



TECHNICAL DATA

MODEL VXD DELUGE SYSTEM WITH HYDRAULIC RELEASE

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. INTRODUCTION

Viking VXD Deluge Systems utilize a Viking Model VXD Deluge Valve to control the water supply to system piping equipped with open sprinklers and/or spray nozzles. The system piping remains empty until the deluge valve is activated by operation of the release system. Deluge systems are commonly used where it is desirable to simultaneously spray water from all open sprinklers and/ or nozzles on the system when the system operates.

Hydraulically controlled deluge systems require a hydraulic release system equipped with thermostatic (rate-of-rise) releases, and/or fixed-temperature releases, and/or pilot sprinkler heads.

In fire conditions, operation of a releasing device on the hydraulic release system opens the deluge valve, allowing water to enter the system piping. Water will flow from any open sprinklers and/or spray nozzles on the system.

2. LISTINGS AND APPROVALS

cULus Listed - Categories VLFT and VLFT7

FM Approved

3. ORDERING INFORMATION

**Table 1: Available Sizes for Model VXD Deluge System
with Hydraulic Release (Vertical)**

Nominal Size	Part Number		
	Loose trim ¹ Galvanized	Loose trim ¹ Brass	Pre-trimmed ² Galvanized
1-½	23542-1	23542-2	23543
2	23574-1	23574-2	23575
2½	23595-1	23595-2	23596
3	23616-1	23616-2	23617
4	23637-1	23637-2	23638
6	23659-1	23659-2	23660
8	23680-1	23680-2	23681
10	23701-1	23701-2	23702

1. Loose trim packages do not include the deluge valve. Refer to the Model VXD Deluge Valve Technical Data Page for available options.

2. Pre-trimmed packages are only available with galvanized pipe and groove/groove valves.



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

**Table 2: Additional System
Component Information**

Component	Scan, click or tap
Pressure Operated Relief Valve (PORV)	



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4. SYSTEM COMPONENTS

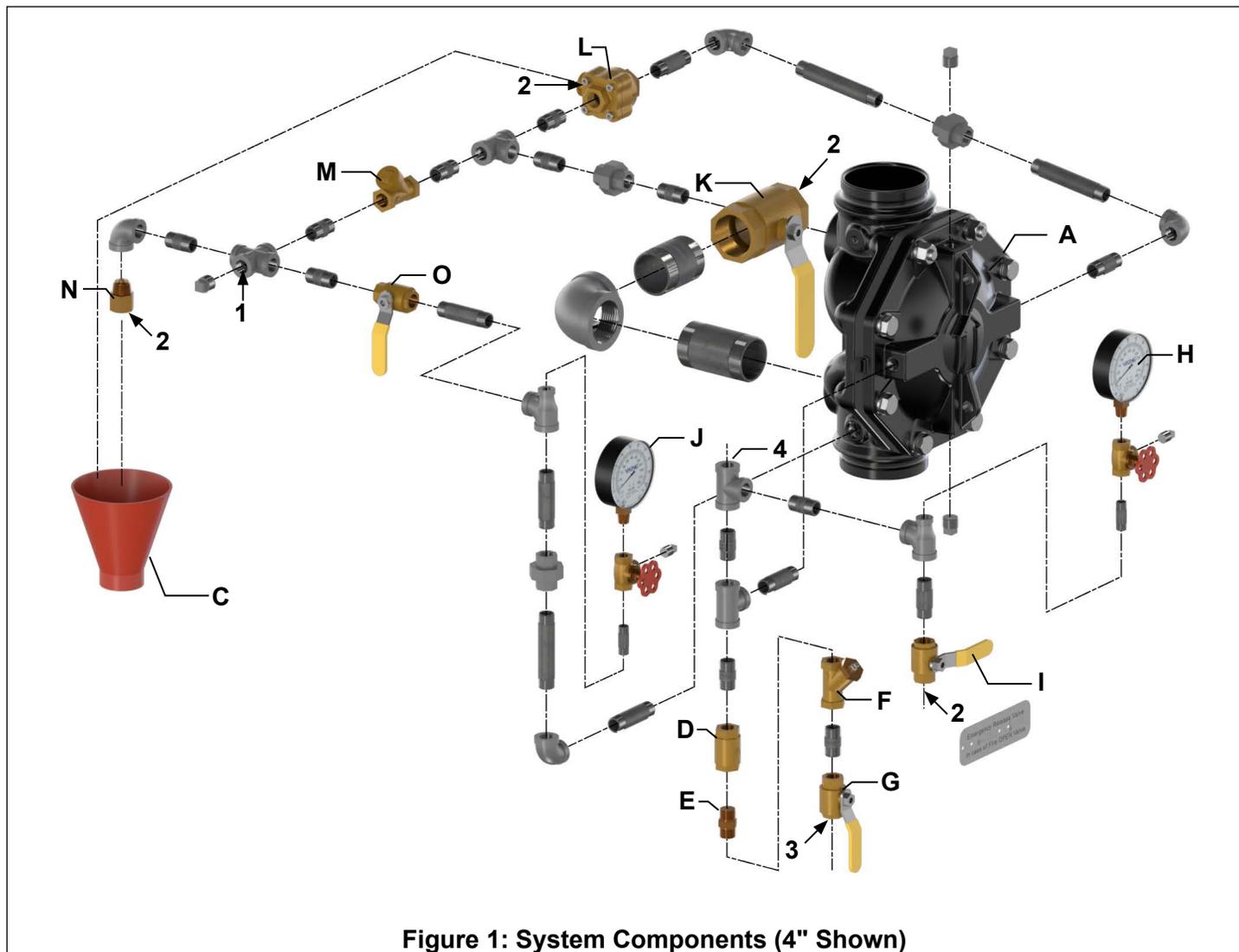


Figure 1: System Components (4" Shown)

