection type Grooved (Table 3.4.1) or Flanged (Table 3.4.2).
   Note: *Take care in selecting the correct part number due to different connection styles (different grooved outside diameters, flanges and threads)*
2. Select the Foam Concentrate Type in table 3.4.1 or 3.4.2
3. The minimum and maximum flow demand of the sprinkler/deluge system must be known to ensure correct selection of the ratio controller. The required minimum flow rate should be higher than the minimum flow rate shown in table 3.4.1 or 3.4.2 for the Foam Type selected in Step 2). The required higher flow rate should be lower than the maximum flow rate shown in table 3.4.1 or 3.4.2. If more than one size of ratio controller is suitable then size selection can then be based on the size of the riser or supply pipework into which the ratio controller will be installed.
   Note: *The flow rates in the FM Approval and UL Listing sometimes differ. Please check the flow range data in table 3.4.1 or 3.4.2 according to the FM Approval or UL Listing.*
4. After selecting the size, check the appropriate graph in section 7.2.1 to ensure the required flows are possible at the available system pressure. If not, it may be necessary to increase to the next pipe size.
   Note*: Grooved Nickel Aluminium Bronze Ratio Controllers are standard for EMEA and Asia sales regions and Brass is standard for the Americas. Flanged Ratio Controllers are only available in Nickel Aluminium Bronze.*

Ordering example: A Ratio Controller is required with a minimum flow rate of 65 GPM and maximum flow rate of 570 GPM using Viking XMAX Foam Concentrate in a 3” Wet System. The ordering part number is VRC089JAN in EMEA/Asia and F20152N in the Americas.

TECHNICAL DATA

FOAM RATIO CONTROLLER MODEL VRC

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Table 3.4.1 - Ordering information (Grooved Connection)

Connection		Foam Type[5]	Part Number		Foam Inlet Orifice Size		FM Approved				UL Listed			
Body Grooved	Foam Inlet Grooved		Nickel Aluminium Bronze[2,4]	Brass[3]	Inch	mm	Minimum Flow Rate[1]		Maximum Flow Rate[1]		Minimum Flow Rate		Maximum Flow Rate	
							GPM	L/min	GPM	L/min	GPM	L/min	GPM	L/min
2" (51mm)	1.5" (48,3mm)	Viking USP, 3%	VRC060JAL	F20282L	0.221	5.61	95	360	309	1170	--	--	--	--
		Viking ARK, 3%	VRC060JP	F20282P	0.227	5.77	93	352	300	1136	--	--	--	--
		Viking USP, 3%	VRCS060JAL	F25332L	0.127	3.22	49	185	104	394	--	--	--	--
		Viking ARK, 3%	VRCS060JP	F25332P	0.127	3.22	40	151	101	382	--	--	--	--
2.5" (76,0mm)	1.5" (48,3mm)	Viking USP, 3%	VRC076JAL	--	0.276	7.01	155	587	502	1900	--	--	--	--
		Viking ARK, 3%	VRC076JP	--	0.278	7.06	165	625	475	1798	--	--	--	--
2.5" (73,0mm)	1.5" (48,3mm)	Viking USP, 3%	VRC073JAL	F20162L	0.276	7.01	155	587	502	1900	--	--	--	--
		Viking ARK, 3%	VRC073JP	F20162P	0.278	7.06	165	625	475	1798	--	--	--	--
3" (88,9mm)	1.5" (48,3mm)	Viking XMAX	VRC089JAN	F20152N	0.362	9.19	--	--	--	--	50	189	740	2801
		Viking USP, 3%	VRC089JAL	F20152L	0.392	9.96	360	1363	775	2934	--	--	--	--
		Viking ARK, 3%	VRC089JP	F20152P	0.394	10.01	285	1079	770	2915	--	--	--	--
4" (114,3mm)	2" (60,3mm)	Viking XMAX	VRC114JAN	F20217N	0.485	12.32	--	--	--	--	46	174	1600	6057
		Viking USP, 3%	VRCF114JAN	F20217L	0.529	13.44	370	1401	1250	4732	--	--	--	--
			VRC114JAL	F205331L	0.513	13.03	--	--	--	--	420	1590	1515	5735
		Viking ARK, 3%	VRC114JP	F20217P	0.513	13.03	400	1514	1350	5110	--	--	--	--
6" (165,1mm)	2" (60,3mm)	Viking XMAX	VRC165JA	--	0.700	17.78	--	--	--	--	99	375	3050	11546
		Viking USP, 3%	VRC165JAL	--	0.738	18.75	845	3199	2350	8896	990	3748	2670	10107
		Viking ARK, 3%	VRC165JP	--	0.770	19.56	800	3028	2400	9085	--	--	--	--
6" (168,3mm)	2" (60,3mm)	Viking USP, 3%	VRC168JAN	F20214N	0.700	17.78	--	--	--	--	99	375	3050	11546
		Viking USP, 3%	VRC168JAL	F20214L	0.738	18.75	845	3199	2350	8896	990	3748	2670	10107
		Viking ARK, 3%	VRC168JP	F20214P	0.770	19.56	800	3028	2400	9085	--	--	--	--
8" (219,1mm)	2.5" (76,1mm)	Viking XMAX	VRC2196JAN	--	0.975	24.77	--	--	--	--	242	946	4942	19305
		Viking USP, 3%	VRC2196JAL	--	1.009	25.63	2010	7609	4640	17564	2000	7571	5050	19116
		Viking ARK, 3%	VRC2196JP	--	1.040	26.42	1900	7192	4250	16088	--	--	--	--
8" (219,1mm)	2.5" (73,0mm)	Viking XMAX	VRC2193JAN	F20137N	0.975	24.77	--	--	--	--	242	946	4942	19305
		Viking USP, 3%	VRC2193JAL	F20137L	1.009	25.63	2010	7609	4640	17564	2000	7571	5050	19116
		Viking ARK, 3%	VRC2193JP	F20137P	1.040	26.42	1900	7192	4250	16088	--	--	--	--

NOTES:

[1] Please refer to graphs in section 7.2 for specific flow rate parameters.
[2] Nickel Aluminium Bronze (NAB) - Standard Offering in Viking EMEA & APAC Territories. Brass available on request with longer delivery.
[3] Brass - Standard Offering in Viking Americas Territories. Nickel Aluminium Bronze available on request with longer delivery.
[4] NAB 73mm and NAB 219mm with 73mm foam inlet are non standard and could be subject to additional lead time and price.
[5] All foam types comply with the requirements of the EPA 2010/2015 PFOA Stewardship Program.

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Table 3.4.2 - Ordering information (Flanged Connection)

Connection		Foam Type[4]	Part Number [2]		Foam Inlet Orifice Size		FM Approved				UL Listed			
Body Flanged[3]	Foam Inlet Threaded		ANSI	PN16	Inch	mm	Minimum Flow Rate [1]		Maximum Flow Rate [1]		Minimum Flow Rate [1]		Maximum Flow Rate [1]	
							GPM	l/min	GPM	l/min	GPM	l/min	GPM	l/min
3" (DN80)	1,5" NPT (ANSI) or BSP (PN16) Thread	Viking 3% XMAX	VRC080JAN	VRC080PJAN	0.362	9.19	--	--	--	--	50	189	740	2801
		Viking USP, 3%	VRC080JAL	VRC080PJAL	0.392	9.96	360	1363	775	2934	--	--	--	--
		Viking ARK, 3%	VRC080JP	VRC080PJP	0.394	10.01	285	1079	770	2915	--	--	--	--
4" (DN100)	2" NPT (ANSI) or BSP (PN16) Thread	Viking 3% XMAX	VRC100AJAN	VRC100PJAN	0.485	12.32	--	--	--	--	46	174	1600	6057
		Viking USP, 3%	VRCF100AJAL	VRCF100PJAL	0.529	13.44	370	1401	1250	4732	--	--	--	--
			VRC100AJAL	VRC100PJAL	0.513	13.03	--	--	--	--	420	1590	1515	5735
		Viking ARK, 3%	VRC100AJP	VRC100PJP	0.513	13.03	400	1514	1350	5110	--	--	--	--
6" (DN150)	2" NPT (ANSI) or BSP (PN16) Thread	Viking 3% XMAX	VRC150AJAN	VRC150PJAN	0.700	17.78	--	--	--	--	99	375	3050	11546
		Viking USP, 3%	VRC150AJAL	VRC150PJAL	0.700	17.78	845	3199	2350	8896	990	3748	2670	10107
		Viking ARK, 3%	VRC150AJP	VRC150PJP	0.700	17.78	800	3028	2400	9085	--	--	--	--
8" (DN200)	2,5" NPT (ANSI) or BSP (PN16) Thread	Viking 3% XMAX	VRC200AJAN	VRC200PJAN	0.975	24.77	--	--	--	--	242	946	4942	19305
		Viking USP, 3%	VRC200AJAL	VRC200PJAL	0.975	24.77	2010	7609	4640	17564	2000	7571	5050	19116
		Viking ARK, 3%	VRC200AJP	VRC200PJP	0.975	24.77	1900	7192	4250	16088	--	--	--	--

NOTES:
[1] Please refer to graphs in section 7.2 for specific flow rate parameters.
[2] Flanged ratio controller not available in Brass - Nickel Aluminium Bronze only.
[3] ANSI and PN16 flanges with Flat Face (FF) only.
[4] Relevant foam types comply with the requirements of the EPA 2010/2015 PFOA Stewardship Program.

4. SCOPE OF DELIVERY

Ensure that all components are complete and in good condition. The ratio controller is supplied boxed, with data plate and an integral sized orifice disc specific to its approved/listed concentrate. Grooved couplings are not included.

5. AVAILABILITY

The product is available directly from Viking and official distributors only.

Americas:
The Viking Corporation
5150 Beltway SE
Caledonia, MI 49316
Tel.: (800) 968–9501
Fax: 269–818–1680
Technical Services: 1–877–384–5464
techsvcs@vikingcorp.com

6. PRODUCT VARIANTS

6.1 Options

- Suitable for Viking Foam Concentrates: 3% XMAX, 3% ARK, AND 3% USP
- Nickel Aluminum Bronze UNS C95800 or Brass UNS C84400 (see table 3.4.1)
- Pre-Assembled with Bladder Tank and water/foam pipe work

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6.2 Dimensions and Equivalent Length

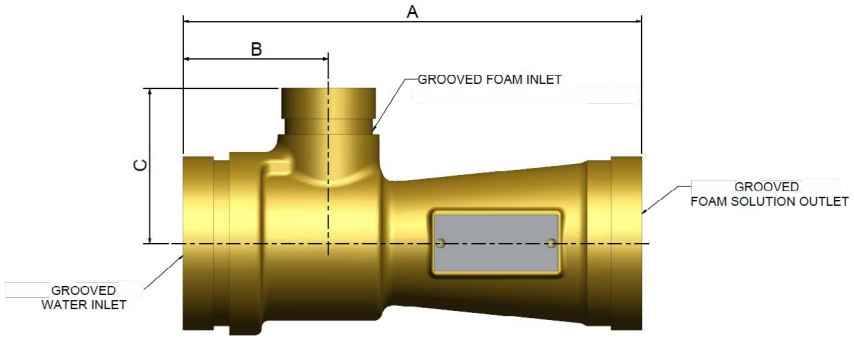

Figure 6.2.1 Model VRC Ratio Controller (Grooved)

Table 6.2.2 - Equivalent Length, Weight & Dimension Data

Nominal Size	Equivalent Length (friction loss)*		Approximate Weight				Approximate Dimensions							
			NAB Version		Brass Version		A		B		C		Grooved Foam Inlet	
	Feet	Metre	LBS	KGs	LBS	KGs	Inch	mm	Inch	mm	Inch	mm	Inch	mm
2” (DN50) Grooved	46	14.02	4.9	2.2	6.5	3.0	8-1/4	210	3	76	2-9/16	65	1.5	48.3
2” (DN50) VRCS Grooved	941	286.82	4.9	2.2	6.5	3.0	8-1/4	210	3	76	2-9/16	65	1.5	48.3
2.5” (DN65) Grooved	39	11.89	6.0	2.7	7.5	3.4	8-3/4	222	2-15/16	75	2-13/16	71	1.5	48.3
3” (DN80) Grooved	31	9.45	8.6	3.9	11.0	5.0	9-1/4	235	2-15/16	79	3-1/8	79	1.5	48.3
4” (DN100) Grooved	37	11.28	13.9	6.3	25.0	11.3	11	279	3-5/16	84	3-9/16	91	2	60.3
6” (DN150) Grooved	88	26.82	30.6	13.9	37.0	16.8	15	381	3-5/16	84	4-5/8	118	2	60.3
8” (DN200) Grooved	114	34.75	51.8	23.5	63.0	28.5	16-3/4	426	3-11/16	94	5-5/8	143	2.5	76.1
8” (DN200) Grooved	114	34.75	51.8	23.5	63.0	28.5	16-3/4	426	3-11/16	94	5-5/8	143	2.5	73.0

* Expressed in equivalent length of schedule 40 pipe based on Hazen & Williams C=120

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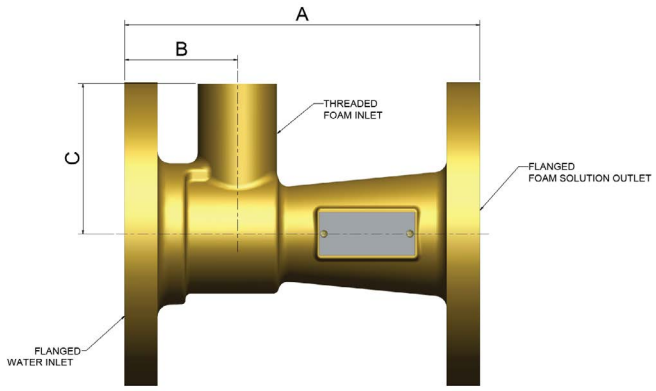

Figure 6.2.3 Model VRC Ratio Controller (Flanged)

Table 6.2.4 - Equivalent Length, Weight & Dimension Data

Nominal Size (Water Inlet/Foam Solution Outlet)	Equivalent Length (friction loss)*		Approximate Weight		Approximate Dimensions							
			NAB Version		A		B		C		Threaded Foam Inlet	
	Feet	Metre	LBS	KGs	Inch	mm	Inch	mm	Inch	mm	Inch	Type
3” PN16	31	9.45	27.2	12.3	9-1/4	235	2-15/16	79	3-15/16	100	1.5	BSP
3” ANSI	31	9.45	27.4	12.4	9-1/4	235	2-15/16	79	3-15/16	100	1.5	NPT
4” PN16	37	11.28	36.7	16.6	11	279	3-5/16	84	4-3/8	111	2	BSP
4” ANSI	37	11.28	37.1	16.8	11	279	3-5/16	84	4-3/8	111	2	NPT
6” PN16	88	26.82	62.7	28.4	15	381	3-5/16	84	5-7/16	138	2	BSP
6” ANSI	88	26.82	63.2	28.6	15	381	3-5/16	84	5-7/16	138	2	NPT
8” PN16	114	34.75	98.9	44.8	16-3/4	426	3-11/16	94	6-11/16	170	2.5	BSP
8” ANSI	114	34.75	99.6	45.1	16-3/4	426	3-11/16	94	6-11/16	170	2.5	NPT

* Expressed in equivalent length of schedule 40 pipe based on Hazen & Williams C=120

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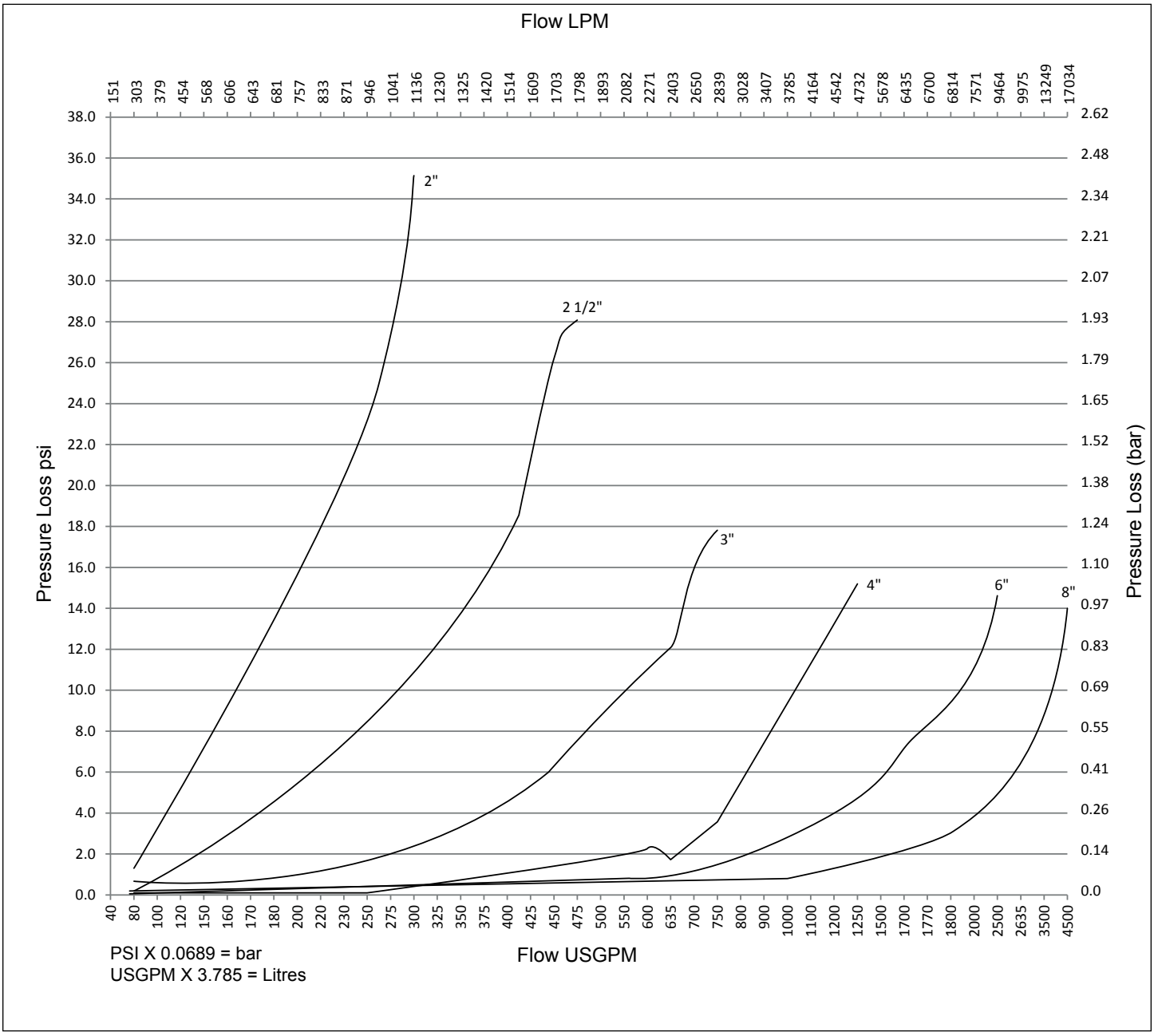
7. PERFORMANCE DATA

7.1 Friction Loss vs Foam Solution Flow



Graph 7.1.1
Friction Loss vs Foam Solution Flow (Model VRC, all sizes)

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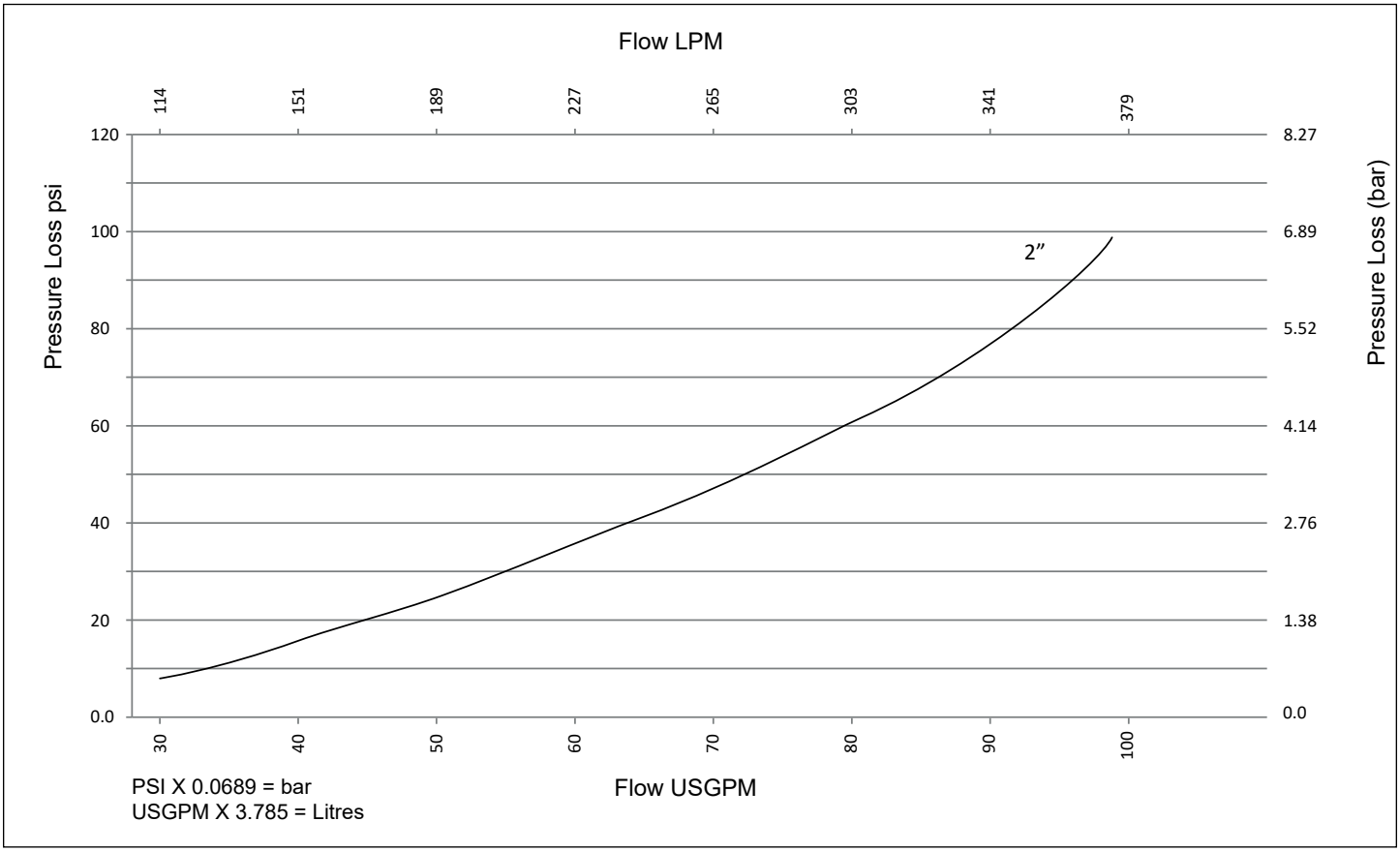

Graph 7.1.2
Friction Loss vs Foam Solution Flow (2” Model VRCS)

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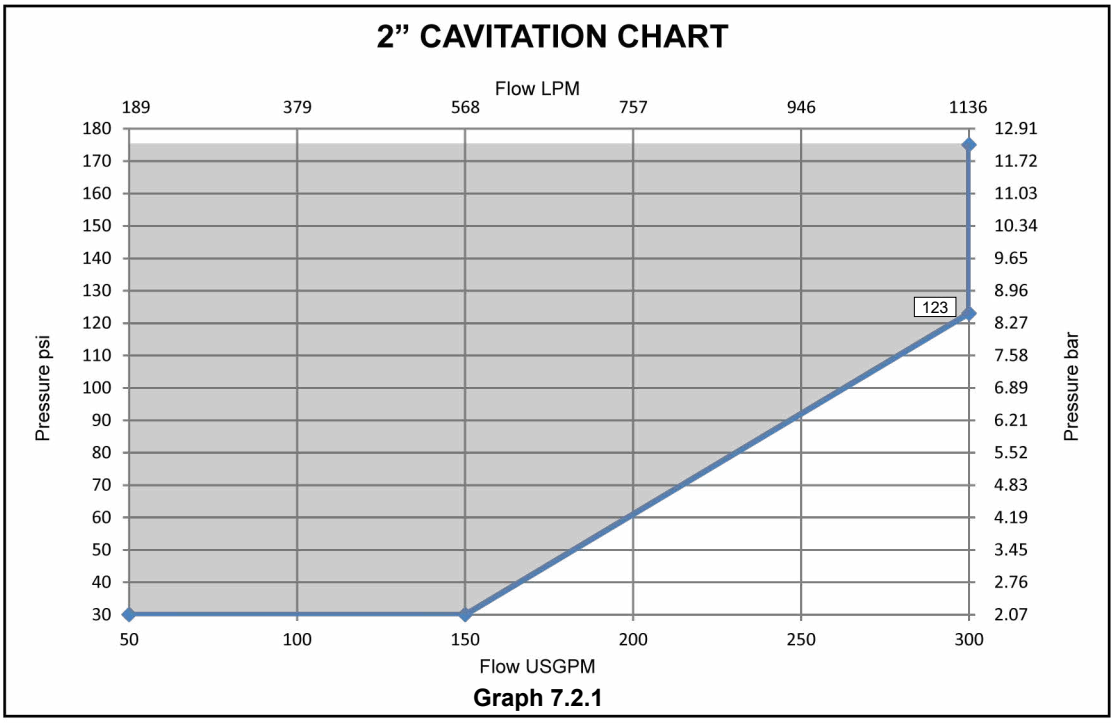
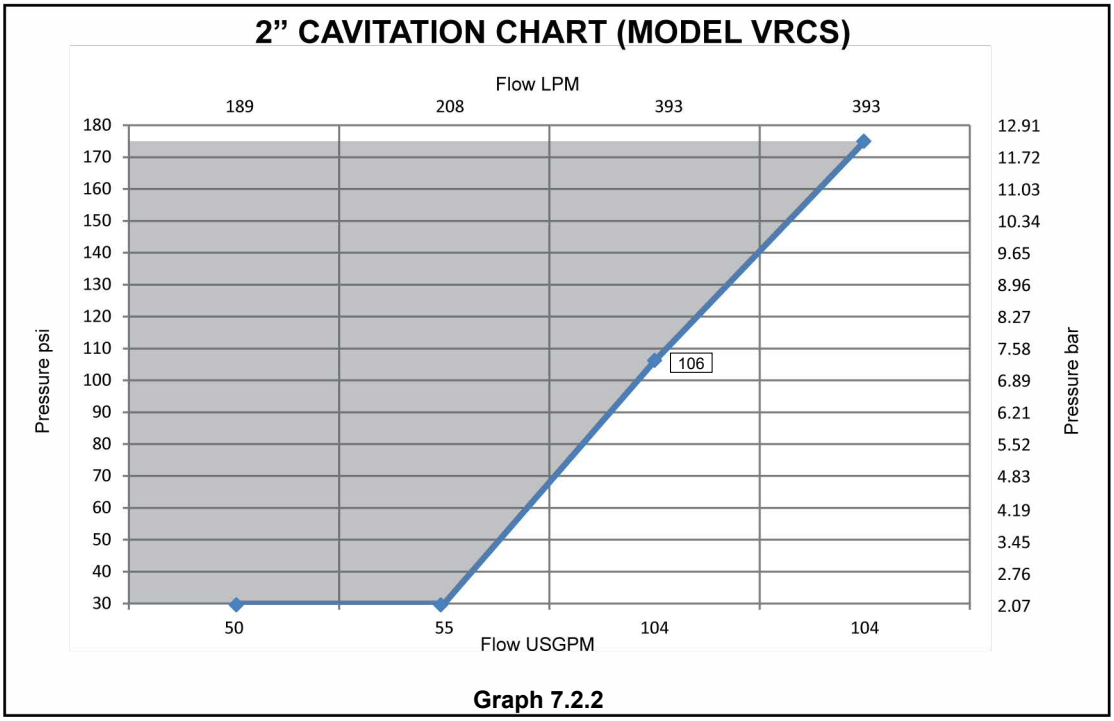
7.2 Inlet Pressure vs Foam Solution Flow

Ratio Controller must be used within the shaded flow and pressure conditions



Graph 7.2.1



Graph 7.2.2

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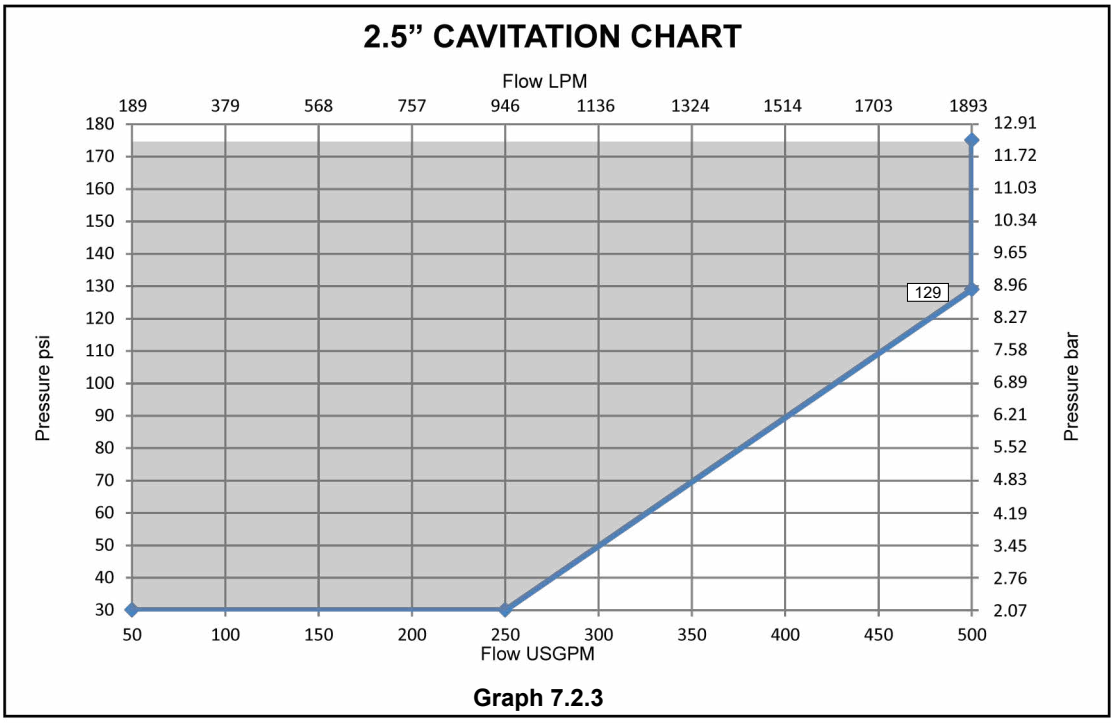
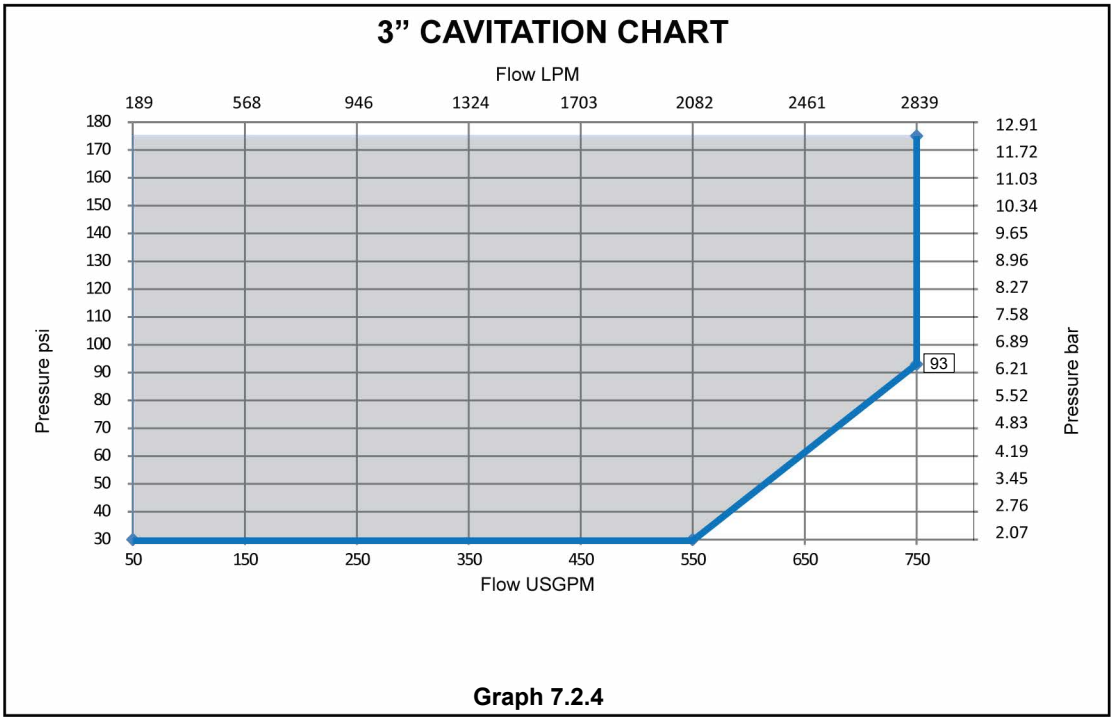


Graph 7.2.3



Graph 7.2.4

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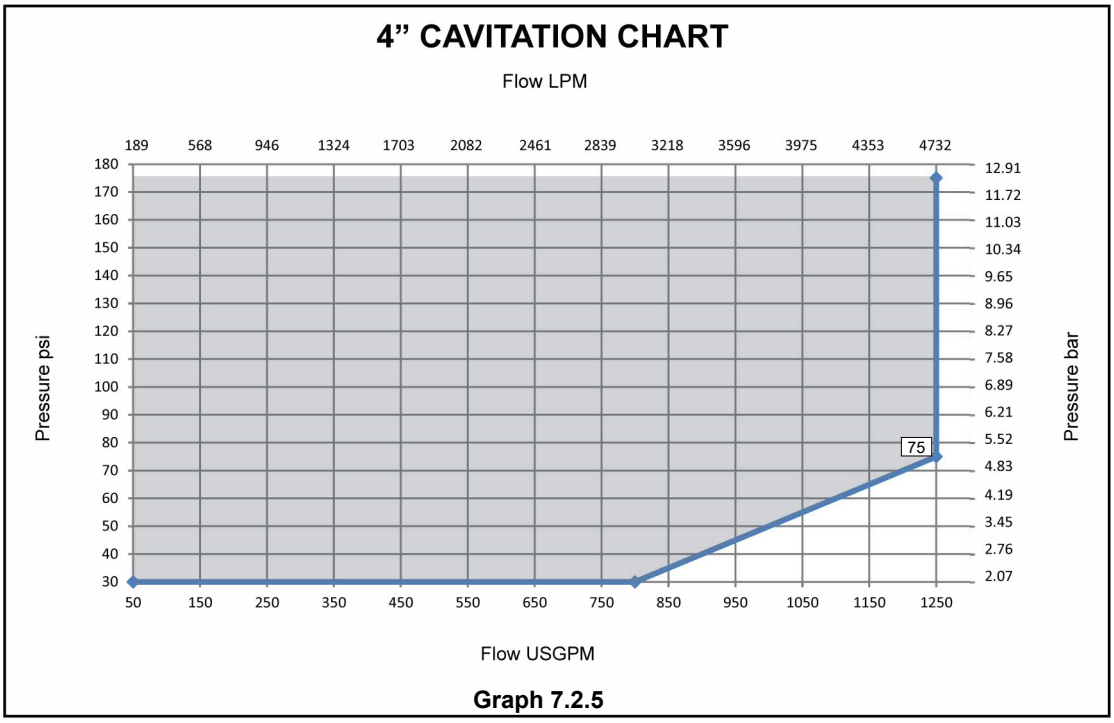
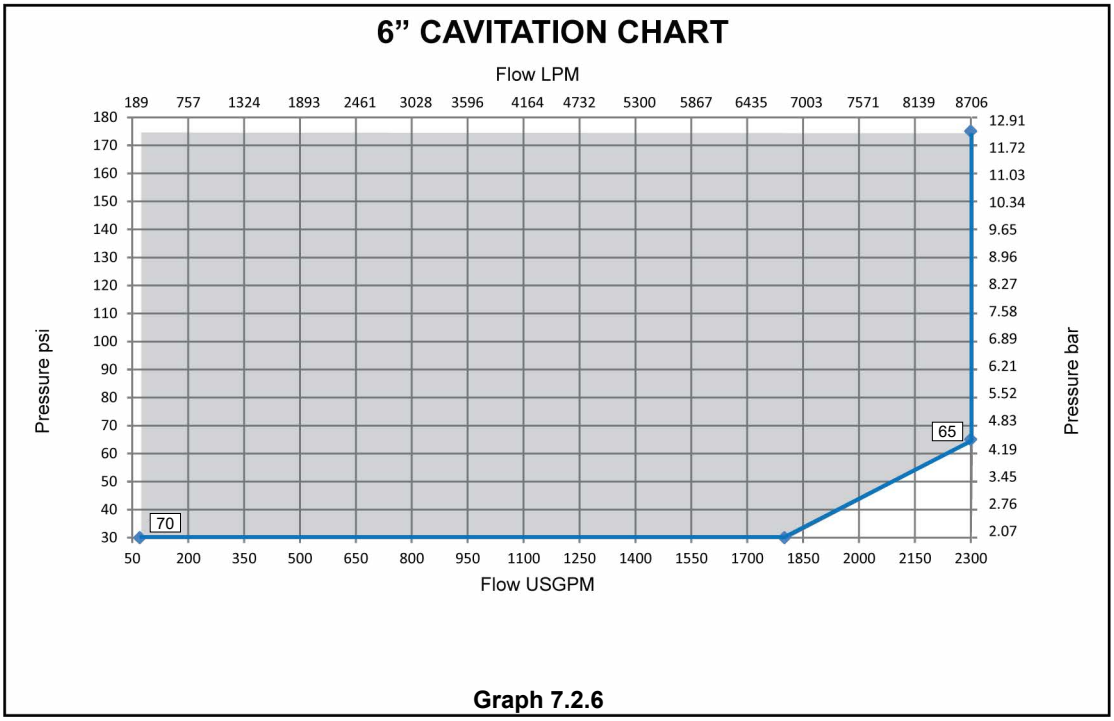


Graph 7.2.5



Graph 7.2.6

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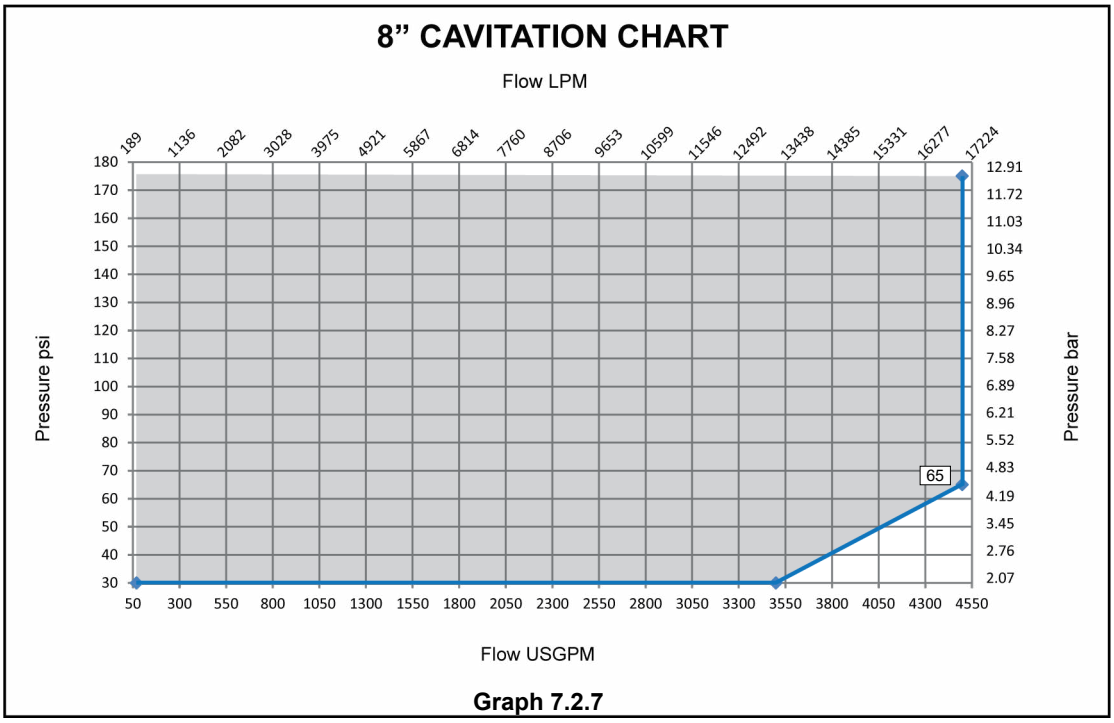

Graph 7.2.7

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8. INSTALLATION

Refer to appropriate Installation Standards (i.e. NFPA, VdS, LPCB, etc.) and / or applicable FM Global Property Loss Prevention Data Sheets such as 4-12, Foam-Water Sprinkler Systems. In addition, the “Authority Having Jurisdiction” (AHJ) may have additional installation requirements that must be followed.

