
GUNN
PRODUCT SERVICES

DIRECT BURY AIR VALVES

AIR PROBLEMS IN WATER/WASTEWATER TRANSMISSION

WHY DO YOU NEED AIR VALVES?

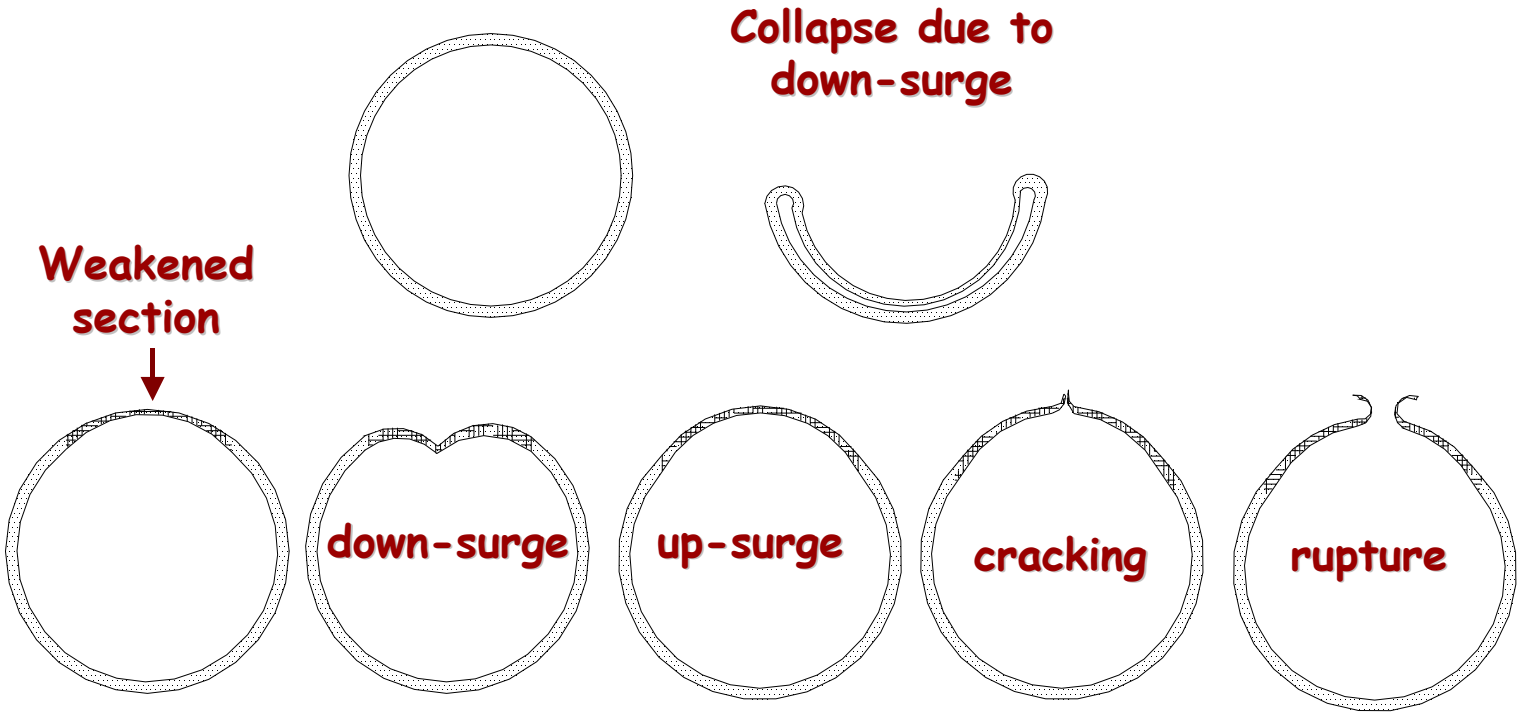
Why do we need controlled intake of air when emptying a pipeline?

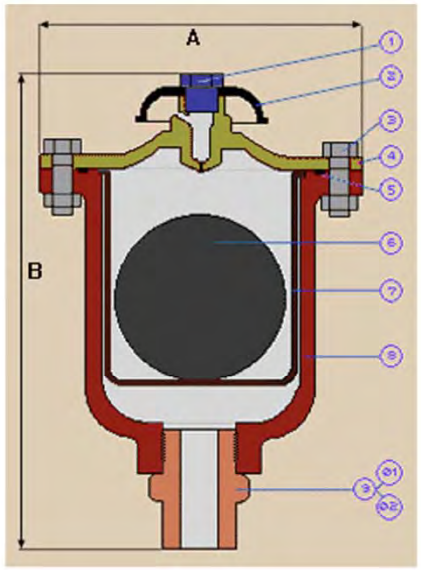
- If air is not admitted into the system during emptying vacuum conditions are created (water column separation).
  - Negative pressure surges as energy is released during changes of state of water.
    - Pipeline flexing occurs which can weaken the wall
    - If grade is significant then the vacuum can collapse the pipeline.
  - Returning water column creates pressure surge or water hammer
    - very large pressures created.