Item	Description	Item	Description	Item	Description
A	Deluge valve	I	Emergency release valve (normally closed)	1	Water flow alarm (example: PS-10) connection point (device purchased separately)
C	Drain cup	J	Water supply pressure gauge		
B	N/A	K	Flow test valve (normally closed)		
D	In-line check valve	L	Pressure Operated Relief Valve (P.O.R.V.)	2	Drain connection point (piping not provided)
E	1/8" Restricted orifice	M	Swing check valve		
F	Y-strainer	N	1/8" Restricted orifice	3	Prime supply connection point (must be piped to upstream of main water supply valve; piping not provided)
G	Priming valve (normally open)	O	Alarm test valve (normally closed)		
H	Prime pressure gauge				
NOTE: Piping shown for reference only.				4	Pilot line connection point



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5. SYSTEM OPERATION

5.1 In the SET condition:

System water supply pressure enters the priming chamber and hydraulic release piping of the deluge valve through the priming line, which includes a normally open priming valve (A), strainer (B), restricted orifice (not shown), check valve (C) and also stops at the inlet of the normally closed PORV (D). In the SET condition, water supply pressure is trapped in the priming chamber by check valve (C), the closed releasing devices, the water-filled pilot line (refer to pilot connection point (E), and the emergency release (F). The pressure in the priming chamber holds the Deluge Valve clapper closed, keeping the outlet chamber and system piping dry.

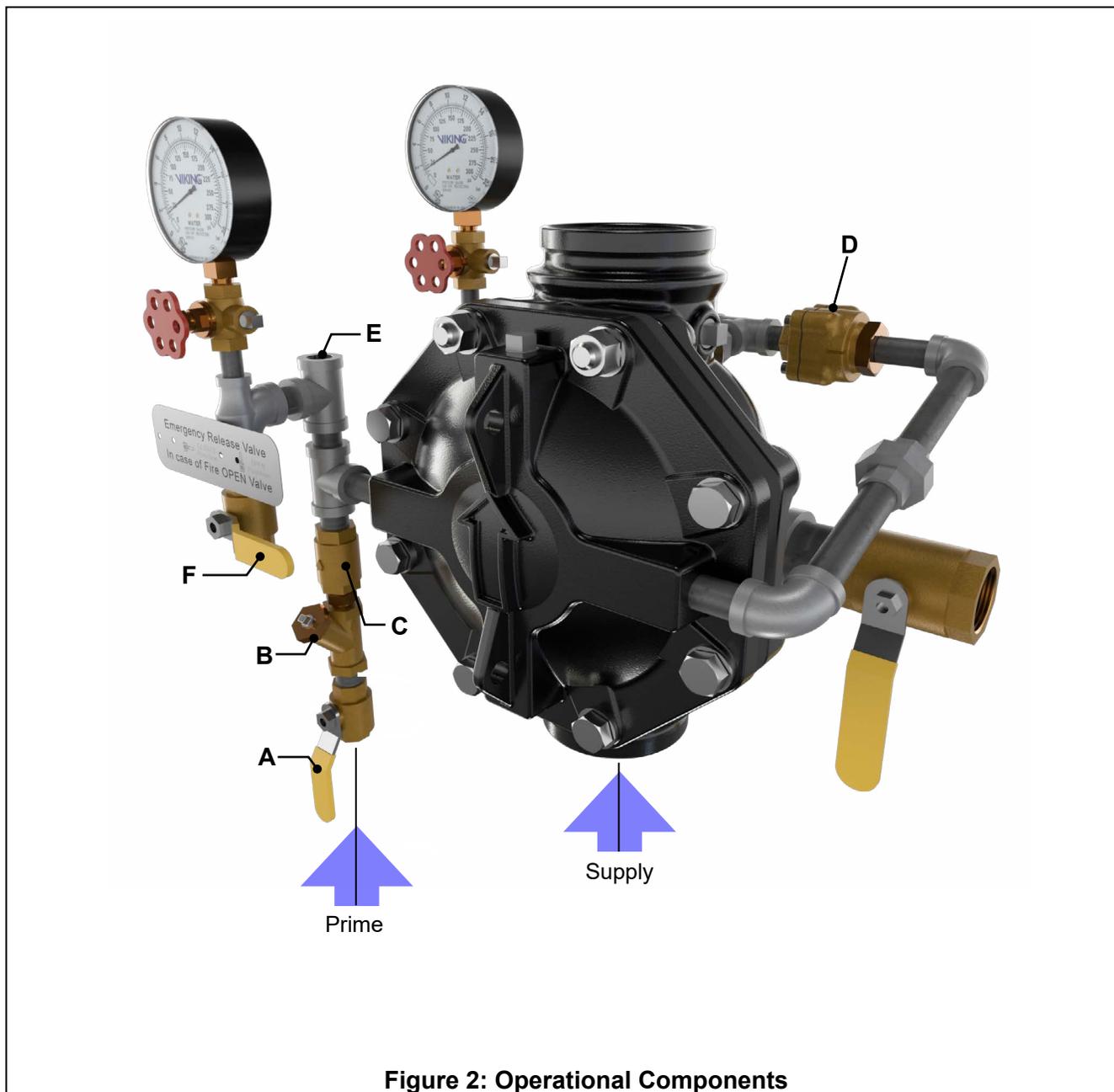


Figure 2: Operational Components



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5.2 In fire conditions:

