



## General Installation, Operation and Maintenance Manual for Vacuum Breaker Valves

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# 1 Introduction

This manual will provide the information to properly install and maintain the VB-060 vacuum breaker valve and ensure a long service life. The VB-060 vacuum breaker valves have rugged construction to provide many years of trouble-free operation.

The VB-060 vacuum breaker valve provides high capacity vacuum protection. When vacuum condition occurs the valve will intake a full volume of air.

All VB-060 vacuum breaker valves have an optional installation of an additional A.R.I combination type air valve, threaded or flanged, to the side of the valve. This add-on will discharge air during pipeline filling and release air continuously during pipeline operation.

The special orifice design, a combination of stainless steel and E.P.D.M., assures long-term maintenance-free operation.

The valve size, nominal working pressure, model number, individual serial number and production date are stamped on the product name plate for future reference.

## 2 Receiving, Handling & Storage

Inspect vacuum breaker valves upon receipt for damage in shipment. Carefully remove the vacuum breaker valve from the shipping package.

Unload all vacuum breaker valves carefully on to a sturdy level surface, taking care not to drop them. The vacuum breakers should be lifted by using the eye bolts (lifting rings) only and not by any other means (Fig.1)

When the valves are to be stored for some time before being installed, storage should be in the original delivery crates or cases. Storage should be off the ground in a clean, dry indoor area.

## 3 Description of Operation

The VB-060 valve is designed to prevent vacuum conditions from occurring in pipelines. After a power failure or rapid draining of the system, a vacuum condition often occurs in a pipeline.

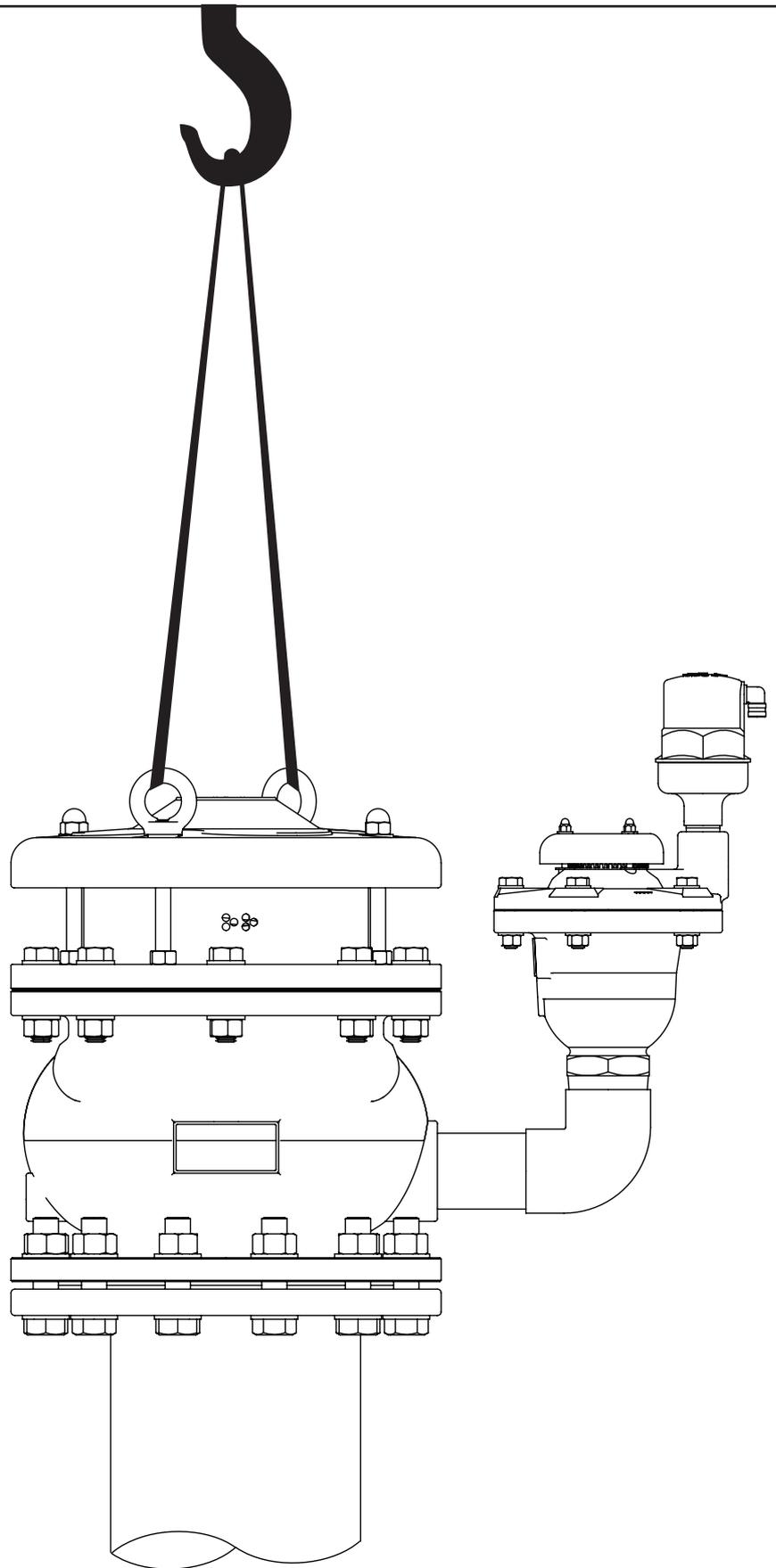
The pressure differential between the inside vacuum and the atmosphere will cause a downward force on the sealing disc. At vacuum pressures greater than 0.02 bar, the vacuum will compress the spring and move downward, allowing the free flow of air into the pipeline to eliminate vacuum.