Do not alter the piping without consulting a system design representative.

Before installing a ratio controller, check the system design drawing to ensure the controller location does not create excessive head pressure or frictional losses.

a) The ratio controller must be installed with the arrow pointing in the direction of the water flow.
b) The ratio controller can be installed in the vertical or horizontal position.
c) Straight piping equal to a minimum of five (5) pipe diameters should be installed before and after the ratio controller to help ensure proportioning accuracy. This includes the proportioning test connection which is best installed further downstream after changes in pipe direction which helps to ensure a better mixing of foam solution.
d) In Dry, Deluge and Preaction systems a removable section of pipe should be installed between the Concentrate Control Valve and Ratio Controller foam inlet to allow the flushing of foam concentrate after system activation.
e) The ideal location for the controller is level or below the top discharge and within 3 feet (1m) of the tank.
f) The pressure drop within the piping to the bladder tank water or foam concentrate piping can be minimized by:
    1) Limiting the number of tees and elbows used
    2) Using full port valves
    3) Increasing the pipe diameter
g) The combined total equivalent length (pipe length plus equivalent lengths for fittings and valves) of the water supply inlet piping and the foam concentrate discharge piping should not exceed 65 equivalent feet (19,8m).
h) The foam concentrate line should run as directly as possible from the bladder tank outlet to the ratio controller and avoid excessive changes in elevation.
i) The diameter of this piping must be the same size or larger than the foam concentrate inlet into the ratio controller.
j) Installation of a concentrate control valve (CCV) is highly recommended to prevent unintentional migration of foam from the bladder tank.
k) Install a suitable check valve between the bladder tank and ratio controller to prevent system water flowing back to the bladder tank. This should be installed close to the ratio controller foam inlet connection.
l) Care should be taken to ensure that the bladder tank and foam concentrate line are vented of trapped air to assist proportioning performance.

9. OPERATION

The ratio controller is a modified Venturi device. As water flows through the calibrated water nozzle, it creates an area of lower pressure, referred to as the metering pressure drop. As the water flow increases through the Venturi, the metering pressure drop increases, allowing more foam concentrate to enter through the sized foam orifice. A decrease in the water flow reduces the metering pressure drop, thereby reducing the foam concentrate flow.

Because the foam concentrate flow changes in direct proportion to the water flow, the ratio controller can accurately proportion foam concentrate over a wide range of water flow rates.

The flow rate at which the metering pressure drop is just high enough to overcome the pressure losses through the bladder tank and its piping, is called the low flow rating. The water flow rate through the ratio controller must be at or above its low flow rating in order to properly proportion foam concentrate.

10. GUARANTEE

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

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11. INSPECTION, TESTS AND MAINTENANCE

Refer to respective requirements, according to the relevant standards for Inspection, Testing and Maintenance.
If applicable, refer to FM Global Property Loss Prevention Datasheet 4-12 for specific test and commissioning criteria.
In addition, the “Authority Having Jurisdiction” (AHJ) may have additional maintenance, testing and inspection requirements that must be followed.

⚠ WARNING

Any system maintenance or testing that 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 Authorities Having Jurisdiction. Consideration should be given to employment of a fire patrol in the affected area.

12. DISPOSAL

At end of use the product described here should be disposed of via the national recycling system.

13. ACCESSORIES AND SPARE PARTS

None.

14. DECLARATION OF CONFORMITY

If required, Contact the appropriate Viking sales office in ***Section 5 Availability*** for further assistance.

TECHNICAL DATA

MODEL VNR WIDE RANGE PROPORTIONER

The Viking Corporation, 5150 Beltway Dr. SE, Caledonia MI, 49316
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com
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1. DESCRIPTION

The wide range proportioner accurately proportions foam concentrate into a water stream over a wide range of system flow rates. The device is configured to proportion foam concentrate at a 3% ratio. Wide range proportioners are an integral part of an approved foam system. In addition to the wide range proportioner, the main components of the approved foam system are: foam concentrate, a foam storage tank, a concentrate control valve, and foam discharge devices.

The system must be designed so that the wide range proportioner can accurately proportion foam over the range of flow rates expected during the system operation.

The wide range proportioner has the capability to accurately proportion foam concentrate into the water supply at low flow rates as required when only a small quantity of sprinklers have activated.

Please refer to specific system manual(s) for further information.

For further information, please contact the appropriate sales office in ***Section 5***, or refer to the technical documentation.

The contents of this publication are subject to modifications without notice.

Image for illustration purposes only

2. LISTINGS AND APPROVALS

FM Approved – Low Expansion Foam Systems (FM5130)

The wide range proportioner is FM Approved as part of a fire extinguishing system combining designated foam concentrates, bladder tanks and discharge devices. Approved system components can be found at www.approvalguide.com

Other International approval certificates may be available upon request.

"SFFF compatible" refers to this product as being part of a SFFF Foam system that has been tested to recognized standards. Not all configurations are available. Please consult technical data and/or the Approval/Listing for usage requirements.

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

3. TECHNICAL DATA

3.1 Construction features

- Available in 6” (DN150) and 8” (DN200) sizes
- Wafer connection for installation between ANSI and PN16 flanges
- Brass construction
- Horizontal or vertical installation
- Direction of flow indicator on body
- For use with fresh or salt water
- Identification tag plate

3.2 Standard Design Specifications

Table 3.2.1 - Standard design specifications	
Design pressure	250 psi / 17.2 bar (1.7 MPa)
Test pressure	500 psi / 34.4 bar (3.4 Mpa)
Design temperature range	14 °F to 120 °F (-10 °C to 49 °C)
Operating temperature range	35 °F to 120 °F (1.7 °C to 49 °C) (as per FM 5130)
Minimum operating inlet pressure	30 psi / 2.1 bar (0.2 MPa)
Maximum operating inlet pressure	175 psi / 12.1 bar (1.2 MPa)
Proportioning range	See ***Table 3.5.1***

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3.3 Components and Dimensions

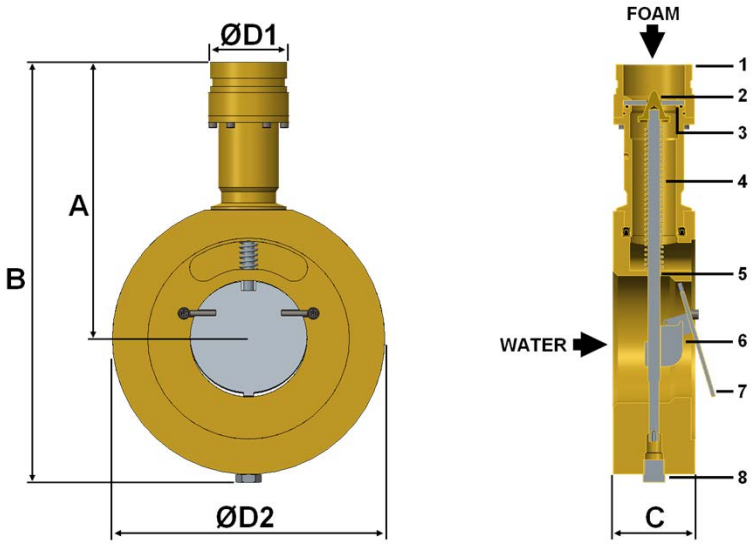

Figure 3.2.1: Components and Dimensions

Table 3.3.1 - Components					
Item	**Description**	**Item**	**Description**	**Item**	**Description**
1	Grooved foam inlet	4	Spring	7	Clapper
2	Orifice restrictor	5	Rod	8	Plug
3	Orifice plate	6	Threaded collar	-	-

Table 3.3.2 – Weights and Dimensions										
Nominal size (D2)	**Approximate weight**		**Approximate dimensions**							
			A		**B**		**C**		**Foam inlet (D1)**	
	lbs	**kg**	**Inch**	**mm**	**Inch**	**mm**	**Inch**	**mm**	**Inch**	**mm**
6” (150 mm) Wafer	47	21	9-1/4	236	13	353	2-3/4	70	2.5	76.1
6” (150 mm) Wafer	47	21	9-1/4	236	13	353	2-3/4	70	2.5	73.0
8” (200 mm) Wafer	71	32	10-7/8	277	16-1/2	419	3-1/4	82	2.5	76.1
8” (200 mm) Wafer	71	32	10-7/8	277	16-1/2	419	3-1/4	82	2.5	73.0

3.4 Standard Materials

Table 3.4.1 - Standard materials	
Body, neck, grooved inlet	Brass EN CB491K
Rod, clapper, threaded collar	Stainless steel
Orifice plate	UNS C95800
Spring	Stainless steel AISI-302 (DIN 17224)

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3.5 Ordering information

1. This wide range proportioner is for use with listed and approved foam concentrates at 3% proportioning rates.
2. The minimum and maximum flow demand of the fire protection system must be known to ensure correct selection of the wide range proportioner. The required minimum flow rate should be higher than the minimum flow rate shown in ***Table 3.5.1***. The required higher flow rate should be lower than the maximum flow rate shown in ***Table 3.5.1***. If more than one size is suitable, size selection can then be based on the size of the riser or supply pipework into which the wide range proportioner will be installed.
3. After selecting the size, check the appropriate graph in ***Section 6.2*** to ensure the required flows are possible at the available system pressure. If not, it may be necessary to increase to the next pipe size.

Table 3.5.1 - Ordering information

Connection		Foam type	Part number	Foam inlet orifice size[3]		FM approved			
Body wafer[2]	Foam inlet grooved					Minimum flow rate[1]		Maximum flow rate[1]	
				Inch	mm	GPM	l/min	GPM	l/min
6" (150mm)	2.5" (76.1mm)	Viking ARK, 3%	VNR066P	0.717	18.2	50	189	1895	7,173
		Viking USP, 3%	VNR066L	0.709	18.0	50	189	1420	5375
6" (150mm)	2.5" (73.0mm)	Viking ARK, 3%	VNR063P	0.717	18.2	50	189	1895	7,173
		Viking USP, 3%	VNR063L	0.709	18.0	50	189	1420	5375
8" (200mm)	2.5" (76.1mm)	Viking ARK, 3%	VNR086P	0.945	24.0	50	189	3003	11,368
		Viking USP, 3%	VNR086L	0.929	23.6	50	189	3010	11,394
8" (200mm)	2.5" (73.0mm)	Viking ARK, 3%	VNR083P	0.945	24.0	50	189	3003	11,368
		Viking USP, 3%	VNR083L	0.929	23.6	50	189	3010	11,394

NOTES:
[1] Please refer to graphs in ***Section 6.2*** for specific flow rate parameters.
[2] Can be installed between ANSI or PN16 flanges
[3] Foam inlet orifice is variable up to the point when the hinged clapper is fully open

4. SCOPE OF DELIVERY

a) Ensure that all components are complete and in good condition.
b) Check that the tamper proof seal on bottom plug is not damaged or removed. In case of either scenario, report immediately to supplier.
c) The wide range proportioner is supplied boxed, with a fixed data plate and an integral sized orifice disc specific to its approved/listed foam concentrate.
d) Grooved couplings and flange kits are not included.

5. AVAILABILITY

Please contact your local Viking sales office for further information. The product is available directly from Viking and official distributors only.

Americas:
The Viking Corporation
5150 Beltway SE
Caledonia, MI 49316
Tel.: (800) 968–9501
Fax: 269–818–1680
Technical Services: 1–877–384–5464
techsvcs@vikingcorp.com

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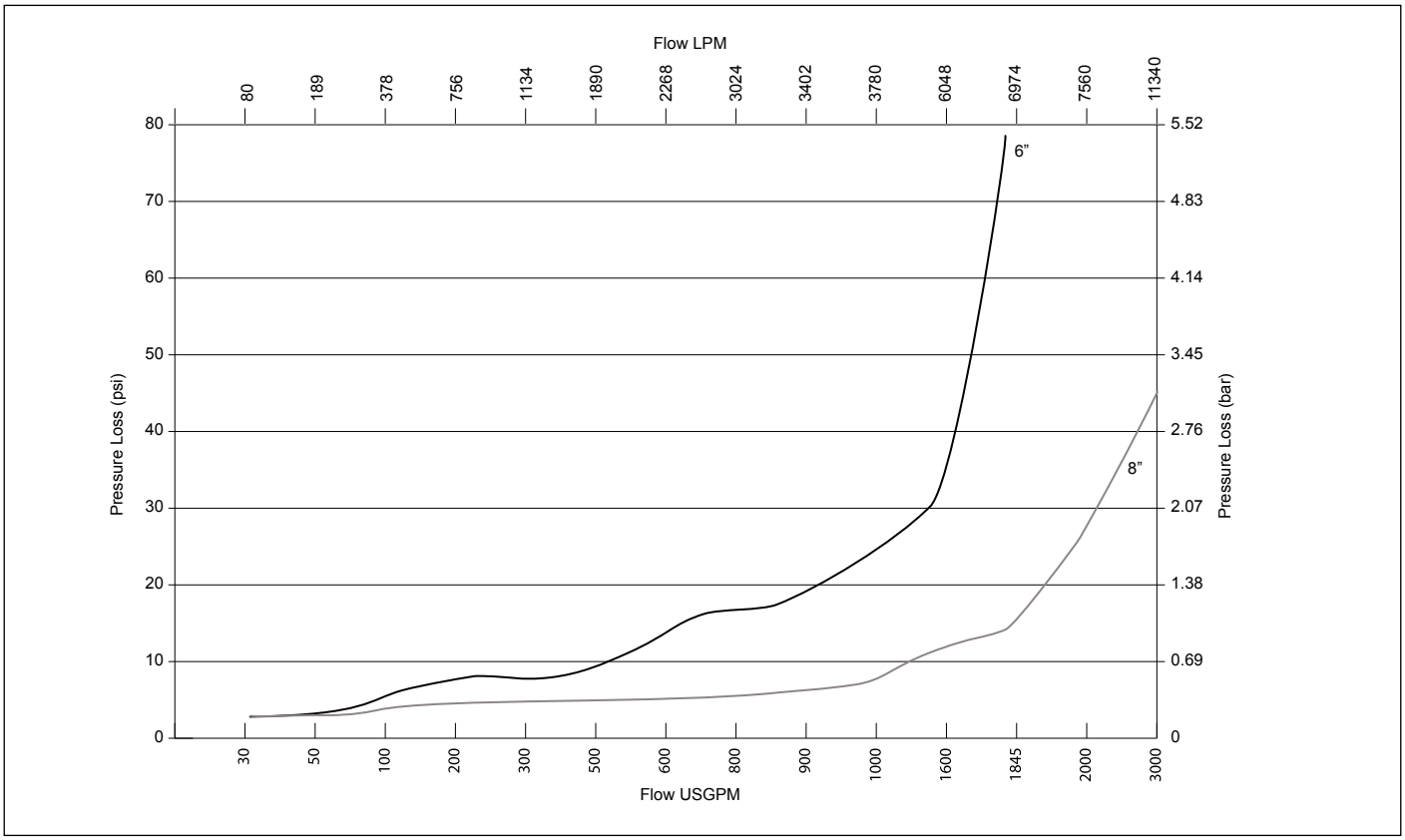
6. PERFORMANCE DATA

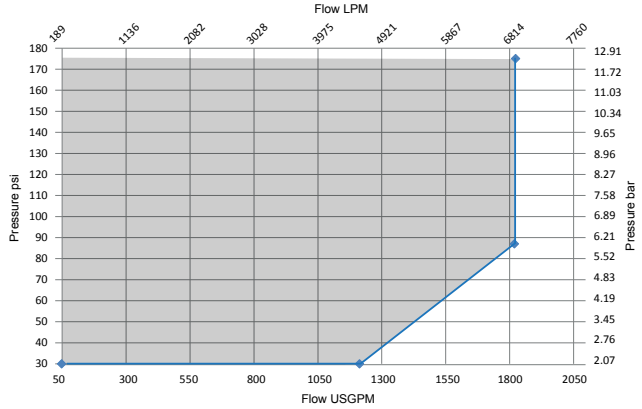
6.1 Friction loss vs foam solution flow



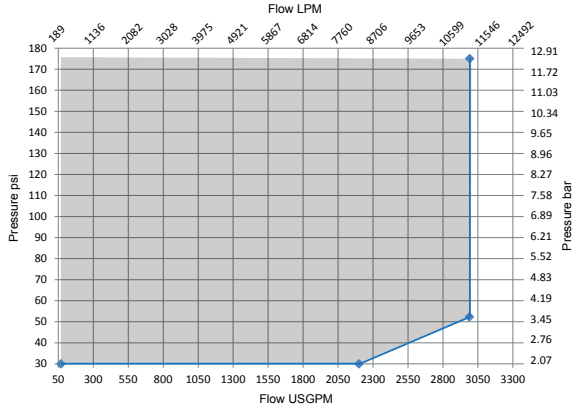
6.2 Inlet pressure vs foam solution flow

Wide range proportioner must be used within the shaded flow and pressure conditions.

6" CAVITATION CHART



8" CAVITATION CHART



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7. INSTALLATION

⚠ WARNING **Adjustment of the epuipment poses the risk of fatal consequences.**

The wide range proportioner must not be adjusted. A security tag is placed on the plug (#8) to prevent unauthorized adjustment.

Refer to appropriate Installation Standards (i.e. NFPA, VdS, LPCB, etc.) and / or applicable FM Global Property Loss Prevention Data Sheets such as 4-12, Foam-Water Sprinkler Systems. In addition, the Authority Having Jurisdiction (AHJ) may have additional installation requirements that must be followed.

Do not alter the piping without consulting a system design representative.

Before installing a wide range proportioner, check the system design drawing to ensure the device location does not create excessive head pressure or frictional losses.

⚠ WARNING

The wide range proportioner must not be installed in dry pipework. If used in preaction, dry or deluge type systems, the wide range proportioner must be installed in the wet pipework upstream of the system control valve.

a) Check that the tamper proof seal on bottom plug is not damaged or removed. In case of either scenario, report immediately to supplier.
b) The wide range proportioner must be installed with the arrow pointing in the direction of the water flow.
c) The wide range proportioner can be installed in the vertical or horizontal position.
d) If installed in the system riser, consideration should be given to drainage as the clapper (7) acts as a partial check valve which will result in slow drainage. Use of or installation of a drain valve downstream of the wide range proportioner is advisable for faster drainage.
e) Straight piping equal to a minimum of five (5) pipe diameters should be installed upstream and five (5) downstream of the wide range proportioner to help ensure proportioning accuracy.
f) A check valve must be placed on the foam concentrate line and a concentrate control valve is highly recommended.
g) A removable section of pipe should be installed between the check valve and wide range proportioner foam inlet to allow the flushing of foam concentrate after system activation.
h) The ideal location for the wide range proportioner is level with or below the top tank discharge point and within 3 ft. (1m) of the tank.
i) The combined total equivalent length of pipe (pipe length, plus equivalent lengths for fittings and valves), including both the water supply inlet piping and the foam concentrate discharge piping, should not exceed 65 equivalent feet (19.8 m). This will allow both pipes to be the same size as the foam liquid inlet to the wide range proportioner.
j) The pressure drop within the piping to the bladder tank water or foam concentrate piping can be minimized by:
    1. Limiting the number of tees and elbows used
    2. Using full port valves
    3. Increasing the pipe diameter
k) Care should be taken to ensure that the bladder tank and foam concentrate line are vented of trapped air to assist proportioning performance.

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8. OPERATION

The wide range proportioner is a modified venturi device for use in bladder tank balanced pressure type proportioning systems. As water flows through the device, it creates an area of lower pressure, referred to as the metering pressure drop. As the water flow increases through the venturi, the metering pressure drop increases, allowing more foam concentrate to enter through the sized foam orifice. The foam orifice size is specific to the foam concentrate used. A decrease in the water flow reduces the metering pressure drop, thereby reducing the foam concentrate flow.

Because the foam concentrate flow changes in direct proportion to the water flow, the wide range proportioner can accurately proportion foam concentrate over a wide range of system flow rates.

The flow rate at which the metering pressure drop is just high enough to overcome the pressure losses through the bladder tank and its piping, is called the low flow rating. The water flow rate through the wide range proportioner must be at or above its low flow rating in order to properly proportion foam concentrate.

The wide proportioner is designed to accurately proportion foam at low flow rates when a small number of sprinklers are operating.

The proportioning is accomplished by means of a variable geometry concept where the foam concentrate inlet size varies as a function of the sprinkler system's water flow rate. When water passes through the main waterway as described above, the hinged clapper (7) changes the geometry of the orifice restriction (2) thereby increasing the cross sectional area of the foam inlet. The clapper (7) and the orifice restriction (2) progressively open further as the system flow rate increases. At larger water flow rates, the water clapper (7) and the orifice restriction (2) are fully open. (Refer to ***Table 3.3.1***).

9. GUARANTEE

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

10. INSPECTION, TESTS AND MAINTENANCE

Refer to respective requirements, according to the relevant standards for Inspection, Testing and Maintenance. If applicable, refer to FM Global Property Loss Prevention Datasheet 4-12 for specific test and commissioning criteria. In addition, the "Authority Having Jurisdiction" (AHJ) may have additional maintenance, testing and inspection requirements that must be followed.

NOTICE

The owner is responsible for maintaining the fire protection system and devices in proper operating condition.

WARNING

Any system maintenance or testing that 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 Authorities Having Jurisdiction. Consideration should be given to employment of a fire patrol in the affected area.

11. DISPOSAL

At end of use the product described here should be disposed of via the national recycling system.

12. ACCESSORIES AND SPARE PARTS

This device is not field repairable and there are no spares parts.

13. DECLARATION OF CONFORMITY

If required, contact the appropriate Viking sales office in ***Section 5 Availability*** for further assistance.

TECHNICAL DATA

VERTICAL AND HORIZONTAL BLADDER TANKS MODEL VFT ASME Sec.VIII Div.1 - U-1A

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1. GENERAL DESCRIPTION

The bladder tank is a carbon steel pressure vessel containing an elastomeric bladder between the water and foam concentrate. The bladder permits water pressure to be transferred to the foam concentrate without the two fluids mixing together.
This Technical Data Page is intended for trained experts. It contains basic information needed to use the product described. Legally binding is the product operation and maintenance manual which must be observed.
For further information, please contact the appropriate sales office in Section 5 Availability or refer to the technical documentation.
The contents of this publication are subject to modifications without notice.

2. LISTINGS AND APPROVALS

The bladder tank is FM Approved and/or UL Listed as part of a fire extinguishing system combining designated foam concentrates, specific proportioning equipment, and discharge devices. Approved and Listed system components can be found at www.approvalguide.com and https://iq.ulprospector.com

FM Approved – Low Expansion Foam Systems (FM5130)

UL Listed – Guide GFGV.EX27255 & GHXV.EX5002 (UL162)

Constructed according to ASME Boiler and Pressure Vessel Code (BPVC) Sec.VIII Div.1 with U-1A (“U” Stamp certification process.

CE marked according to the PED Directive 2014/68/EU (Europe Only)

NOTE: Other international approval certificates may be available upon request.

“SFFF compatible” refers to this product as being part of a SFFF Foam system that has been tested to recognized standards. Not all configurations are available. Please consult technical data and/or the Approval/Listing for usage requirements.

Photographs are for illustration purposes only. Refer to drawings for actual design details.

SFFF compatible

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

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3. TECHNICAL DATA

3.1 Construction Features

- Vertical tanks on legs or horizontal tanks on saddles
- Legs and saddles are provided with mounting brackets/holes.
- Approved system design pressure of 175 PSI (12.1 bar) or 232 PSI (16.0 bar)
- 100% pressure tested according to the applied design code
- Shell and heads in ASME SA-516 Gr.70
- Lockable corrosion resistant brass tank trim/service ball valves (UL Listed / FM Approved)
- Inspection flange available on left or right side of horizontal tanks (left as standard)
- Machine welded circumferential and longitudinal seams for maximum quality and durability
- Welded lifting lugs to facilitate safe handling operations
- Earth lug for electrical safety
- Safety thermal valve for water side of bladder to prevent slow overpressure and relieve thermal fluctuations
- Bladder equipped with cast rubber caps to ensure water & foam integrity under constant pressure
- Bladder specifically tested for compatibility with foams shown in FM Approval and UL Listing
- Oversized to permit concentrate thermal expansion (volume expansion allowance)
- Tank equipped with inside protection at any opening to ensure no damage to the bladder
- Internal PVC foam concentrate distribution pipe ensures optimal foam concentrate usage
- Internal water distribution channel to equalize the water pressure everywhere avoiding damage to the bladder and to drain the tank during service and maintenance
- Nameplate holder to avoid undetected corrosion on the tank's shell behind the plate
- Sight Tube level indicator
- External epoxy zinc rich primer with aliphatic polyurethane finish tested by FM and UL for corrosive atmosphere (salt fog)

3.2 Standard Materials

Table 3.2.1 - Standard Materials	
Tank shell and heads:	ASME SA-516 Gr. 70
Bladder:	Reinforced NBR and EPDM
Trim valves:	Brass
Safety thermal relief valve:	Brass
Level indicator:	Sight Tube: PVC
Paint:	Epoxy zinc rich primer with aliphatic polyurethane finish
Standard colour:	Flame Red RAL3000
Connection:	Grooved (2.5" available with 73.0 or 76.1 mm - specify upon ordering)

3.3 Standard Design Specifications

Table 3.3.1 - Standard Design Specifications	
Design pressure:	175 PSI / 12.1 bar (1.2MPa) **or** 232 PSI /16.0 bar (1.6MPa)
Operating temperature range*:	35°F to 120°F (1.7°C to 49°C)
Capacity:	See tables
Empty weight:	See tables
Proportioning range:	See Ratio Controller data sheet
(*) Refer to the appropriate proportioner for faom concentrate being used.	

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3.4 Ordering Information

The following information is provided to ensure that the correct design requirements are provided during the order and manufacturing process. Mandatory information is required in every case. Optional information is required in case of special project or specification requirements.

Table 3.4.1: Ordering Information

	Ref	Criteria	Option
Mandatory Information (required for quote/order processing)	1a	Configuration	a) Vertical b) Horizontal
	1b	Capacity	a) 25 to 4000 US Gallons Vertical b) 50 to 5250 US Gallons Horizontal (see tables for available sizes)
	1c	Design Code	ASME Bolier and Pressure Vessel (BPVC) Code with U-1A Manufacturer Data Report
	1d	Standby Pressure Rating	a) 175 PSI / 12.1 bar (1.2 MPa) b) 232 PSI /16.0 bar (1.6 MPa)
	1e	Inspection Flange	a) Left (Standard) b) Right (required for Horizontal Tanks only)
	1g	Language	Select Bladder Tank Manual Language (see Table 12.1.2)
Optional	2a	Design Temperature	Contact technical department
	2b	Corrosion Allowance	Contact technical department
	2c	Radiographic Test Report (*)	Contact technical department
	2d	Liquid Penetrant Test Report (*)	Contact technical department
Pre-Assembled with Ratio Controller	3a	Ratio Controller Size(s)	2”, 2.5”, 3”, 4”, 6”, 8”
	3b	Direction of Flow	a) Left to right b) Right to left (direction of flow as you face the tank)
	3c	Water Line Piping	Carbon Steel
	3d	Foam Line Piping	a) Brass b) Stainless Steel
	3e**	Foam Concentrate Type(**)	a) 3% xMAX b) Viking ARK 3% c) Viking USP 3%
	3f	Concentrate Control Valve	Viking Halar CCV (FM|UL) or Hydraulic Ball Valve

(*) With additional cost
(**) These foam concentrates have been tested for bladder compatibility as per UL162 and/or FM5130. The long term compatibility of other foams concentrates cannot be verified.

INFORMATION

Some of the available options may be not covered by the UL Listing or FM Approval. Please always make reference to the appropriate approval directory or guides or contact the appropriate sales office in Section 5 Availability for further assistance.

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4. SCOPE OF DELIVERY

Ensure that all components are complete and in good condition.
The bladder tank is supplied in or on a suitable wooden pallet skid or shipping crate in the horizontal position.
All bladder tanks have lifting lugs to allow safe maneuverability on site.
Tank is supplied empty with pre-installed bladder.
Small trim valves and contents level device are supplied pre-assembled to the tank as standard.
Safety thermal relief valve supplied as standard, unmounted from tank. UV marked Safety Valve according to ASME BPVC Sec. VIII Div.1 available for an additional cost.
Anchor fixing bolts are not part of our supply scope.

Table 4.1.1 - Documentation

Standard Documentation	Optional Documentation *
Warranty Certificate	Dimensional Drawings
PED Declaration or Conformity	Material Certificates according to ASME Code Specifications
Safety Thermal Relief Valve Declaration of Conformity	Certificate of Conformity Type 2.1 to EN10204
Hydrostatic Pressure Test Certificate	Design Structural Calculations
Bladder Pneumatic Test Certificate	Spot or Full Radiographic Examination with Report (when not mandatorily required by design parameters)
Painting Inspection Certificate	Spare Parts List
Final Inspection Certificate	Copy of Procedure Qualification Record (PQR) and Welding Procedure Specification (WPS) according to tank construction code
Operating, Filling and Maintenance Manual (English)	Operating, Filling and Maintenance Manual (Language)
Manufacturer Data Report Form U-1A	
(*) Contact the sales office listed in section 5 for further information and price.	

5. AVAILABILITY

The Viking Corporation, 210 N. Industrial Park Drive, Hastings,Michigan 49058, Toll free phone: (800) 968-9501

6. PRODUCT VARIANTS

6.1 Options

- Flanged connections (ANSI or PN16)
- Special coatings for salt-water applications or harsh environmental conditions
- Nameplate in corrosion resistant material
- Increased wall thickness for corrosion allowance
- Internal coatings such as epoxy tar
- 232 PSI /16.0 bar (1.6 MPa) design pressure rating with UL Listing and FM Approval
- Other design pressure and seismic ratings
- Ladders | Work Platform | Sunshield
- Full bladder tank stainless steel construction
- Heat tracing and/or insulation
- Bladder tank pre-installed on base frame or containerized to customer requirements
- Various colors and painting cycles with UL Listing and FM Approval (120-300 microns)
- Nondestructive examinations
- Factory acceptance test, notified body or third party inspections
- Special sea freight and fumigated packaging
- UV certified Safety Valve according to ASME BPVC Code Sec.VIII Div.1

Please contact us for further details, pricing and availability

INFORMATION *Some of the available options may be not covered by the UL Listing or FM Approval. Please always make reference to the appropriate approval directory or guides or contact us for further assistance.*

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6.2 General bladder tank layout and P&ID

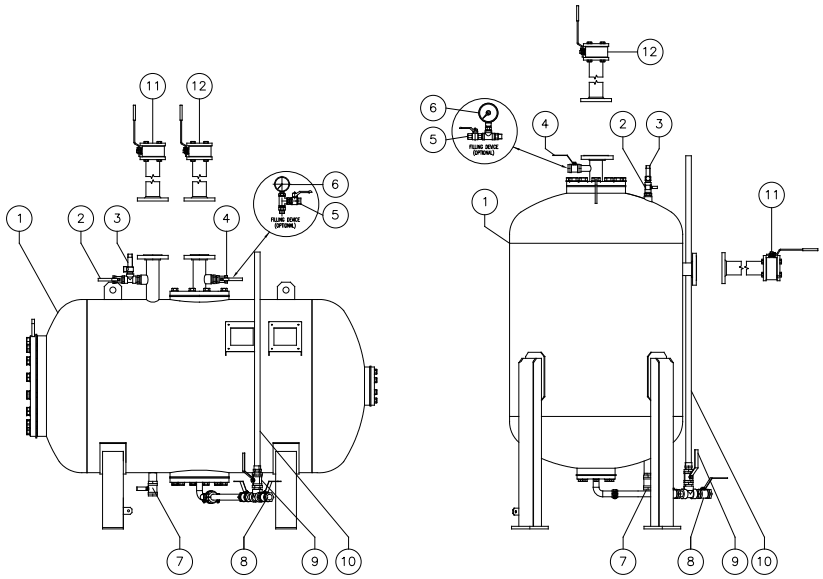

Figure 6.2.1
Vertical and Horizontal Bladder Tanks

Table 6.2.2 - General Bladder Tank Layout and P&ID

Item	Description	Item	Description
1	Bladder Tank	7	Water Filling/Drain Valve (NPT)
2	Water Vent Valve (NPT)	8	Foam Concentrate Filling/Drain Valve (NPT)
3	Safety Thermal Relief Valve	9	Concentrate Level Indicator Drain Valve
4	Foam Concentrate Vent Valve (NPT)	10	Concentrate Level Indicator
5	Filling Vent Valve (Optional)	11	Water Shut Off Valve (to be ordered separately)
6	Filling Pressure Gauge 1-10 kpa (Optional)	12	Foam Concentrate Shut Off Valve (to be ordered separately)
Note: Item 10 shown with Sight Tube. Level Gauge also available and connected at position 10.			