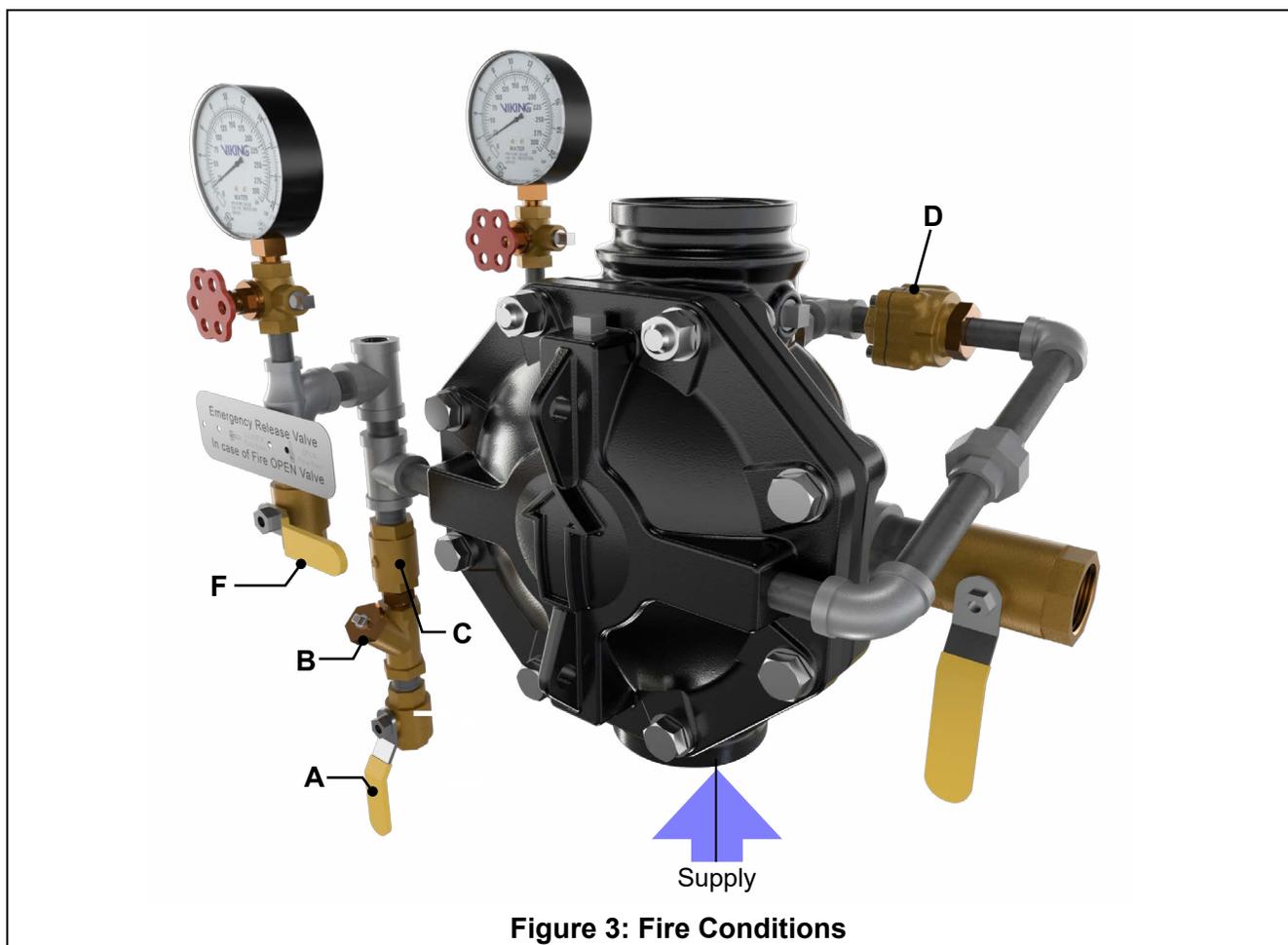
When a releasing device operates, water pressure in the hydraulic release system is allowed to escape. Hydraulic pressure is released from the priming chamber faster than it is supplied through restricted orifice. The deluge valve diaphragm opens to allow water to flow into the system piping and alarm devices, causing the water motor alarm and water flow alarms connected to alarm pressure switch to activate. Water will flow from any open sprinklers and /or spray nozzles on the system..

5.3 In trouble conditions:

If the hydraulic release system operates due to mechanical damage or malfunction, the deluge valve will open. Water will flow from any open sprinklers and /or spray nozzles on the system. Water motor alarm and alarms connected to alarm pressure switch will activate.

5.4 Manual operation:

Anytime the emergency release is pulled, pressure is released from the priming chamber and the deluge valve will open. Water will flow into the system piping and alarm devices. Water will flow from any open sprinklers and/or spray nozzles on the system.



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6. INSTALLATION

Refer to current Viking Technical Data describing individual components of the Viking VXD Deluge System. Also, refer to applicable installation standards, codes, and Authorities Having Jurisdiction.

6.1 Important Requirements

1. The deluge valve, trim, and entire hydraulic release system must be installed only in areas where they will not be subjected to freezing temperatures.
2. Alarm pressure switch should activate when pressurized to 4 to 8 PSI (.3 to .6 bar) on pressure rise. Alarm pressure switch should be wired to activate the water flow alarm.
3. Release system piping for the hydraulically controlled deluge valve must not exceed the maximum elevation allowed for hydraulic release piping above the deluge valve. Refer to Technical Data for the Model VXD deluge valve.
4. The water supply to the hydraulic release system must include restricted orifice to ensure that the priming line cannot replace hydraulic pressure as fast as it escapes when a releasing device operates.

6.2 Recommendation

Viking recommends providing an inspectors test connection on the hydraulic release system. The inspectors test connection should be equipped with a ball valve (normally locked closed) capable of being opened to simulate the opening of a releasing device. Locate the connection and valve at the highest, most hydraulically demanding location of the release system. Inspectors test connections provided on hydraulic release systems should terminate in an orifice equal to the smallest orifice of the releasing devices provided. The inspectors test connection may be used to test operation of the deluge system and to verify that the priming line cannot replace hydraulic pressure as fast as it escapes when a releasing device operates. Refer to section 9: INSPECTIONS, TESTS, and MAINTENANCE.