When positive pressure is restored in the pipeline, the spring will extend upward, lifting the float and sealing the valve tightly.



## 4 Installation

### Lifting Options

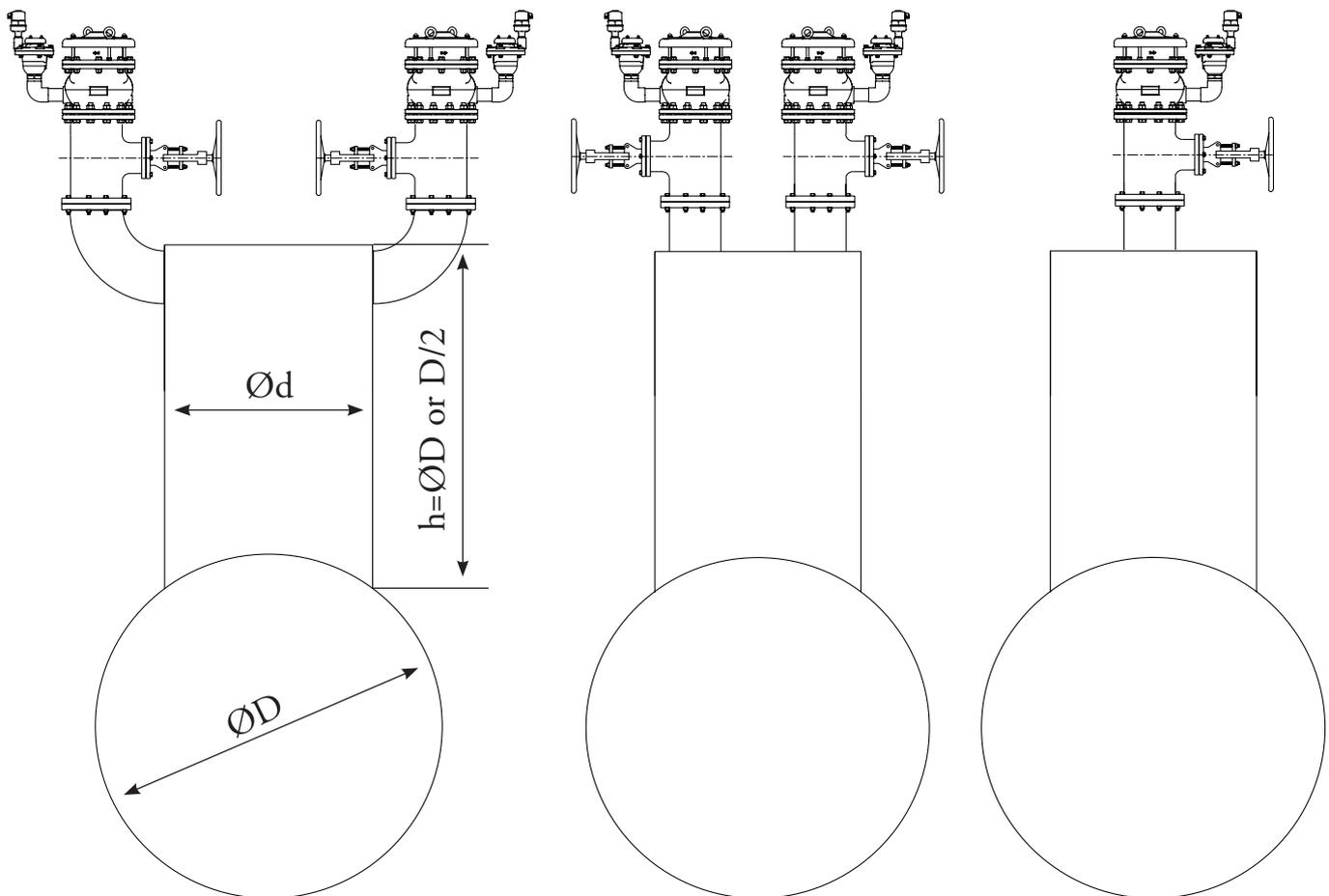