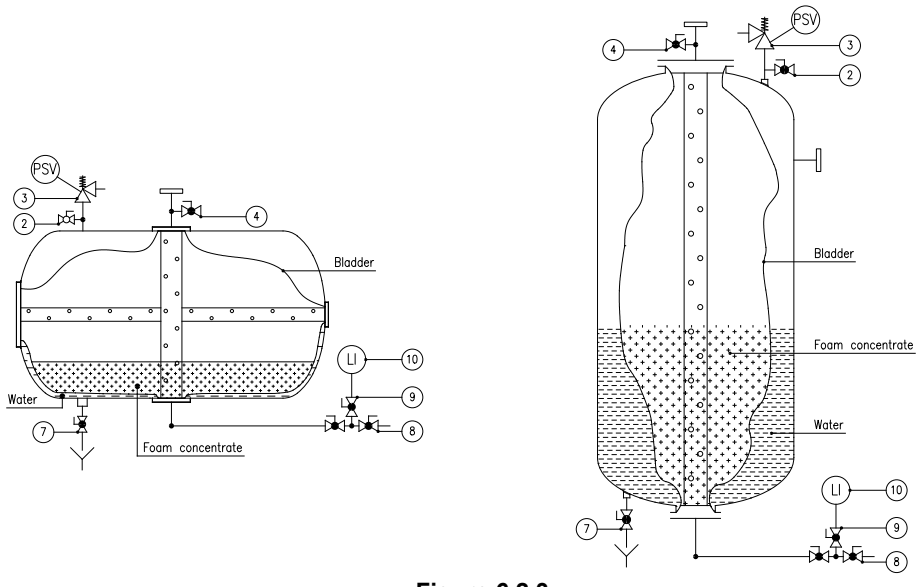

Figure 6.2.3

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6.3 Dimensions

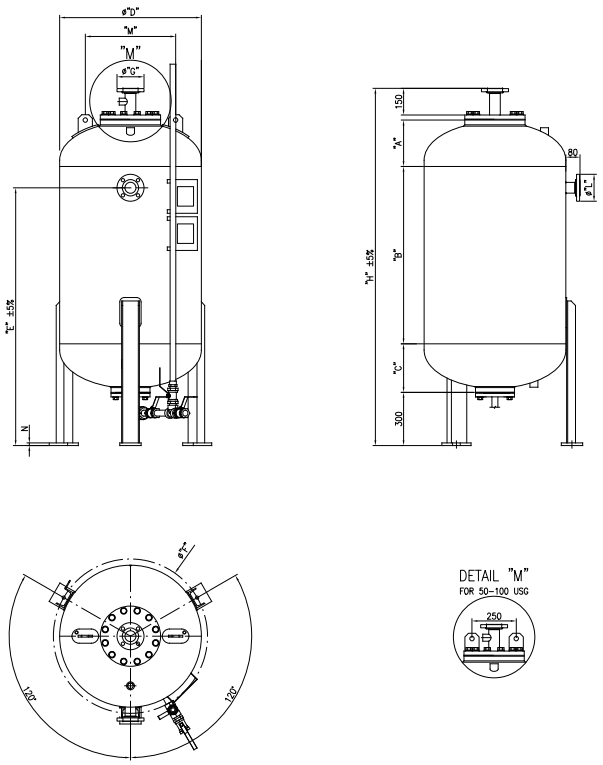

Figure 6.3.1
Vertical Bladder Tank: 25 to 200 US gallons

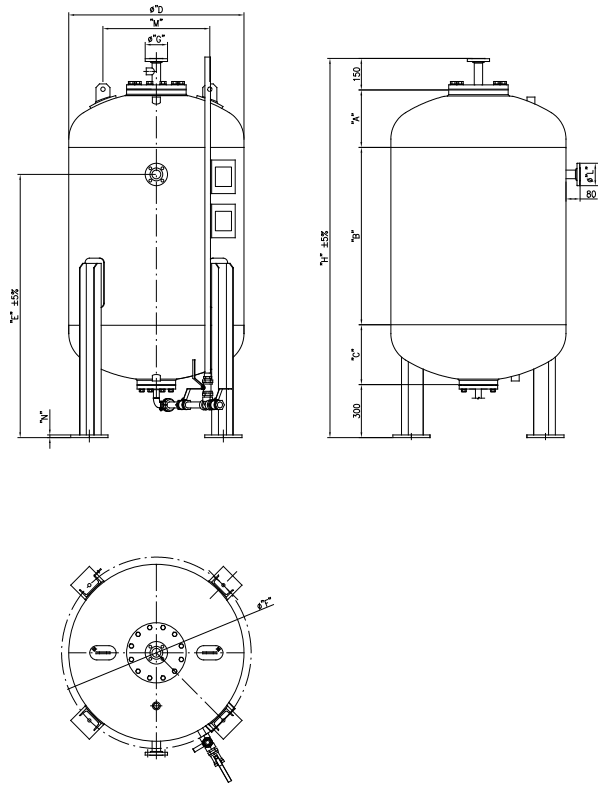

Figure 6.3.2
Vertical Bladder Tank: 250 to 4000 US gallons

TECHNICAL DATA

VERTICAL AND HORIZONTAL BLADDER TANKS MODEL VFT ASME Sec.VIII Div.1 - U-1A

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
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Table 6.3.3 - Vertical Bladder Tank Dimensions (ASME Sec VIII Design Code)

ASME Sec VIII Design Code		Capacity		Weight		A	B	C	ØD	E	ØF	ØG	H	ØL	M	N
175 PSI / 12.1 bar	232 PSI / 16.0 bar	USG	Litres	LBS	KG	inch	inch	inch	inch	inch	inch	inch	inch	inch	inch	inch
						mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
VFTV0025U	VFTV0025U-16	25	94	221	100	6.4	15.7	7.0	19.7	30.2	22.4	2	48.1	2	9.8	0.6
						163	400	178	500	768	570	50	1221	50	250	15
VFTV0036U	VFTV0036U-16	36	136	309	140	6.4	23.6	7.0	19.7	38.1	22.4	2	55.9	2	9.8	0.6
						163	600	178	500	968	570	50	1421	50	250	15
VFTV0050U	VFTV0050U-16	50	189	411	186	7.4	27.6	8.0	23.6	44.5	26.4	2	61.8	2	9.8	0.6
						187	700	203	600	1130	670	50	1570	50	250	15
VFTV0075U	VFTV0075U-16	75	283	450	204	7.4	35.4	8.0	23.6	44.5	26.4	2	69.7	2	9.8	0.6
						187	900	203	600	1130	670	50	1770	50	250	15
VFTV0100U	VFTV0100U-16	100	378	528	239	7.4	49.2	8.0	23.6	64.6	26.4	2	83.4	2	9.8	0.59
						187	1250	203	600	1640	670	50	2120	50	250	15
VFTV0150U	VFTV0150U-16	150	567	850	385	10.3	39.4	10.8	31.5	57.1	34.3	2	79.4	2	9.8	0.6
						262	1000	274	800	1450	870	50	2016	50	510	15
VFTV0200U	VFTV0200U-16	200	757	938	425	10.3	51.2	10.8	31.5	57.1	34.3	2	91.2	2	9.8	0.6
						262	1300	274	800	1450	870	50	2316	50	510	15
VFTV0250U	VFTV0250U-16	250	946	940	426	12.9	39.4	13.2	39.4	59.7	42.6	2.5	84.3	2.5	24.0	0.6
						327	1000	336	1000	1516	1082	65	2142	65	610	15
VFTV0300U	VFTV0300U-16	300	1135	1091	494	12.9	51.2	13.2	39.4	71.5	42.6	2.5	96.1	2.5	24.0	0.6
						327	1300	336	1000	1816	1082	65	2442	65	610	15
VFTV0350U	VFTV0350U-16	350	1324	1113	504	12.9	55.1	13.2	39.4	75.4	42.6	2.5	100.1	2.5	24.0	0.6
						327	1400	336	1000	1916	1082	65	2542	65	610	15
VFTV0400U	VFTV0400U-16	400	1514	1150	521	12.9	65.0	13.2	39.4	85.3	42.6	2.5	109.9	2.5	24.0	0.6
						327	1650	336	1000	2166	1082	65	2792	65	610	15
VFTV0450U	VFTV0450U-16	450	1703	1823	826	13.0	59.1	13.3	43.3	79.4	46.5	2.5	104.1	2.5	24.0	0.6
						329	1500	337	1100	2017	1181	65	2645	65	610	15
VFTV0500U	VFTV0500U-16	500	1892	2004	908	13.0	70.9	13.3	43.3	91.2	46.5	2.5	115.9	2.5	24.0	0.6
						329	1800	337	1100	2317	1181	65	2945	65	610	15
VFTV0600U	VFTV0600U-16	600	2271	2267	1027	13.0	65.0	14.5	47.2	84.6	51.2	3	110.5	3	37.4	0.6
						330	1650	368	1200	2148	1300	80	2807	80	950	15
VFTV0700U	VFTV0700U-16	700	2649	2514	1139	14.1	65.0	15.5	51.2	86.4	55.3	3	113.4	3	33.5	0.6
						358	1650	394	1300	2194	1405	80	2881	80	850	15
VFTV0800U	VFTV0800U-16	800	3028	2695	1221	14.1	78.7	15.5	51.2	100.2	55.3	3	127.2	3	33.5	0.6
						358	2000	394	1300	2544	1405	80	3231	80	850	15
VFTV0900U	VFTV0900U-16	900	3406	3907	1770	15.3	78.7	16.5	55.1	100.0	59.3	3	129.4	3	36.6	0.6
						388	2000	420	1400	2540	1505	80	3287	80	930	15
VFTV1000U	VFTV1000U-16	1000	3785	3583	1623	15.8	74.8	17.1	57.1	96.6	61.2	3	126.6	3	36.6	0.6
						402	1900	434	1450	2454	1555	80	3215	80	930	15
VFTV1100U	VFTV1100U-16	1100	4163	3764	1705	15.8	82.7	17.1	57.1	104.5	61.2	3	134.4	3	36.6	0.6
						402	2100	434	1450	2654	1555	80	3415	80	930	15
VFTV1200U	VFTV1200U-16	1200	4542	3817	1729	16.4	82.7	17.6	59.1	105.0	63.2	3	135.5	3	37.4	0.6
						416	2100	447	1500	2667	1605	80	3442	80	950	15
VFTV1300U	VFTV1300U-16	1300	4921	4276	1937	17.4	78.7	18.5	63.0	102.0	67.1	3	133.6	3	41.3	0.6
						443	2000	471	1600	2591	1705	80	3393	80	1050	15
VFTV1400U	VFTV1400U-16	1400	5299	4358	1974	17.4	88.6	18.5	63.0	111.9	67.1	3	143.4	3	41.3	0.6
						443	2250	471	1600	2841	1705	80	3643	80	1050	15
VFTV1500U	VFTV1500U-16	1500	5678	4525	2050	19.6	74.8	20.6	68.9	100.1	73.2	3	133.8	3	45.3	0.6
						497	1900	522	1750	2542	1860	80	3398	80	1150	15
VFTV1600U	VFTV1600U-16	1600	6056	4636	2100	19.6	78.7	20.6	68.9	104.0	73.2	3	137.7	3	45.3	0.6
						497	2000	522	1750	2642	1860	80	3498	80	1150	15
VFTV1700U	VFTV1700U-16	1700	6435	4724	2140	20.5	78.7	21.5	70.9	103.4	75.2	3	139.6	3	45.3	0.6
						521	2000	547	1800	2627	1910	80	3547	80	1150	15
VFTV1800U	VFTV1800U-16	1800	6813	5347	2422	22.6	59.1	23.5	78.7	88.5	83.5	3	121.3	3	51.2	0.8
						575	1500	598	2000	2248	2120	80	3082	80	1300	20
VFTV1900U	VFTV1900U-16	1900	7192	5501	2492	22.6	63.0	23.5	78.7	92.4	83.5	3	125.3	3	51.2	0.8
						575	1600	598	2000	2348	2120	80	3182	80	1300	20
VFTV2000U	VFTV2000U-16	2000	7570	5722	2592	22.6	68.9	23.5	78.7	98.3	83.5	3	131.2	3	51.2	0.8
						575	1750	598	2000	2498	2120	80	3332	80	1300	20
VFTV2200U	VFTV2200U-16	2200	8327	6459	2926	22.6	82.7	23.5	78.7	112.1	83.5	3	145.0	3	51.2	0.8
						575	2100	598	2000	2848	2120	80	3682	80	1300	20
VFTV2400U	VFTV2400U-16	2400	9084	6691	3031	22.6	88.6	23.5	78.7	119.2	83.5	3	150.9	3	51.2	0.8
						575	2250	598	2000	3028	2120	80	3832	80	1300	20
VFTV2600U	VFTV2600U-16	2600	9842	6954	3150	22.6	102.4	23.5	78.7	131.8	83.5	3	164.6	3	51.2	0.8
						575	2600	598	2000	3348	2120	80	4182	80	1300	20
VFTV2800U	VFTV2800U-16	2800	10599	7605	3445	22.6	114.2	23.5	78.7	143.6	83.5	3	176.5	3	51.2	0.8
						575	2900	598	2000	3648	2120	80	4482	80	1300	20
VFTV3000U	VFTV3000U-16	3000	11356	7901	3579	22.6	122.0	23.5	78.7	151.5	83.5	3	184.3	3	51.2	0.8
						575	3100	598	2000	3848	2120	80	4682	80	1300	20
VFTV3200U	VFTV3200U-16	3200	12113	8442	3824	22.6	133.9	23.5	78.7	163.3	83.5	3	196.1	3	51.2	0.8
						575	3400	598	2000	4148	2120	80	4982	80	1300	20
VFTV3400U	VFTV3400U-16	3400	12870	8881	4023	22.6	145.7	23.5	78.7	175.1	83.5	3	208.0	3	51.2	0.8
						575	3700	598	2000	4448	2120	80	5282	80	1300	20
VFTV3600U	VFTV3600U-16	3600	13627	9113	4128	22.6	151.6	23.5	78.7	181.0	83.5	3	213.9	3	51.2	0.8
						575	3850	598	2000	4598	2120	80	5432	80	1300	20
VFTV3800U	VFTV3800U-16	3800	14384	9629	4362	22.6	165.4	23.5	78.7	194.8	83.5	3	227.6	3	51.2	0.8
						575	4200	598	2000	4948	2120	80	5782	80	1300	20
VFTV4000U	VFTV4000U-16	4000	15141	9916	4492	22.6	173.2	23.5	78.7	202.7	83.5	3	235.5	3	51.2	0.8
						575	4400	598	2000	5148	2120	80	5982	80	1300	20

TECHNICAL DATA

VERTICAL AND HORIZONTAL BLADDER TANKS MODEL VFT ASME Sec.VIII Div.1 - U-1A

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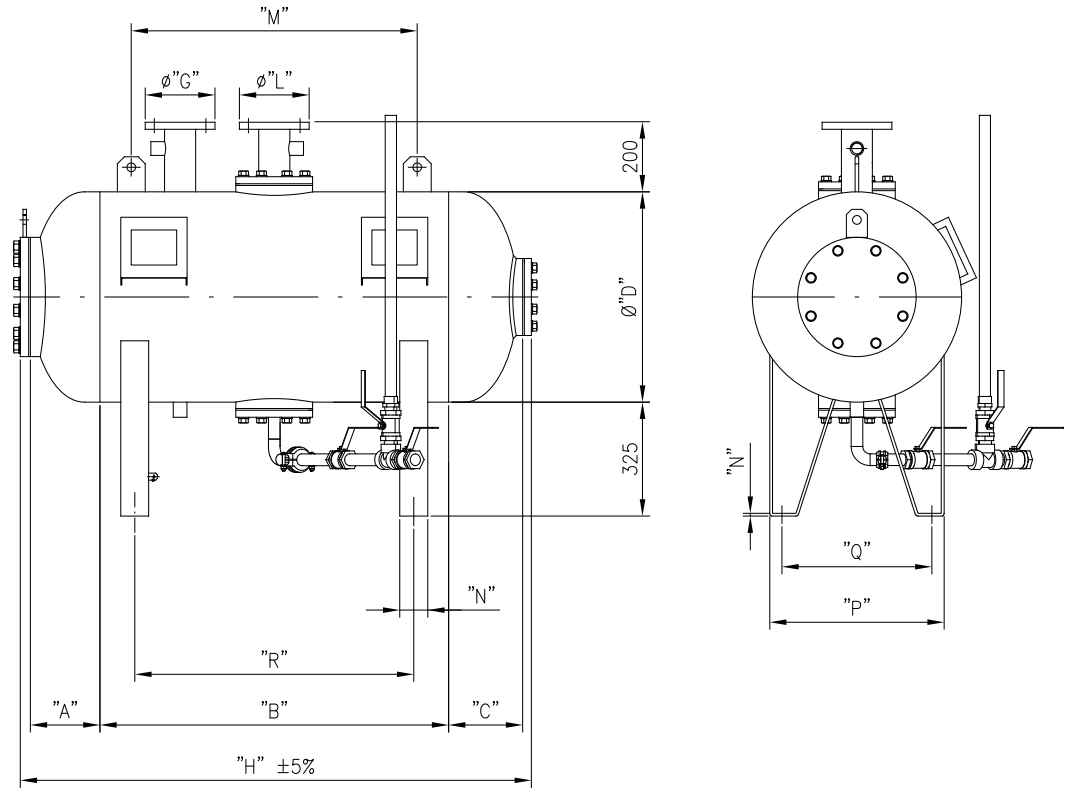

Figure 6.3.4
Horizontal Bladder Tank: 50 to 100 US Gallons

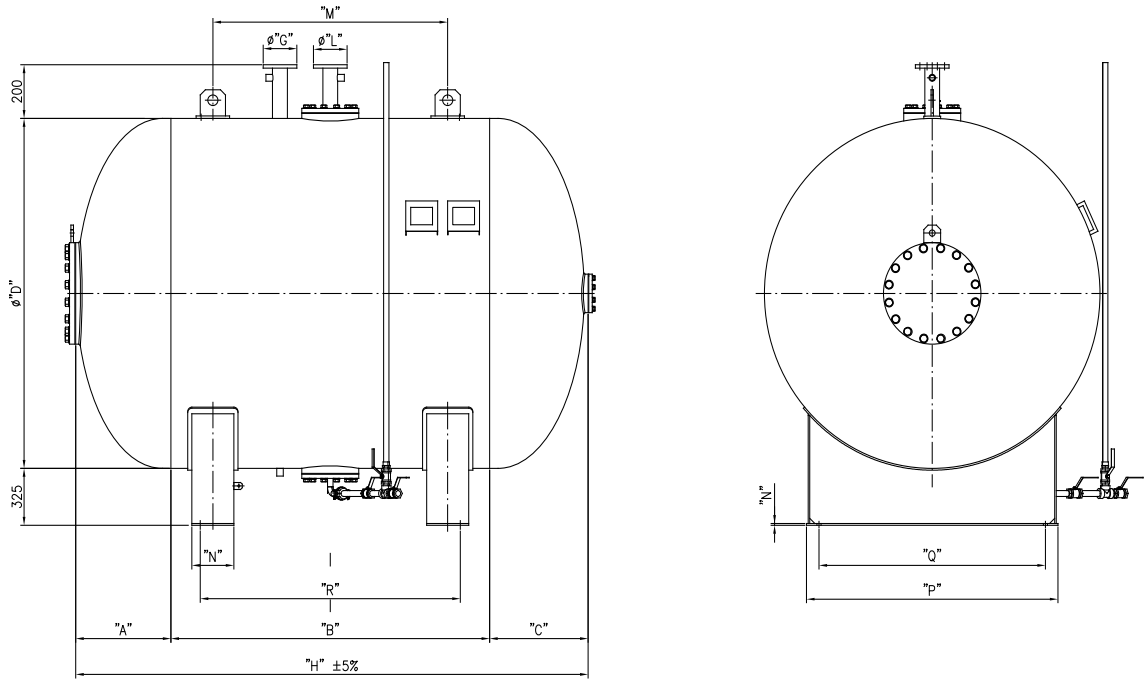

Figure 6.3.5
Horizontal Bladder Tank: 150 to 5250 US Gallons

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Table 6.3.6 - Horizontal Bladder Tank Dimensions (ASME Sec VIII Design Code)

Bladder Tank : ASME Sec VIII Design Code		Capacity		Weight		A	B	C	ØD	ØG	H	ØL	M	N	O	P	Q	R
175 PSI / 12.1 bar	232 PSI / 16.0 bar	USG	Litres	LBS	KG	inch	inch	inch	inch	inch	inch	inch	inch	inch	inch	inch	inch	inch
						mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
VFTH0050U	VFTH0050U-16	50	189	574	260	8.0	39.4	8.0	19.7	2	55.4	2	32.3	0.3	7.9	16.7	13.8	32.3
						203	1000	203	500	50	1406	50	820	8	200	425	350	820
VFTH0075U	VFTH0075U-16	75	283	640	290	9.0	39.4	9.0	23.6	2	57.3	2	32.3	0.3	7.9	19.7	16.9	32.3
						228	1000	228	600	50	1456	50	820	8	200	500	430	820
VFTH0100U	VFTH0100U-16	100	378	684	310	9.0	49.2	9.0	23.6	2	67.2	2	42.1	0.3	7.9	19.7	16.9	40.2
						228	1250	228	600	50	1706	50	1070	8	200	500	430	1020
VFTH0150U	VFTH0150U-16	150	567	828	375	10.3	39.4	10.8	31.5	2	60.5	2	51.0	0.3	7.9	19.7	15.7	32.3
						262	1000	274	800	50	1536	50	1295	8	200	500	400	820
VFTH0200U	VFTH0200U-16	200	757	883	400	10.3	51.2	10.8	31.5	2	72.3	2	62.8	0.3	7.9	19.7	15.7	42.1
						262	1300	274	800	50	1836	50	1595	8	200	500	400	1070
VFTH0250U	VFTH0250U-16	250	946	1258	570	11.3	39.4	13.2	39.4	2.5	63.9	2.5	51.0	0.3	7.9	27.6	23.6	32.3
						288	1000	336	1000	65	1624	65	1295	8	200	700	600	820
VFTH0300U	VFTH0300U-16	300	1135	1391	630	11.3	51.2	13.2	39.4	2.5	75.7	2.5	39.4	0.3	7.9	27.6	23.6	42.1
						288	1300	336	1000	65	1924	65	1000	8	200	700	600	1070
VFTH0350U	VFTH0350U-16	350	1324	1453	650	11.3	55.1	13.2	39.4	2.5	79.7	2.5	39.4	0.3	7.9	27.6	23.6	42.1
						288	1400	336	1000	65	2024	65	1000	8	200	700	600	1070
VFTH0400U	VFTH0400U-16	400	1514	1479	670	11.3	65.0	13.2	39.4	2.5	89.5	2.5	51.2	0.3	5.9	27.6	23.6	53.5
						288	1650	336	1000	65	2274	65	1300	8	150	700	600	1360
VFTH0450U	VFTH0450U-16	450	1703	2137	968	11.6	59.1	13.2	43.3	2.5	83.9	2.5	45.3	0.3	5.9	31.5	27.6	48.0
						294	1500	336	1100	65	2130	65	1150	8	150	800	700	1220
VFTH0500U	VFTH0500U-16	500	1892	2318	1050	11.6	70.9	13.2	43.3	2.5	95.7	2.5	57.1	0.3	5.9	31.5	27.6	59.8
						294	1800	336	1100	65	2430	65	1450	8	150	800	700	1520
VFTH0600U	VFTH0600U-16	600	2271	2377	1077	12.7	65.0	14.2	47.2	3	91.9	3	53.5`	0.3	5.9	35.4	31.5	56.7
						322	1650	361	1200	80	2333	80	1360	8	150	900	800	1440
VFTH0700U	VFTH0700U-16	700	2649	2651	1201	13.8	65.0	15.2	51.2	3	94.0	3	58.3	0.3	5.9	35.4	31.5	56.7
						351	1650	386	1300	80	2387	80	1480	8	150	900	800	1440
VFTH0800U	VFTH0800U-16	800	3028	2898	1313	13.8	78.7	15.2	51.2	3	107.8	3	63.0	0.3	5.9	35.4	31.5	66.1
						351	2000	386	1300	80	2737	80	1600	8	150	900	800	1680
VFTH0900U	VFTH0900U-16	900	3406	3680	1667	15.3	78.7	16.3	55.1	3	110.3	3	63.0	0.3	5.9	39.4	33.5	66.1
						389	2000	413	1400	80	2801	80	1600	8	150	1000	850	1680
VFTH1000U	VFTH1000U-16	1000	3785	3592	1627	15.8	74.8	16.8	57.1	3	107.4	3	63.0	0.4	5.9	39.4	33.5	62.2
						402	1900	426	1450	80	2728	80	1600	10	150	1000	850	1580
VFTH1100U	VFTH1100U-16	1100	4163	3777	1711	15.8	82.7	16.8	57.1	3	115.3	3	63.0	0.4	5.9	39.4	33.5	66.1
						402	2100	426	1450	80	2928	80	1600	10	150	1000	850	1680
VFTH1200U	VFTH1200U-16	1200	4542	4159	1884	16.5	82.7	17.3	59.1	3	116.4	3	66.9	0.4	5.9	39.4	33.5	70.1
						418	2100	439	1500	80	2957	80	1700	10	150	1000	850	1780
VFTH1300U	VFTH1300U-16	1300	4921	4355	1973	17.5	78.7	18.3	63.0	3	114.6	3	63.0	0.4	5.9	43.3	37.4	68.1
						445	2000	465	1600	80	2910	80	1600	10	150	1100	950	1730
VFTH1400U	VFTH1400U-16	1400	5299	4629	2097	17.5	88.6	18.3	63.0	3	124.4	3	70.9	0.4	5.9	43.3	37.4	76.0
						445	2250	465	1600	80	3160	80	1800	10	150	1100	950	1930
VFTH1500U	VFTH1500U-16	1500	5678	4525	2050	19.6	74.8	20.6	68.9	3	115.0	3	61.0	0.4	5.9	47.2	41.3	63.4
						498	1900	522	1750	80	2920	80	1550	10	150	1200	1050	1610
VFTH1600U	VFTH1600U-16	1600	6056	4746	2150	19.6	78.7	20.6	68.9	3	118.9	3	61.0	0.4	5.9	47.2	41.3	65.4
						498	2000	522	1750	80	3020	80	1550	10	150	1200	1050	1660
VFTH1700U	VFTH1700U-16	1700	6435	4967	2250	20.2	78.7	21.1	70.9	3	120.0	3	61.0	0.4	5.9	47.2	41.3	66.1
						513	2000	535	1800	80	3047	80	1550	10	150	1200	1050	1680
VFTH1800U	VFTH1800U-16	1800	6813	5700	2582	22.3	59.1	23.1	78.7	3	104.4	3	47.2	0.4	5.9	59.1	53.1	49.2
						566	1500	586	2000	80	2652	80	1200	10	150	1500	1350	1250
VFTH1900U	VFTH1900U-16	1900	7192	5854	2652	22.3	63.0	23.1	78.7	3	108.3	3	52.4	0.4	5.9	59.1	53.1	49.2
						566	1600	586	2000	80	2752	80	1330	10	150	1500	1350	1250
VFTH2000U	VFTH2000U-16	2000	7570	6086	2757	22.3	68.9	23.1	78.7	3	114.3	3	52.4	0.4	5.9	59.1	53.1	55.1
						566	1750	586	2000	80	2902	80	1330	10	150	1500	1350	1400
VFTH2200U	VFTH2200U-16	2200	8327	6581	2981	22.3	82.7	23.1	78.7	3	128.0	3	63.0	0.4	5.9	59.1	53.1	68.9
						566	2100	586	2000	80	3252	80	1600	10	150	1500	1350	1750
VFTH2400U	VFTH2400U-16	2400	9084	6823	3091	22.3	88.6	23.1	78.7	3	133.9	3	68.9	0.4	5.9	59.1	53.1	74.8
						566	2250	586	2000	80	3402	80	1750	10	150	1500	1350	1900
VFTH2600U	VFTH2600U-16	2600	9842	7362	3335	22.3	102.4	23.1	78.7	3	147.7	3	82.7	0.4	5.9	59.1	53.1	88.6
						566	2600	586	2000	80	3752	80	2100	10	150	1500	1350	2250
VFTH2800U	VFTH2800U-16	2800	10599	7870	3565	22.3	114.2	23.1	78.7	3	159.5	3	94.5	0.4	5.9	59.1	53.1	100.4
						566	2900	586	2000	80	4052	80	2400	10	150	1500	1350	2550

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Table 6.3.6 - Horizontal Bladder Tank Dimensions (ASME Sec VIII Design Code) (cont.)

Bladder Tank : ASME Sec VIII Design Code		Capacity		Weight		A	B	C	ØD	ØG	H	ØL	M	N	O	P	Q	R
175 PSI /12.1 bar	232 PSI / 16.0 bar	USG	Litres	LBS	KG	inch	inch	inch	inch	inch	inch	inch	inch	inch	inch	inch	inch	inch
						mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
VFTH3000U	VFTH3000U-16	3000	11356	8177	3704	22.3	122.0	23.1	78.7	3	167.4	3	102.4	0.4	5.9	59.1	53.1	108.3
						566	3100	586	2000	80	4252	80	2600	10	150	1500	1350	2750
VFTH3200U	VFTH3200U-16	3200	12113	8618	3904	22.3	133.9	23.1	78.7	3	179.2	3	114.2	0.4	5.9	59.1	53.1	120.1
						566	3400	586	2000	80	4552	80	2900	10	150	1500	1350	3050
VFTH3400U	VFTH3400U-16	3400	12870	8925	4043	22.3	141.7	23.1	78.7	3	187.1	3	126.0	0.4	5.9	59.1	53.1	131.9
						566	3600	586	2000	80	4752	80	3200	10	150	1500	1350	3350
VFTH3600U	VFTH3600U-16	3600	13627	9311	4218	22.3	151.6	23.1	78.7	3	196.9	3	139.8	0.4	5.9	59.1	53.1	145.7
						566	3850	586	2000	80	5002	80	3550	10	150	1500	1350	3700
VFTH3800U	VFTH3800U-16	3800	14384	9631	4363	22.3	159.4	23.1	78.7	3	204.8	3	139.8	0.4	5.9	59.1	53.1	145.7
						566	4050	586	2000	80	5202	80	3550	10	150	1500	1350	3700
VFTH4000U	VFTH4000U-16	4000	15141	10170	4607	22.3	173.2	23.1	78.7	3	218.6	3	139.8	0.4	5.9	59.1	53.1	145.7
						566	4400	586	2000	80	5552	80	3550	10	150	1500	1350	3700
VFTH4250U	VFTH4250U-16	4250	16088	10631	4816	22.3	185.0	23.1	78.7	3	230.4	3	139.8	0.4	5.9	59.1	53.1	145.7
						566	4700	586	2000	80	5852	80	3550	10	150	1500	1350	3700
VFTH4500U	VFTH4500U-16	4500	17034	11095	5026	22.3	196.9	23.1	78.7	3	242.2	3	139.8	0.4	5.9	59.1	53.1	151.6
						566	5000	586	2000	80	6152	80	3550	10	150	1500	1350	3850
VFTH4750U	VFTH4750U-16	4750	17980	11634	5270	22.3	210.6	23.1	78.7	3	256.0	3	139.8	0.4	5.9	59.1	53.1	151.6
						566	5350	586	2000	80	6502	80	3550	10	150	1500	1350	3850
VFTH5000U	VFTH5000U-16	5000	18927	12097	5480	22.3	222.4	23.1	78.7	3	267.8	3	139.8	0.4	5.9	59.1	53.1	159.4
						566	5650	586	2000	80	6802	80	3550	10	150	1500	1350	4050
VFTH5250U	VFTH5250U-16	5250	19873	12636	5724	22.3	236.2	23.1	78.7	3	281.6	3	139.8	0.4	5.9	59.1	53.1	159.4
						566	6000	586	2000	80	7152	80	3550	10	150	1500	1350	4050

7. INSTALLATION

Refer to appropriate Installation Standards (i.e. NFPA, VdS, LPCB, etc.) and / or FM applicable FM Global Property Loss Prevention Data Sheets such as 4-12, Foam-Water Sprinkler Systems.

The Installation, Operation and Maintenance Bladder Tank Manual shall also be referenced.

NOTICE

When designing a bladder tank into your fire protection system, please give consideration to future maintenance activities. Ensure that adequate clearance above a vertical bladder tank or at the inspection flange end of a horizontal tank is allowed. For further guidance contact us.

8. OPERATION

1. Foam concentrate is stored inside the bladder. When used in conjunction with a Ratio Controller it proportions foam concentrate accurately into the water stream.
2. During system activation, the outer side of the bladder is pressurized by the system water supply which forces foam concentrate to the proportioner or a ratio controller.
3. Simultaneously, as water flows through the venturi area of the wide range proportioner or ratio controller, a metered pressure drop draws foam concentrate into the system water stream creating a foam solution mixed to the appropriate ratios.
4. The foam solution flows through the system pipework and out of any open sprinklers, nozzles or other discharge devices.
5. As the foam concentrate continues to flow from the inside of the bladder, system water enters the bladder tank on the outside of the bladder keeping a balanced pressure system.

9. GUARANTEE

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

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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10. INSPECTION, TESTS AND MAINTENANCE

⚠ WARNING

Any system maintenance or testing that 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 Authorities Having Jurisdiction. Consideration should be given to employment of a fire patrol in the affected area.

Refer to respective requirements, according to the relevant standards for Inspection, Testing and Maintenance.

If applicable, refer to FM Global Property Loss Prevention Datasheet 4-12 for specific test and commissioning criteria.

In addition, the “Authority Having Jurisdiction” (AHJ) may have additional maintenance, testing and inspection requirements that must be followed.

11. DISPOSAL

At end of use the product described here should be disposed of via the national recycling system.
Upon request the manufacturer can take back and properly dispose of the electrical equipment and electronic devices.

12. ACCESSORIES AND SPARE PARTS

Contact the appropriate sales office in Section 5 Availability for further assistance.

Table 12.1.1 - Optional / Standard Spare Parts

Description	Material	Connection	Part Number	
			175 PSI (12 bar) Tanks	16 bar Tanks
Safety Thermal Relief Valve	Brass	1/2"	B10C12.1	B10C16
ASME Safety Valve	Carbon Steel	3/4"	EUV34CS-12.1	EUV34CS-16.0
ASME Safety Valve	Stainless Steel 316	3/4"	EUV34SS-12.1	EUV34SS-16.0
Filling Device & KPA Gauge	Carbon Steel	1"	FILLDEVICE	
Replacement Bladder	Various	Contact us with tank serial number		
Sight tube replacement kit	Various	Contact us with tank serial number		

Table 12.1.2 - Bladder Tank Manual

Language	Part Number	Language	Part Number
English	F032216-EN	Dutch	F032216-NL
German	F032216-DE	Polish	F032216-PL
Spanish	F032216-ES	Swedish	F032216-SV
French	F032216-FR	Turkish	F032216-TR
Italian	F032216-IT	--	--

13. DECLARATION OF CONFORMITY

If required, contact the appropriate sales office in ***Section 5 Availability*** for further assistance.

TECHNICAL DATA

VIKING USP SFFF FLUORINE FREE FOAM CONCENTRATE

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 USP concentrate concentrate is specially designed and tested to be an effective fluorine free fire protection system foam alternative. This concentrate is approved for use with fresh water when proportioned at 3%.

Features:
- New generation hydrocarbon risk fluorine free foam (SFFF)
- For Class A & B fires
- 100% Biodegradable

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

2. LISTINGS AND APPROVALS

This product must be used in accordance with the certifications listed below. Approved and listed system components can be found at www.approvalguide.com and https://iq.ulprospector.com

FM Approved

FM Approved Refer to the FM Approval guide for systems and devices that are approved for use with this concentrate. Refer to the system and device data sheets from Viking, NFPA, FM Global Property Loss Prevention Data Sheets, and relevant local codes and/or standards for correct system design. FM Approval of the foam extinguishing system is contingent upon the design, installation, testing and maintenance performed in accordance with NFPA and/or FM Global Property Loss Prevention Data Sheet 4-12, Foam/ Water Sprinkler Systems.

UL Listed – GFGV.EX27255

Underwriters Laboratories, UL 162 7th Edition Refer to the UL Listing for systems and devices that are approved for use with this concentrate. Refer to the system and device data sheets from Viking, NFPA, and relevant local codes and/or standards for correct system design.

"SFFF compatible" refers to this product as being part of a SFFF Foam system that has been tested to recognized standards. Not all configurations are available. Please consult technical data and/or the approval/ listing for usage requirements.

The following additional approvals are in the name of the manufacturer.
- EN 1568 Part 1 / EN 1568 Part 2 / EN 1568 part 3, Class 1A fresh water*
- ICAO Level B*
- GESIP approved for hydrocarbon fuels*
- IMO 1312*
- MED Module B and D*
- Boeing Specification Support Standard BSS 7432*

3. TECHNICAL DATA

Physical Data

Appearance	Clear to yellowish liquid
Specific gravity at 68 °F (20 °C)	1.04 +/- 0.01 g/mll
Viscosity	Pseudoplasitc*
pH	6.5 to 8.5
Freezing point	12 °F (-11 °C)
Recommended storage temperature	32 °F to 131 °F (0 to 55°C)
FM Approved storage temperature	35 °F to 120 °F (1.7 to 49 °C)
Suspended sediment (v/v)	Less than 0.2%

*see detailed viscosity data in section 16

VIKING®	TECHNICAL DATA	VIKING USP SFFF FLUORINE FREE FOAM CONCENTRATE

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TABLE 1: ORDERING INFORMATION

Volume	Packaging	Part Number	Approximage Shipping Weight*		Dimensions* In (mm)		Sales Region
			Lbs.	Kg	Inches	mm	
25 Litres	Can	V-SFFFUSP/25	59**	26.7**	11x10x17	295x260x441	EMEA/APAC
200 Litres	Drum	V-SFFFUSP/200	469**	212.5**	23x23x37	581x581x935	EMEA/APAC
1000 Litres	IBC Tote	V-SFFFUSP/1000	2381	1080	47x39x45	1200x1000x1150	EMEA/APAC
6.5 US Gallons	Can	F21720-6.5	62**	28**	11x10x29	295x260x737	AMERICAS
55 US Gallons	Drum	F21720-55	487**	220.7**	23x23x37	581x581x935	AMERICAS
265 US Gallons	IBC Tote	F21720-265	2389	1083.6	47x39x45	1200x1000x1150	AMERICAS
Bulk	Bulk tanker deliveries available by special request. Contact Viking for availability.						

*Shipping weight and dimensions are approximate. **Weight does not include pallet.

4. ENVIRONMENTAL IMPACT

The Viking USP concentrate is formulated using specially selected raw materials for their fire performance and their environmental profile. The product contains no intentionally added fluorinated surfactants, polymers, and other organohalogens. The Viking USP concentrate is biodegradable and contains NO PFOS NOR PFOA. The handling of foam concentrate or foam solution spills should be in accordance with local regulations. Sewage systems should have no processing issues with foam solution based on the Viking USP concentrate but local sewage operators should be consulted in this respect. The Viking USP concentrate is formulated without the use of fluorinated surfactants. Full details can be found in the Safety Data Sheet (SDS).

5. APPLICATION

The Viking USP concentrate is intended for use on class B hydrocarbon fuel fires such as oil, diesel, aviation fuel and gasoline. It is also suitable for class A fires such as wood, paper, textiles etc. The Viking USP concentrate is especially suited whenever a fluorine-free alternative with high fire performance is required. The Viking USP concentrate is tested for use in sprinkler systems. Refer to listing or approval for further details of approved use combinations.
Note: Not for use as a premixed solution.

6. PROPORTIONING

The Viking USP concentrate can be proportioned at the correct dilution using conventional equipment like bladder tanks and proportioners. Refer to the FM Approval or UL Listing for proportioning equipment approved for use with this concentrate.

7. FIRE PERFORMANCE & FOAMING

The fire performance of this product has been measured and documented according to “International Approvals” stated in this document. The foaming properties are depending on equipment used and other variables such as water and ambient temperatures.

8. SPRINKLER APPLICATION

Sprinkler applications are especially challenging for any foam due to the low operating pressure and the very low expansion reached. Applying foam through a sprinkler is a forceful application method and requires foam that can handle direct application and partial submersion into the fuel without losing its fire performance and burnback resistance. Foams that shall be regarded as suitable for sprinkler applications shall also be able to withstand limited time of water deluge directly onto the foam blanket and still maintain the burnback properties. The Viking USP concentrate has passed above described tests showing very good extinguishing and burnback properties. Refer to the FM Approval Guide or UL Product iQ for acceptable system configurations used with this concentrate and specific sprinkler SINs and their associated minimum application densities.

VIKING®	TECHNICAL DATA	VIKING USP SFFF FLUORINE FREE FOAM CONCENTRATE

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9. STORAGE / SHELF LIFE

Stored in original unbroken packaging the product will have a long shelf life. Shelf life in excess of 10 years will be found in temperate climates. As with all foams, shelf life will be dependent on storage temperatures and conditions.

10. SCOPE OF DELIVERY

We supply this product in 25 litre and 6.5 US gallon cans, 200 litre and 55 US gallon drums, 1000 litre and 265 US gallon IBC containers and in bulk on special request.