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7. PLACING THE SYSTEM IN SERVICE

Placing the Valve in Service (Refer to Figure 4):

1. Verify the following:
 - The system main water supply control valve (not shown) is closed.
 - The system has been properly drained.
 - The emergency release (F) is closed.
 - The system water supply piping is pressurized up to the closed main water supply control valve and the priming line is pressurized up to the closed priming valve.
2. Open the priming valve (A). Verify that the prime pressure gauge indicates proper pressurization.
3. Open flow test valve (G).
4. Slowly and partially open main water supply control valve (not shown).

NOTE: Opening the main water supply valve too quickly can create excessive pressure causing the valve to trip.
5. When full flow develops from the flow test valve (G), close the valve. Verify that there is no flow from the open orifice.
6. Fully open and secure the main water supply control valve.
7. Verify that all valves are in their normal operating position.
8. Verify that no water is discharging into the drain cup.
9. Check for, and repair all leaks.
10. 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 Annual Trip Tests, section 9.2.C.
11. After completing a trip test, perform semi-annual maintenance. Refer to section 9.3.B.

⚠ 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.

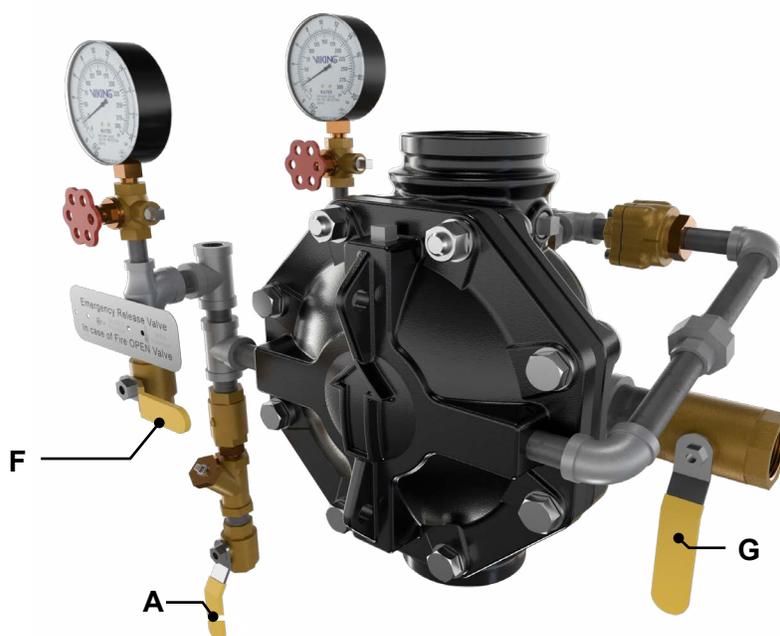


Figure 4: Placing the System in Service



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8. EMERGENCY INSTRUCTIONS

⚠ WARNING

WARNING: Placing a control valve or detection system out of service may eliminate the fire protection capabilities of the system. Prior to proceeding, notify all Authorities Having Jurisdiction (AHJ). Consideration should be given to employment of a fire patrol in the affected areas.

Refer to the appropriate technical data page and NFPA standards for complete care, handling, installation, and maintenance instructions. For additional product and system information, Viking data pages and installation instructions are available on the Viking Web site at www.vikinggroupinc.com.

To take system out of service (Refer to Figure 4):

After a fire, verify that the fire is OUT and that placing the system out of service has been authorized by the appropriate Authority Having Jurisdiction.

1. Close the water supply control valve (not shown).
NOTE: 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. Close the priming valve (A).
3. Replace any release devices, sprinklers and/or spray nozzles that have been damaged or have been exposed to fire conditions.
4. Perform all maintenance procedures recommended in Technical Data describing individual components of the system that has operated.
5. Return the system to service as soon as possible. Refer to section 7: Placing the System In Service.

9. INSPECTIONS, TESTS, AND MAINTENANCE

⚠ WARNING

Any system maintenance 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 areas.

NOTICE

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

It is imperative that the system be inspected and tested on a regular basis in accordance with NFPA 25. Refer to current Viking Technical Data describing individual components.

The frequency of the inspections may vary due to contaminated water supplies, corrosive water supplies, corrosive atmospheres, as well as the condition of the air supply to the system. 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.

9.1 Inspection

Weekly - Viking recommends a weekly visual inspection; check the following items.

- Verify that the main water supply control valve is open and that all other valves are in their normal operating position and appropriately secured. (refer to Figure 1)
- Check for signs of mechanical damage, leakage, and/or corrosive activity. If detected, perform maintenance as required. If necessary, replace the device.
- Verify that the valve and trim are adequately heated and protected from freezing and physical damage.

NOTE: For normal operating position, refer to Figure 1.



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9.2 Periodic System 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 mechanical water motor alarm (if provided), OPEN the alarm test valve in the Deluge Valve trim.
 - a. The local water motor gong should be audible.
 - b. If equipped with remote station alarm signaling devices, verify that alarm signals were received.
3. When testing is complete, CLOSE the Alarm Test Valve.
4. Verify the following:
 - a. All local alarms stop sounding.
 - b. All remote station alarms reset.
 - c. Supply piping to water motor alarm properly drains.
5. Verify that the Alarm Test Valve is CLOSED.
6. Verify that the outlet chamber is free of water. No water should flow from the alarm drain line.
7. Notify the Authority Having Jurisdiction and those in the affected area that testing is complete.