# Air Valve Installation

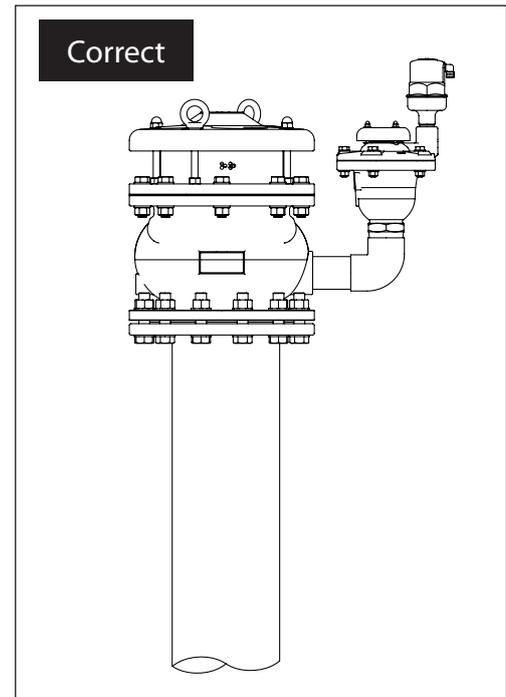
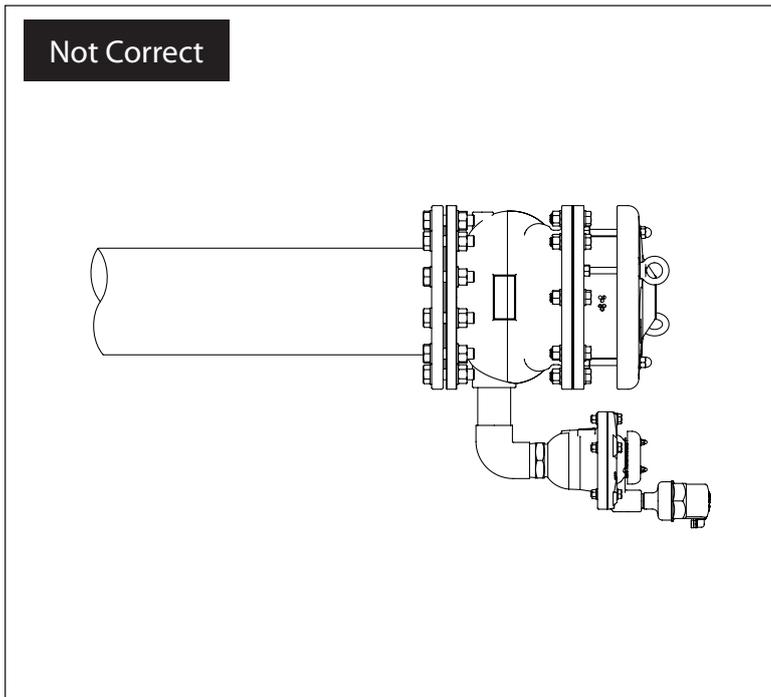
## 1. Recommendation for Riser Dimensions

$d=D$  for  $D \leq 300$  mm  
 $d=0.6 D$  for  $300 \text{ mm} < D \leq 1500$  mm  
 $d \geq 0.35 D$  for  $D > 1500$  mm