11. INSPECTIONS, TESTS AND MAINTENANCE

The foam concentrate should be tested annually. Refer to respective requirements, according to the relevant codes and/or standards for Inspection, Testing and Maintenance. If applicable, refer to FM Global Property Loss Prevention Datasheet 4-12 for specific test and commissioning criteria. In addition, the “Authority Having Jurisdiction” (AHJ) may have additional maintenance, testing and inspection requirements that must be followed

12. DISPOSAL

At the end of use the product packaging should be disposed of via the national recycling system. Some IBC Tote containers maybe part of a national collection scheme. Details will be attached to the IBC Tote if this service is available. Foam Concentrate should be disposed of according to local regulations.

13. AVAILABILITY

The product is available directly from Viking and official distributors only.

Americas:
The Viking Corporation
5150 Beltway SE
Caledonia, MI 49316
Tel.: (800) 968–9501
Fax: 269–818–1680
Technical Services: 1–877–384–5464
techsvcs@vikingcorp.com

EMEA:
Viking S.A.
21, Z.I, Haneboesch
L–4562 Differdange / Niederkorn
Tel.: +352 58 37 37 – 1
Fax: +352 58 37 36
vikinglux@viking–emea.com

Asia Pacific (APAC) Main Office:
The Viking Corporation (Far East) Pte. Ltd.
69 Tuas View Square
Westlink Techpark, Singapore 637621
Tel: (+65) 6 278 4061
Fax: (+65) 6 278 4609
vikingAPAC@vikingcorp.com

14. GUARANTEE

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

15. COMPATIBILITY

Contact Viking with questions regarding the compatibility of this product.

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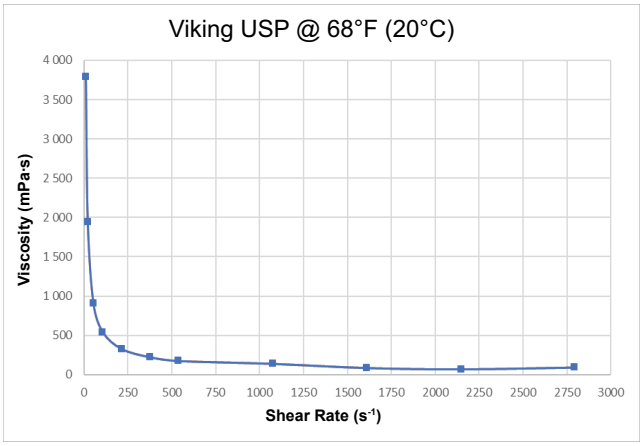
16. VISCOSITY

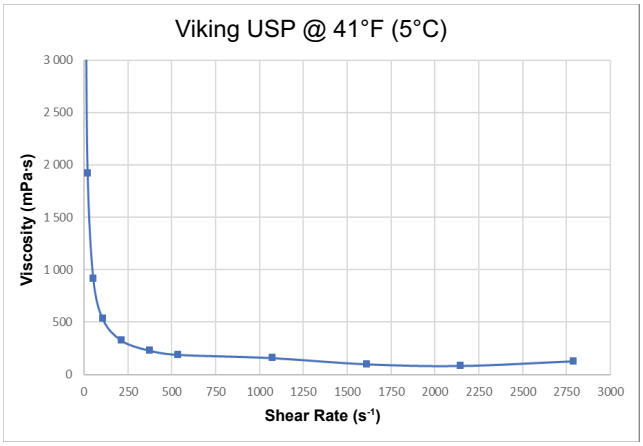
The viscosity flow curves are determined by Brookfield RST rheometer from low to high shear rates. The viscosity curves below are determined by calculating the average value of at least 8 different measurements and add a safety margin of three standard deviations to the average. The viscosity curves are determined for 68 °F and 41 °F (20 °C and 5 °C). In the table below the kinematic viscosity (mm²/s) is calculated as dynamic viscosity (mPa·s) divided by the specific gravity of the concentrate.

TABLE 2: Viscositiy Information

RPM	Shear Rate (s^{-1})	Dynamic Viscosity (mPa/s)		Kinetic Viscosity (mm^2/s)	
		68 °F (20 °C)	41 °F (5 °C)	68 °F (20 °C)	41 °F (5 °C)
5	10.7	3793	3716	3647	3573
10	21.5	1948	1921	1873	1847
25	53.7	910	916	875	881
50	107.4	541	531	521	510
100	214.8	328	325	316	312
175	375.0	224	229	215	220
250	537.0	176	189	169	182
500	1074.0	139	158	134	152
750	1611.0	86	99	82	96
1000	2148.0	70	83	67	80
1300	2792.2	91	128	88	123

Viscosity vs Shear Rate





TECHNICAL DATA

MODEL VMT, VMH, VMW MONITOR
MODEL VNN, VNS NOZZLE
MODEL VSO OSCILLATING UNIT

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

Monitors are fixed fire suppression discharge devices used in the application of firefighting water or foam solution to a specific area or risk. Monitors are an effective way of covering large areas of application.

Manual or oscillating monitors are usually part of a fixed deluge or flow control system but can also be supplied locally via hydrant or fire truck hose supplies. Monitors can also be mounted on mobile trailers for greater versatility in challenging fire scenarios.

Monitors are commonly used in high risk areas such as flammable liquid storage tank farms, loading racks, incineration facilities, recycling plants, aircraft hangars, helidecks and jetty protection.

This technical data is intended for trained experts.

For further information, please contact the appropriate Viking sales office in ***Section 5 Availability*** or refer to the technical documentation. The contents of this publication are subject to modifications without notice.

2. LISTINGS AND APPROVALS

The Monitor/Nozzle/Oscillation combination is UL Listed as part of a fire extinguishing system with specific foam concentrates.

Listed system components can be found at https://iq.ulprospector.com

UL Listed GFXX.EX28118 - Foam Monitors

Oscillating unit compliant with 2006/42/EC machine directive

Certificated by the Academy of the State Fire Service of the Ministry of Emergency Situations of Russia

3. TECHNICAL DATA

3.1 Construction Features

- UL Listed flow rates of 250, 350, 500, 750 or 1,000 GPM
- Available as non-oscillating or oscillating
- Stainless steel monitor body for enhanced corrosion protection
- Suitable for use with fresh water, salt water or foam solution
- Tiller or handwheel control options
- 2.5” or 3” body with range of inlet flange sizes
- ANSI 150 or PN16 inlet flanges
- Maximum working pressure, UL Listed: 250 psi (17.2 bar)
- Non-self-inducting or self-inducting nozzle options
- NH (NST) or BSP threads
- Oscillation test feature
- UL Listed with Viking AFFF 3%S C6 foam

Fig 1.1 Manual handwheel monitor

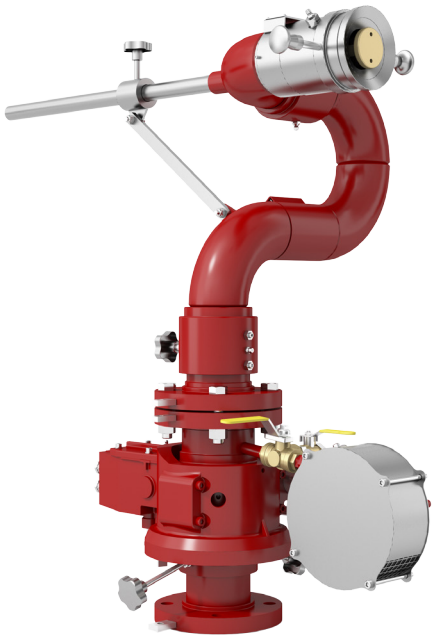

Fig 1.2 Oscillating tiller operated monitor

Images for illustration purposes only

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

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3.2 Standard Materials

Table 3.2.1 - Standard Materials	
VMT - Tiller control style monitor	
Monitor inlet flange	Stainless steel ASME SA-182 F316 (ANSI 150 or PN16)
Monitor body	Stainless steel ASME SA-312 TP316
Locking knob	Stainless steel AISI 304
Monitor outlet	NH (NST) or BSP threaded (parallel)
Tiller	Stainless steel ASME SA-312 TP316
Tiller grip	Rubber
Joint	Stainless steel AISI 316. Phosphor bronze balls
Finish	Flame Red RAL3000 (epoxy zinc-rich primer with aliphatic polyurethane finish)
VMH, VMW - Handwheel control style monitor	
Monitor inlet flange	Stainless steel ASME SA-182 F316 (EN 1.4401 AISI-316)
Monitor body	Stainless steel ASME SA-312 TP316
Locking knob	Stainless steel AISI 304
Gear	Bronze
Monitor outlet	NH (NST) or BSP threaded
Handwheel	Stainless steel AISI 304
Handwheel shaft	Stainless steel AISI 316
Joint	Stainless steel AISI 316. Phosphor bronze balls
Finish	Flame Red RAL3000 (epoxy zinc-rich primer with aliphatic polyurethane finish)
VNN Non-self-inducting and VNS Self-inducting nozzles	
Nozzle inlet	NH (NST) or BSP threaded (parallel)
Nozzle body (250, 350, 500 US GPM)	Anodized aluminium or nickel aluminium bronze
Nozzle body (750, 1,000 US GPM)	Stainless steel AISI 316
Spray adjustment knob	Stainless steel AISI 304
Diffuser	Brass
Finish	Natural
Self-inducting hose (model VNS only)	Steel reinforced PVC
Self-inducting isolation valve (model VNS only)	Brass (lockable)
Foam orifice (model VNS only)	Stainless steel AISI 316
VSO Oscillating unit	
Inlet / Outlet flange	Stainless steel AISI 316
Body	Stainless steel AISI 316
Gearbox enclosure	Aluminium
Impeller nozzle	Brass
3-Way test / run / isolation valve	Brass
Impeller	Anodized aluminium
Splash shield / guard	Stainless steel AISI 316
Finish	Body/Flange - Flame Red RAL3000 (epoxy zinc-rich primer with aliphatic polyurethane finish) Components - Natural
Rotation speed	Approximately 4°/second @ 100 psi (6.89 bar)
Note: This is a list of main components only. Further details can be given on request.	

3.3 Standard Design Specifications

Table 3.3.1 - Standard Design Specifications	
Working pressure	250 psi (17.2 bar)
Factory test pressure	500 psi (34.4 bar)
Design temperature range	-20 °C / +80 °C (-4 °F / 176 °F)
Operating temperature range	-10 °C / +60 °C (14 °F / 140 °F)

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3.4 Ordering Information

3.4.1 – Monitor selection

Non-oscillating and oscillating monitors are available in 3 different control types:

(VMT) Tiller – Vertical and horizontal stand-by setting can be fixed via the locking knobs (***6***).
Manual movement by a trained operator is controlled by releasing the locking knobs and directing the water/foam flow via the tiller in the desired direction. (***Fig 3.4.1.1***)

(VMH) 1-Handwheel - Vertical stand-by setting can be fixed by adjusting the handwheel (***5***) to the desired position. The horizontal position is fixed via the locking knob (***6***). Manual movement by a trained operator is controlled by adjusting the handwheel for the vertical movement. Manual operation of the horizontal movement is not practical during water/foam flow so for this reason it is best suited to use with the oscillating unit only. (***Fig 3.4.1.2***)

(VMW) 2-Handwheel - Vertical and horizontal stand-by setting can be fixed by turning the handwheels (***5***). Manual movement by a trained operator is controlled by turning the handwheels and directing the water/foam flow. (***Fig 3.4.1.3***)

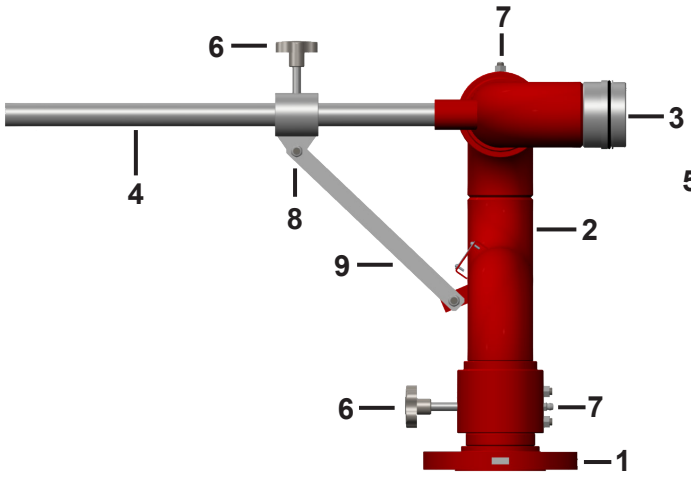

Figure 3.4.1.1

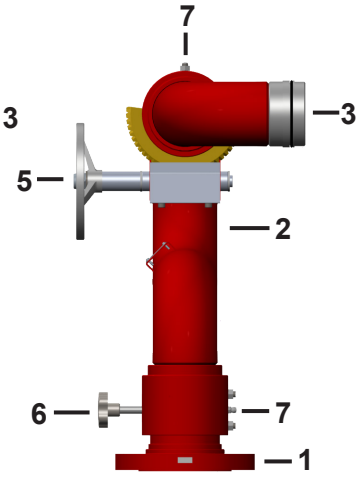

Figure 3.4.1.2

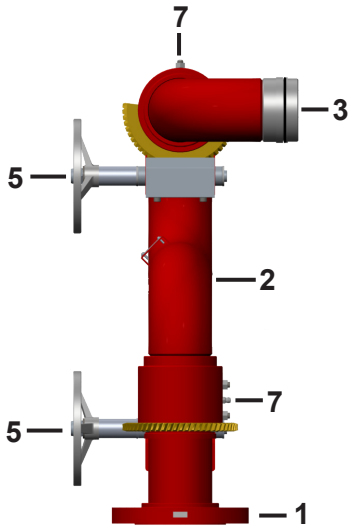

Figure 3.4.1.3

Table 3.4.1.4 – Manual Monitor General Features			
Item	**Description**	**Item**	**Description**
1	Water / foam inlet (flanged)	6	Locking knob
2	Body	7	Greaser nipple
3	Water / foam outlet (threaded)	8	Tiller slide
4	Tiller	9	Tiller connecting rod
5	Handwheel		

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3.4.2 – Nozzle selection

Non-oscillating and oscillating monitors are available with non-self-inducting or self-inducting type nozzles.

(VNN) Non-self-inducting nozzle is for use with water or with foam solution supplied via a suitable bladder tank proportioning, foam pump proportioning or other foam dosing system. (***Fig 3.4.2.1***)

(VNS) Self-inducting nozzle will use the flow of water through the internal waterway to draw foam into the nozzle and mix into a foam solution locally before discharging from the outlet. The foam induction can be isolated using the supplied ball valve and water only can be used. The total flow in this condition will be 3% less than nominal. ***(Fig 3.4.2.2)***

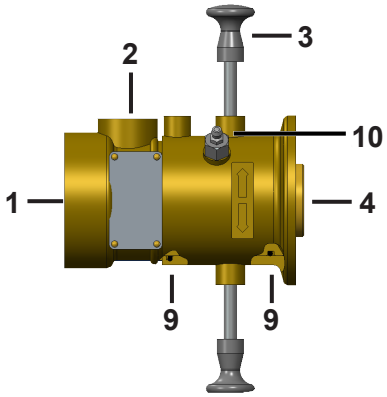

Figure 3.4.2.1

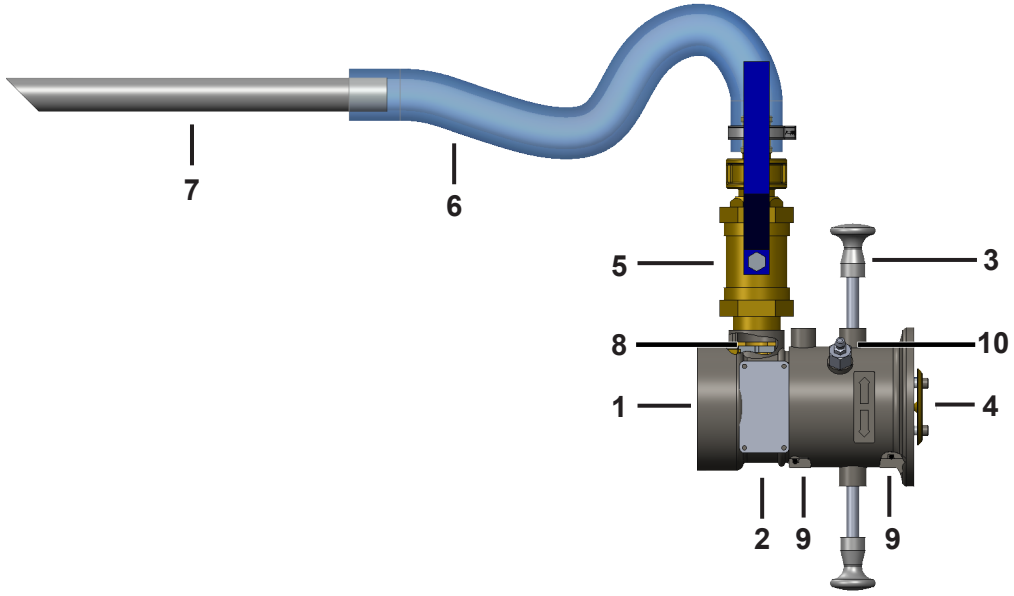

Figure 3.4.2.2

Table 3.4.2.3 – Nozzle General Features

Item	Description	Item	Description
1	Water / foam inlet (threaded)	6	Foam concentrate suction hose
2	Body	7	Foam concentrate pick-up pipe
3	Jet / spray adjustment knob	8	Sized orifice
4	Water / foam outlet	9	Terminal gasket
5	Foam concentrate isolation valve	10	Greaser nipple

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3.4.3 – Oscillating unit

(VSO) Oscillating unit can be added to any of the monitors featured in this data page to allow automatic coverage of a fixed area (from 15º to 360º) in a fire condition. This can be beneficial when human (manual) control is not possible or is undesirable due to safety concerns or accessibility. Manual operation by trained personnel is also possible. The requirement for oscillating monitors is detailed in various design standards such as NFPA409, NFPA418 and EN13565-2 for example.

The oscillating unit's movement is driven by a small amount of redirected water/foam solution travelling through the monitor. A water turbine shield is included as standard to direct this water/foam solution downwards.

A test feature is included to enable a test of the oscillation function and range without discharging from the monitor.

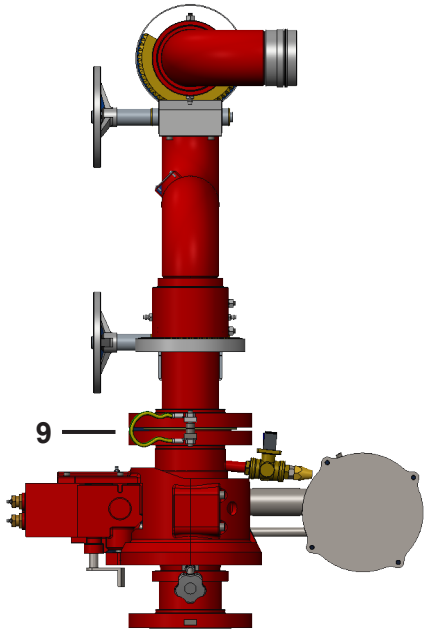

Figure 3.4.3.1 | VSO with monitor VMH

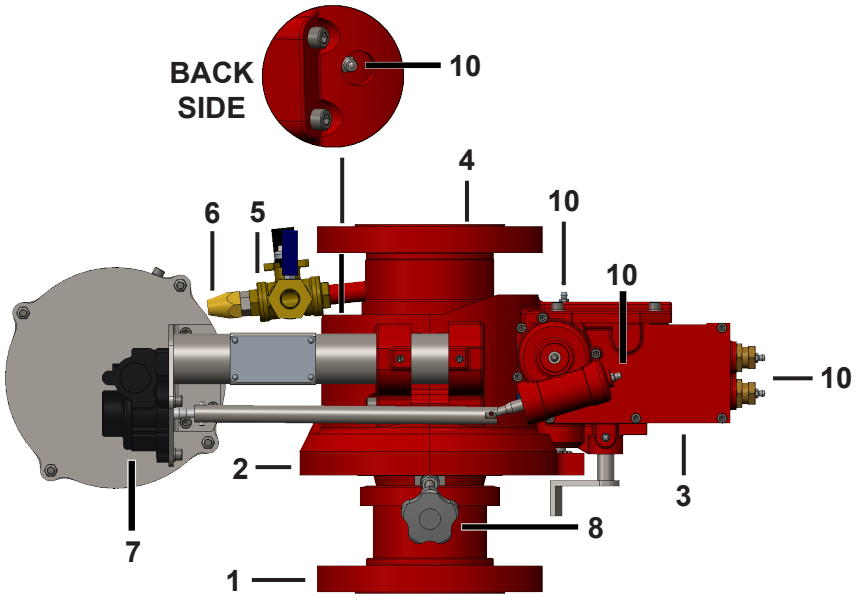

Figure 3.4.3.2 | VSO

Table 3.4.3.3 – Oscillating Unit General Features

Item	Description	Item	Description
1	Water / foam inlet (flanged)	6	Impeller nozzle
2	Body	7	Impeller wheel and reduction gear assembly
3	Gearbox	8	Oscillation angle adjustment knob (x2)
4	Water / foam outlet (flanged)	9	Earthing cable
5	3-Way test / run / impeller isolation valve	10	Greaser nipple

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3.4.4 – Product selection guide

A complete monitor can be ordered by selecting the correct monitor and nozzle for non-oscillating units or monitor, nozzle and oscillating unit where the self-oscillation function is required.

1) Select the monitor type as described in ***section 3.4.1*** (Tiller, 1-handwheel or 2-handwheel)
2) Select the flow rate required (this will define the monitor body size automatically)
3) Select the monitor inlet flange size and flange pattern

   Note: ANSI flanged monitor only with NH (NST) nozzle threads and PN16 flanged monitor only with BSP nozzle threads.

4) Select the nozzle type as described in ***section 3.4.2*** (Non-self-inducting or self-inducting)
5) Select the nozzle material (choice with 2.5" model only)
6) If an oscillating monitor is required, select the oscillating unit part number from the same line as the monitor part number to ensure flange compatibility.

The ordering part numbers can now be defined.

Example 1

1,000 USG Non-oscillating, 2-handwheel monitor with 4" PN16 inlet flange & self-inducting stainless steel nozzle.
Monitor = VMW3X4P, Nozzle = VNN1000BS. (Monitor outlet/nozzle inlet threads are BSP by default due to PN16 flange selection)

Example 2

250 USG Oscillating tiller monitor with 3" ANSI inlet flange and non-self-inducting nickel aluminium bronze nozzle.
Monitor = VMT25X3A, Oscillating unit = VSO3X3A, Nozzle = VNS250NN. (Monitor outlet/nozzle inlet threads are NH (NST) by default due to ANSI flange selection)

Table 3.4.5 – VMT Tiller Control Monitor

Flow rate[2,3]		Monitor body		Monitor inlet flange		Part number	
GPM	l/min	Size	Outlet[4]	Size	Pattern	Monitor	Oscillating unit
250 / 350 / 500	946 / 1,325 / 1,892	2.5"	NH (NST)	2.5"	ANSI	VMT25X25A	N/A[1]
250 / 350 / 500	946 / 1,325 / 1,892	2.5"	BSP	2.5"	PN16	VMT25X25P	N/A[1]
250 / 350 / 500	946 / 1,325 / 1,892	2.5"	NH (NST)	3"	ANSI	VMT25X3A	VSO3X3A
250 / 350 / 500	946 / 1,325 / 1,892	2.5"	BSP	3"	PN16	VMT25X3P	VSO3X3P
250 / 350 / 500	946 / 1,325 / 1,892	2.5"	NH (NST)	4"	ANSI	VMT25X4A	VSO4X4A
250 / 350 / 500	946 / 1,325 / 1,892	2.5"	BSP	4"	PN16	VMT25X4P	VSO4X4P
750 / 1,000	2,838 / 3,785	3"	NH (NST)	3"	ANSI	VMT3X3A	VSO3X3A
750 / 1,000	2,838 / 3,785	3"	BSP	3"	PN16	VMT3X3P	VSO3X3P
750 / 1,000	2,838 / 3,785	3"	NH (NST)	4"	ANSI	VMT3X4A	VSO4X4A
750 / 1,000	2,838 / 3,785	3"	BSP	4"	PN16	VMT3X4P	VSO4X4P

Table 3.4.6 – VMH 1-Handwheel Control Monitor

Flow rate[2,3]		Monitor body		Monitor inlet flange		Part number	
GPM	l/min	Size	Outlet[4]	Size	Pattern	Monitor	Oscillating unit
750 / 1,000	2,838 / 3,785	3"	NH (NST)	3"	ANSI	VMH3X3A	VSO3X3A
750 / 1,000	2,838 / 3,785	3"	BSP	3"	PN16	VMH3X3P	VSO3X3P
750 / 1,000	2,838 / 3,785	3"	NH (NST)	4"	ANSI	VMH3X4A	VSO4X4A
750 / 1,000	2,838 / 3,785	3"	BSP	4"	PN16	VMH3X4P	VSO4X4P

Table 3.4.7 – VMW 2-Handwheel Control Monitor

Flow rate[2,3]		Monitor body		Monitor inlet flange		Part number	
GPM	l/min	Size	Outlet[4]	Size	Pattern	Monitor	Oscillating unit
750 / 1,000	2,838 / 3,785	3"	NH (NST)	3"	ANSI	VMW3X3A	VSO3X3A
750 / 1,000	2,838 / 3,785	3"	BSP	3"	PN16	VMW3X3P	VSO3X3P
750 / 1,000	2,838 / 3,785	3"	NH (NST)	4"	ANSI	VMW3X4A	VSO4X4A
750 / 1,000	2,838 / 3,785	3"	BSP	4"	PN16	VMW3X4P	VSO4X4P

For footnotes see next page

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Table 3.4.8 – VNN Non-Self-Inducting and VNS Self-Inducting Monitor Nozzle

Flow Rate[2,3]		Nozzle			Part number	
GPM	l/min	Size	Thread[4]	Material	Non-self-inducting	Self-inducting[5]
250	946	2.5”	NH (NST)	Anodized aluminium	VNN250NA	VNS250NA
250	946	2.5”	BSP	Anodized aluminium	VNN250BA	VNS250BA
250	946	2.5”	NH (NST)	Nickel aluminium bronze	VNN250NN	VNS250NN
250	946	2.5”	BSP	Nickel aluminium bronze	VNN250BN	VNS250BN
350	1,325	2.5”	NH (NST)	Anodized aluminium	VNN350NA	VNS350NA
350	1,325	2.5”	BSP	Anodized aluminium	VNN350BA	VNS350BA
350	1,325	2.5”	NH (NST)	Nickel aluminium bronze	VNN350NN	VNS350NN
350	1,325	2.5”	BSP	Nickel aluminium bronze	VNN350BN	VNS350BN
500	1,892	2.5”	NH (NST)	Anodized aluminium	VNN500NA	VNS500NA
500	1,892	2.5”	BSP	Anodized aluminium	VNN500BA	VNS500BA
500	1,892	2.5”	NH (NST)	Nickel aluminium bronze	VNN500NN	VNS500NN
500	1,892	2.5”	BSP	Nickel aluminium bronze	VNN500BN	VNS500BN
750	2,838	3”	NH (NST)	Stainless steel	VNN750NS	VNS750NS
750	2,838	3”	BSP	Stainless steel	VNN750BS	VNS750BS
1,000	3,785	3”	NH (NST)	Stainless steel	VNN1000NS	VNS1000NS
1,000	3,785	3”	BSP	Stainless steel	VNN1000BS	VNS1000BS

Footnotes for ***tables 3.4.5, 3.4.6, 3.4.7 and 3.4.8***

1 Monitor with 2.5” inlet flange not suitable for oscillating unit.
2 Flow rates based on nozzle inlet pressure of 100 psi (6.89 bar).
3 Flow rate with water or foam solution.
4 NH (National Hose) and NST (National Standard Thread) are two references for the same thread specification.
5 Self-inducting nozzle factory set at 3% in line with UL listing requirements.

4. SCOPE OF DELIVERY

Ensure that all components are complete and in good condition.

Included

The non-oscillating monitor and selected nozzle are supplied separately (unassembled).

The oscillating monitor, selected nozzle and oscillating unit are supplied separately (unassembled).

The self-inducting nozzle is supplied with a 7-1/2 ft (2.3 m) long pick-up tube assembly (hose & tube) which is supplied loose. A shut-off valve and sized orifice is supplied with the self-inducting nozzle. It is recommended that this hose length is not changed to ensure optimum performance and listing compliance.

Not included

Flange bolts, nuts, washers, gaskets for the connection of the monitor/oscillating unit to the system pipework.

5. AVAILABILITY

Please contact your local Viking sales office for further information.
The product is available directly from Viking and official distributors only.

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Americas: The Viking Corporation, 210 N. Industrial Park Drive, Hastings, Michigan 49058, Toll free phone: (800) 968-9501

APAC: The Viking Corporation (Far East) Pte. Ltd., 69 Tuas View Square, Westlink Techpark, Singapore 637621
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6. PRODUCT VARIANTS

6.1 Options

- None

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6.2 Monitor dimensions

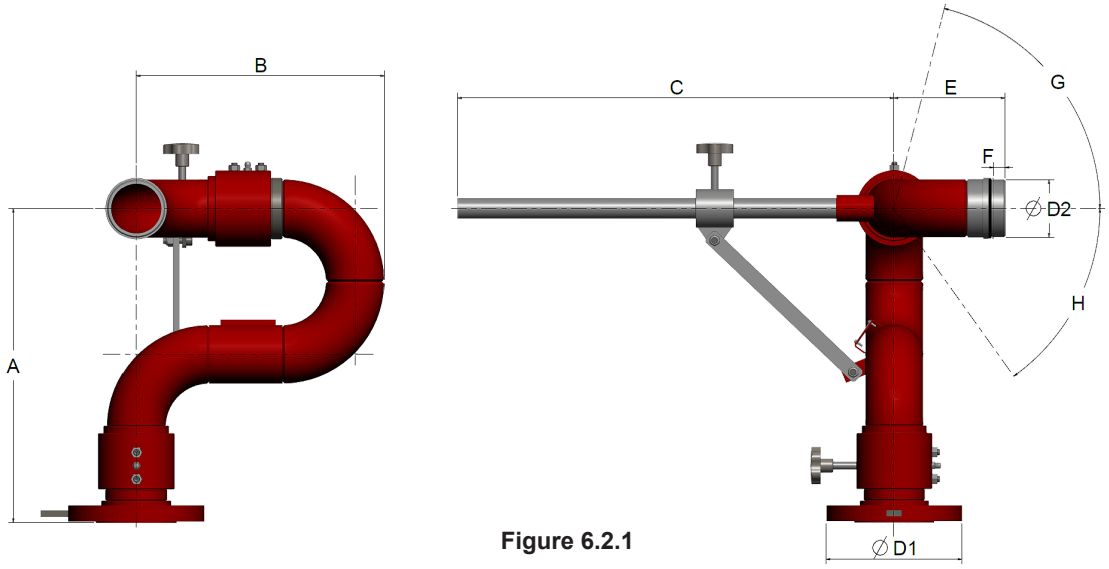

Figure 6.2.1

Table 6.2.2 – VMT Tiller Control Monitor Dimensions																	
Body	Inlet flange (ØD1)	Body outlet (ØD2)	Weight		A		B		C		E		F		Angle		Rotation
			lbs	kg	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	G	H	
2.5”	2.5”, 3”, 4”	2.5” NH (NST), BSP	37.5	17	15.75	400	12.99	330	14.17	360	5.71	145	0.83	21	+85°	-65°	360°
3”	3”, 4”	3” NH (NST), BSP	47.5	21.5	18.7	475	15.16	385	25.2	640	5.91	150	0.91	23	+70°	-55°	360°

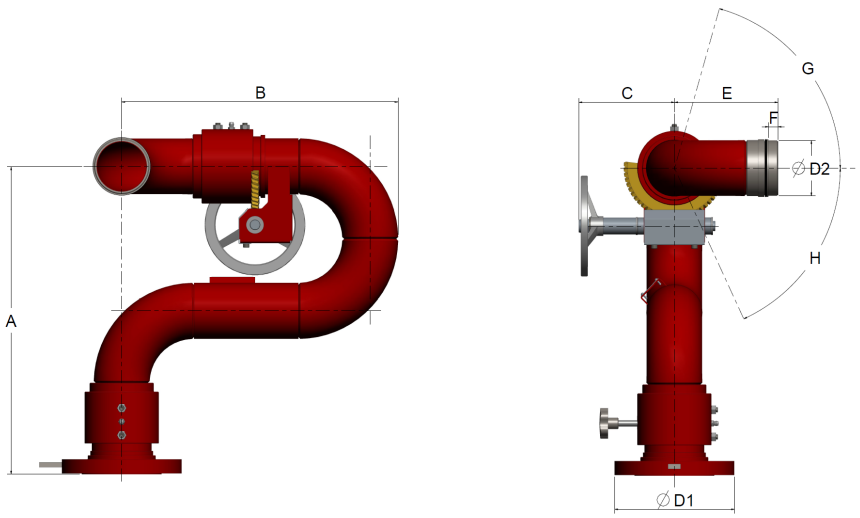

Figure 6.2.3

Table 6.2.4 – VMH 1-Handwheel Control Monitor Dimensions																	
Body	Inlet flange (ØD1)	Body outlet (ØD2)	Weight		A		B		C		E		F		Angle		Rotation
			lbs	kg	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	G	H	
3”	3”, 4”	3” NH (NST), BSP	51.9	23.5	18.7	475	17.32	440	6.2	158	5.91	150	0.91	23	+85°	-70°	360°

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6.2 Monitor dimensions (*continued*)

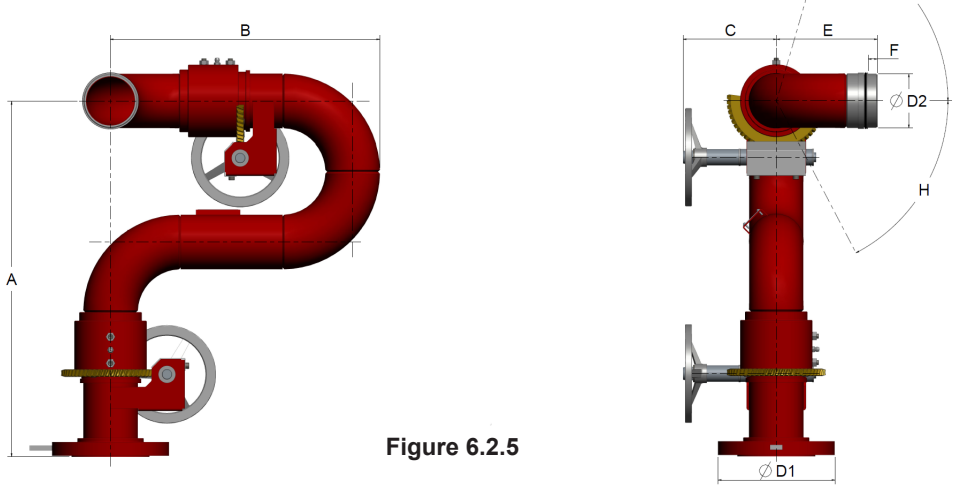

Figure 6.2.5

Table 6.2.6 – VMW 2-Handwheel Control Monitor Dimensions																	
Body	Inlet flange (ØD1)	Body outlet (ØD2)	Weight		A		B		C		E		F		Angle		Rotation
			lbs	kg	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	G	H	
3”	3”, 4”	3” NH (NST), BSP	56.3	25.5	21.65	550	17.32	440	6.2	158	5.91	150	0.91	23	+85°	-70°	360°

6.3 Nozzle dimensions

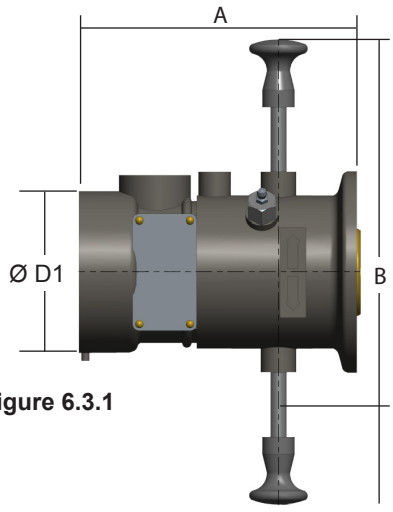

Figure 6.3.1

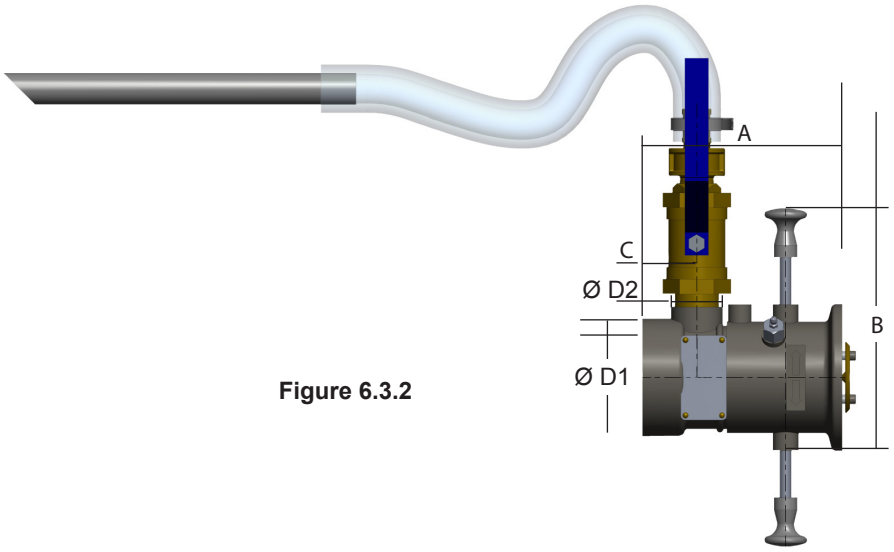

Figure 6.3.2

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6.3 Nozzle dimensions (*continued*)

Table 6.3.3 – VNN Non-Self-Inducting and VNS Self-Inducting Monitor Nozzle Dimensions