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.
3. Verify that the outlet chamber of the Deluge Valve is free of water. No water should flow from the alarm drain line.
4. Fully OPEN the Flow Test Valve.
5. When a full flow is developed from the Flow Test Valve, record the residual pressure from the water supply pressure gauge.
6. When the test is complete, SLOWLY CLOSE the Flow Test Valve.
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 (refer to Figure 1).
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.

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 to flush away any accumulation of foreign material.
3. Close the Flow Test Valve.
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.
 - b. Close the Priming Valve.
 - c. Open all system main drains. Allow the system to drain completely.
6. Perform semi-annual maintenance. Refer to section 9.3.B: Semi-Annual Maintenance.
7. Place the system in service. Refer to section 7: Placing the System in 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.

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9.3 Maintenance**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/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.

B. Semi-Annually:

1. Remove the system from service.
2. Close the Main Water Supply Control Valve and Priming Valve.
3. Relieve pressure in the priming chamber by opening the emergency release Valve.
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.
6. Refer to section 7: Placing the System 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 the Model VXD Valve Technical Data Page.
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.

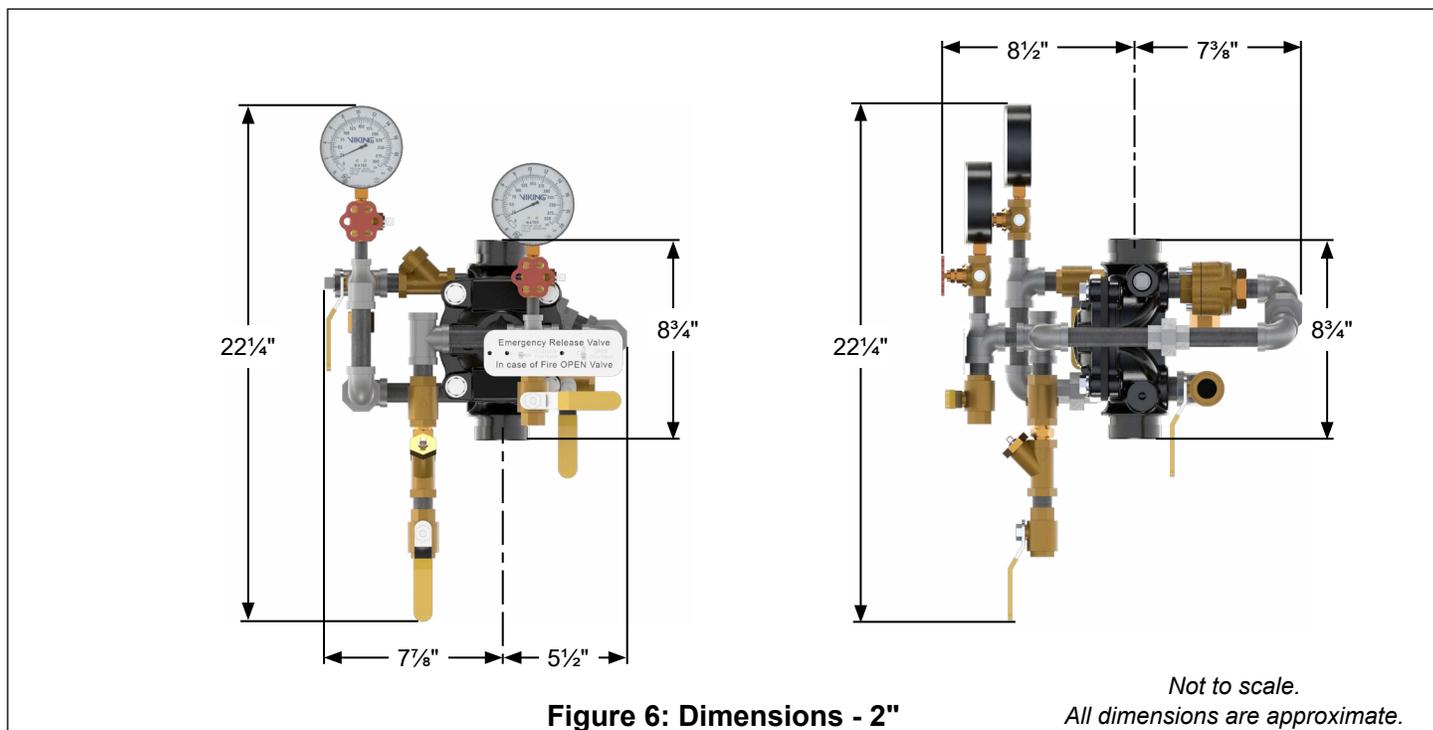
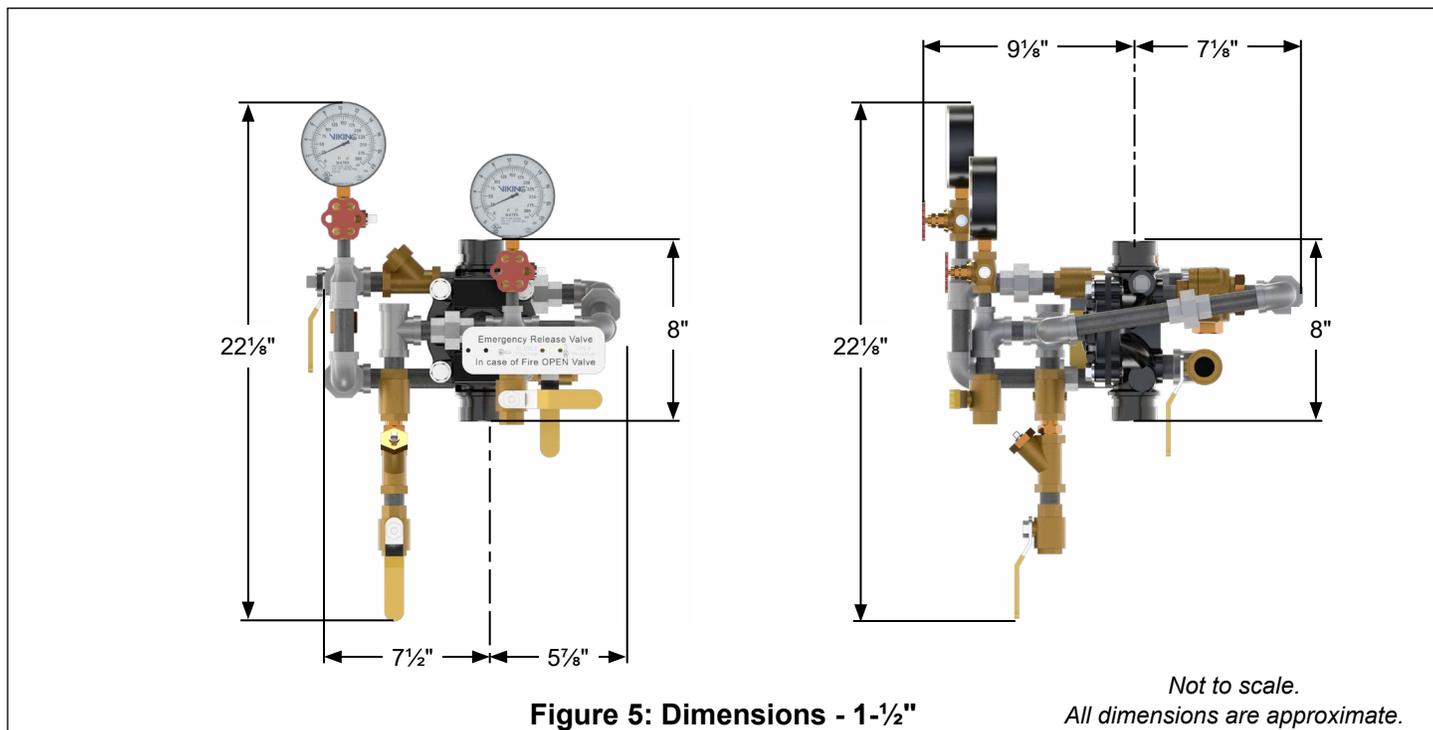