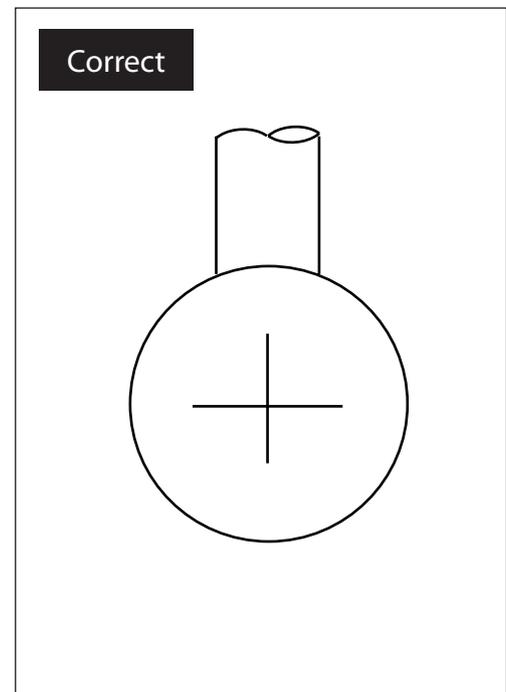
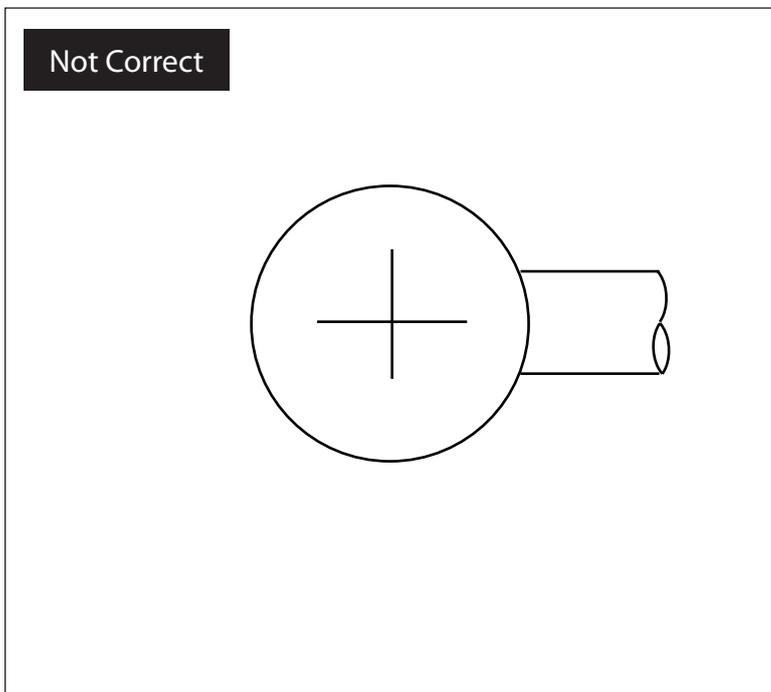
$h \geq D$  or  $h=D/2$  and  $h \geq 150$  mm



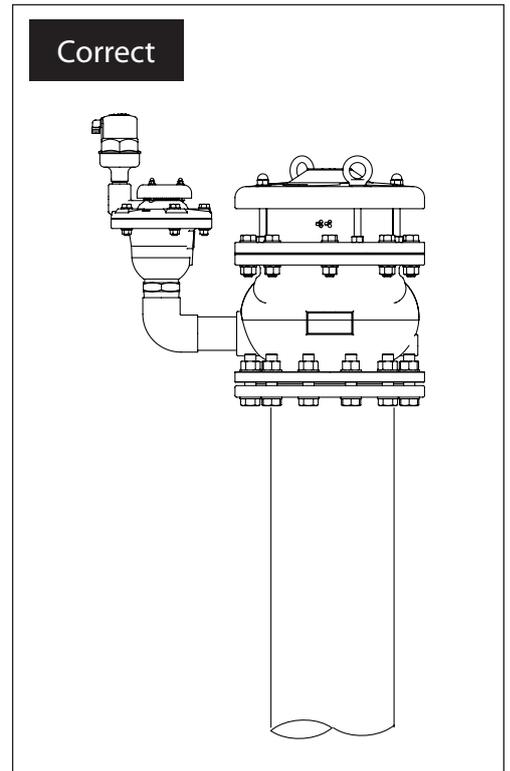
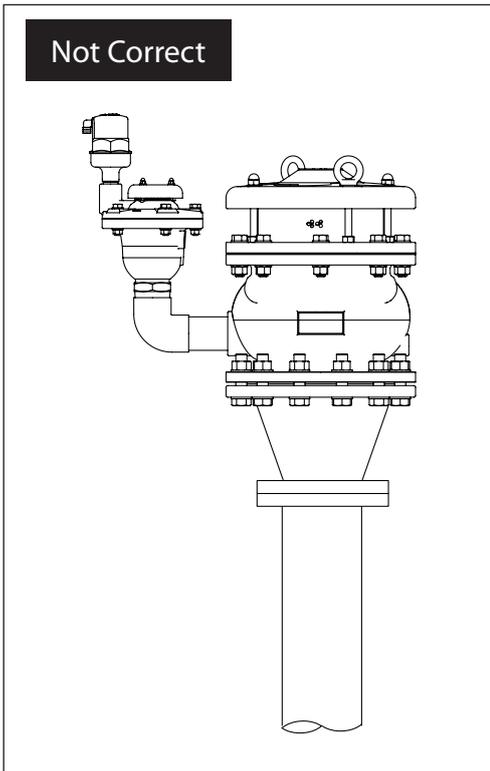
2. The air valve should be installed in a vertical position.