Inlet (ØD1)	Type	Material	Flow rate (GPM)	Thread	Weight		A		B		C		Ø D2	
					lbs	kg	Inch	mm	Inch	mm	Inch	mm	Inch	mm
2.5”	VNN Non-self-inducting	AA	250, 350 500	BSP	5.5	2.5	6.7	170	11.1	282	N/A	N/A	N/A	N/A
		NAB		NH	12.1	5.5	6.7	170	11.1	282	N/A	N/A	N/A	N/A
3”		SST	750	BSP	14.3	6.5	6.5	164	10.75	273	N/A	N/A	N/A	N/A
		SST	750	NH	15.9	7.2	7.8	198	10.75	273	N/A	N/A	N/A	N/A
		SST	1,000	BSP, NH	33.1	15	9.3	237	11.97	304	N/A	N/A	N/A	N/A
2.5”	VNS Self-inducting	AA	250, 350 500	BSP	7.7	3.5	6.7	170	11.1	282	1.81	46	1	25
		NAB		NH	16.6	7.5	6.7	170	11.1	282	1.81	46	1	25
3”		SST	750	BSP	19.2	8.7	9.1	231	11.1	282	1.81	46	1	25
		SST	750	NH	17.7	8	7.8	197	10.75	273	2.09	53	1.25	32
		SST	1,000	BSP, NH	39.7	18	9.3	237	11.97	304	2.36	60	1.25	32

Notes: All nozzles have an effective spray angle from Jet to Fog
AA = Anodized Aluminium; NAB = Nickel Aluminium Bronze; SST = Stainless Steel

6.4 Oscillating unit dimensions

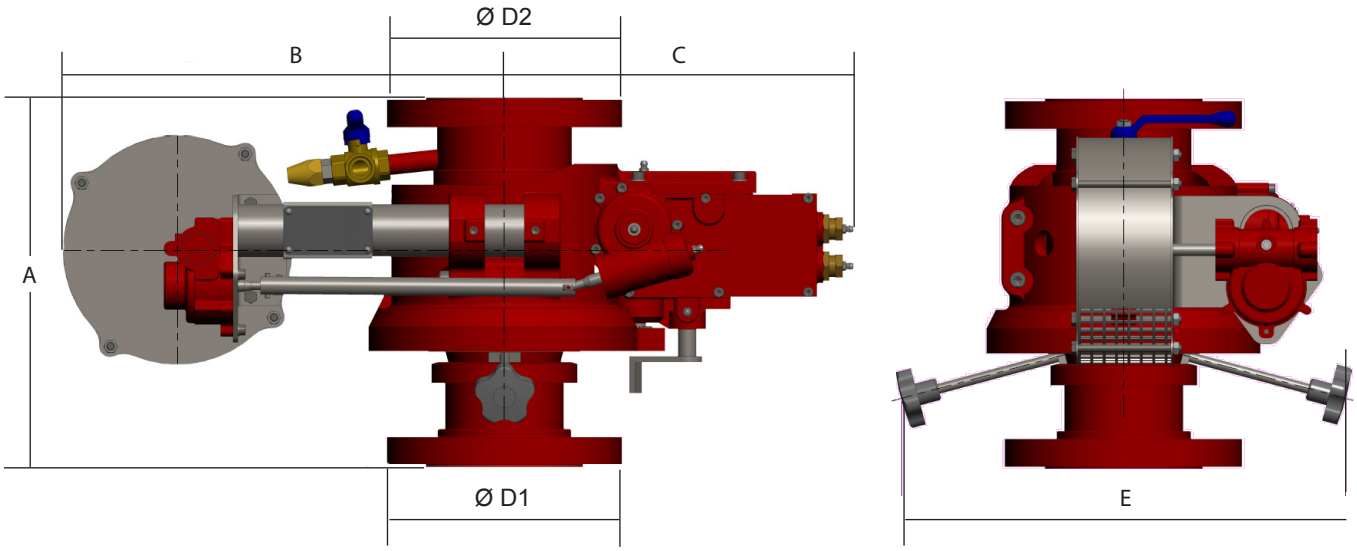

Figure 6.4.1

Table 6.4.2 - Oscillating Unit Dimensions

Flange			Weight		A		B		C		E	
Inlet (ØD1)	Outlet (ØD2)	Pattern	lbs	kg	Inch	mm	Inch	mm	Inch	mm	Inch	mm
3”	3”	ANSI, PN16	69	31	11.73	298	14.09	358	11.1	282	14.45	367
4”	4”	ANSI, PN16	71	32	11.73	298	14.09	358	11.1	282	14.45	367

Notes: Turbine flow rate is approximately 5.5 GPM (21 l/min) @ 100 psi (6.89 bar)
Oscillation range adjustable from 15° to 360° continuous

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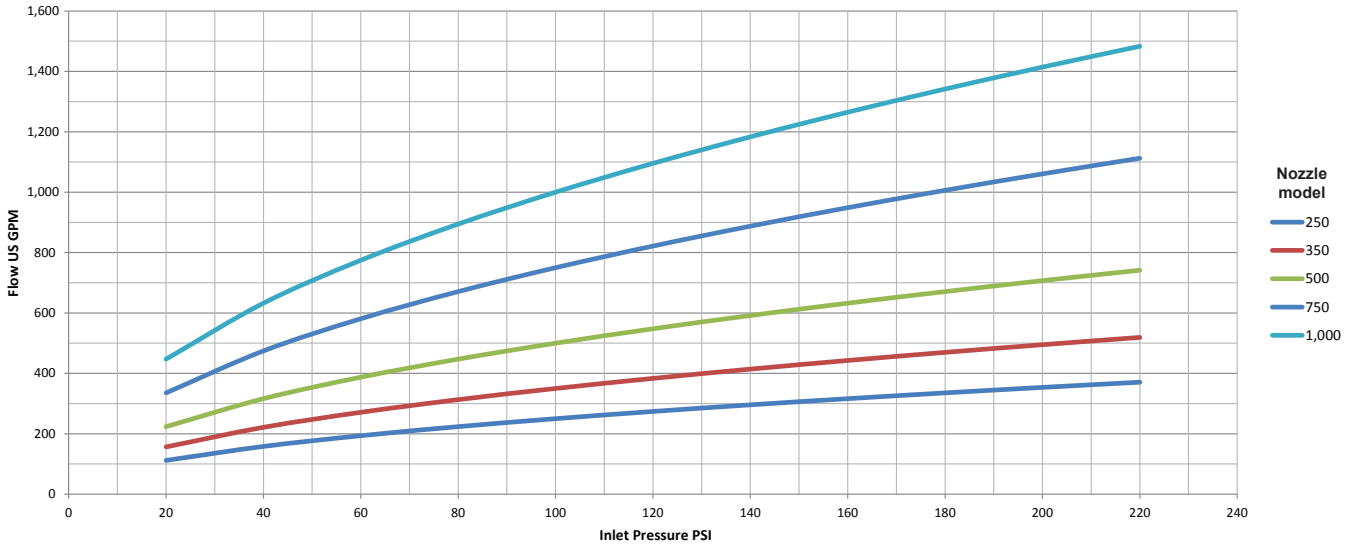
7. PERFORMANCE DATA

NOTICE

The following data is based on the monitors and nozzles referenced in this data page working together at their listed flow rates and pressures. Tests conducted without wind. Actual site conditions may produce different results.

7.1 Flow rate vs. Nozzle inlet pressure

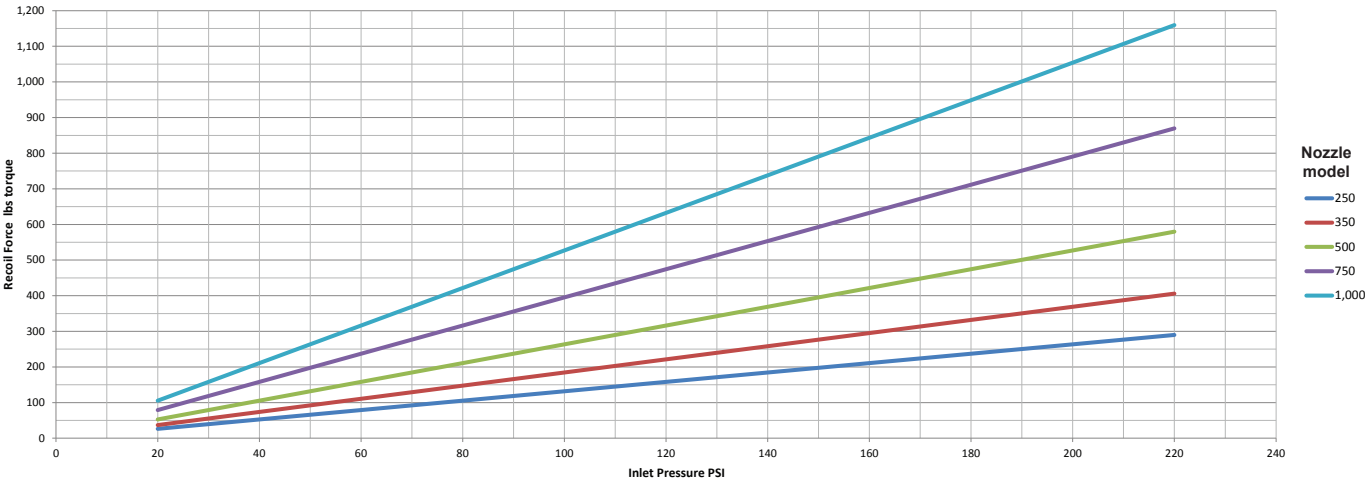


Graph 7.1.1 | Flow rate vs. Nozzle inlet pressure

7.2 Recoil force vs. Nozzle inlet pressure

WARNING

Take care to secure the monitor during installation to take account of the recoil force which increases with flow.



Graph 7.2.1 | Recoil force vs. Nozzle inlet pressure

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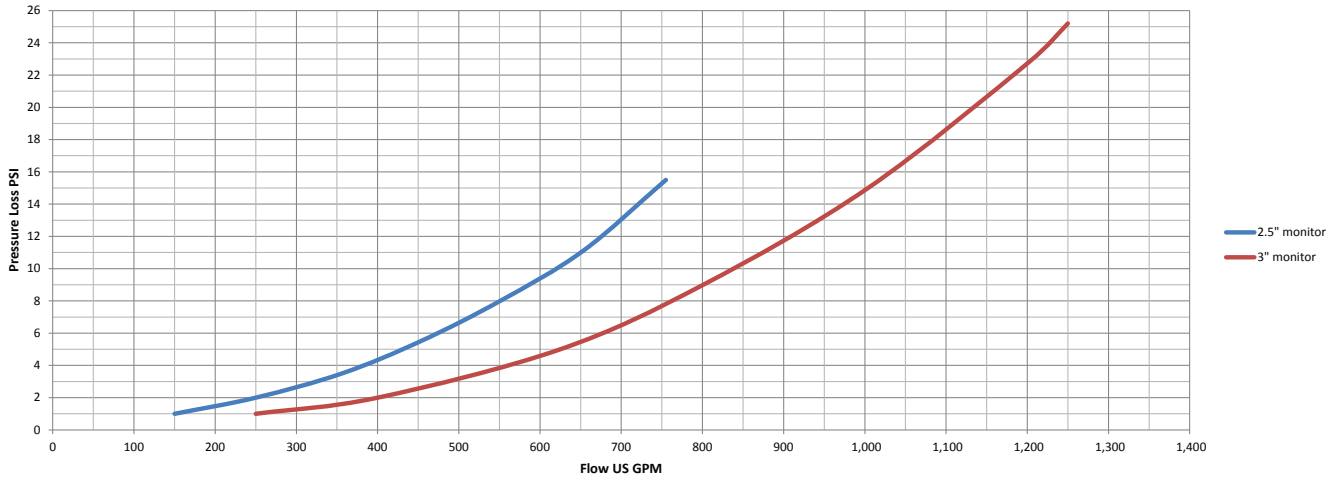
7.3 Pressure loss vs. Flow rate

As the flow increases through the monitor, the pressure loss effect also increases. As the monitor / nozzle performance data is based on the nozzle inlet pressure, the losses through the monitor (from monitor inlet flange to monitor outlet thread) should be taken into consideration at the design phase.



Graph 7.3.1 | Pressure loss vs. Flow rate

7.4 Throw performance

The following charts are designed to give a general guide to monitor performance. The curves are an approximation based upon theoretical calculations. External factors WILL have an effect on this performance. The charts are based on a straight stream jet spray with water through a non-self-inducting nozzle. (Note that other monitor discharge devices such as branch pipes are not considered as they are not covered by this UL listing). The design and installation shall take into consideration all external factors on discharge performance and use products and water supplies capable of achieving the required result.

The following conditions will have an adverse impact on performance:

1) Discharge of foam solution.
2) Use of a self-inducting foam concentrate nozzle rather than an upstream proportioning system to supply the foam solution.
3) Nozzle spray angle. These charts are based on a full jet / straight stream only.
4) Wind will have a major impact on performance and the general location should be considered when planning. Throw angles above 35° will see a greater effect from the presence of wind.
5) Downstream valves or pipework configurations causing excessive pressure loss or turbulence.

Outside applications such as tank farms and loading jettys pose the greatest challenge as multiple factors normally need to be considered.

All simulations assume the monitor is mounted at ground level with the nozzle approximately 1 m from ground level. Maximum theoretical throw is normally found between a 32° and 38° degrees monitor angle. Referenced pressures are measured at the nozzle inlet.

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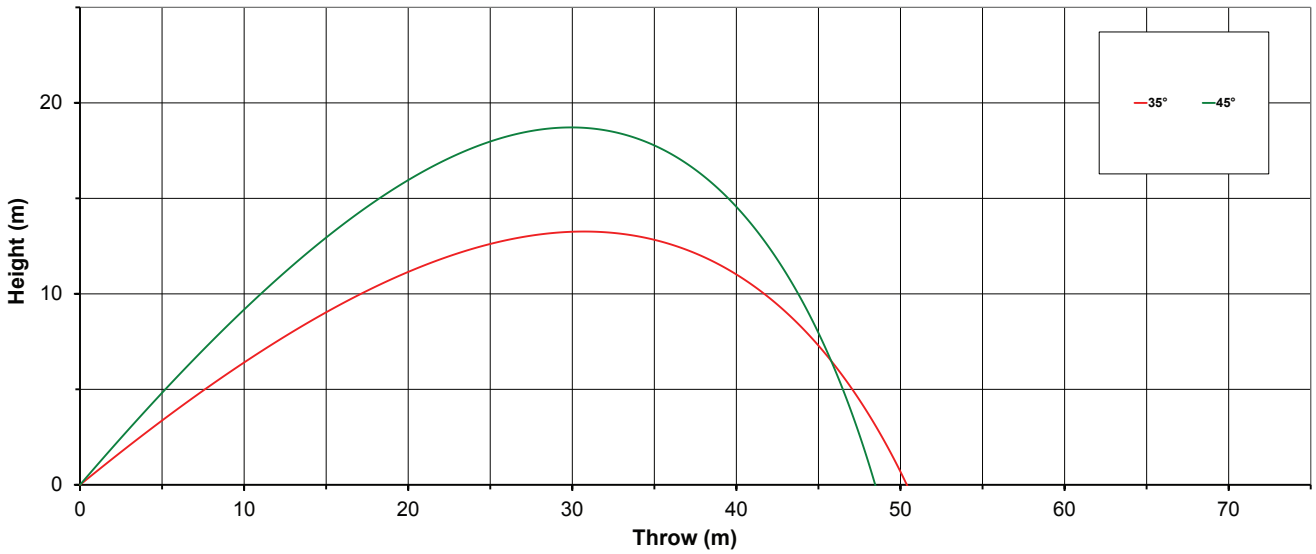
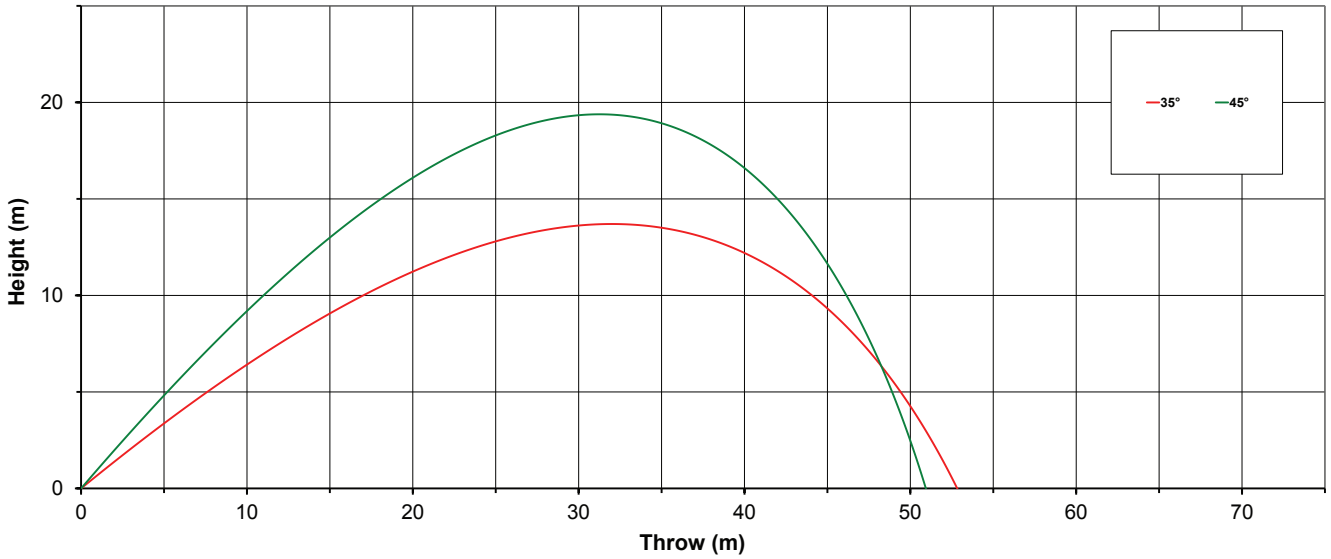


Graph 7.4.1 | 946 l/min (250 GPM) @ 6.89 bar (100 psi)



Graph 7.4.2 | 1,325 l/min (350 GPM) @ 6.89 bar (100 psi)

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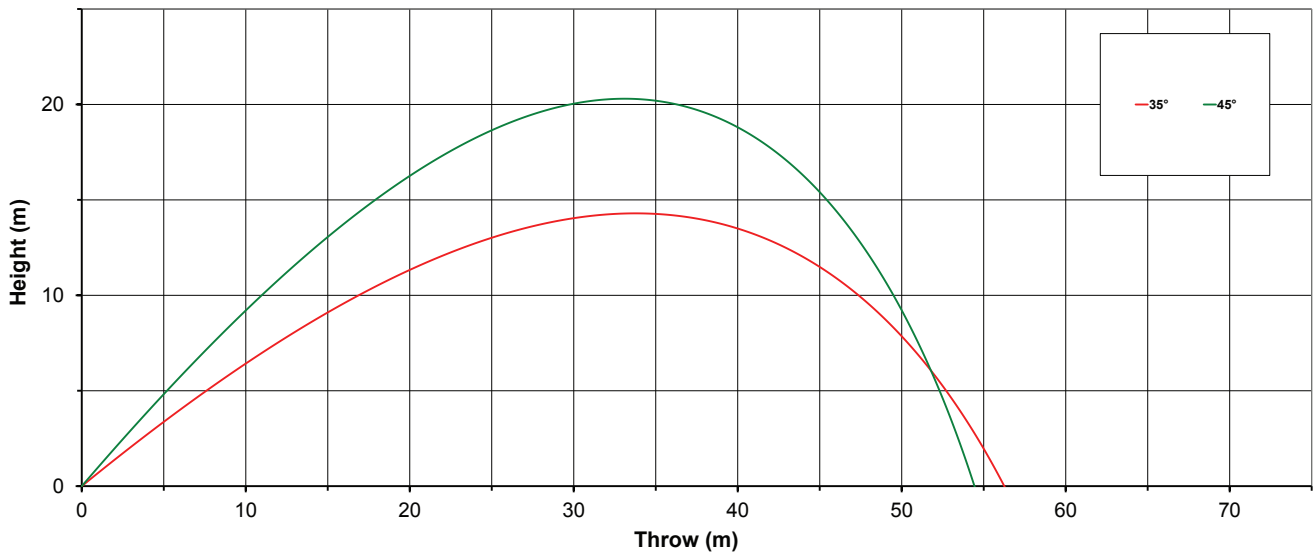
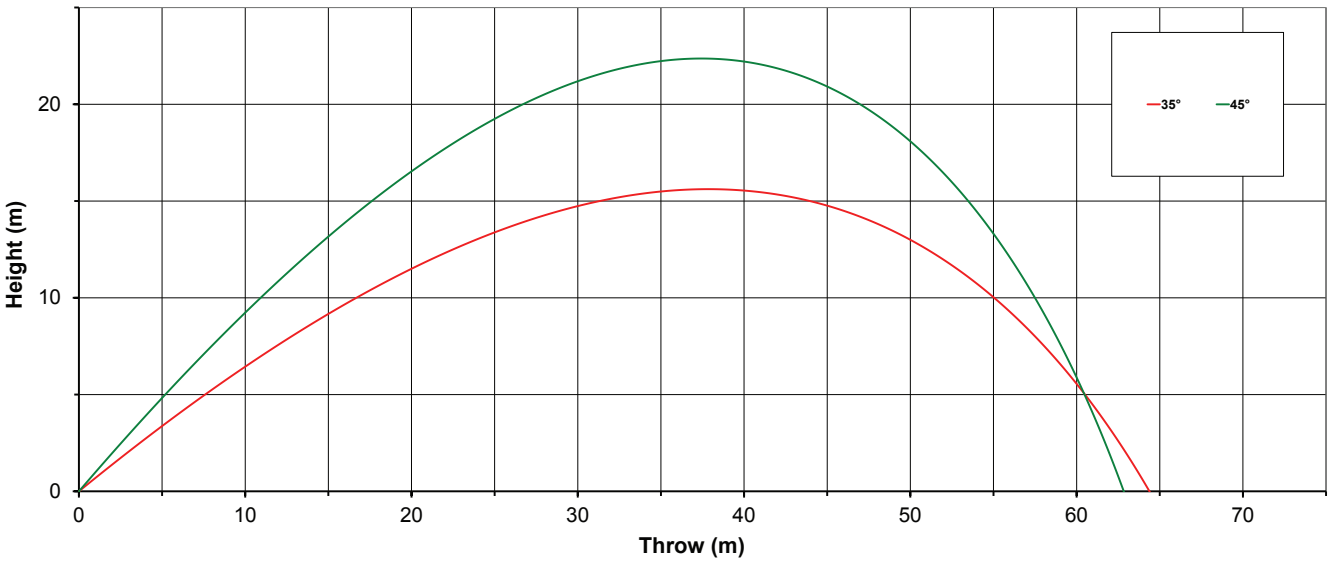


Graph 7.4.3 | 1,892 l/min (500 GPM) @ 6.89 bar (100 psi)



Graph 7.4.4 | 2,838 l/min (750 GPM) @ 6.89 bar (100 psi)

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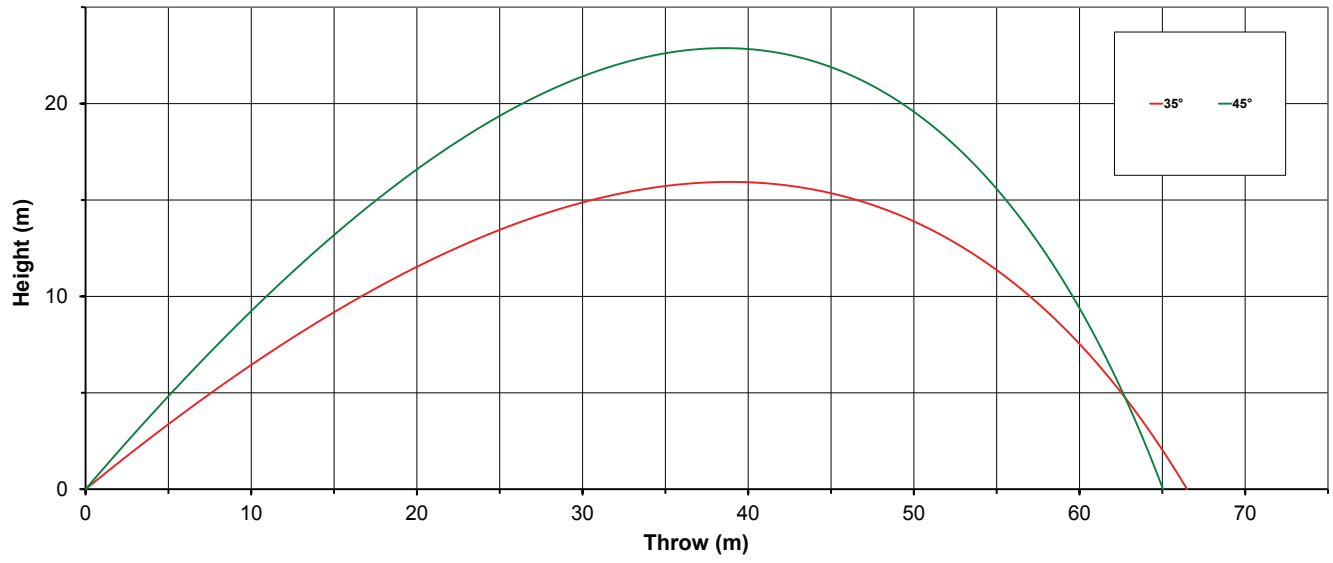

Graph 7.4.5 | 3,785 l/min (1,000 GPM) @ 6.89 bar (100 psi)

8. INSTALLATION

Refer to respective requirements, according to the relevant standards for installation. If applicable, refer to FM Global Property Loss Prevention Datasheet 4-12 for specific test and commissioning criteria. In addition, the “Authority Having Jurisdiction” (AHJ) may have additional maintenance, testing and inspection requirements that must be followed.
For manufacturer’s recommendations and requirements, please refer to ***Operation & Maintenance Manual F_102619 / TM1.3.5.1***

WARNING

Monitors are designed to work under pressure and should only be installed and operated by trained personnel with the appropriate permission and supervision. The correct operation of this monitor has been tested up to a flowing pressure of 250 psi (17.2 bar). However, consideration should be given to the actual usable pressure based on site conditions, operator competence and the integrity of the installation structure. For the appropriate operation guidance, please refer to the instructions in our Operation & Maintenance manual.

9. OPERATION

9.1 The non-oscillating (manual) tiller or handwheel operated monitor

This is a local discharge device used in fixed or mobile firefighting protection systems. These systems can be of the automatic or manually activated deluge/flow control type or a manually operated mobile trailer for example. The local control feature gives the possibility of controlling the water or water/foam discharge by adjusting its horizontal or vertical angle via the tiller or handwheel control.

The equipped nozzle can be adjusted to give various stream pattern shapes - from full jet to fog type.
All these controls are intended to achieve the highest efficiency in controlling and suppressing a fire or in cooling down hot surfaces exposed to fire.

The monitor is composed by three main parts:

- A lower body, rigidly connected through a flanged connection to the system’s supply piping network
- An intermediate body containing the two rotating joints– this section being the one rotating horizontally
- A top terminal section which is connected to the nozzle (or branch pipe). This terminal section rotates horizontally together with the intermediate body and independently of it, it can also rotate vertically

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9.2 The oscillating tiller or handwheel monitor

This has all the features mentioned under 9.1, but also gives the possibility of operation without human intervention in fixed systems. This is particularly useful in dangerous areas, difficult to access areas or in applications where continuous operator availability cannot be guaranteed.

The oscillating unit is a device which enables a continuous movement on the horizontal plane to the monitor installed on it. The rotation motion is generated by a hydraulic turbine fed by the same water/foam solution flow going to the discharge device at the end of the monitor. The turbine is combined with a reduction gear system and an inverting gear. The inverting gear changes the movement direction when the unit reaches one of the stops.

These stops are field adjustable so the range of oscillation can be adjusted freely between 15° to 340°. If only one stop is used, the total oscillation is approximately 355°. If both the stops are removed, the rotation of 360° continuously is possible. The oscillating unit can also be purchased separately for retrospective fitting to existing monitor installations. The required oscillating angles must be site configured.

10. GUARANTEE

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

11. INSPECTION, TESTS AND MAINTENANCE

NOTICE
The owner is responsible for maintaining the fire protection system and devices in proper operating condition.

WARNING
Any system maintenance or testing that 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 Authorities Having Jurisdiction. Consideration should be given to employment of a fire patrol in the affected area.

Refer to respective requirements, according to the relevant standards for Inspection, Testing and Maintenance. If applicable, refer to FM Global Property Loss Prevention Datasheet 4-12 for specific test and commissioning criteria. In addition, the "Authority Having Jurisdiction" (AHJ) may have additional maintenance, testing and inspection requirements that must be followed.

For manufacturer's recommendations and requirements, please refer to ***Operation & Maintenance Manual F_102619 / TM1.3.5.1***

12. DISPOSAL

At end of use the product described here should be disposed of via the national recycling system. Upon request the manufacturer can take back and properly dispose of the electrical equipment and electronic devices.

13. ACCESSORIES AND SPARE PARTS

Contact the appropriate Viking sales office in ***Section 5 Availability*** for further assistance.

For manufacturer's recommendations and requirements, please refer to ***Operation & Maintenance Manual F_102619 / TM1.3.5.1***

14. DECLARATION OF CONFORMITY

If required. Contact the appropriate Viking sales office in ***Section 5 Availability*** for further assistance.

PS10 Series

Pressure Switch

Features

- One or two switch models available
- Independent switch adjustment on two switch models, no tools needed
- Two 1/2” conduit/cable entrances
- Separate isolated wiring chambers
- Non-corrosive pressure connection
- VdS version available
- Non-Conductive enclosure

NOTICE

This document contains important information on the installation and operation of PS10 pressure switches. Please read all instructions carefully before beginning installation. A copy of this document is required by NFPA 72 to be maintained on site.

Installation

The Potter PS10 Series Pressure Actuated Switches are designed for the detection of a waterflow condition in automatic fire sprinkler systems of particular designs such as wet pipe systems with alarm check valves, dry pipe, preaction, or deluge valves. The PS10 is also suitable to provide a low pressure supervisory signal; adjustable between 4 and 15 psi (0,27 and 1,03 bar).

1. Apply Teflon tape to the threaded male connection on the device. (Do not use pipe dope)
2. Device should be mounted in the upright position (threaded connection down).
3. Tighten the device using a wrench on the flats on the device.

Wiring Instructions

1. Remove the tamper resistant screw with the special key provided.
2. Carefully place a screwdriver on the edge of the knockout and sharply apply a force sufficient to dislodge the knockout plug. See Fig 9.
3. Run wires through an approved conduit connector and affix the connector to the device. NEMA 4 rated conduit and fittings are required for outdoor use.
4. Connect the wires to the appropriate terminal connections for the service intended. See Figures 2,4,5, and 6. See Fig. 7 for two switch, one conduit wiring.

Technical Specifications

Conduit Entrances	Two knockouts for 1/2” conduit provided. Individual switch compartments and ground screw suitable for dissimilar voltages
Contact Ratings	SPDT (Form C) 10.1 Amps at 125/250VAC, 2.0 Amps at 30VDC One SPDT in PS10-1, Two SPDT in PS10-2
Cover Tamper	Cover incorporates tamper resistant fastener that requires a special key for removal. One key is supplied with each device.
Differential	2 psi (0,13 bar) typical
Dimensions	3.78”(9,6cm)Wx3.20”(8,1cm)Dx4.22”(10,7cm)H
Enclosure	Cover: Weather/UV/Flame Resistant High Impact Composite Base: Die Cast All parts have corrosion resistant finishes
Environmental Limitations	-40º F to 140ºF (-40ºC to 60ºC) NEMA 4/IP66 Rated Enclosure indoor or outdoor when used with NEMA 4 conduit fittings
Factory Adjustment	4 - 8 psi (0,27 - 0,55 bar)
Maximum System Pressure	300 psi (20,68 bar)
Pressure Connection	Nylon 1/2” NPT male
Pressure Range	4-15 psi (0,27 - 1,03 bar)
Service Use	NFPA 13, 13D, 13R, 72

*Specifications subject to change without notice.

Testing and Adjustment

NOTE: Testing the PS10 may activate other system connected devices. The operation of the pressure alarm switch should be tested upon completion of installation and periodically thereafter in accordance with the applicable NFPA codes and standards and/or the authority having jurisdiction (manufacturer recommends quarterly or more frequently). There should be no need to adjust the PS10 when it is used as a pressure type waterflow indicator. It is factory set to comply with UL and FM standards.

Wet System

Method 1: When using PS10 and control unit with retard - connect PS10 into alarm port piping on the input side of retard chamber and electrically connect PS10 to control unit that provides a retard to compensate for surges. Insure that no unsupervised shut-off valves are present between the alarm check valve and PS10.

Method 2: When using the PS10 for local bell application or with a control that does not provide a retard feature - the PS10 must be installed on the alarm outlet side of the retard chamber of the sprinkler system.

Testing: Accomplished by opening the inspector's end-of-line test valve. Allow time to compensate for system or control retard.

NOTE: Method 2 is not applicable for remote station service use, if there is an unsupervised shut-off valve between the alarm check valve and the PS10.

Wet System With Excess Pressure

Connect PS10 into alarm port piping extending from alarm check valve. Retard provisions are not required. Insure that no unsupervised shut-off valves are present between the alarm check valve and the PS10.

Testing: Accomplished by opening the water by-pass test valve or the inspector's end-of-line test valve. When using end-of-line test, allow time for excess pressure to bleed off.

Dry System

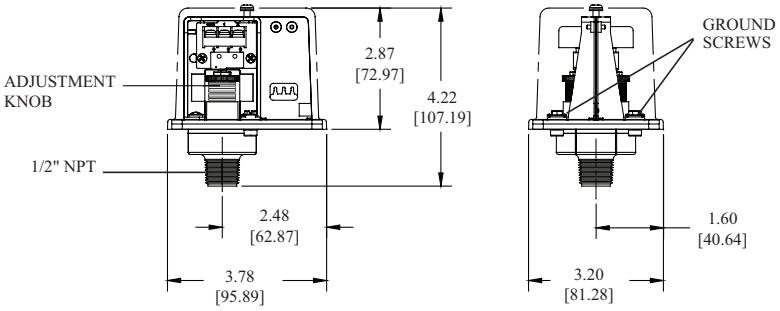
Connect PS10 into alarm port piping that extends from the intermediate chamber of the alarm check valve. Install on the outlet side of the in-line check valve of the alarm port piping. Insure that no unsupervised shut-off valves are present between the alarm check valve and the PS10.

Testing: Accomplished by opening the water by-pass test valve.

NOTE: The above tests may also activate any other circuit closer or water motor gongs that are present on the system.

Dimensions

Fig 1

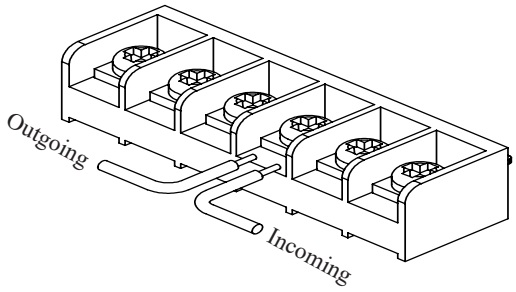


NOTE: To prevent leakage, apply Teflon tape sealant to male threads only.

DWG# 930-1

Switch Clamping Plate Terminal

Fig 2

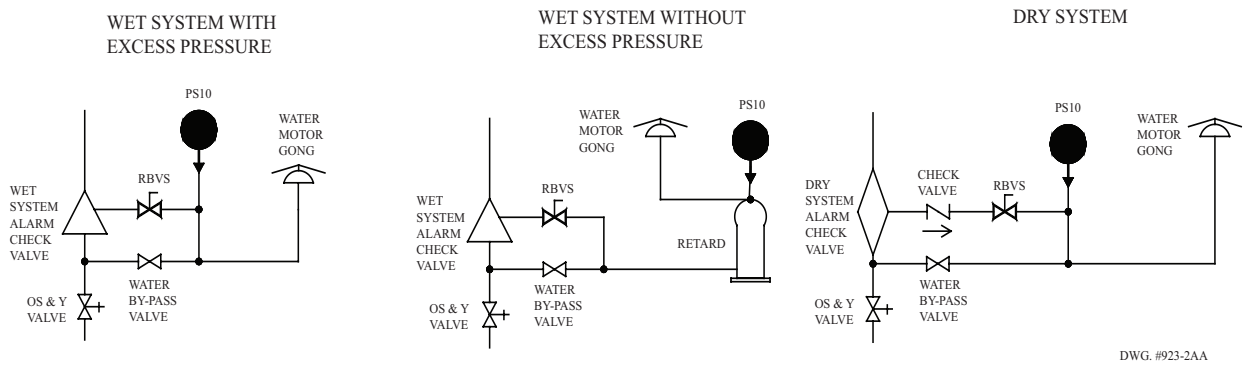


⚠ WARNING

An uninsulated section of a single conductor should not be looped around the terminal and serve as two separate connections. The wire must be severed, thereby providing supervision of the connection in the event that the wire becomes dislodged from under the terminal.

Typical Sprinkler Applications

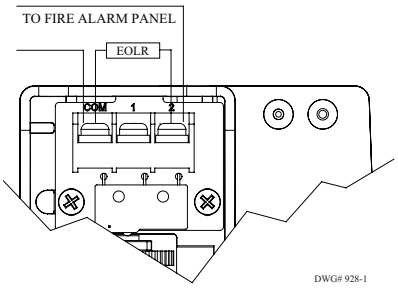
Fig 3



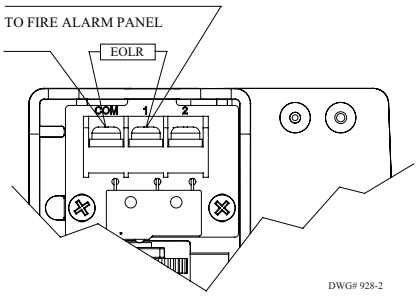
⚠ CAUTION

Closing of any shutoff valves between the alarm check valve and the PS10 will render the PS10 inoperative. To comply with NFPA-72 any such valve shall be electrically supervised with a supervisory switch such as Potter Model RBVS.

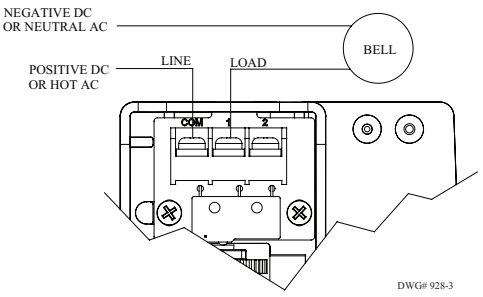
Low Pressure Signal Connection
Fig 4



Waterflow Signal Connection
Fig 5



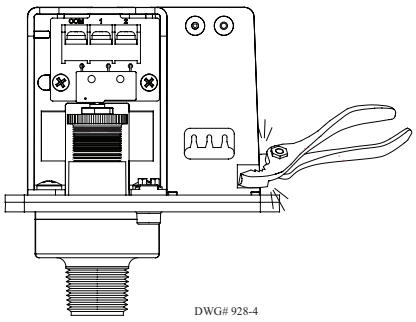
Local Bell For Waterflow Connection
Fig 6



One Conduit Wiring

Fig 7

Break out thin section of divider to provide path for wires when wiring both switches from one conduit entrance.