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10. DIMENSIONS





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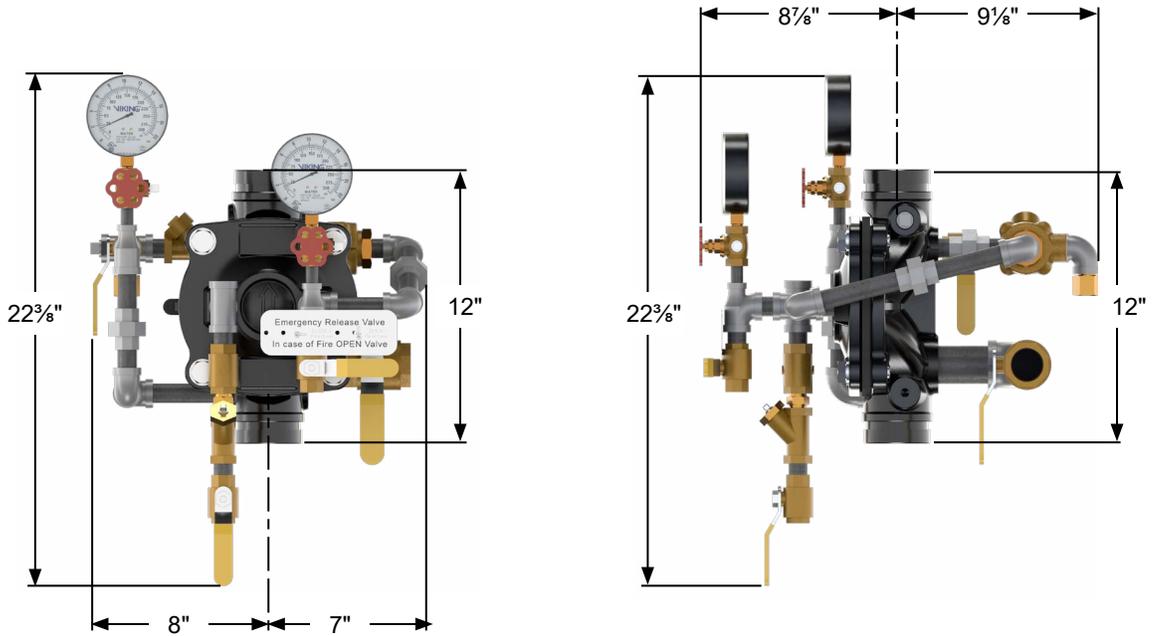


Figure 7: Dimensions - 2.5"