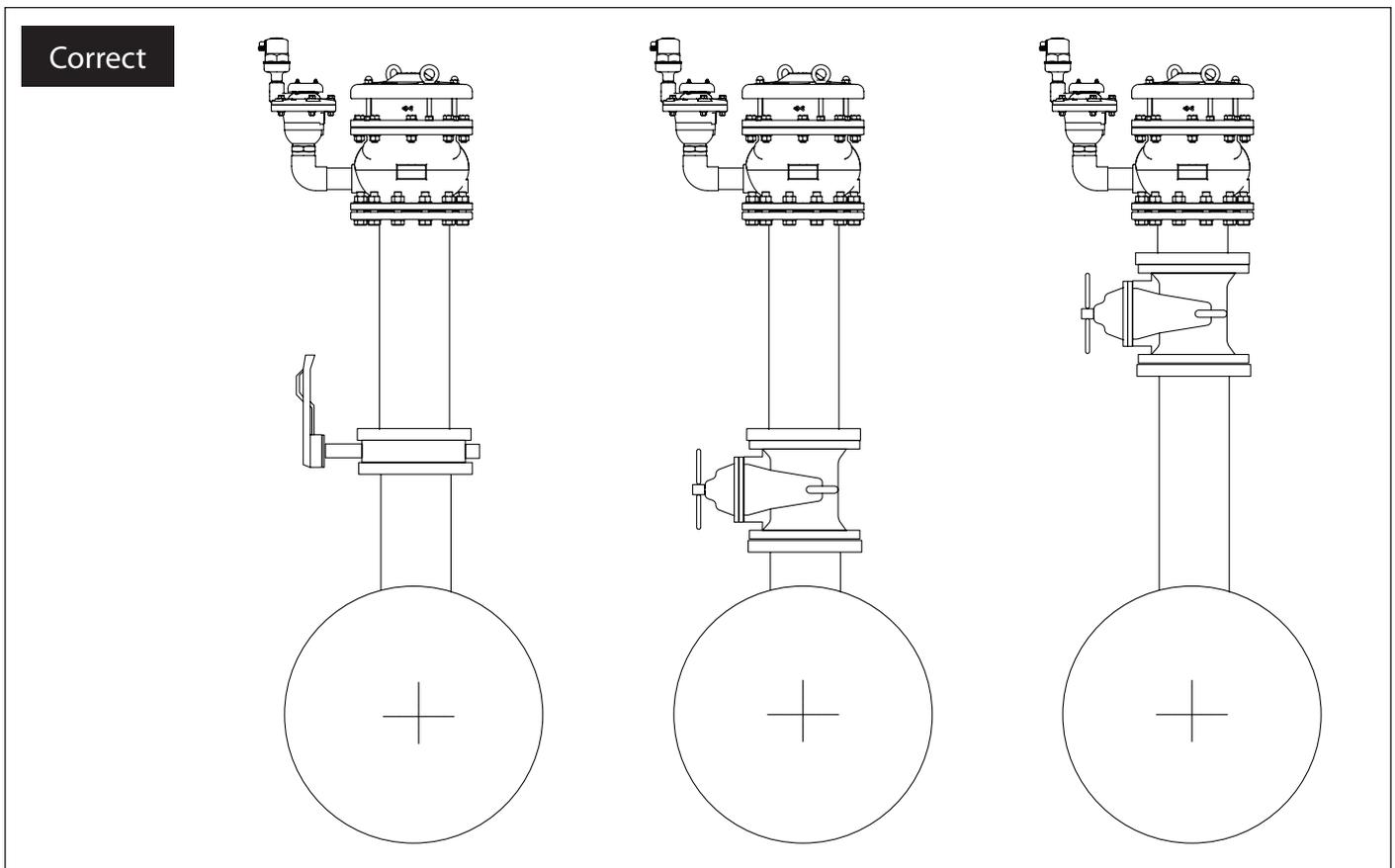
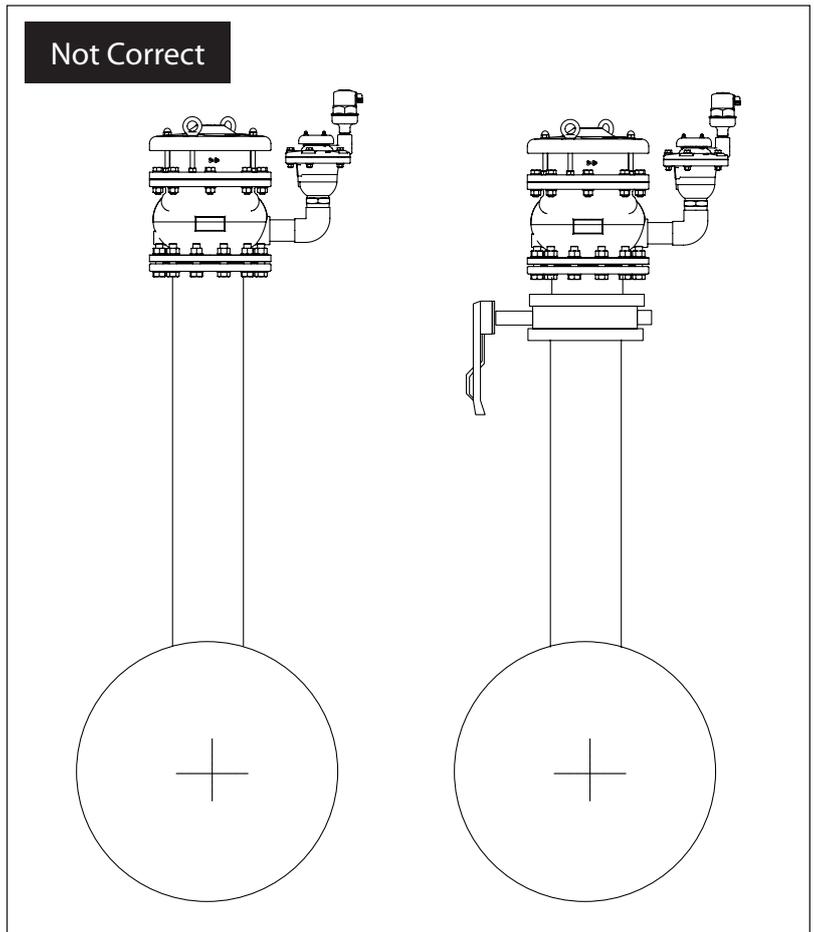
3. The standpipe should be attached to the crown of the pipe and not from the side of the pipe.