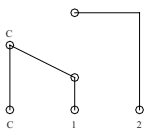


Switch Operation

Fig 8

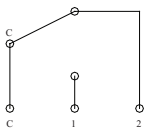
Terminal
C: Common
1: Closed when installed under normal system pressure.
2: Open when installed under normal system pressure. Closes on pressure drop. Use for low pressure supervision.

W/ PRESSURE APPLIED



Terminal
1: Open with no pressure supplied. Closes upon detection of pressure. Use for waterflow indication.
2: Closed with no pressure applied.

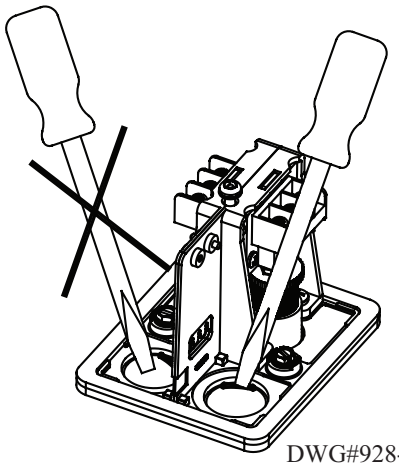
W/O PRESSURE APPLIED



DWG#928-6

Removing Knockouts

Fig 9



DWG#928-5

Engineer/Architect Specifications Pressure Type Waterflow Switch

Pressure type waterflow switches; shall be a Model PS10 as manufactured by Potter Electric Signal Company, St Louis MO., and shall be installed on the fire sprinkler system as shown and or specified herein.

Switches shall be provided with a ½" NPT male pressure connection and shall be connected to the alarm port outlet of; Wet Pipe Alarm Valves, Dry Pipe Valves, Pre-Action Valves, or Deluge Valves. The pressure switch shall be actuated when the alarm line pressure reaches 4 - 8 psi (0,27 - 0,55 bar).

Pressure type waterflow switches shall have a maximum service pressure rating of 300 psi (20,68 bar) and shall be factory adjusted to operate on a pressure increase of 4 - 8 psi (0,27 - 0,55 bar)

Pressure switch shall have one or two form C contacts, switch contact rating 10.1 Amps at 125/250 VAC, 2.0 Amps at 30 VDC.

Pressure type waterflow switches shall have two conduit entrances one for each individual switch compartment to facilitate the use of dissimilar voltages for each individual switch.

The cover of the pressure type waterflow switch shall be Weather/UV/ Flame Resistant High Impact Composite with rain lip and shall attach with one tamper resistant screw. The Pressure type waterflow switch shall be suitable for indoor or outdoor service with a NEMA 4/IP66 rating.

The pressure type waterflow switch shall be UL Ulc and CSFM listed, FM and LPC approved and NYMEA accepted.

⚠ WARNING

- Installation must be performed by qualified personnel and in accordance with all national and local codes and ordinances.
- Shock hazard. Disconnect power source before servicing. Serious injury or death could result.
- Read all instructions carefully and understand them before starting installation. Save instructions for future use. Failure to read and understand instructions could result in improper operation of device resulting in serious injury or death.
- Risk of explosion. Not for use is hazardous locations. Serious injury or death could result.

⚠ CAUTION

- Do not tighten by grasping the switch enclosure. Use wrenching flats on the bushing only. Failure to install properly could damage the switch and cause improper operation resulting in damage to equipment and property.
- To seal threads, apply Teflon tape to male threads only. Using joint compounds or cement can obstruct the pressure port inlet and result in improper device operation and damage to equipment.
- Do not over tighten the device, standard piping practices apply.

Ordering Information

Model	Description	Part Number
PS10-1	Pressure switch with one set SPDT contacts	1340103
PS10-2	Pressure switch with two sets SPDT contacts	1340104
Hex Key		5250062
Cover Tamper Switch Kit		0090200

Tamper

Cover incorporates tamper resistant fastener that requires a special key for removal. One key is supplied with each device. For optional cover tamper switch kit, order Stock No. 0090200. See bulletin #5401200 PSCTSK.

NOTICE

Pressure switches have a normal service life of 10-15 years. However, the service life may be significantly reduced by local environmental conditions.

TECHNICAL DATA

DELUGE VALVE, MODEL F-1 STRAIGHT THROUGH STYLE

2-1/2" (DN65) - 8" (DN200)

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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1. DESCRIPTION

The Viking Model F-1 Deluge Valve is a quick opening, differential diaphragm and flood valve with one moving mechanism. The Deluge Valve is used to control water flow in Deluge and Preaction sprinkler systems. The valve is held closed by system water pressure trapped in the priming chamber; keeping the outlet chamber and system piping dry. In fire conditions, when the releasing system operates, pressure is released from the priming chamber. The Deluge Valve clapper opens to allow water to flow into the system piping.

Features:

1. Field replaceable Diaphragm and Seat Rubbers
2. Designed for installation in the horizontal or vertical position
3. Designed to be reset without opening the valve
4. Compatible with Hydraulic, Pneumatic and/or Electric Release Systems

NOTE: FOR PART NUMBERS OF ACCESSORIES, REFER TO VIKING LIST PRICE SCHEDULE.

2. LISTINGS AND APPROVALS:

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

U.L. Listed - Guide No. VLFT & VLJH
C-UL Listed
FM Approved - Deluge Sprinkler Systems, Preaction Sprinkler Systems, Refrigerated Area Sprinkler Systems
American Bureau of Shipping (ABS) - Certificate No. 15-HS1332725-PDA
NYC Department of Buildings - MEA 89-92-E Vol XXXI
CE - Pressure Equipment Directive 97/23/EC

3. TECHNICAL DATA

Specifications:

Maximum Working Water Pressure: 250 PSI (17.4 bar)
Style: Straight through
Connections: See Table 1.
Factory tested: to 500 psi (34.5 bar)
Valve differential: 2:1 (priming chamber to inlet chamber)
Priming chamber supply restriction (required): 0.0625" (1.6 mm)
Color of Valve: Red
Friction loss: Refer to Table 1.
Cv Factor: Refer to Table 1.

Material Standards:

Refer to Figure 2.

Ordering Information:

Part Numbers - Refer to Table 1
8" - Manufactured since 2002
4" & 6" - Manufactured since 2003
2-1/2" & 3" - Manufactured since 2004

ACCESSORIES:

Refer to Current VIKING PRICE LIST for Part Numbers.

1. A Conventional Trim Trim package for use with the Model F-1 Deluge Valve. The trim package includes the VALVE ACCESSORY PACKAGE and the fittings and nipples shown on the Viking Deluge Valve Conventional Trim Chart Trim Chart for the valve used. Trim Charts are provided in trim packages and the Viking website. For optional factory assembled "modular" trim packages, refer to the Viking list price schedule or contact the manufacturer.
2. A Deluge VALVE ACCESSORY PACKAGE includes required trim components. This package is needed when Viking Trim Packages are not used.
3. Auxiliary Components are required for specific valve functions. For complete operating trim requirements, refer to system data for the system used. System data is provided on the Viking website.

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

VIKING®

TECHNICAL DATA

DELUGE VALVE, MODEL F-1 STRAIGHT THROUGH STYLE

2-1/2" (DN65) - 8" (DN200)

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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DESCRIPTION	Nominal Size	Part Number	Friction Loss*	Cv Factor	Shipping Weight
Threaded					
Pipe O.D.					
NPT 65 mm	2½"	12401	12 ft. (3.6 m)	155	67 lbs. (30 kg)
Flange/Flange					
Flange Drilling					
ANSI	3"	12014	12 ft. (3.6 m)	155	82 lbs. (37 kg)
ANSI	4"	11953	21 ft. (6.5 m)	428	146 lbs. (66 kg)
ANSI	6"	11955	39 ft. (11.9 m)	839	271 lbs. (123 kg)
ANSI	8"	11991	57 ft. (17.4 m)	1577	466 lbs. (212 kg)
ANSI/Japan	6"	11964	39 ft. (11.9 m)	839	271 lbs. (123 kg)
PN10/16	DN80	12026	12 ft. (3.6 m)	155	82 lbs. (37 kg)
PN10/16	DN100	11965	21 ft. (6.5 m)	428	127 lbs. (58 kg)
PN10/16	DN150	11956	39 ft. (11.9 m)	839	271 lbs. (123 kg)
PN10	DN200	11995	57 ft. (17.4 m)	1577	418 lbs. (190 kg)
PN16	DN200	11999	57 ft. (17.4 m)	1577	466 lbs. (212 kg)
Flange/Groove					
Flange Drilling / Pipe O.D.					
ANSI / 89 mm	3"	12018	12 ft. (3.6 m)	155	75 lbs. (34 kg)
ANSI / 114 mm	4"	11952	21 ft. (6.5 m)	428	136 lbs, (62 kg)
ANSI / 168 mm	6"	11954	39 ft. (11.9 m)	839	261 lbs. (118 kg)
PN10/16 / 89 mm	DN80	12030	12 ft. (3.6 m)	155	75 lbs. (34 kg)
PN10/16 / 114 mm	DN100	11958	21 ft. (6.5 m)	428	136 lbs. (62 kg)
PN10/16 / 165 mm	DN150	12640	39 ft. (11.9 m)	839	261 lbs. (118 kg)
PN10/16 / 168 mm	DN150	11954	39 ft. (11.9 m)	839	261 lbs. (118 kg)
Groove/Groove					
Pipe O.D.					
73 mm	2½" / DN65	12403	12 ft. (3.6 m)	155	67 lbs. (30 kg)
76 mm	DN80	12729	12 ft. (3.6 m)	155	67 lbs. (30 kg)
89 mm	3" / DN80	12022	12 ft. (3.6 m)	155	64 lbs. (29 kg)
114 mm	4" / DN100	11513	21 ft. (6.5 m)	428	127 lbs. (58 kg)
165 mm	DN150	11910	39 ft. (11.9 m)	839	245 lbs. (111 kg)
168 mm	6" / DN150	11524	39 ft. (11.9 m)	839	245 lbs. (111 kg)
219 mm	8" / DN200	11018	57 ft. (17.4 m)	1577	403 lbs. (183 kg)

*Expressed in equivalent length of Schedule 40 pipe based on Hazen & Williams C=120

$$Q = Cv \sqrt{\frac{\Delta P}{S}}$$

Q= Flow
Cv= Flow Factor (GPM/1 PSI ΔP)
ΔP= Pressure Loss through Valve
S= Specific Gravity of Fluid

Table 1 - Valve Part Numbers and Specifications

4. INSTALLATION (Refer to Figure 1 identification of trim components.)

A. General Instruction

1. Viking Straight Through Deluge Valves may be installed in the horizontal or vertical position.
2. The valve must be installed in an area not subject to freezing temperatures or physical damage.
3. The valve must be trimmed according to current Viking Trim Charts and appropriate instructions for the system used. Trim Charts are printed in the *Viking Engineering and Design Data* book, and are provided with trim packages.
   a. Remove all plastic protectors from the openings of the Deluge Valve.
   b. 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 of the nipples or openings of the valve or trim components.
   c. Viking Model F-1 Deluge Valve Conventional Trim Charts are provided with Trim Packages and in the *Viking Engineering and Design Data* book.
   d. Verify that all system components are rated for the water working pressure of the system.

Hydrostatic Test:

The Model F-1 Deluge Valve is manufactured and listed for use at a maximum Water Working Pressure of 250 PSI (17.2 bar). The valve is factory tested at 500 PSI (34.5 bar). Model F-1 Deluge Valves 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 Authority Having Jurisdiction. If air testing is required, do not exceed 60-PSI (4.1 bar) air pressure.

NOTE: NEVER CONDUCT THE HYDROSTATIC TEST AGAINST THE PRESSURE OPERATED RELIEF VALVE. (P.O.R.V.) TEMPORARILY REMOVE THE P.O.R.V. FROM THE TRIM AND PLUG TRIM OPENINGS WHILE CONDUCTING THE HYDROSTATIC TEST.

TRIM NOTE: DISCHARGE PIPING FROM THE AUXILIARY DRAIN VALVE, THE FLOW TEST VALVE, AND ALL SYSTEM DRAINS SHOULD BE KEPT SEPARATE. DO NOT CONNECT THE OUTLET OF THE DRIP CHECK TO ANY OTHER DRAIN.

4. The priming line must be connected upstream of the system water supply main control valve or to a constant source of water at a pressure equal to the system water supply.

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5. After the Deluge Valve is set, operation of the Deluge Valve requires the release of priming water from the priming chamber. This may be by automatic or manual operation of the release system. Viking Deluge Valves are compatible with hydraulic, pneumatic, and electric release systems. For specific Trim arrangements refer to Trim Charts and System Data describing the system being installed. Trim Charts are printed in the *Viking Engineering and Design Data* book, and are provided with trim packages. System Data sheets are printed in the *Viking Engineering and Design Data* book.
   a. Hydraulic Release Systems: See Figures 3-6 for the maximum allowable elevation of hydraulic release piping above the Deluge Valve. If the maximum height of hydraulic release piping exceeds the limit shown in Figures 3-6 for the valve used, use a Pneumatic or Electric Release System.
   b. Pneumatic Release Systems: A Viking Pneumatic Actuator is required between the release system connection provided on deluge valve trim and pneumatic release system piping.
   c. Electric Release Systems: Solenoid Valves, System Control Panels, and Electrical Detectors must be compatible. Consult appropriate listing and/or approval guides.

NOTE: FOR OPERATION AT WATER PRESSURES IN EXCESS OF 175 PSI (12.1 BAR), A 250 PSI (17.2 BAR) RATED SOLENOID VALVE MUST BE USED. REFER TO APPROPRIATE VIKING TECHNICAL DATA PAGE FOR TYPE OF SYSTEM USED.

⚠ CAUTION

Operation of Viking Deluge Valves by pressurizing the priming chamber with air pressure or any other pressurized gas is not recommended or approved.

B. Placing the Valve in Service

For Deluge Valves equipped with Conventional Deluge Valve Trim, follow steps 1 through 10 (and 11 & 12 if applicable) below.

1. Verify:
   a. The system Main Water Supply Control Valve (D.1) is closed and the Deluge Valve is trimmed according to current Viking Trim Charts and schematic drawings for the system used.
   b. The system has been properly drained.
   c. Auxiliary Drain (B.13) is open.
   d. The Emergency Release (B.9) is closed.
   e. The system water supply piping is pressurized up to the closed Main Water Supply Control Valve (D.1) and the priming line is pressurized up to the closed Priming Valve (B.1).
2. For Systems equipped with:
   a. Hydraulic Release Systems:
      i. Verify that all releasing devices are set and that any Inspector's Test Valve and/or auxiliary drain valves are closed.
      ii. Open Priming Valve (B.1).Allow the hydraulic release system to fill. When priming pressure gauge (B.7) indicates that the release piping and priming chamber pressure is equal to system supply pressure, proceed to step 3.
      iii. Proceed to step 3.
   b. Pneumatic Release Systems:
      i. Set the release system.
      ii. Open Priming Valve (B.1).
      iii. Proceed to step 3.
   c. Electric Release Systems:
      i. Open Priming Valve (B.1).
      ii. Set the electric release system.
      iii. Proceed to step 3.
3. Open Flow Test Valve (B.11).
4. Partially open Main Water Supply Control Valve (D.1).
5. When full flow develops from the Flow Test Valve (B.11), close the Flow Test Valve. Verify that there is no flow from the open Auxiliary Drain (B.13).
6. Close Auxiliary Drain (B.13).
7. Fully open and secure the Main Water Supply Control Valve (D.1).
8. Verify that the Alarm Shut-off Valve (B.6) is open and that all other valves are in their normal** operating position.
9. Depress the plunger of Drip Check (B.14). No water should flow from the Drip Check when the plunger is pushed.
10. Check for, and repair all leaks.
11. On new installations, those systems that have been placed out of service, or where new equipment has been installed, trip test the system to verify that all equipment functions properly. Refer to INSPECTION, TESTS AND MAINTENANCE paragraph 6-II-C: ANNUAL Trip Test instructions.

⚠ CAUTION

Performing a trip test results in operation of the Deluge Valve. Water will flow into the sprinkler piping. Take necessary precautions to prevent damage.

TECHNICAL DATA

DELUGE VALVE, MODEL F-1
STRAIGHT THROUGH STYLE
2-1/2" (DN65) - 8" (DN200)

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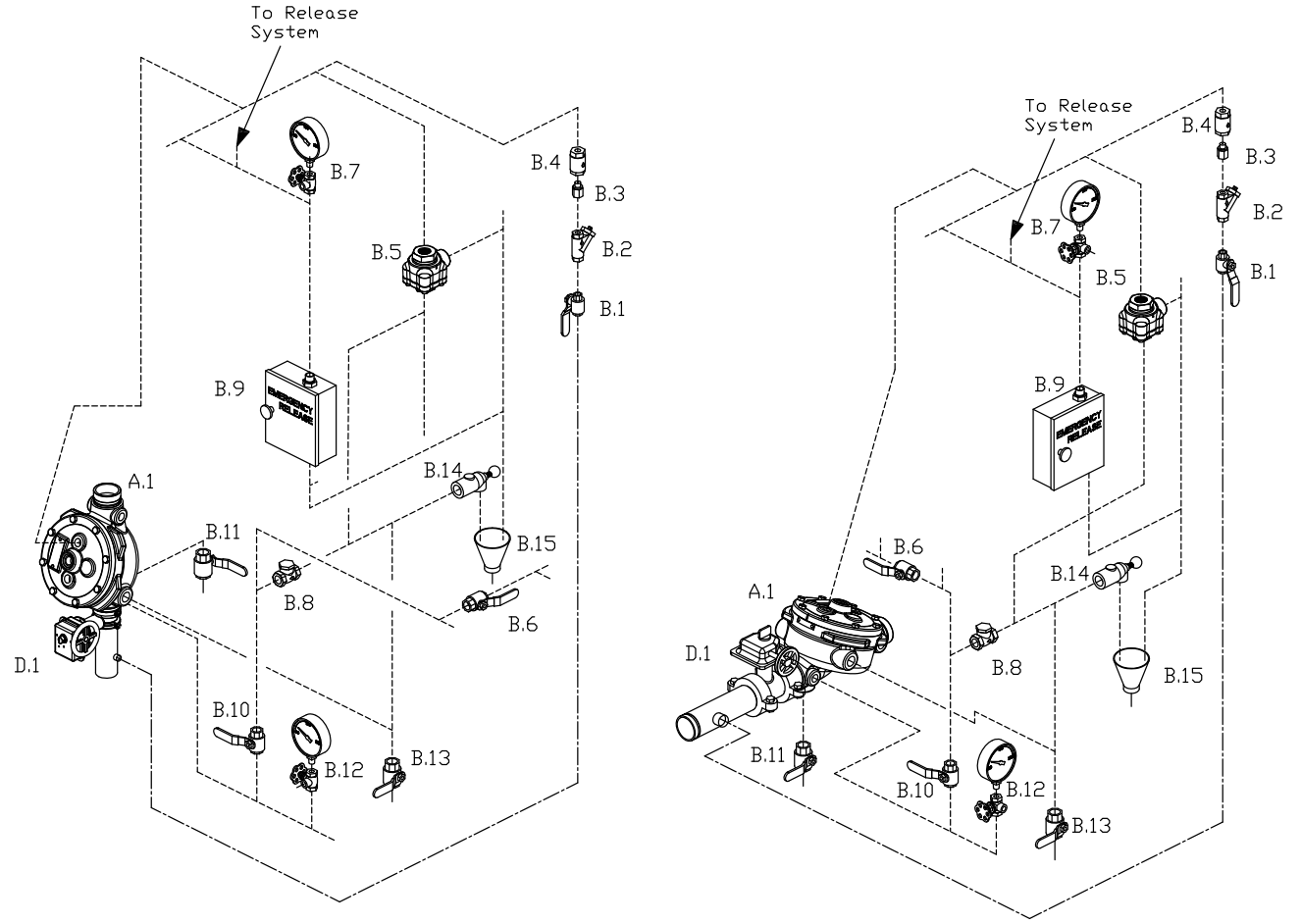

Vertical Valve **Horizontal Valve**

– – – – – Dashed lines indicate nipples and fittings included with trim.
—·—·— Phantom lines indicate piping required, but not included with trim.

Figure 1 - Conventional Trim Components

A.1	Deluge Valve	B.9	Emergency Release
B.1	Priming Valve (Normally Open)	B.10	Alarm Test Valve (Normally Closed)
B.2	Strainer	B.11	Flow Test Valve (Normally Closed)
B.3	1/16" Restricted Orifice	B.12	Water Supply Pressure Water Gauge and Valve
B.4	Spring Loaded Check Valve	B.13	Auxiliary Drain Valve (Normally Closed)
B.5	Pressure Operated Relief Valve (PORV)	B.14	Drip Check Valve
B.6	Alarm Shut Off Valve (Normally Open)	B.15	Drain Cup
B.7	Priming Pressure Water Gauge and Valve	D.1	Water Supply Control Valve
B.8	Drain Check Valve		

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After completing a trip test, perform SEMI-ANNUAL maintenance.

C. Valve Removed From Service

NOTE: WHEN A VALVE HAS BEEN REMOVED FROM SERVICE AND IS SUBJECT TO FREEZING OR WILL BE OUT OF SERVICE FOR AN EXTENDED PERIOD OF TIME, ALL WATER MUST BE REMOVED FROM THE PRIMING CHAMBER, TRIM PIPING, WATER SUPPLY PIPING AND OTHER TRAPPED AREAS.

5. OPERATION (Refer to Figure 2.)

The Viking Model F-1 Deluge Valve has an inlet chamber, an outlet chamber and a priming chamber. The inlet chamber and outlet chamber are separated from the priming chamber by the clapper (5) and diaphragm (6).

In the set condition:

System pressure is supplied to the priming chamber through a restricted priming line (trim) equipped with a check valve. System water supply pressure trapped in the priming chamber holds the clapper (5) on seat (2) due to area differential design. Clapper (5) separates the inlet chamber from the outlet chamber, keeping the outlet chamber and system piping dry.

In fire conditions:

When the release system operates, pressure is released from the priming chamber faster than it is supplied through the restricted priming line. Water supply pressure in the inlet chamber forces the clapper (5) off from seat (2), allowing water to flow through the outlet and into the system and alarm devices.

For Deluge Valves equipped with Conventional Trim:

When the deluge valve operates, the air side of the PORV looses pressure, causing the PORV to operate. When the PORV operates, it continually vents the priming chamber to prevent the deluge valve from resetting even if the open releasing devices close. The deluge valve can only be reset after the system is taken out of service, and the outlet chamber of the deluge valve and associated trim piping is depressurized and drained.

6. INSPECTIONS, TESTS AND MAINTENANCE

I. Inspection

It is imperative that the system is inspected and tested on a regular basis. The frequency of the inspections may vary due to contaminated water supplies, corrosive water supplies or corrosive atmospheres. Also, the alarm devices, detection systems or other connected trim may require a more frequent schedule. 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. The following recommendations are minimum requirements. (For additional information, refer to Viking Trim Charts and System Data describing systems with the release system used.)

A. Weekly:

Weekly visual inspection of the Viking Deluge Valve is recommended.

1. Verify that the Main Water Supply Control Valve (D.1) is open and that all other valves are in their normal** operating position and appropriately secured.
2. Check for signs of mechanical damage, leakage, and/or corrosive activity. If detected, perform maintenance as required. If necessary, replace the device.
3. Verify that the valve and trim are adequately heated and protected from freezing and physical damage.

II. Tests

A. Quarterly Water Flow Alarm Test

1. Notify the Authority Having Jurisdiction and those in the area affected by the test.
2. To test the local electric alarm (if provided) and/or mechanical water motor alarm (if provided), OPEN the alarm test valve (B.10) in the deluge valve trim.
   a. Electric alarm pressure switches (if provided) should activate.
   b. Electric local alarms should be audible.
   c. The local water motor gong should be audible.
   d. If equipped with remote station alarm signaling devices, verify that alarm signals were received.
3. When testing is complete, CLOSE the alarm test valve (B.10).
4. Verify:
   a. All local alarms stop sounding and alarm panels (if provided) reset.
   b. All remote station alarms reset.
   c. Supply piping to water motor alarm properly drains.
5. Verify that the alarm shut-off valve (B.6) is OPEN, and the alarm test valve (B.10) is CLOSED.
6. Verify that the outlet chamber is free of water. No water should flow from the drip check (B.14) when the plunger is pushed.
7. Notify the Authority Having Jurisdiction and those in the affected area that testing is complete.

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B. Quarterly Main Drain Test

1. Notify the Authority Having Jurisdiction and those in the area affected by the test.
2. Record pressure reading from the water supply pressure gauge (B.12).
3. Verify that the outlet chamber of the deluge valve is free of water. No water should flow from the drip check (B.7) when the plunger is pushed.
4. Fully OPEN the flow test valve (B.11).
5. When a full flow is developed from the flow test valve (B.11), record the residual pressure from the water supply pressure gauge (B.12).
6. When the test is complete, SLOWLY CLOSE the flow test valve (B.11).
7. Compare test results with previous flow information. If deterioration of the water supply is detected, take appropriate steps to restore adequate water supply.
8. Verify:
   a. Normal water supply pressure has been restored to the inlet chamber, the priming chamber, and the release system. The pressure on the priming chamber water pressure gauge should equal the system water supply pressure.
   b. All alarm devices, and valves are secured in normal** operating position.
9. Notify the Authority Having Jurisdiction that the test is complete. Record and/or provide notification of test results as required by the Authority Having Jurisdiction.

** For normal operating position, refer to Figure 1 and/or Trim Charts and System Data for the system used.

C. Annual Trip Test:

⚠ CAUTION

Performing this test results in operation of the Deluge Valve. Water will flow into the sprinkler piping and from any open sprinklers and/or nozzles. Take necessary precautions to prevent damage.

1. Notify the Authority Having Jurisdiction and those in the area affected by the test.
2. Fully open the flow test valve (B.11) to flush away any accumulation of foreign material.
3. Close the flow test valve (B.11).
4. Trip the system by operating the release system. Allow a full flow to pass through the deluge valve. Water flow alarms should operate.
5. When test is complete:
   a. Close the main water supply control valve (D.1).
   b. Close the priming valve (B.1).
   c. Open the auxiliary drain valve (B.13).
   d. Open all system main drains and auxiliary drains. Allow the system to drain completely.
6. Perform SEMI-ANNUAL maintenance. Refer to paragraph 6.III.B SEMI-ANNUAL MAINTENANCE.
7. Place the system in service. Refer to Item 4.B, INSTALLATION: PLACING THE VALVE IN SERVICE.

NOTE: DELUGE VALVES SUPPLIED BY BRACKISH WATER, SALT WATER, FOAM, FOAM/WATER SOLUTION, OR ANY OTHER CORROSIVE WATER SUPPLY, SHOULD BE FLUSHED WITH GOOD QUALITY FRESH WATER BEFORE BEING RETURNED TO SERVICE.

8. Notify the Authority Having Jurisdiction that the test is complete. Record and/or provide notification of test results as required by the Authority Having Jurisdiction.

III. Maintenance

NOTICE

The owner is responsible for maintaining the fire protection system and devices in proper operating condition. The Deluge Valve must be kept from freezing conditions and physical damage that could impair its operation.

⚠ 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 Authorities Having Jurisdiction. Consideration should be given to employment of a Fire Patrol in the affected areas.

Where difficulty in performance is experienced, the valve manufacturer or authorized representative shall be contacted if any field adjustment is to be made.

A. After Each Operation:

1. 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.
2. Deluge Valves and trim that have been subjected to brackish water, salt water, foam, foam/water solution, or any other corrosive water supply should be flushed with good quality fresh water before being returned to service.
3. Perform SEMI-ANNUAL maintenance after every operation.

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B. Semi-Annual Maintenance:

1. Remove the system from service. (Refer to Deluge or Preaction System Data that describes systems with the release system used for additional information.)
   a. Close the Main Water Supply Control Valve (D.1) and Priming Valve (B.1).
   b. Open the Auxiliary Drain Valve (B.13).
   c. Relieve pressure in the priming chamber by opening the Emergency Release Valve (B.9).
4. Inspect all trim for signs of corrosion and/or blockage. Clean and/or replace as required.
5. Clean and/or replace all strainer screens (including B.2).
6. Refer to Item 4-B, INSTALLATION: PLACING THE VALVE IN SERVICE.

C. Every Fifth Year

1. Internal inspection of Deluge Valves is recommended every five years unless inspections and tests indicate more frequent internal inspections are required. Refer to DISASSEMBLY instructions provided below.
2. Internal inspection of strainers and restricted orifices is recommended every five years unless inspections and tests indicate more frequent internal inspections are required.
3. Record and provide notification of inspection results as required by the Authority Having Jurisdiction.

D. Valve Disassembly (Refer to Figure 2)

1. Remove the valve from service (see the release system description and Technical Data for additional information). Close the main control valve and open the main drain valve. Release the pressure in the priming chamber by opening the Emergency Release Valve.
2. Remove trim as required to allow removal of cover (4).
3. Remove screws (9).
4. Lift cover (4) from body (1).
5. Remove clapper assembly (No. 3, 5, 6, 7, 9, 10, 11) by lifting it from the body (1).
6. Inspect seat (2). If replacement is necessary, remove screws (12). Remove old seat (2) and o-ring (13). Replace with new seat (2) and o-ring (13). Replace screws (12).
7. To replace the diaphragm rubber (6), remove the circle of screws (10). Remove the clamp ring (3) and remove the diaphragm rubber (6).
8. To replace the seat rubber assembly (7), clapper assembly (3, 5, 6, 7, 9, 10, 11) must be removed from the valve. Remove the circle of screws (12). Seat rubber assembly (7) can be removed.

NOTE: PRIOR TO INSTALLING A NEW CLAPPER RUBBER (6) OR SEAT RUBBER ASSEMBLY (7), MAKE CERTAIN THAT ALL SURFACES ARE CLEAN AND FREE OF FOREIGN MATTER. THE PLATED SEAT (2) MUST BE SMOOTH AND FREE OF NICKS, BURRS OR INDENTATIONS.

E. Valve Reassembly

1. Prior to reassembly, flush the valve of all foreign matter.
2. To reassemble, reverse disassembly procedure.

7. AVAILABILITY

The Viking Model F-1 Deluge 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.

TECHNICAL DATA

DELUGE VALVE, MODEL F-1 STRAIGHT THROUGH STYLE

2-1/2" (DN65) - 8" (DN200)

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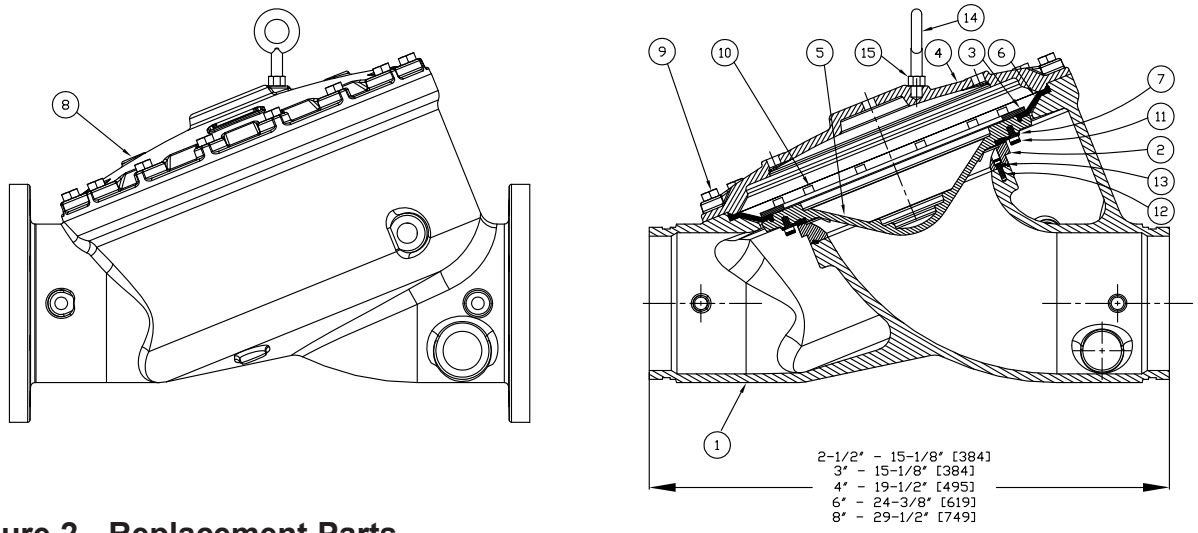

Figure 2 - Replacement Parts

ITEM NO.	PART NUMBER				DESCRIPTION	MATERIAL	NO. REQ'D.			
	2-1/2" (DN65) & 3" (DN80)	4" (DN100)	6" (DN150)	8" (DN200)			2-1/2" (DN65) & 3" (DN80)	4" (DN100)	6" (DN150)	8" (DN200)
1	--	--	--	--	Body	Ductile Iron	1	1	1	1
2	*	*	*	*	Seat	Brass	1	1	1	1
3	02493B	02378B	05704B	10514	Ring Clamp, Upper Diaphragm	Brass Casting	1	1	1	1
4	--	--	--	--	Cover	Ductile Iron 65-45-12	1	1	1	1
5	08846N	08844N	08570N	10518N/B	Clapper	Ductile Iron 65-45-12, PTFE Powder Coated	1	1	1	1
6	12012	11560	11561	10510	Upper Diaphragm	EPDM - ASTM D-2000	1	1	1	1
7	02497B	02382B	02176B	10512	Rubber Seat Assembly	EPDM - ASTM D-2000	1	1	1	1
8	--	--	--	--	Data Plate	Aluminum Etched	1	1	1	1
9	02169A				Screw, H.H.C.[1], 1/2-13 x 1-1/4 (32)	Steel, SAE-Grade 5, ASTM A449	10			
		02200A			Screw, H.H.C[1]., 1/2-13 x 1 1/2 (38)	Steel, SAE-Grade 5, ASTM A307-90		12		
			05707A	05707A	Screw, H.H.C[1]., 5/8-11 x 1 3/4 (44)	Steel, SAE Grade 5, ASTM A307-90			15	16
10	02496A				Screw, R.H.[3]., 10-24 x 3/8 (9.5)	Stainless Steel UNS-S30200	6			
		02383A			Screw, H.H.C[1]., 5/16-18 x 1/2 (13)	Stainless Steel UNS-S30400		8		
			07932		Screw, H.H.C[1]., 3/8-16 x 1/2 (13)	Stainless Steel UNS-S30400			12	
				11022	Screw, S.H.C[2]., 3/8-16 x 3/4 (19.1)	Stainless Steel UNS-S31600				12
11	02494A				Screw, R.H.[3]., 10-24 x 1/2 (12.7)	Stainless Steel UNS-S30200	6			
		02383A			Screw, H.H.C[1]., 5/16-18 x 1/2 (13)	Stainless Steel UNS-S30400		6		
			02454A		Screw, H.H.C[1]., 3/8-16 x 5/8 (16)	Stainless Steel UNS-S30400			12	
				11021	Screw, S.H.C[2]., 3/8-16 x 1/2 (12.7)	Stainless Steel UNS-S30400				12
12	*				Screw, R.H.[3]., 10-24 x 5/8 (16)	Stainless Steel UNS-S30200	4			
		*			Screw, H.H.C[1]., 5/16-18 x 1/2 (13)	Stainless Steel UNS-S30400		8		
			*	*	Screw, S.H.C[2]., 1/4-20 x 3/4 (19.1)	Stainless Steel UNS-S31600			8	6
13	*	*	*	*	O-Ring	EPDM	1	1	1	1
14	--	--	--	11570	Eye Bolt, 5/8-11-UNC	Carbon Steel				1
15				F01256	Nut, 5/8-11-UNC	Stainless Steel				1
-- Indicates replacement part not available										
* Indicates part available only in sub-assembly listed below										
SUB-ASSEMBLY										
2, 12, 13	14711-3	14711-4	14711-6	14711-8	Seat Replacement Kit*					
3, 5-7, 9-11	13488	13490	13492	13484	Clapper Assembly Kit					

***Note:** Includes o-ring lubricant to be added to ring groove in seat.

[1] Hex Head Cap Screw [2] Socket Head Cap Screw, (8" Valve - #10 & 11 must be S.H.C. for clearance with seat) [3] Round Head, Phillips Drive Screw

VIKING®

TECHNICAL DATA

DELUGE VALVE, MODEL F-1 STRAIGHT THROUGH STYLE

2-1/2" (DN65) - 8" (DN200)

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Maximum Allowable Pilot Heights for Select Equivalent Lengths of Hydraulic Release Piping.
For valves with 1/16" (1.6 mm) Restricted Orifice
Graphs are based on 1/2" (15 mm) pilot sprinklers installed on 1/2" (15 mm) Schedule 40 galvanized released piping.
If the maximum height of hydraulic release piping exceeds the limits shown on the graph, use pneumatic or electric release system

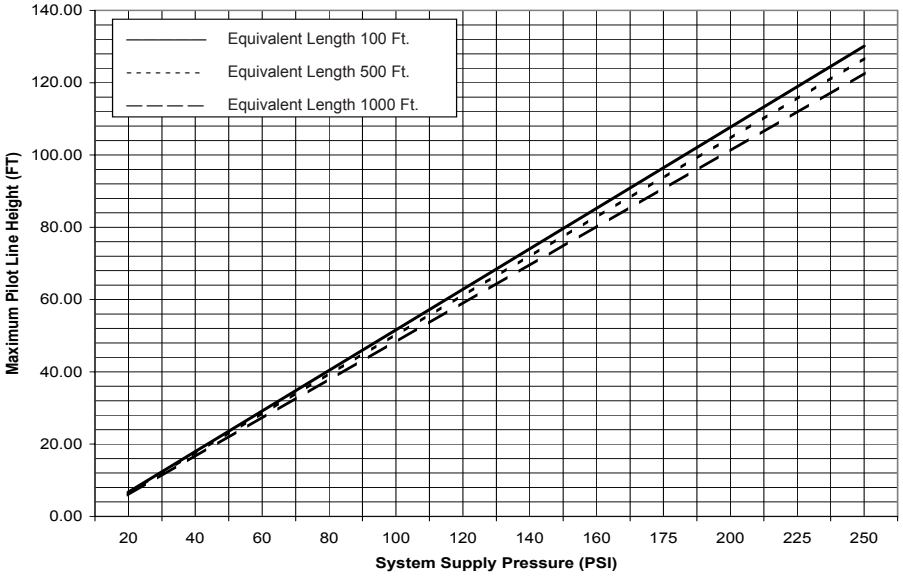

Figure 3 - 2-1/2" (DN65) & 3" (DN80) Model F-1 Deluge Valves

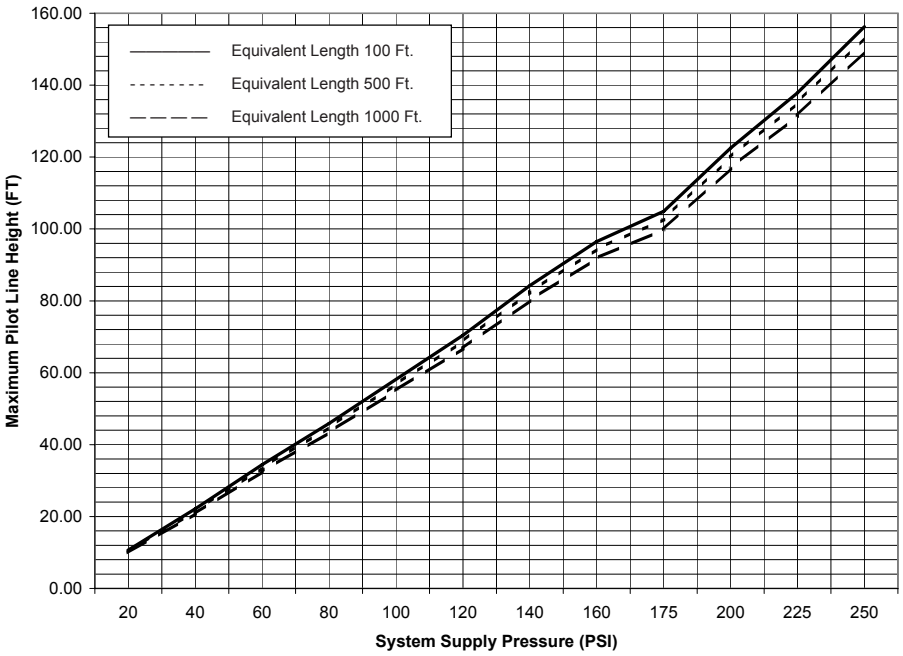

Figure 4 - 4" (DN100) Model F-1 Deluge Valves

VIKING®

TECHNICAL DATA

DELUGE VALVE, MODEL F-1 STRAIGHT THROUGH STYLE

2-1/2" (DN65) - 8" (DN200)

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Maximum Allowable Pilot Heights for Select Equivalent Lengths of Hydraulic Release Piping.