*Not to scale.
 All dimensions are approximate.*

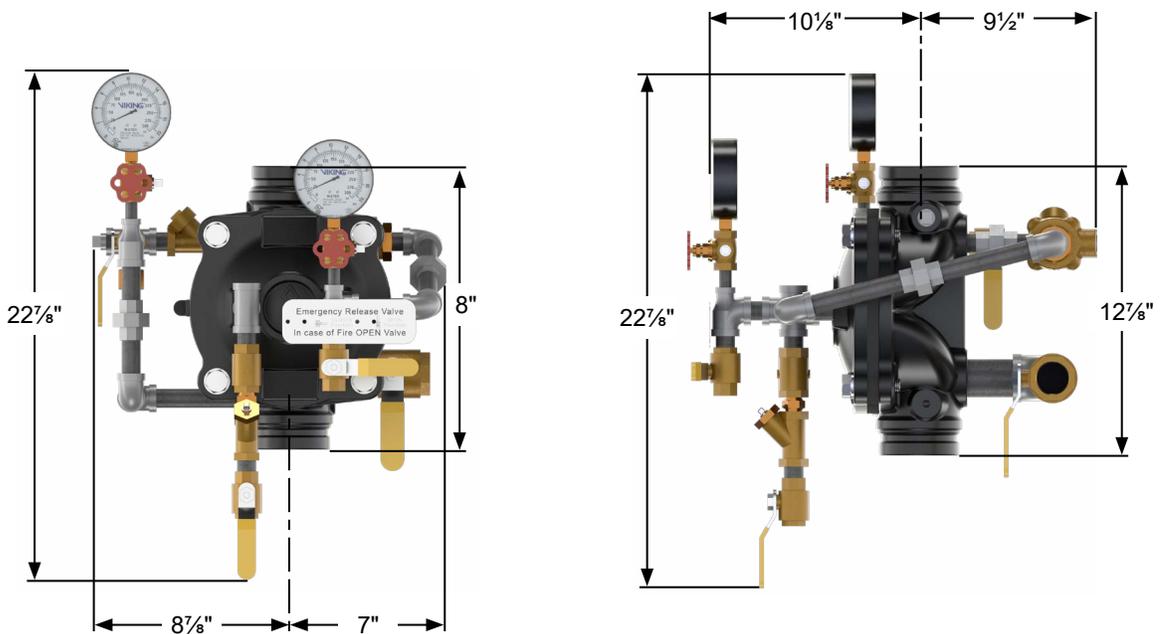


Figure 8: Dimensions - 3"

*Not to scale.
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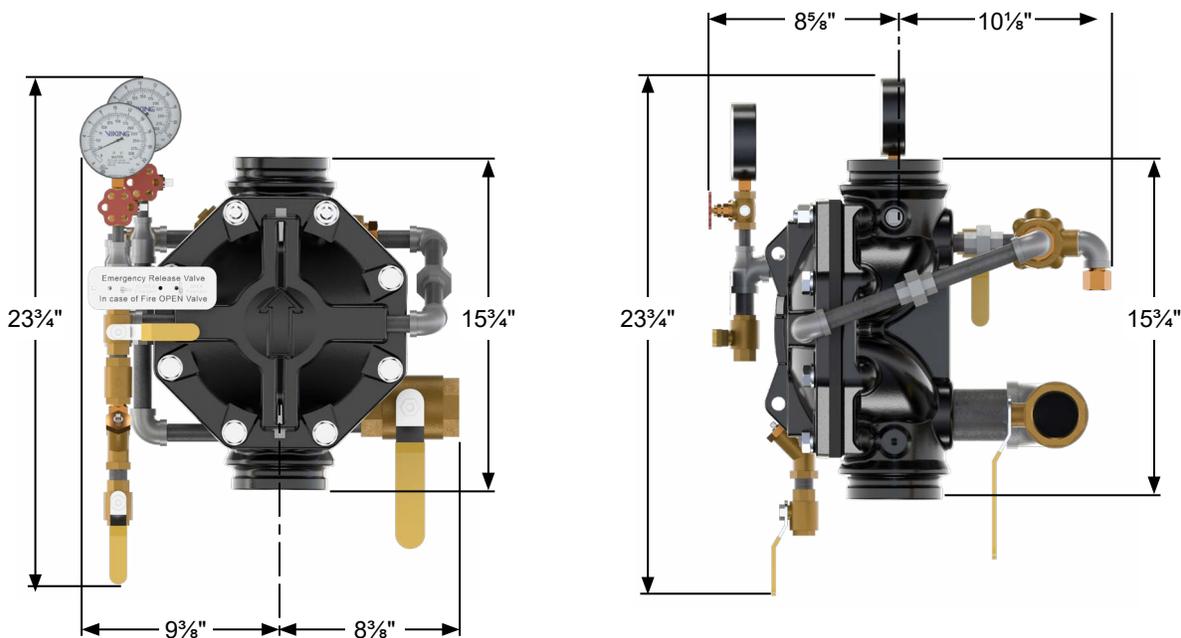


Figure 9: Dimensions - 4"

*Not to scale.
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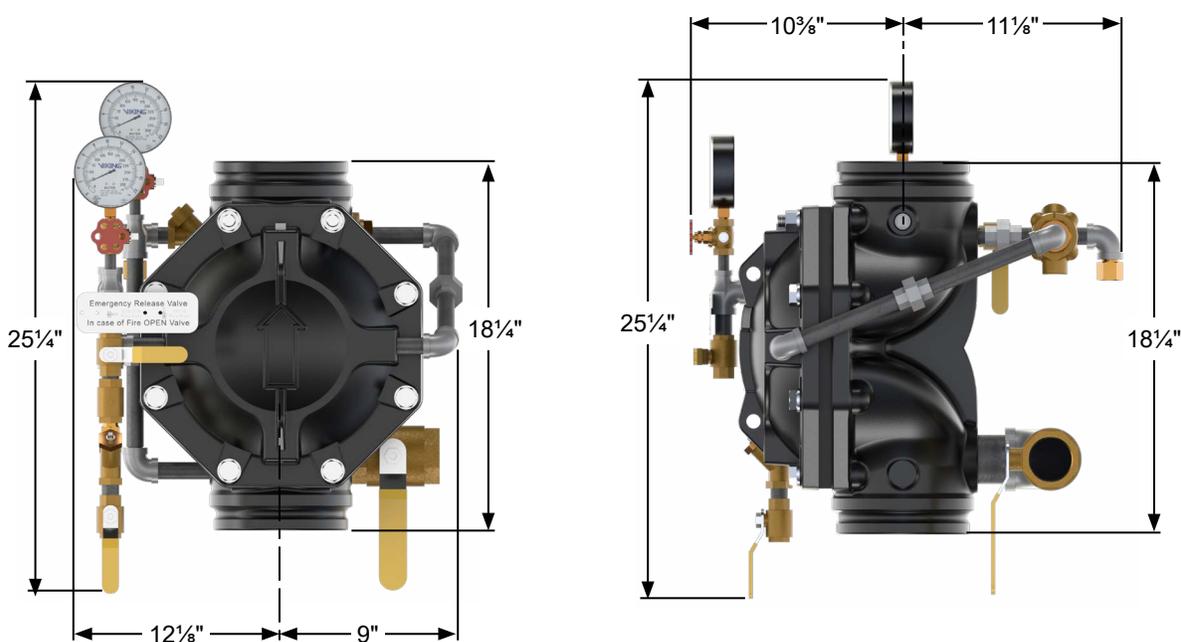