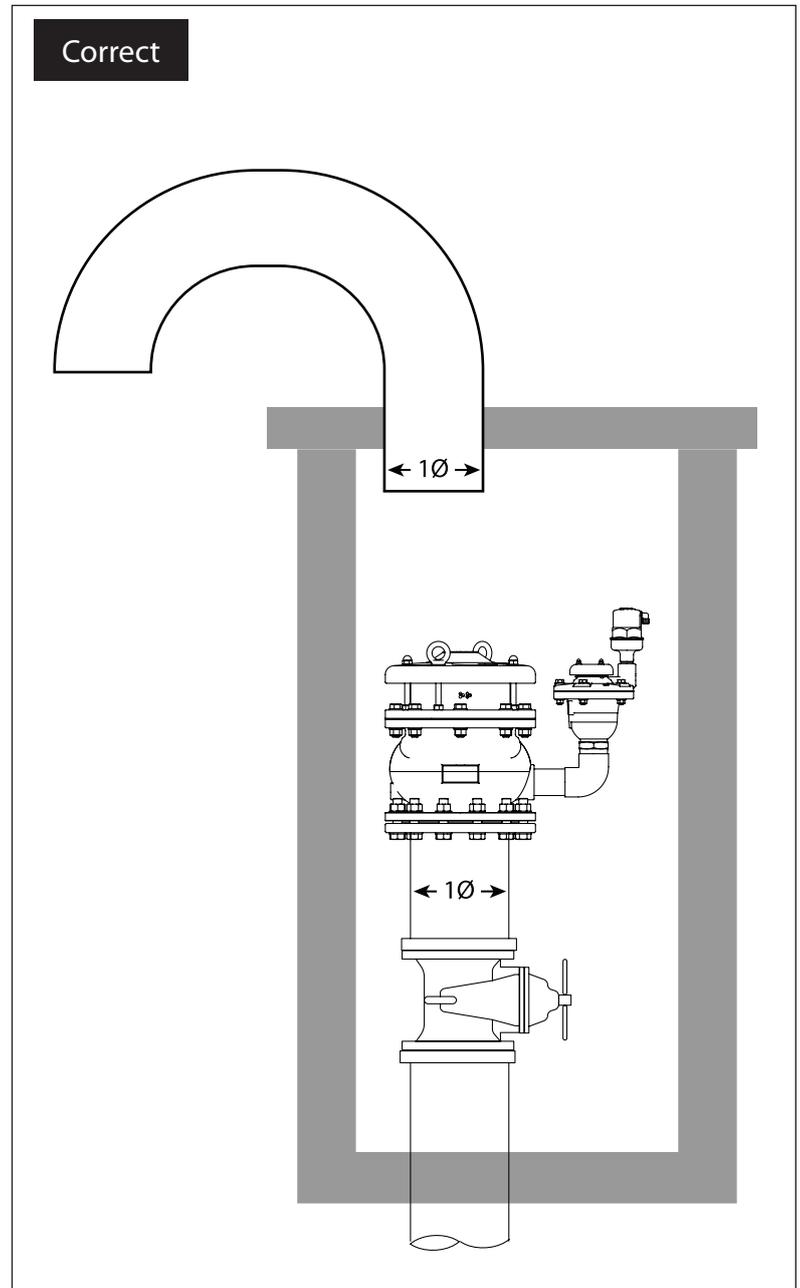
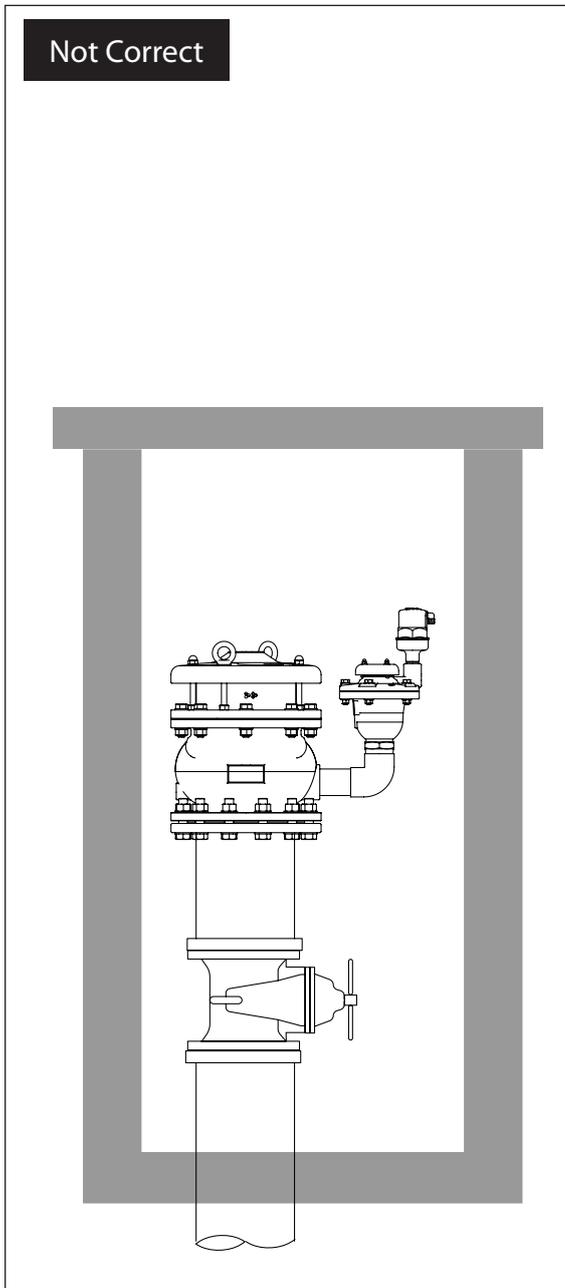
4. The standpipe should connect directly to the air valve and must be of an equal or greater diameter than the air valve.