For valves with 1/16" (1.6 mm) Restricted Orifice

Graphs are based on 1/2" (15 mm) pilot sprinklers installed on 1/2" (15 mm) Schedule 40 galvanized released piping.

If the maximum height of hydraulic release piping exceeds the limits shown on the graph, use pneumatic or electric release system

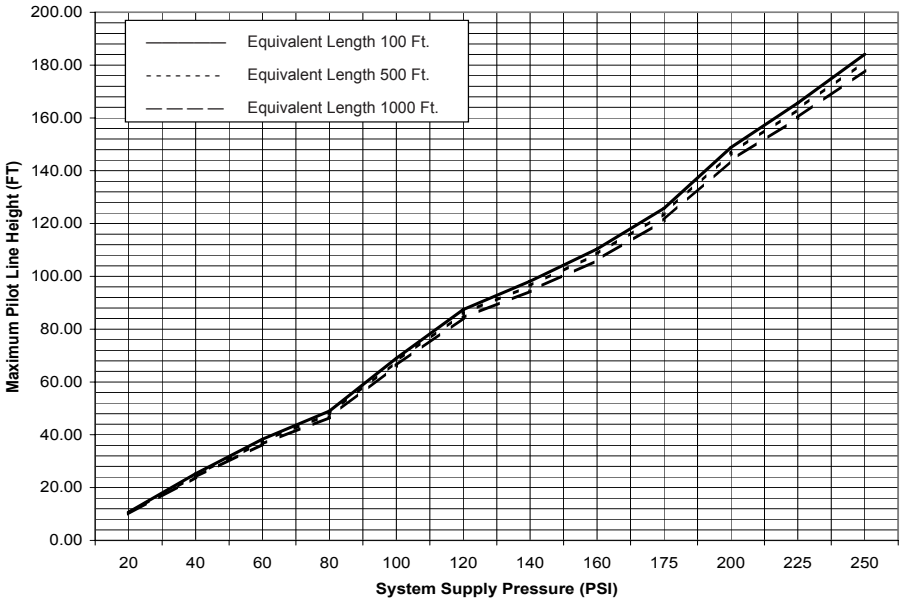

Figure 5 - 6" (DN150)
Model F-1 Deluge Valves

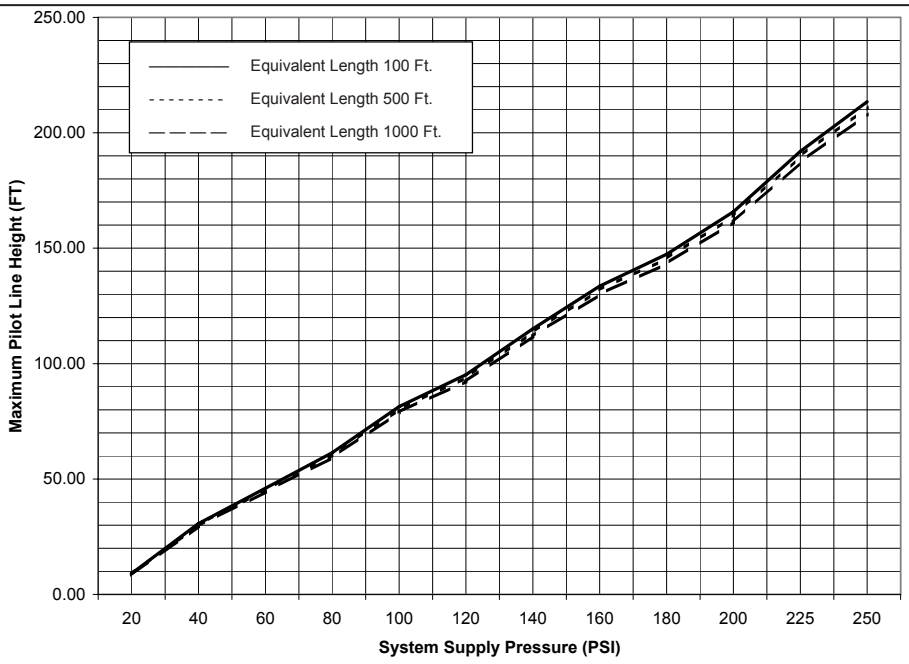

Figure 6 - 8" (DN200)
Model F-1 Deluge Valves

TECHNICAL DATA

CONCENTRATE CONTROL VALVE APPLICATIONS, PRIMING CONNECTIONS, AND TRIMS

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1. GENERAL DESCRIPTION

The Halar® Coated Concentrate Control Valve (CCV) is utilized in Viking foam systems as a positive shut-off valve for the foam concentrate supplied either from a bladder tank or a foam pump. The CCV valve opens automatically when there is a water flow in the sprinkler system. This allows concentrate to flow through the proportioning device to create foam solution.

A. Standard Foam Deluge, Foam Preaction, and Foam Flow Control Systems (See Figure 4)

The CCV valve is a straight through Halar® coated deluge. The priming connection can be part of the riser control valve trim, (conventional deluge or flow control trim). When the priming connection to the CCV is located on the primary riser valve trim, the priming supply connection to the CCV is located prior to the release trim. The actual supply inlet to the CCV should be connected to an open connection port on the cover of the deluge or flow control valve. The 1/2” pipe plugs installed in the cover of the deluge or flow control valve may be removed and piping from the valve cover can be connected to the priming chamber of the CCV or an outlet can be created prior to the release device (solenoid or pneumatic actuator) on the valve trim. When the deluge or flow control valve activates, the priming water in the deluge or flow control valve and the CCV are released simultaneously allowing both valves to open. Priming water pressure will be drained through the deluge or flow control valve trim. The valves will remain open until the system is reset. Refer to design data pages for re-setting instructions.

B. Wet Foam Systems (See Figure 3)

The CCV valve is a straight through Halar® coated deluge or flow control valve. Where the CCV is used in conjunction with a wet foam system a separate primary priming connection is required. The separate priming connection will consist of a ½” ball valve, ½” “Y” strainer, 1/8” restricted orifice, ½” spring loaded check valve, and Pressure Operated Relief Valve (PORV). The priming water supply to the CCV is taken upstream of the riser control valve. The priming supply feeds through the system to the priming chamber of the CCV. The sensing side of the PORV is connected to the alarm connection of the Alarm Valve. When water flow is present through the sprinkler riser, water flows from the alarm connection to the sensing side of the PORV, the PORV opens which drains the CCV priming chamber allowing it to open. Foam concentrate will discharge from the CCV to the proportioning device until water pressure is removed from the sensing side of the PORV. Note that the PORV ½” drain will operate when the system is activated. The PORV must be piped to an open drain.

2. LISTINGS AND APPROVALS

UL Listed - Deluge Valve EX2006
FM Approved - FM5130, 1020
LPCB
Refer to the individual technical data sheets for the components within the system.

3. TECHNICAL DATA

3.1 Specifications:

Refer to individual component techincal data pages for PORV, Pressure Switch, Solenoid Valve, and Deluge Valves.

3.2 Material Standards:

Refer to individual component technical data page.

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3.3 Ordering Information:

Table 3.3.1: Ordering Information

HALAR® COATED CONCENTRATE CONTROL VALVES											TRIM KIT PART NUMBERS	
Valve Style	Valve Model	Deluge Part No.	Valve Size Nominal	Inlet Type	Outlet Type	Pipe O.D. Actual	Flange Drilling	Friction Loss*	Cv Factor	Shipping Weight	Galvanized & Brass	Brass only
Straight Through	F-2	12127Q/B	1½" (DN40)	Grooved	Grooved	1 29/32" (48.3 mm)	--	7 ft. (2.1 m)	66	36 lbs. (16.3 kg)	12848-1	12848-2
	F-2	12058Q/B	2" (DN50)	Grooved	Grooved	2 3/8" (60.3 mm)	--	13 ft. (3.9 m)	93	36.5 (16.5 kg)	12848-1	12848-2
	F-2	12404Q/B	2½" (DN65)	Grooved	Grooved	2 7/8" (73 mm)	--	12 ft. (3.6 m)	155	66 lbs. (30 kg)	12929-1	12929-2
	F-2	12730Q/B	DN65	Grooved	Grooved	76 mm	--	12 ft. (3.6 m)	155	66 lbs. (30 kg)		
	F-2	12015Q/B	3" (DN80)	Flanged	Flanged	3½" (88.9 mm)	ANSI B16.42 Class 150	12 ft. (3.6 m)	228	82 lbs. (37 kg)		
	F-2	12019Q/B	3" (DN80)	Flanged	Grooved	3½" (88.9 mm)	ANSI B16.42 Class 150	12 ft. (3.6 m)	228	73 lbs. (33.1 kg)		
	F-2	12023Q/B	3" (DN80)	Grooved	Grooved	88.9 mm		12 ft. (3.6 m)	228	64 lbs. (29 kg)		

* Expressed in equivalent length of pipe based on Hazen & Williams Formula C=120.

4. INSTALLATION

Refer to specific technical data sheets, acceptable installation standards, codes and Authority Having Jurisdiction for additional installation, operation and maintenance instructions.

5. OPERATION

Refer to individual component technical data page.

6. INSPECTIONS, TESTS AND MAINTENANCE

NOTICE

The owner is responsible for maintaining the fire protection system and devices in proper operating condition. For minimum maintenance and inspection requirements, refer to recognized standards such as those produced by NFPA, LPC, and VdS which describe care and maintenance of sprinkler systems. In addition, the Authority Having Jurisdiction may have additional maintenance, testing and inspection requirements which must be followed.

⚠ WARNING

Any system maintenance or testing that involves placing a control valve or detection system out of service may eliminate the fire protection of that system. Prior to proceeding, notify all Authorities Having Jurisdiction. Consideration should be given to employment of a fire patrol in the affected area.

It is imperative that the system is inspected and tested on a regular basis. The frequency of the inspections may vary due to contaminated or corrosive water supplies and corrosive atmospheres. In addition, the alarm devices or other connected equipment may require more frequent inspections. Refer to the technical data, system description, applicable codes and Authority Having

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Jurisdiction for minimum requirements.

7. AVAILABILITY

The product is available directly from Viking and official distributors only.

Americas:
The Viking Corporation
5150 Beltway SE
Caledonia, MI 49316
Tel.: (800) 968–9501
Fax: 269–818–1680
Technical Services: 1–877–384–5464
techsvcs@vikingcorp.com

EU:
Viking S.A.
21, Z.I, Haneboesch
L–4562 Differdange / Niederkorn
Tel.: +352 58 37 37 – 1
Fax: +352 58 37 36
vikinglux@viking–emea.com

Asia Pacific (APAC) Main Office:
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Fax: (+65) 6 278 4609
vikingAPAC@vikingcorp.com

8. GUARANTEE

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

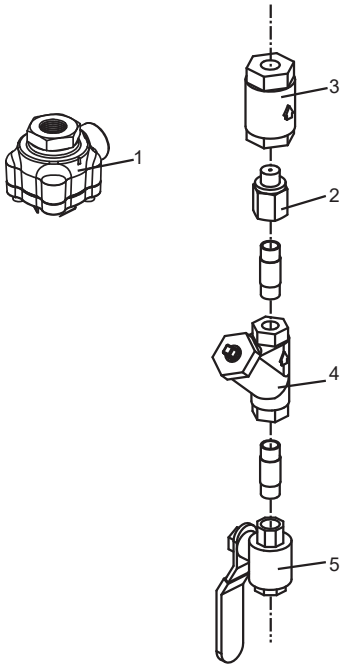

Figure 1 - Priming Connection Package Components
NOTE: All components shown here are included with the Priming Connection Package (PN 10985)

Table 2: Priming Line Connection Package (PN 10985) Components

REF.	DESCRIPTION
1	1/2" Pressure Operated Relief Valve (PORV)
2	1/8" Restricted Orifice
3	1/2" Swing Check Valve
4	1/2" Y-Strainer
5	1/2" Ball Valve

TECHNICAL DATA

CONCENTRATE CONTROL VALVE APPLICATIONS, PRIMING CONNECTIONS, AND TRIMS

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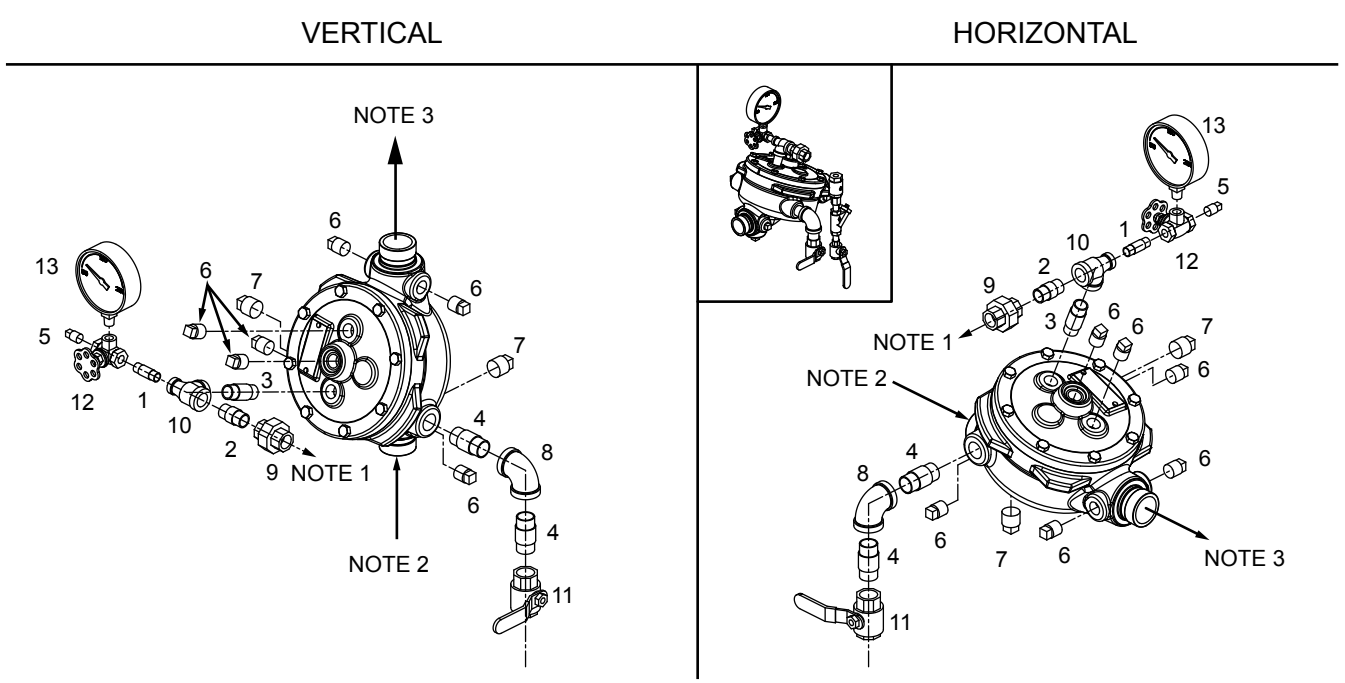

Figure 2 - Straight Through CCV Valve Trim

NOTE: 1-1/2" & 2" (DN40 & DN50) Shown; 2-1/2" & 3" (DN 65 &DN80) Also available

Table 1: CCV and Trim Components and Material Identification

REF.	SIZE (INCH)	DESCRIPTION	MATERIAL G = Galvanized, B = Brass, ST = Stainless steel	
			On Galvanized Trim	On Brass Trim
1	1/4 X 1-1/2	NIPPLE	G	B
2	1/2 X 1-1/2	NIPPLE	G	B
3	1/2 X 2	NIPPLE	G	B
4	3/4 X 2	NIPPLE	B	B
5	1/4	PLUG	G	B
6	1/2	1/2 PLUG	ST	B
7	3/4	3/4 PLUG	B	B
8	3/4	3/4 ELBOW	B	B
9	1/2	1/2 UNION	G	B
10	1/2 X 1/4 X 1/2	TEE	G	B
11	3/4	SHUTOFF VALVE	-	-
12	1/4	SIDE OUTLET VALVE	-	-
13	1/4-	WATER GAUGE	-	-

Note 1: Field pipe to hydraulic release of system control valve or PORV as determined by system type.

Note 2: Foam concentrate inlet from bladder tank.

Note 3: To foam proportioner device.

TECHNICAL DATA

CONCENTRATE CONTROL VALVE APPLICATIONS, PRIMING CONNECTIONS, AND TRIMS

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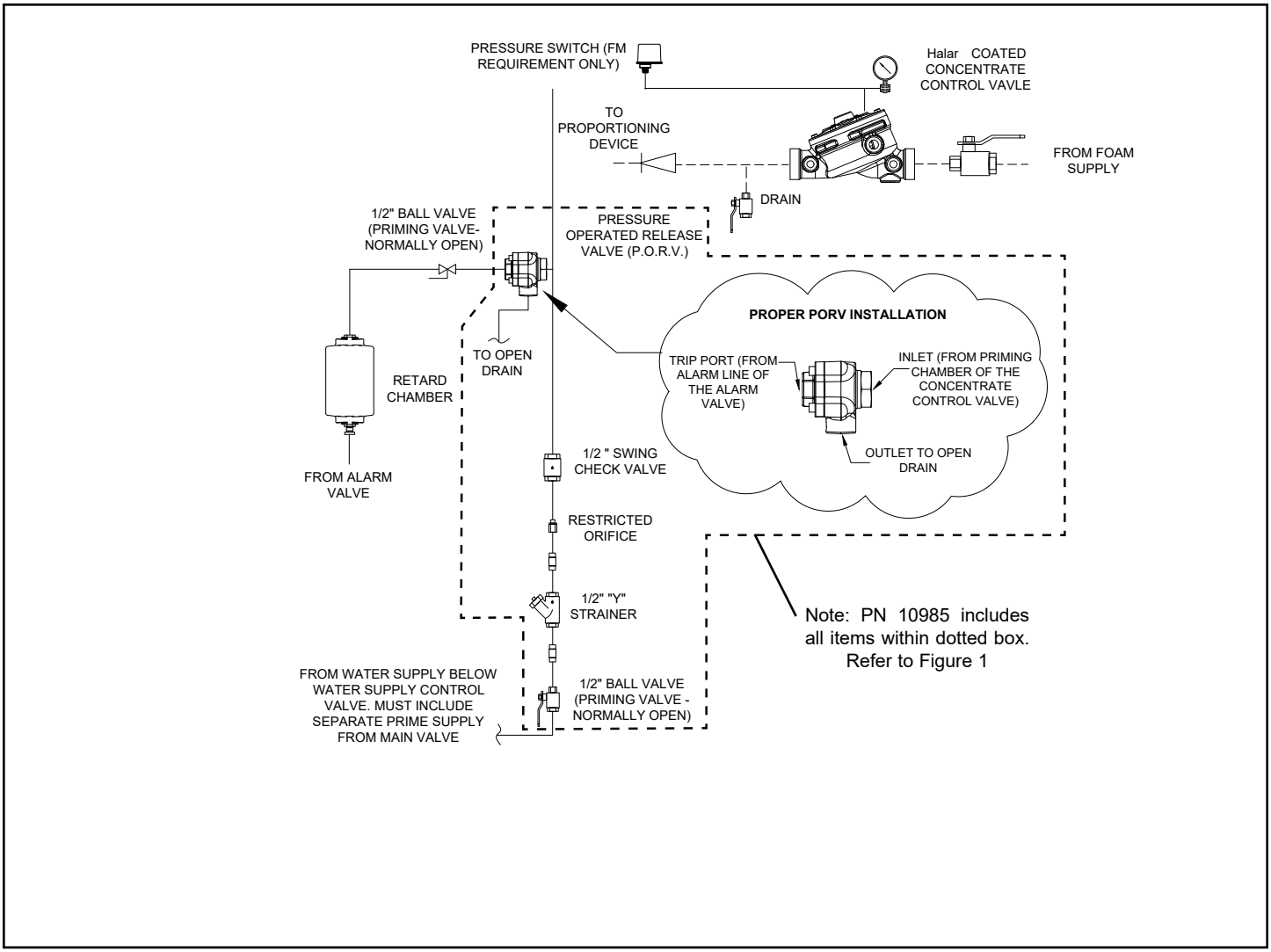

Figure 3 - Wet Pipe Foam Systems

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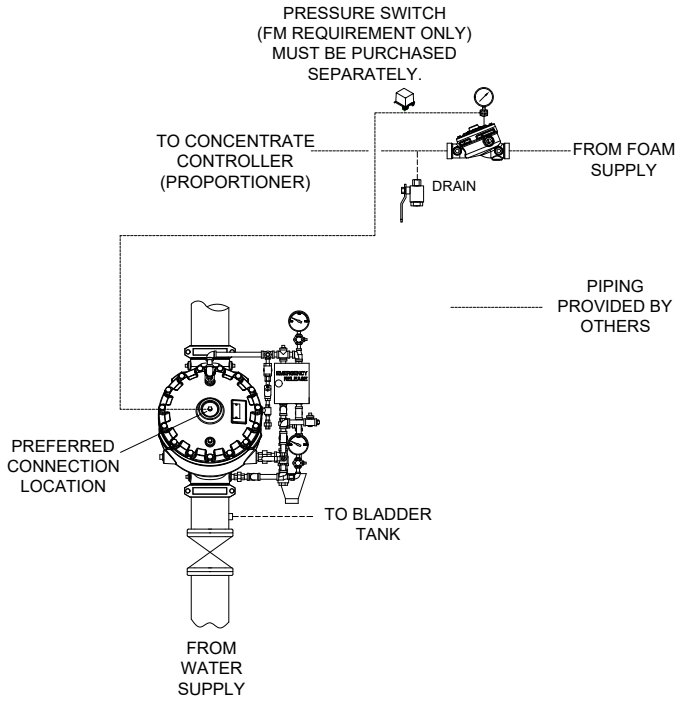

Figure 4 - Deluge and Preaction Systems

TECHNICAL DATA

SWING CHECK VALVE
MODEL D-1 & G-1

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

The Viking Swing Check Valve is a general purpose rubber-faced check valve approved for use in fire protection systems. The Swing Check Valve is manufactured with a ductile iron body, brass seat, and a rubber-faced clapper assembly, hinged to a removable access cover for easy inspection and maintenance.

The valve may be installed vertically or horizontally with access cover facing up. For availability of flanged-flanged and grooved-grooved options, refer to Table 1. Tapped openings (with plugs) and gauge connections are provided on both the inlet and outlet chambers of the valve.

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

FEATURES

A. Ductile iron body for less weight and extra strength.
B. Rated to 300 psi (20.7 bar) water working pressure.
C. Rubber-faced clapper hinged to access cover for quick removal and easy servicing. All moving parts can be serviced without removing the valve from the installed position.
D. With the cover/clapper assembly removed, the clapper rubber replacement requires removal of only one screw.
E. Can be installed vertically or horizontally with access cover facing up.

2. LISTINGS AND APPROVALS

cULus Listed: Guide No. HMER
FM Approved: Single Check Valves
NYC Department of Buildings: MEA 89-92-E, Vol. XI

3. TECHNICAL DATA

Specifications:

Rated to 300 psi (20.7 bar) water working pressure.
Factory tested hydrostatically to 600 psi (41.4 bar).
Standard Flanged Connections: ANSI B16.42 Class 150 (mates with ANSI Class 125 and Class 150 flanges).
Standard Grooved Connections: ANSI/AWWA C606
Tapped Bosses: 2-1/2" (DN65), 3" (DN80) and 4" (DN100): Two 1/2" (15 mm) NPT
6" (DN150) and 8" (DN200): Two 3/4" (20 mm) NPT

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: Refer to Figure 1.

Ordering Information: Refer to Table 1 for part numbers and shipping weight.

Table 1

Size Valve Nominal	Inlet Type	Outlet Type	Friction Loss*	Shipping Weight	Part No.
2-1/2" (DN65)	Groove	Groove	6 ft.(1.8 m)	16 lbs. (7 kg)	05497C
3" (DN80)	Goove	Groove	10 ft. (3.1 m)	20 lbs. (9 kg)	08536
4" (DN100)	Flange	Flange	13 ft. (4.0 m)	47 lbs. (21 kg)	08538
4" (DN100)	Groove	Groove	13 ft. (4.0 m)	27 lbs. (12 kg)	08539
6" (DN150)	Flange	Flange	20 ft. (6.0 m)	75 lbs. (34 kg)	08542
6" (DN150)	Groove	Groove	20 ft. (6.0 m)	51 lbs. (23 kg)	08543
8" (DN200)	Flange	Flange	23 ft. (7.0 m)	135 lbs. (61 kg)	08546
8" (DN200)	Groove	Groove	23 ft. (7.0 m)	106 lbs. (48 kg)	08547

*Expressed in equivalent length of Schedule 40 pipe based on Hazen & Williams formula: C = 120.

Systems with water working pressures above 175 psi (12 bar) may require extra-heavy pattern fittings. Viking Swing Check Valve flanges are Ductile Iron ANSI B16.42, Class 150, with a maximum water working pressure of 300 psi (20.7 bar). ANSI B16.42, Class 150 flanges are NOT compatible with ANSI Class 250 or Class 300 flanges. To mate the Viking Swing 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/grooved-outlet style Swing Check Valve may be installed with listed grooved couplings of the appropriate pressure rating.

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4. INSTALLATION

The Swing Check Valve must be installed in an area not subject to physical damage. When corrosive atmospheres and/or contaminated water supplies are present, it is the owner's responsibility to verify compatibility with the Swing Check Valve and associated equipment. Prior to installing the valve, thoroughly flush the water supply piping to verify that no foreign matter is present. The Swing Check Valve may be installed in the vertical position with direction of flow up, or in the horizontal position with the access cover up.

Systems with water working pressures above 175 psi (12 bar) may require extra-heavy pattern fittings. Viking Swing Check Valve flanges are Ductile Iron ANSI B16.42, Class 150, with a maximum water working pressure of 300 psi (20.7 bar). ANSI B16.42, Class 150 flanges are not compatible with ANSI Class 250 or Class 300 flanges. To mate the Viking Swing 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/grooved-outlet style Swing Check Valve may be installed with listed grooved couplings of the appropriate pressure rating.

5. OPERATION (Refer to Figure 1)

Flow through the Viking Swing Check Valve lifts the rubber-gasketed clapper (8, and 9) off the seat (12) to enter the sprinkler piping. When flow through the valve stops, the clapper (8) closes quickly. The rubber gasket (9) forms a tight seal against the brass water seat (12), trapping pressure above the clapper and preventing reverse flow from sprinkler piping.

Hydrostatic Test:

The Swing Check Valve is manufactured and listed for use at a maximum water working pressure of 300 psi (20.7 bar). The valve is factory tested at 600 psi (41.4 bar). Check Valves may be hydrostatically tested (in accordance with NFPA 13) at 350 psi (24.1 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 Authority Having Jurisdiction. If air testing is required, do not exceed 40 psi (2.8 bar) air pressure.

6. INSPECTIONS, TESTS AND MAINTENANCE

NOTICE: The owner is responsible for maintaining the fire-protection system and devices in proper operating condition.

The Viking Swing Check Valve must be kept free of foreign matter, freezing conditions (when used on wet systems), corrosive atmospheres, contaminated water supplies, and any condition that could impair its operation or damage the device.

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.

6-A. Five-Year Internal Inspection

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

(Refer to Figure 1)

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 the appropriate wrench to loosen and remove the cover screws (14), and remove the cover/clapper assembly (2-11).
5. Inspect the water seat (12). Wipe away all contaminants, dirt, and mineral deposits. DO NOT use solvents or abrasives.
6. Inspect the cover/clapper assembly (2-11) and the cover gasket (13). Test the hinged clapper (8) for freedom of movement. 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 Check Valve is complete, perform step 6 of paragraph 11. VALVE MAINTENANCE to reinstall the cover/clapper assembly (2-11).

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6-B. Valve Maintenance

(Refer to Figure 1)

1. Perform steps 1 through 5 of paragraph 6.A - FIVE-YEAR INTERNAL INSPECTION.
2. To remove clapper rubber (9):
   a. Use the appropriate wrenches to loosen and remove the button-head socket screw (11), hex nut (6), sealing washer (7), and rubber retainer (10).
   b. Remove the clapper rubber (9) 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 (9):
   a. Place the clapper rubber (9) over the center hub of the rubber retainer (10).
   b. Position the retainer (10) (with rubber in place) against the clapper (8) as shown in Figure 1.
   c. Replace and tighten the button-head socket screw (11), sealing washer (7), and hex nut (6). The sealing washer (7) and hex nut (6) must be located on the top side of the clapper as shown in Figure 1. Do not over-tighten.
4. To remove clapper (8), and/or hinge pin (4):
   a. Remove the hinge pin retaining rings (5) to free the hinge pin (4) for removal. After the hinge pin (4) is removed, the clapper (8) can be removed.
5. To re-install clapper (8), and/or hinge pin (4):
   a. Verify that the clapper rubber (9) is in good condition and that it is properly installed.
   b. Position the clapper (8) with the elongated hinge holes aligned between the holes of the hinge bracket welded inside the cover (2). The system (top) side of the clapper (8) 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. 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 (2-11):
   a. Verify that cover gasket (13) is in position and in good condition.
   b. Slide the cover/clapper assembly (2-11) into the Swing Check Valve so that the clapper rubber (9) contacts the water seat (12).
   c. Replace the cover screws (14). Use the appropriate wrench to cross-tighten all screws to the torque value shown in Table 2 for the valve used. DO NOT over-tighten.

7. AVAILABILITY

The Viking Swing 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 The Viking Corporation directly.

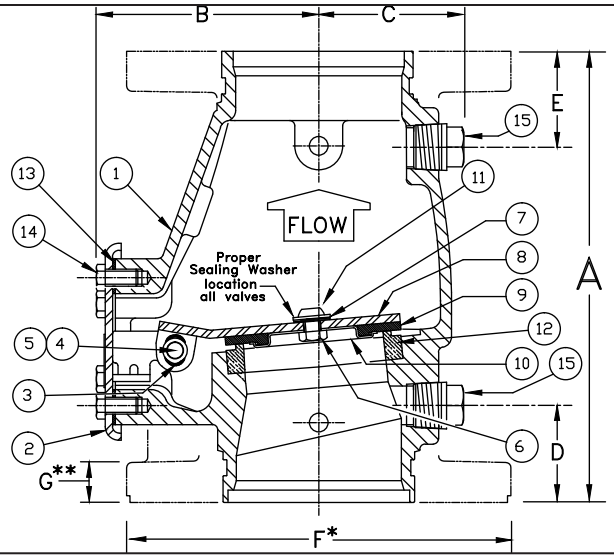
Table 2: Torque Values for Viking Swing Check Valve Cover Screws

Valve Size	Screw Size	Torque Values
2-1/2" (DN65)	3/8"-16 HHC	19 ft-lbs 2.63 kg-m
3" (DN80)	3/8"-16 HHC	19 ft-lbs 2.63 kg-m
4" (DN100)	3/8"-16 HHC	19 ft-lbs 2.63 kg-m
6" (DN150)	1/2"-13 HHC	45 ft-lbs 6.23 kg-m
8" (DN200)	5/8"-11 HHC	93 ft-lbs 12.9 kg-m

TECHNICAL DATA

SWING CHECK VALVE
MODEL D-1 & G-1

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



SIZE	A	B	C	D	E	F	G**
2-1/2" (65mm)	9" (228,6)	4-1/2" (114,3)	2-5/8" (66,7)	2" (50,8)	2" (50,8)	Flg-Flg Not Available	
3" (80mm)	10-1/8" (257)	4-13/16" (122,2)	2-11/16" (68,3)	2-9/32" (58.1)	2-9/32" (58.1)	Flg-Flg Not Available	
4" (100mm)	10-5/8" (269,9)	5-3/16" (131,8)	3-1/8" (79.4)	2-1/4" (57.2)	2-1/4" (57,2)	9" (228,6)	15/16" (23,81)
6" (150mm)	13-3/8" (340)	6-13/16" (173,3)	4-1/16" (103.2)	2-1/4" (57,2)	2-1/4" (57,2)	11" (279,4)	1" (25,4)
8" (200mm)	17" (431,8)	8-13/16" (223,4)	5" (127)	2-1/2" (63,4)	2-7/8" (73,0)	13-1/2" (342,9)	1-1/8" (28,58)

Dimensions shown in parentheses are millimeters.

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

Figure 1

ITEM NO.	PART NUMBER D-1 2-1/2" (DN65)	G-1 3" (DN80)	G-1 4" (DN100)	G-1 6" (DN150)	G-1 8" (DN200)	DESCRIPTION	MATERIAL	NO. REQ'D 2-1/2"	3"	4"	6"	8"
1	--	--	--	--	--	Body	Ductile Iron, ASTM A536 (65-45-12)	1	1	1	1	1
2	--	--	--	--	--	Cover Assembly, 300 PSI WWP	E-Coated HSLA Steel, A715 and Stainless Steel, UNS-S30400	1	1	1	1	1
3	07576	07576	07576	07576	None	Bushing	Lubricomp 189 Ryton	2	2	2	2	0
4	05355A	05355A	04900A	04991A	05334A	Clapper Hinge Pin	Stainless Steel, UNS-S30400	1	1	1	1	1
5	05445A	05445A	05445A	05445A	05369A	Hinge Pin Retaining Ring	Stainless Steel, UNS-S15700	2	2	2	2	2
6	01755A					Clapper Hex Jam Nut #10-24 UNC	Stainless Steel, UNS-S30400	1	0	0	0	0
		08159	08159			Clapper Hex Jam Nut 3/8"-24 UNF	Stainless Steel, UNS-S30400	0	1	1	0	0
				08144	08144	Clapper Hex Jam Nut ½"-20 UNC	Stainless Steel, UNS-S30400	0	0	0	1	1
7	06595A	08158	08158	08143	08143	Sealing Washer	EPDM and Stainless Steel	1	1	1	1	1
8	*	*	*	*	*	Clapper	Teflon® Coated HR Steel UNS-G10180	1	1	1	1	1
9	*	*	*	*	*	Clapper Rubber	EPDM, ASTM D2000	1	1	1	1	1
10	*	*	*	*	*	Clapper Rubber Retainer	Stainless Steel, UNS-S30400	1	1	1	1	1
11	06595A					H.H.C. Screw #10-24 UNC x 1/2" (12.7 mm) lg.	Stainless Steel, UNS-S30400	1	0	0	0	0
		10194	10194			Screw, Button Head, Socket, 3/8" - 24 UNF x 1/2"	Stainless Steel, UNS-S30400	0	1	1	0	0
				10308		Screw, Button Head, Socket, 1/2" - 20 UNF x 3/4" (19.1 mm) lg.	Stainless Steel, UNS-S30400	0	0	0	1	1
					10686	Screw, Button Head, Socket, 1/2" - 20 UNF x 7/8"	Stainless Steel, UNS-S30400	0	0	0	0	1
12	--	--	--	--	--	Seat	Brass, UNS-C84400	1	1	1	1	1
13	05354B	05354B	04649B	04992B	05339C	Cover Gasket	EPDM, ASTM D2000	1	1	1	1	1
14	01517A	01517A	01517A			H.H.C. Screw 3/8"-16 UNC x 3/4" (19,1 mm) lg.	Steel, Zinc Plated	4	4	6	0	0
				04993A		H.H.C. Screw ½"-13 UNC x 7/8" (22.2 mm) lg.	Steel, Zinc Plated	0	0	0	6	0
					01922A	H.H.C. Screw 5/8"-11 UNC x 1-1/4" (31.8 mm) lg.	Steel, Zinc Plated	0	0	0	0	6
15	--	--	--			1/2" (15 mm) NPT Pipe Plug	Steel	2	2	2	0	0
				--	--	3/4" (20 mm) NPT Pipe Plug	Steel	0	0	0	2	2

-- Indicates replacement part is not available

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

Sub-Assemblies

3, 6-11	05499B	08518	08519	08520	08521	Clapper Assembly
9, 10	--	14864	14865	14866	--	Replacement Clapper Rubber Kit*

*Clapper rubbers are different on 3", 4", & 6" G-1 valve than original manufacture. If clapper rubber requires replacement, order replacement rubber kit.