Figure 10: Dimensions - 6"

*Not to scale.
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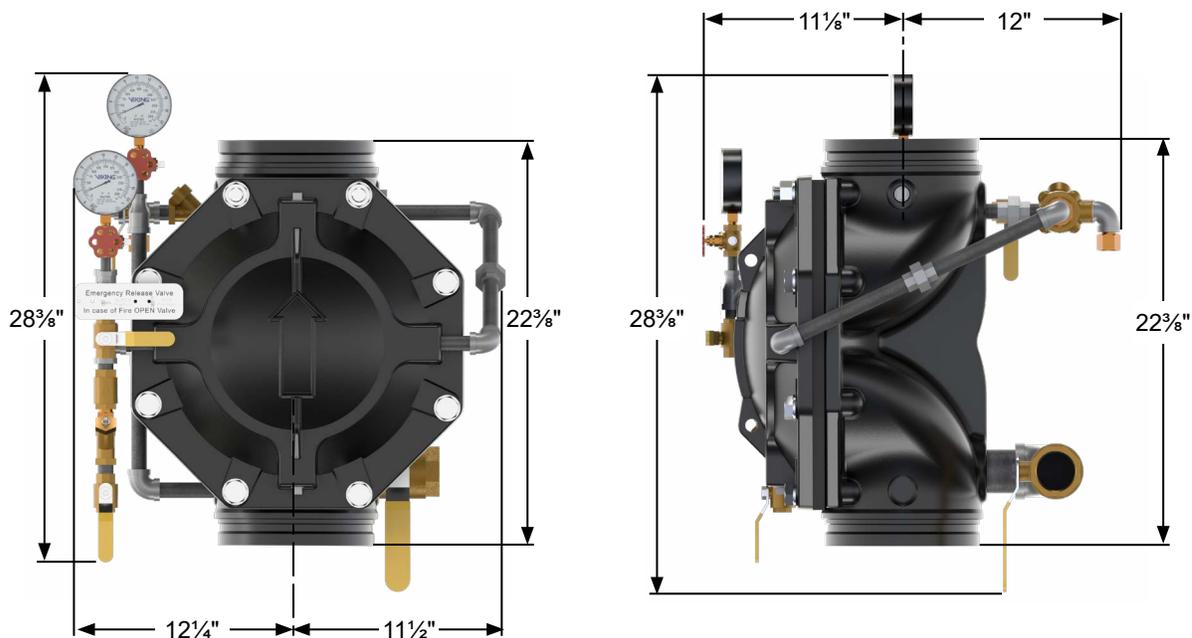


Figure 11: Dimensions - 8"

*Not to scale.
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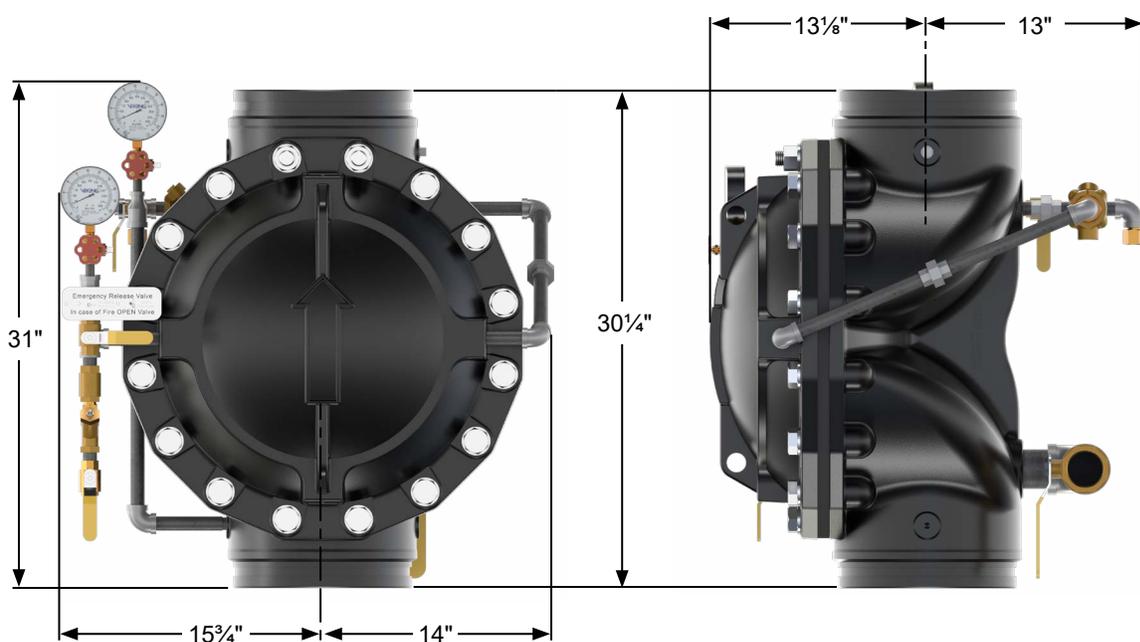


Figure 12: Dimensions - 10"

*Not to scale.
 All dimensions are approximate.*