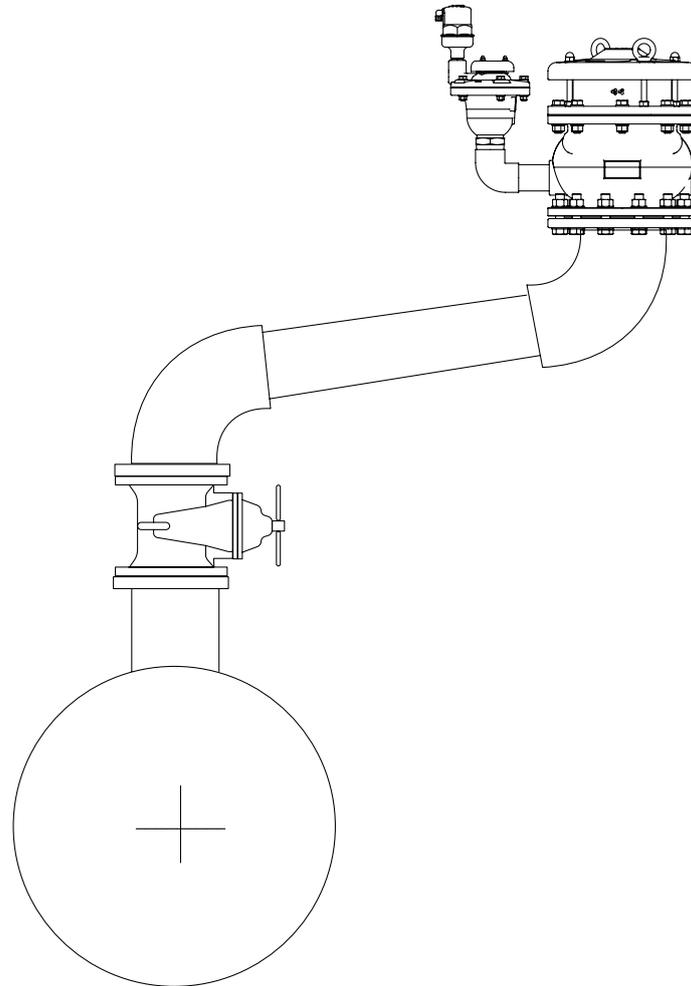
5. An isolation valve must be installed to allow for proper maintenance and should be positioned close to the main pipe.



6. In case of installation in an underground chamber, a vent pipe must be installed with a diameter equal to or greater than the air valve. The vent outlet must have a mesh screen to prevent entry of animals or objects.