Bronze Ball Valves

Dezincification Resistant

Three-Piece Body • Full Port • 316SS Trim • Blowout-Proof Stem • Vented Ball

600 PSI/41.4 bar non-shock cold working pressure
150 PSI/10.3 bar saturated steam♦

CONFORMS TO MSS SP-110

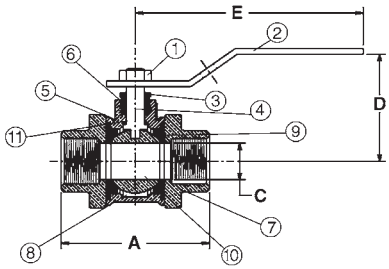
MATERIAL LIST

	PART	SPECIFICATION
1.	Handle Nut	Stainless Steel 300 Series
2.	Handle	Zinc Plated Steel Clear Chromate Plastisol Coated
3.	Threaded Pack Gland	Brass ASTM B 16 Alloy C36000
4.	Stem	Stainless Steel ASTM A 276 Type 316
5.	Body	Bronze ASTM B 584 Alloy C84400
6.	Packing	PTFE
7.	Body End (2)	Cast Bronze ASTM B 584 Alloy C84400
8.	O-Ring Seal (2)	Fluorocarbon Rubber
9.	Seat Ring (2)	PTFE
10.	Ball (Vented)	Stainless Steel ASTM A 276 Type 316 or ASTM A 351 Type CF8M
11.	Thrust Washer	Reinforced PTFE
12.	Body Bolts	Zinc Dichromate Plated Steel ASTM A 449 Grade 5
13.	Body Nuts	Zinc Dichromate Plated Steel ASTM A 449 Grade 5

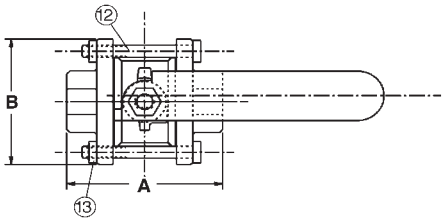
Note: valves are static grounded by a grounding washer. (not shown)

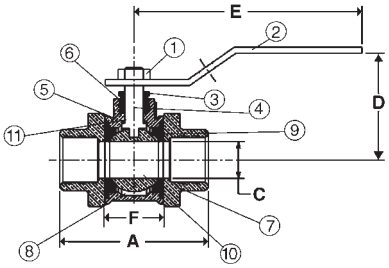
T-595-Y-66
Threaded

S-595-Y-66
Solder



T-595-Y-66
NPT x NPT





S-595-Y-66
C x C

DIMENSIONS—WEIGHTS—QUANTITIES

Size In.	Size mm.	T-595-Y-66 A In.	T-595-Y-66 A mm.	S-595-Y-66 A In.	S-595-Y-66 A mm.	Dimensions B In.	B mm.	C In.	C mm.	D In.	D mm.	E In.	E mm.	S-595-Y-66 F In.	F mm.	T-595-Y-66 Lbs.	T-595-Y-66 Kg.	S-595-Y-66 Lbs.	S-595-Y-66 Kg.	Master Ctn. Qty.
¼	8	2.50	64	1.69	43	1.81	46	.38	10	1.69	43	3.91	99	.875	29	1.03	.47	.89	.40	50
⅜	10	2.50	64	1.81	46	1.81	46	.38	10	1.69	43	3.91	99	.875	29	.98	.44	.89	.40	50
½	15	2.50	64	2.06	52	1.81	46	.50	13	1.69	43	3.91	99	.875	29	1.03	.47	.89	.40	50
¾	20	3.00	76	2.94	75	1.94	49	.75	19	2.00	51	4.66	118	1.190	37	1.70	.77	1.59	.72	30
1	25	3.69	94	3.66	93	2.50	64	1.00	25	2.25	57	4.66	118	1.563	47	2.82	1.28	2.55	1.15	20
1 ¼	32	4.09	104	3.91	99	2.69	68	1.25	32	2.75	70	6.69	170	1.750	50	3.96	1.80	3.61	1.64	10
1 ½	40	4.56	116	4.60	117	3.00	76	1.50	38	2.97	75	6.69	170	2.125	60	5.68	2.57	5.31	2.41	10
2	50	6.16	156	5.78	147	4.00	102	2.00	51	3.63	92	6.69	170	2.640	78	11.40	5.17	10.60	4.81	4
2 ½	65	6.84	174	6.94	176	5.00	127	2.50	64	4.09	104	8.00	203	3.463	102	21.07	9.56	19.30	8.75	2

LEAD FREE* OPTION AVAILABLE

OXYGEN SERVICE OPTION AVAILABLE

♦For detailed operating pressure, refer to pressure temperature chart on page 41.

WARNING: This product can expose you to chemicals including lead, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

*Weighted average lead content ≤ 0.25%

Visit our website for the most current information.

KENNEDY VALVE

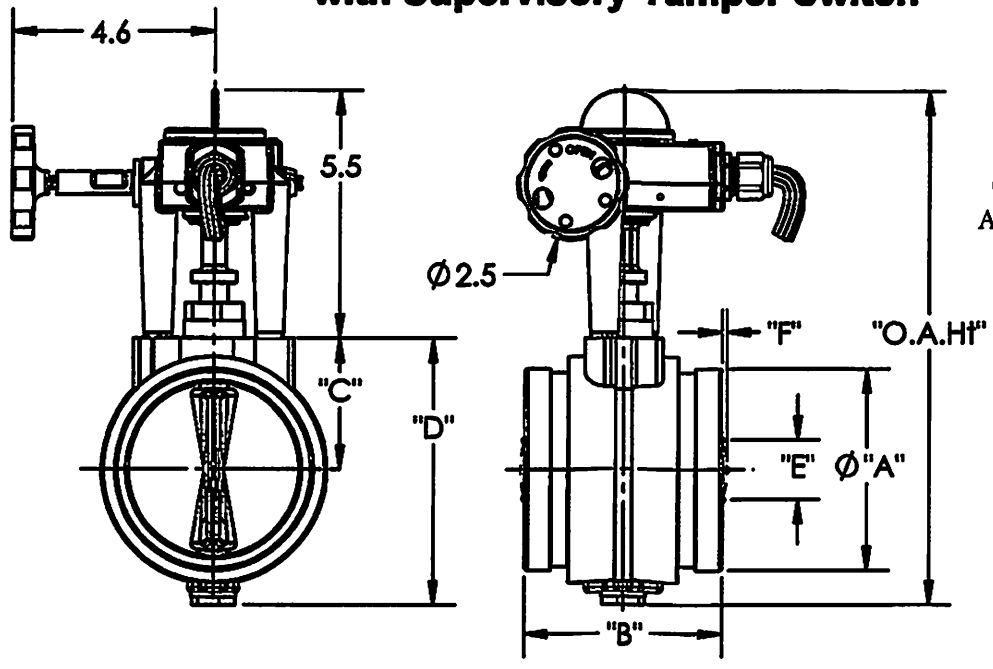
UL/FM BUTTERFLY VALVES

Designed for the Fire Protection Industry

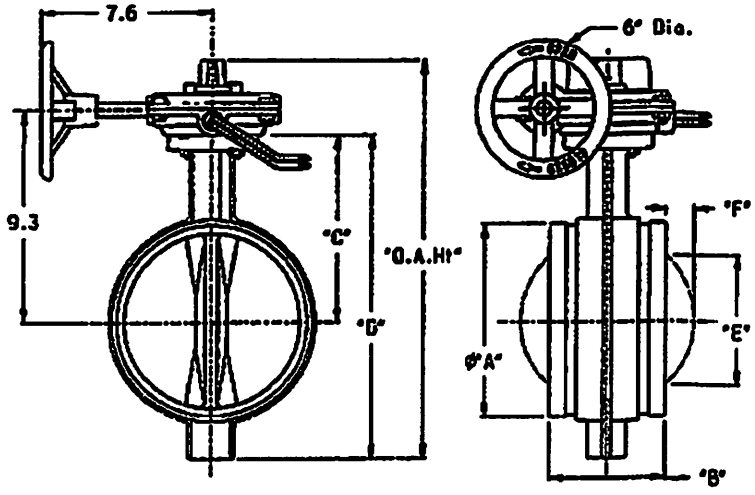
Sizes: 2-1/2",3",4",6",8"
300 PSI Rated
Double Seal Design for Bubble Tight Shut Off
Outdoor Rated
CA. State Fire Marshall Accepted
Lightweight
Fusion Bonded Coated Body
Low Torque Operation
Easy to Read Flag Type Indicator

KENNEDY VALVE
Division of McWane, Inc.
1021 East Water St., Elmira,NY 14901 (607) 734-2211

Grooved End Butterfly Valves 2 1/2" to 8"
Figure G300/G300C & 01G 300 psi
with Supervisory Tamper Switch



Sizes 2 1/2"- 6"
G300/G300C
Outdoor Rated UL/FM
Available Normally Open
and Normally Closed



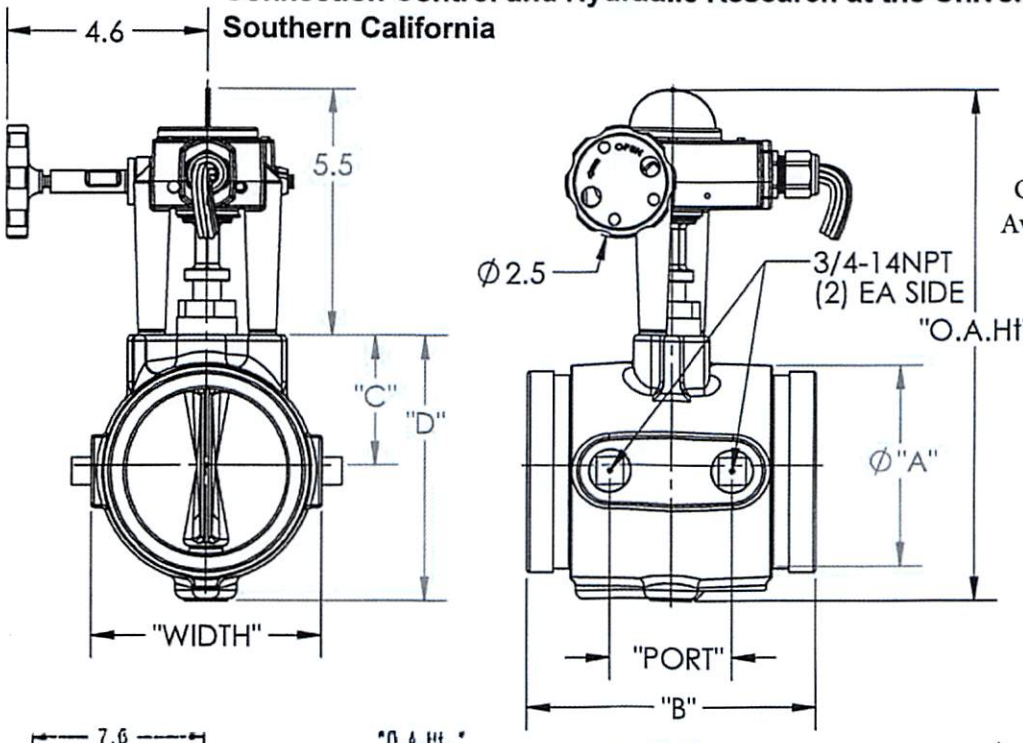
Size 8" Only
OIG
Outdoor Rated UL
Available Normally Open
and Normally Closed

1. UPPER AND LOWER SHAFTS 410SS/416SS					
2. BODY COATING: EPOXY					
3. DISC ENCAPSULATION MTL: EPDM					
	G300				01G
SIZE	2 1/2"	3"	4"	6"	8"
A	2.85	3.47	4.47	6.61	8.6
B	3.8	3.8	4.5	5.8	5.2
C	2.2	2.4	2.9	4.0	8.2
D	4.3	4.8	5.9	8.1	14.3
E	N/A	N/A	N/A	1.7	5.9
F	N/A	N/A	N/A	1	1.3
O.A. HT	10.0	10.4	11.6	13.8	17.6
WT.#	8.8	10.1	13.5	24.6	44

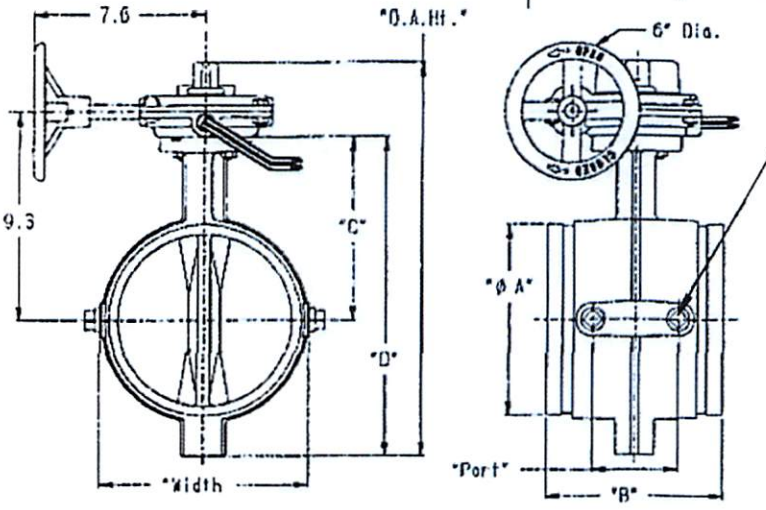
Note: "E will be MINIMUM allowed pipe I.D.
Exercise care handling and installing

KENNEDY VALVE
Division of McWane, Inc.
1021 East Water St., Elmira,NY 14901 (607) 734-2211
Grooved End Butterfly Valves 2 1/2" to 8"
Figure G300E/G300EC & 02G 300 psi
with Supervisory Tamper Switch

- **Extended Length Valves Equipped with Four 3/4" NPT Ports**
- **4"-8" Sizes Approved for Cross Connection**
- **NSF61 Certified**
- **Connection Control and Hydraulic Research at the University of Southern California**



Sizes 2 1/2 " - 6"
G300E / G300EC
Outdoor Rated UL/FM
Available Normally Open
and Normally Closed

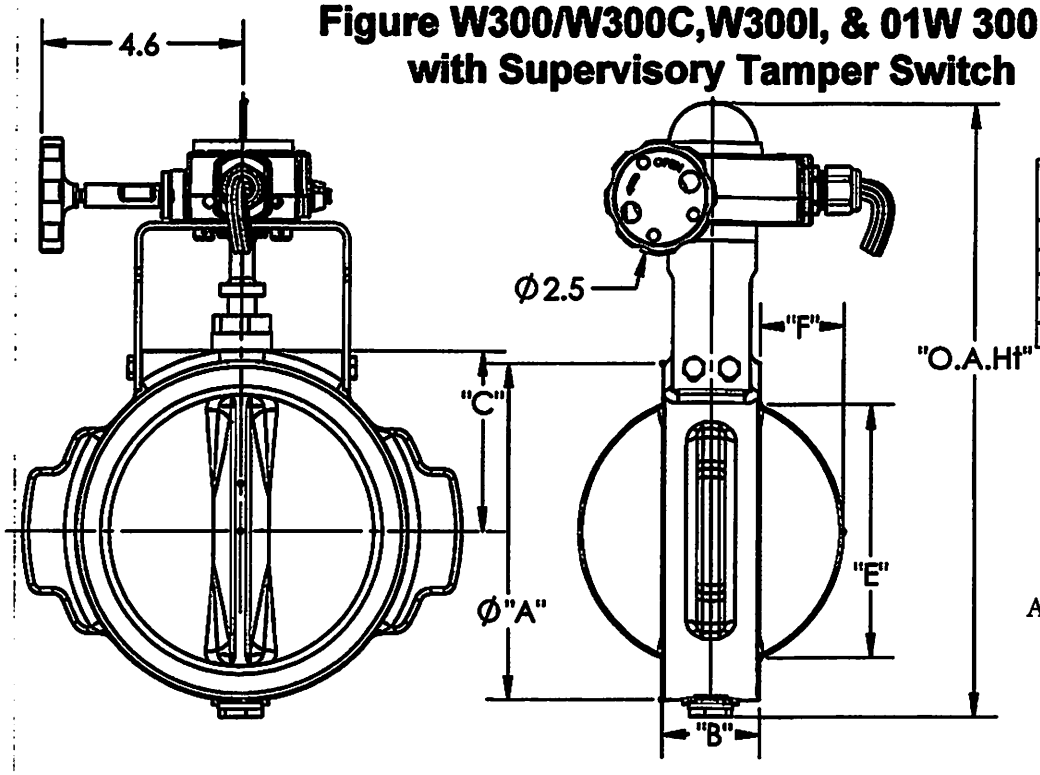


8" Only
02G
Outdoor Rated UL
Available Normally Open
and Normally Closed

1. UPPER AND LOWER SHAFTS 410SS/416SS					
2. BODY COATING: EPOXY					
3. DISC ENAPSULATION MTL: EPDM					
	G300E				02G
SIZE	2 1/2"	3"	4"	6"	8"
A	2.85	3.47	4.47	6.61	8.6
B	6.0	6.3	6.6	6.9	7.9
C	2.2	2.4	2.9	4.0	8.2
D	4.3	4.8	5.9	8.1	14.3
WIDTH	3.7	4.2	5.2	7.4	9.3
PORT	2.3	2.6	2.8	3.1	2.3
O.A. HT	10.0	10.4	11.6	13.8	17.6
Wt.#	12.5	14.5	18	28	55

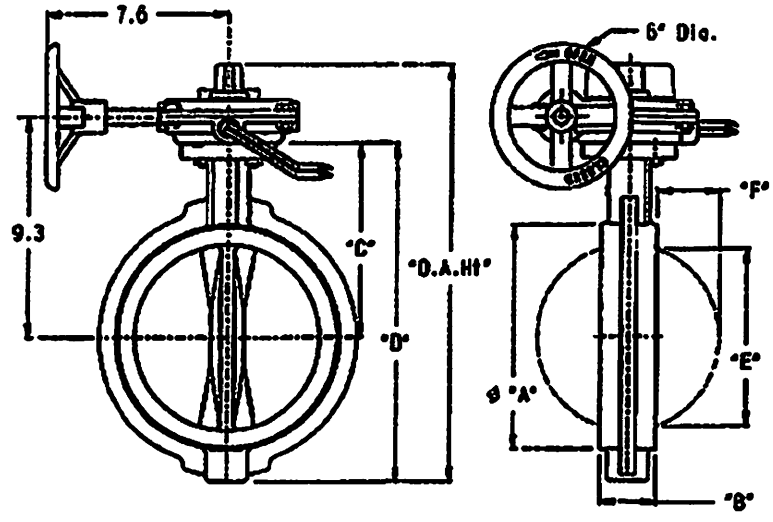
Note:Disc does not protrude past the "B" dimension of the body on any size in the open position. Exercise care handling and during installation

KENNEDY VALVE
Division of McWane, Inc.
1021 East Water St., Elmira,NY 14901 (607) 734-2211
Wafer Butterfly Valves 2 1/2" to 8"
Figure W300/W300C,W300I, & 01W 300 psi
with Supervisory Tamper Switch



Valve Selection for ISO PN16 Flange	
Flange Size	KV Model
65MM	2 1/2" W300
80MM	3" W300I
100MM	4" W300I
150MM	6" W300

Sizes 2 1/2"- 6"
W300/W300C/W3001
Outdoor Rated UL /FM
Available Normally Open and
Normally Closed



8" Size Only
02G
Outdoor Rated UL Available
Normally Open and
Normally Closed

WAFER BOLTING					
SIZE	2-1/2"	3"	4"	6"	8"
Number of Studs	4	4	8	8	8
Stud Size (inch)	5/8	5/8	5/8	3/4	3/4
Stud Length Min (inch)	5.5	5.5	6.5	7	7.5
Recommended Min Torque (Ft Lbs)	30	30	30	40	50

1. UPPER AND LOWER SHAFTS 410SS/416SS					
2. BODY COATING: EPOXY					
3. DISC ENAPSULATION MTL: FPDM					
	W300, W300I				01W
SIZE	2 1/2"	3"	4"	6"	8"
A	4.2	4.4	5.3	7.5	9.5
B	1.8	1.8	2.0	2.2	2.4
C	2.2	2.4	2.9	4.0	8.2
D	4.3	4.8	5.9	8.1	14.3
E	1.7	4.2	3.3	5.6	9.3
F	.4	.6	.9	1.9	2.7
O.A. HT	10.0	10.4	11.6	13.8	17.6
WT.#	10.5	11.1	13.8	20.5	44

Dimenions B,D, and E are referenced in Installation Instructions
"E" is MINIMUM allowed Pipe I.D.
Exercise care handling and during Installation

KENNEDY VALVE

Division of McWane, Inc.

1021 East Water St. Elmira, NY 14901

UL/FM BUTTERFLY VALVES

INSTALLATIONS INSTRUCTIONS FOR INDOOR & OUTDOOR USE

CAUTION

PRIOR TO INSTALLATON OF SUPERVISORY SWITCHS IN FIRE PROTECTION SYSTEMS, REFER TO THE FOLLOWING STANDARDS:

1) NFPA 13: STANDARDS FOR THE INSTALLATION OF SPRINKLER SYSTEMS
2) NFPA 25: INSPECTION, TESTING, MAINTENANCE OF WATER BASED FIRE PROTECTION SYSTEMS
3) NFPA 70: NATIONAL ELECTRICAL CODE
4) NFPA 72 NATIONAL FIRE ALARM CODE

WARNING

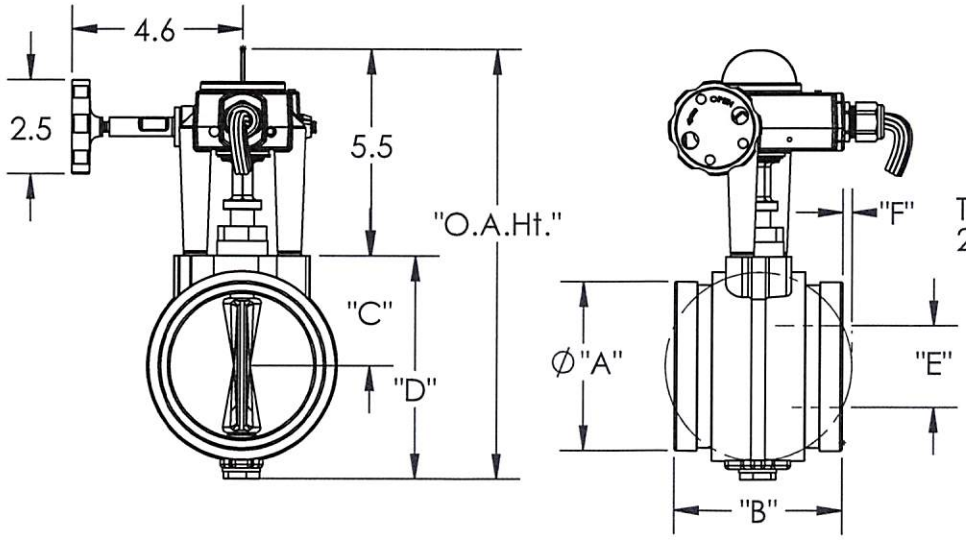
1) REMOVE CORD GRIP FROM GEARBOX BEFORE INSTALLING CONDUIT
2) METALLIC CONDUIT REQUIRED BY NEC FOR PROPER GROUNDING
3) CONDUIT JOINTED MUST BE SEALED WITH CONDUIT SEALANT
4) INSTALL SWITCH IN ACCORDANCE WITH NATIONAL ELECTRICAL CODE AND/OR LOCAL ORDINANCES
5) ASSURE ALL DEVISES ARE PROPERY GROUNDED

G300, G300E, 01G, 01GC
G300C, G300EC, 02G, 02GC
W300,W300C, 01W, 01WC

INSTALATION INSTRUCTIONS FOR INDOOR & OUTDOOR USE

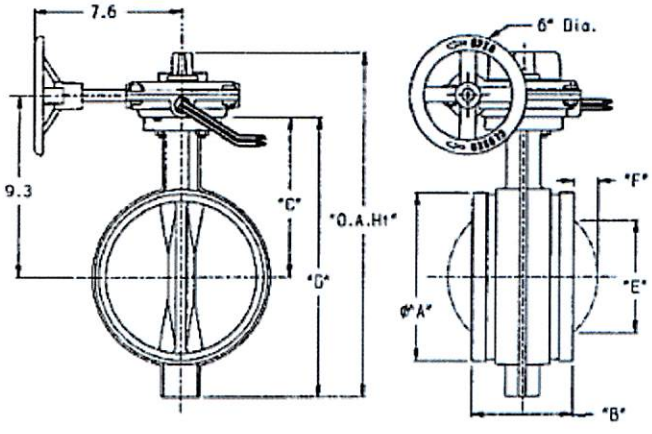
FM APPROVED

c UL us



G300
6" SHOWN

THIS STYLE AVAILABLE ON
2.5", 3", 4", 6" & 8" SIZES



01G
8" SHOWN

NOTE:
INTEGRAL GEARBOX
STYLE APPROVED 2015

FIRE PROTECTION PRODUCT IS NOT NSF CERTIFIED. FOR ACQUIRING NSF61 CERTIFICATION OR USC LISTINGS, CONTACT THE KENNEDY VALVE SALES DEPART.

1. UPPER AND LOWER SHAFTS 410SS/416SS
2. BODY COATING: EPOXY
3. DISC ENAPSULATION MTL: EPDM

	G300				01G	W300				01W
SIZE	2.5"	3"	4"	6"	8"	2.5"	3"	4"	6"	8"
A	2.85	3.47	4.47	6.61	8.6	4.2	4.4	5.3	7.5	9.5
B	3.8	3.8	4.5	5.8	5.2	1.8	1.8	2.0	2.2	2.4
C	2.2	2.4	2.9	4.0	8.2	2.2	2.4	2.9	4.0	8.2
D	4.3	4.8	5.9	8.1	14.3	4.3	4.8	5.9	8.1	14.3
E	N/A	N/A	N/A	1.7	5.9	1.7	4.2	3.3	5.6	9.3
F	N/A	N/A	N/A	.1	1.3	.4	.6	.9	1.9	2.7
O.A. HEIGHT	10.0	10.4	11.6	13.8	17.6	10.0	10.4	11.6	13.8	17.6
WT.(POUNDS)	8.8	10.1	13.5	24.6	44	10.5	11.1	13.8	20.5	44

GROOVED END CONNECTIONS: FOR USE WITH STEEL GROOVED END PIPE (IPS)
MATING PIPE AND COUPLINGS TO CONFORM TO IPS STEEL PIPE DIMENSIONS
FOR OUTSIDE GROOVE AND GASKET SEATING DIMENSIONS.
SEE DIAGRAM DIM "E" FOR MINIMUM INSIDE DIAMETER OF PIPE.

PIPE CONNECTION SPECIFICATIONS-ALL VALVES RATED 300 PSI

SUPERCEDES		KENNEDY VALVE DIVISION OF MCWANE. INC. TECHNICAL SERVICE MANUAL	ISSUED		DRAWING
DATE	PAGE		BY	DATE	32271-04
N/A	N/A		PJD	2/16/21	(PAGE 1/2)

BUTTERFLY VALVES

Models: G300/G300E/G300C/G300EC/W300/W300E/W300C/W300EC/W30001/01G/02G/01W

SUPPLEMENTARY INSTALLATION INSTRUCTIONS

Information shown here is intended to supplement, not to replace, instructions that are shipped with each valve. Dimensional information regarding minimum pipe I.D. and disc protrusion are shown on dimensional page for particular valve. Exercise care handling and during assembly.

Grooved Body

For use with IPS grooved end.
see valve dimensional information for min. pipe I.D. (dimension E)
Valves shall be installed by person(s) certified to install grooved end fittings in a fire protection system by authority having jurisdiction:

*Follow grooved coupling manufacturers latest published directions.

Wafer Body

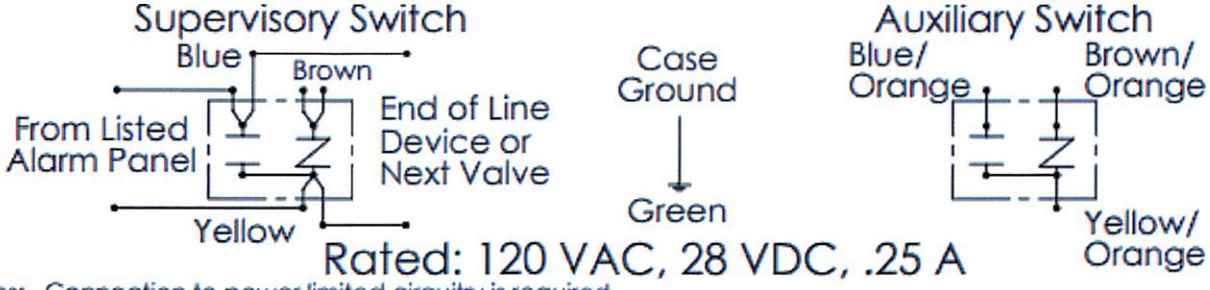
For installation between two ANSI B16.1, 125lb. flanges see valve dimensional information for min. pipe I.D. (dimension E)

1. Two flanged mating pieces should be placed at a distance apart that is slightly more than the thickness of the body (dimension B on wafer table)
2. A minimum of 2 studs shall be placed through adjacent flange holes so that the lower trunnion of the valve can fit between them. Normally this is the bottom 2 holes if the valves will be vertical with open/ closed indicator on top
3. Place the valve between the flanges taking care to not disturb the body gaskets.
4. Place remaining studs around the valve and tighten using an alternating pattern until desired torque is reached.
5. O-ring gaskets are shipped with valve to help facilitate installation against ANSI class flanges. When mating to grooved flange adapters the o-ring gaskets can be discarded.

Switch Wiring

1. Valve has internal switches that operate from the OPEN position. Normally Closed valves are an option(W300C/G300C/G300EC), and operate from CLOSED position
2. One switch has dual leads that is for connection to the SUPERVISORY circuit of an alarm panel. The other switch has single leads and is intended to be connected to AUXILIARY equipment
3. Tuck unused leads into junction box (not provided)
4. Always comply with national codes, local codes and NFPA 13/71 and 72

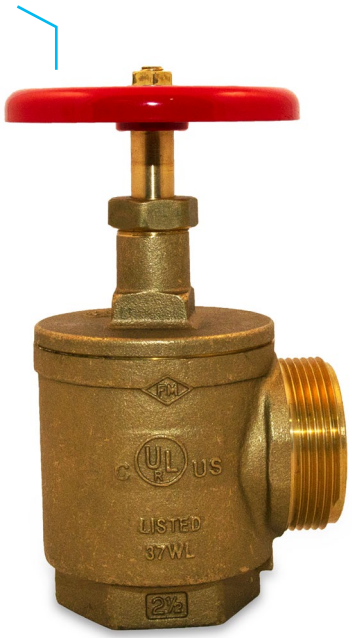
G300,G300E,W300E WIRING 2 1/2"- 8" VALVE NORMALLY OPEN (G300,G300E,W300,01G,02G,01W) OR VALVE NORMALLY CLOSED (G300C,W300C,G300EC,01GC,02GC,01WC



Wiring Notes: Connection to power limited circuitry is required.
Auxiliary switch connections are not intended for electrical supervision.
Switches are checked at factory, check continuity with valve fully open (or closed for normally closed valves),switches activates within 2 turns of handwheel from open.

Kennedy Valve
A Division of McWane Inc
www.kennedyvalve.com
2020
1021 E Water St. Elmira, NY 14901
P.O. Box 981
Phone (607) 734-2211 Fax: 1-800-952-4771

Angle Hose Valves
Fig. 07-000



Description

Angle hose valves feature all brass* construction with forged or cast bodies for rigidity and light weight. Typical uses are in rack assemblies or any other application which requires a listed fire hose valve. Available in rough brass or polished chrome finish with a red hand wheel. UL, ULc Listed, FM Approved. Rated 300psi.

Installation

Install in accordance with customary installation practices. Use an approved thread sealant such as PipeFit® Thread Sealing Paste with PTFE on the male threads to which the valve is being installed.

DO NOT OVER TIGHTEN. Over tightening of the valve during installation to the male pipe threads may crack or deform the valve body. Only use tools suitable for the installation of this product. Do not use pipe wrench extenders to increase leverage on pipe wrenches. This may result in valve damage as well as personal injury.

Specifications

Nomenclature and Material:

Material:
Cast or Forged Brass* Body

Finish:
Rough Brass
Polished Chrome*

Threads:

2 ½"	FNPT	x FNPT
		x MNST
		x MBCT
		x MQST
		x MONT
		x MPHX
		x MTEM
		x MCLV
		x MNYFD
		x MDET
		x MCF
		x MRCH
2 ½"	GRV	x FNPT
		x MNST
		x MQST
		x MNYFD
2 ½"	FNPT	x 3 MNST
1 ½"	FNPT	x FNPT
		x MNST

*Contains lead. Not for use in water systems intended for human consumption.

c UL us 37WL

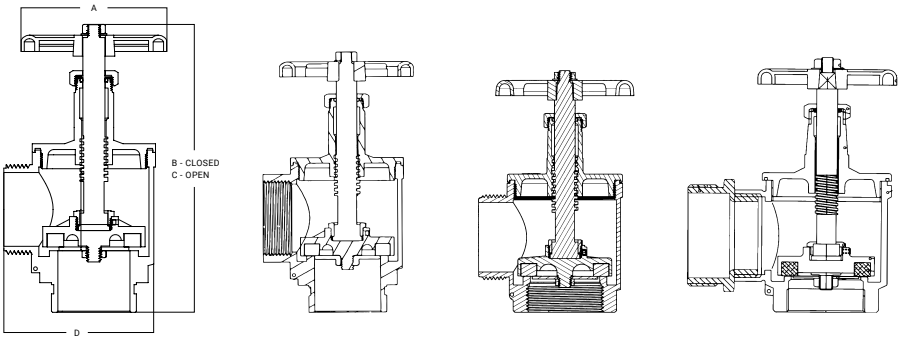
FM APPROVED

FPPI
An ASC Engineered Solution

PROJECT INFORMATION	APPROVAL STAMP
Project:	☐ Approved
Address:	☐ Approved as noted
Contractor:	☐ Not approved
Engineer:	Remarks:
Submittal Date:	
Notes 1:	
Notes 2:	

ASC Engineered Solutions

Angle Hose Valves
Fig. 07-000



Item Number	Configuration	A (IN)	A (MM)	B (IN)	B (MM)	C (IN)	C (MM)	D (IN)	C (MM)
07-000-00	2 1/2" FNPT X MNST	5"	127	8.64"	219.5	10.41"	264.5	5.2"	132
07-000-10	2 1/2" FNPT X MNST (PC)	5"	127	8.64"	219.5	10.41"	264.5	5.2"	132
07-001-00	2 1/2" GRV X MNST	5"	127	9.42"	239.3	11.2"	284.3	5.12"	130
07-001-02	2 1/2" GRV X MQST	5"	127	9.42"	239.3	11.2"	284.3	5.12"	130
07-001-03	2 1/2" GRV X MNYFD	5"	127	9.42"	239.3	11.2"	284.3	5.12"	130
07-002-00	2 1/2" FNPT X MBCT/ NYCORP	5"	127	8.64"	219.5	10.41"	264.5	5.2"	132
07-003-00	2 1/2" FNPT X MNYFD	5"	127	8.64"	219.5	10.41"	264.5	5.2"	132
07-004-00	2 1/2" FNPT X MQST	5"	127	8.64"	219.5	10.41"	264.5	5.2"	132
07-005-00	2 1/2" FNPT X MRCH	5"	127	8.64"	219.5	10.41"	264.5	5.2"	132
07-006-00	2 1/2" FNPT X MONT	5"	127	8.64"	219.5	10.41"	264.5	5.2"	132
07-008-00	2 1/2" FNPT X MPHX	5"	127	8.64"	219.5	10.41"	264.5	5.2"	132
07-010-00	2 1/2" FNPT X MTEM	5"	127	8.64"	219.5	10.41"	264.5	5.2"	132
07-012-00	2 1/2" FNPT X MCLV	5"	127	8.64"	219.5	10.41"	264.5	5.2"	132
07-014-00	2 1/2" FNPT X MDET	5"	127	8.64"	219.5	10.41"	264.5	5.2"	132
07-016-00	2 1/2" FNPT X MCF	5"	127	8.64"	219.5	10.41"	264.5	5.2"	132
07-020-00	2 1/2" FNPT X FNPT	5"	127	8.64"	219.5	10.41"	264.5	5.2"	132
07-021-00	2 1/2" GRV X FNPT	5"	127	9.42"	239.3	11.2"	284.3	5.12"	130
07-022-00	1 1/2" FNPT X MNST	3.89"	98.8	6.71"	170.4	7.81	198.5	3.84"	97.5
07-024-00	1 1/2" FNPT X FNPT	3.89"	98.8	6.71"	170.4	7.81	198.5	3.84"	97.5
07-050-00	2 1/2" FNPT X 3 MNST	5"	127	8.64"	219.5	10.41"	264.5	7.74"	196.5

FPPI
An ASC Engineered Solution

Hose Valve Caps – Plastic (ABS) with Chain
Fig. 07–280

Specifications

Materials:
Cap: Injection Molded ABS
Chain: Zinc plated steels

Sizes:
2 1/2" NST
1 1/2" NST

Color
Red

Inscription:
Do Not Pressurize

Description

Plastic hose valve caps are intended to be used in place of brass or bronze caps. Because of the plastic materials low scrap value, theft and vandalism are significantly reduced. Both size caps feature rocker lug design and are provided with an attaching chain.

Installation

INTENDED ONLY FOR USE WITH NST THREADS. Make sure valve threads are free from debris. Thread correct size cap onto the valve until tight. Attach chain to the valve body at the point provided by the valve manufacturer. CAUTION: PLASTIC HOSE VALVE CAPS ARE FOR PROTECTION OF THE MALE THREAD ONLY. DO NOT PRESSURIZE PLASTIC HOSE VALVE CAPS. SERIOUS BODILY INJURY CAN OCCUR.

FPPI
An ASC Engineered Solution

PROJECT INFORMATION	APPROVAL STAMP
Project:	Approved
Address:	Approved as noted
Contractor:	Not approved
Engineer:	Remarks:
Submittal Date:	
Notes 1:	
Notes 2:	