7. In installations, such as under a road, where the air valve must be displaced to the side, the connecting pipe after the isolation valve must be on a slight incline. The standpipe at this point can be connected vertically to the air valve.



## 5 Maintenance Manual

Vacuum Breakers require no lubrication.

**MAINTENANCE:** consists of keeping the outlet free from debris on an annual basis.

**INSPECTION:** Periodic inspection for leakage can be performed by inspecting the top of the valve for accumulation of fluid. If leakage is heard, close the isolation valve, follow instructions for disassembly, and inspect the sealing surface for wear or mineral deposits. Clean, or repair as needed.

**NOTE:** The valve does not need to be removed from the pipeline to do maintenance and inspection. Remove only if leak is detected at the flange connection.

### Troubleshooting

Several problems and solutions are presented below to assist you in troubleshooting the valve assembly.

- **Valve Leakage:** Check gaskets and flange bolts for tightness. Disassemble and inspect sealing surfaces for debris or damage. If Disc Seal (17) is damaged, then a new seal should be installed.
- **Valve Does Not Allow Intake of Air:** Verify that seal end drops away from the valve body. Verify that pipeline is at a vacuum condition greater than minus 0.25 psig. Verify that isolation valve is open and there is no line blockage downstream. Verify that the Spring (4) is intact. Disassemble and inspect as necessary.
- All work on the valve should be performed by a skilled mechanic with proper tools.

### Disassembly - Refer to Figure 1.

**WARNING: The pipeline must be drained and the valve relieved of pressure before commencing disassembly.**

1. Completely unscrew and remove all the cover Bolts, Washers and Nuts (13)  
– place them in a secure area.
2. Attach a metal cable through the 2 Lifting Rings and lift the entire Cover Assembly (1-15, 17-18) out from the valve Body (16).
3. Place the Cover Assembly on a clean flat working area.
4. Unscrew the Domed Nuts and Washers (10) and Lifting Rings, lift up and remove the Screen Cover (1) and Screen (12).
5. Measure and write down (for Reassembly) the distance from the top of the Guide Pin (5) to the top part of the upper Nut (2).
6. Unscrew the two Nuts from the threaded end of the Guide Pin. Remove the Spring Lock (3) and Spring (4). Check for wear or cracks on the Spring. Replace the Spring, if necessary.
7. Lift up the remaining Cover Assembly from the Guide Pin(5) and Disc Assembly (7,8 – 17,18) and place it to the side.
8. Place the Disc and connected Guide Pin on its side. Examine the Disc Seal (17) for wear and tear. Heavy mineral deposits should be removed using fine sand paper. For replacing the Disc Seal, continue to Step
9. Unscrew the Disc Bolts (18) and remove the Seal Retainer (7).
10. Replace the Disc Seal, return the Seal Retainer to its place and tighten by screwing the Retainer Bolts into the Disc.

# Reassembly

All parts must be clean before reassembly.

1. Place the remaining Cover Assembly on the Disc Assembly (7,8 – 17,18).
2. Place the Spring Lock (3) on to the Guide Pin (5) and screw on the two Nuts (2) until the distance from the top of the Guide Pin to the upper part of the upper Nut is the same as that measured in Disassembly Step 5.
3. Place the Screen (12) on the Cover (14), attach the Screen Cover (1) and tighten with the Domed Nuts and Washers (10).
4. Lift the Cover Assembly (1-15, 17-18) by running a metal cable through the Lifting Rings and lift it onto the valve Body (16).
5. Tighten the Cover Bolts, Nuts & Washers (13) to the Body using the crossover method with standard flange bolt torques.
6. Recharge the pipeline and check for leaks.

## PARTS LIST AND SPECIFICATION

No	Part	Material
1.	Screen Cover	Ductile Iron ASTM A536 65 45 12
2.	Nut	Stainless Steel SAE 316
3.	Spring Lock	Stainless Steel SAE 316
4.	Spring	Stainless Steel SAE 316
5.	Guide Pin	Stainless Steel SAE 316
6.	Cover Bearing	Bronze
7.	Retainer	Stainless Steel SAE 316
8.	Disc	Ductile Iron ASTM A536 65 45 12
9.	Circlip	Stainless Steel SAE 316
10.	Domed Nut & Washer	Stainless Steel SAE 316
11.	Threaded Rod	Stainless Steel SAE 316
12.	Screen	Stainless Steel SAE 316
13.	Bolt, Nut & Washer	Stainless Steel SAE 316
14.	Cover	Ductile Iron ASTM A536 65 45 12
15.	O-Ring	E.P.D.M
16.	Body	Ductile Iron ASTM A536 65 45 12
17.	Rubber Seal	E.P.D.M
18.	Bolt	Stainless Steel SAE 316