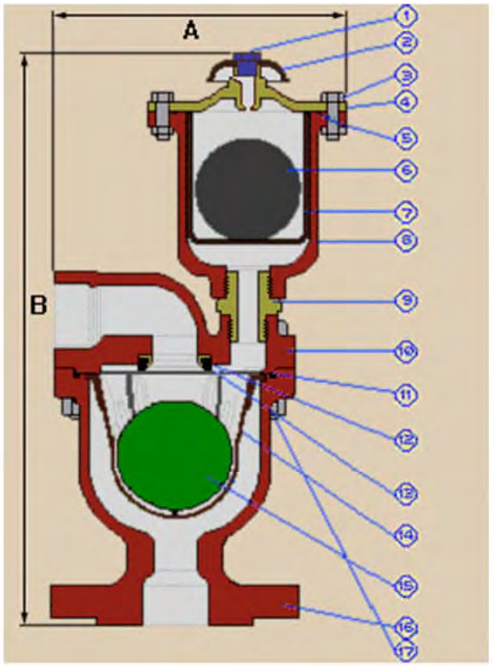
Water Column Separation and Pressure Surges

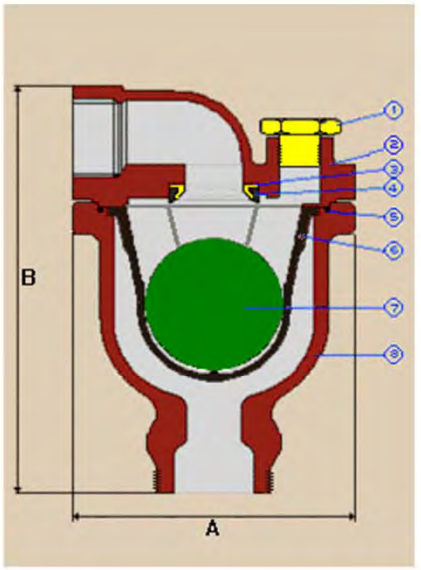
- Pump tripping, sudden in-line valve closing causes water column separation.
  - Sometimes water column separation is caused by more usage than available flow.
  - Vapour cavity develops behind fluid flow and causes down-surge pressure slam
  - When fluid flow bounces back off fitting an upsurge results in additional pressure hit

SURGES DUE TO WATER COLUMN SEPARATION

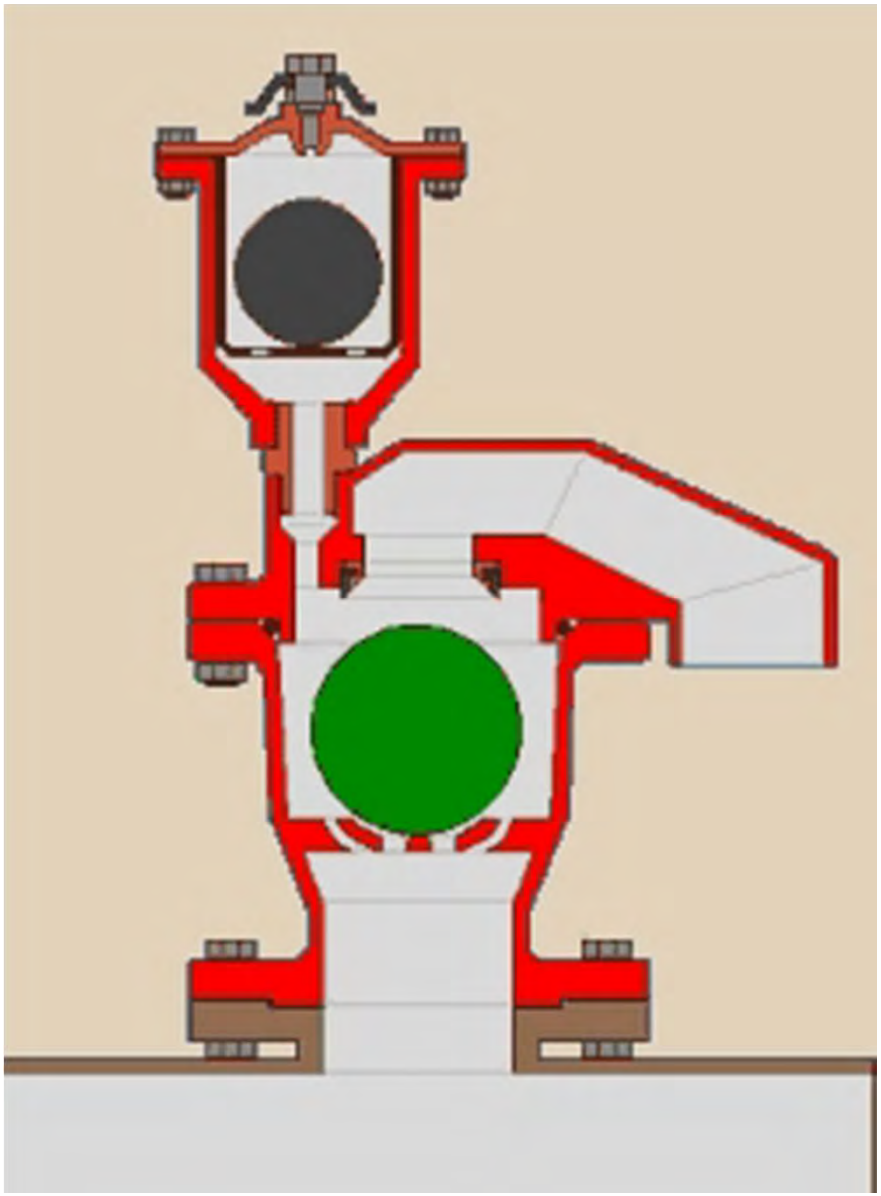


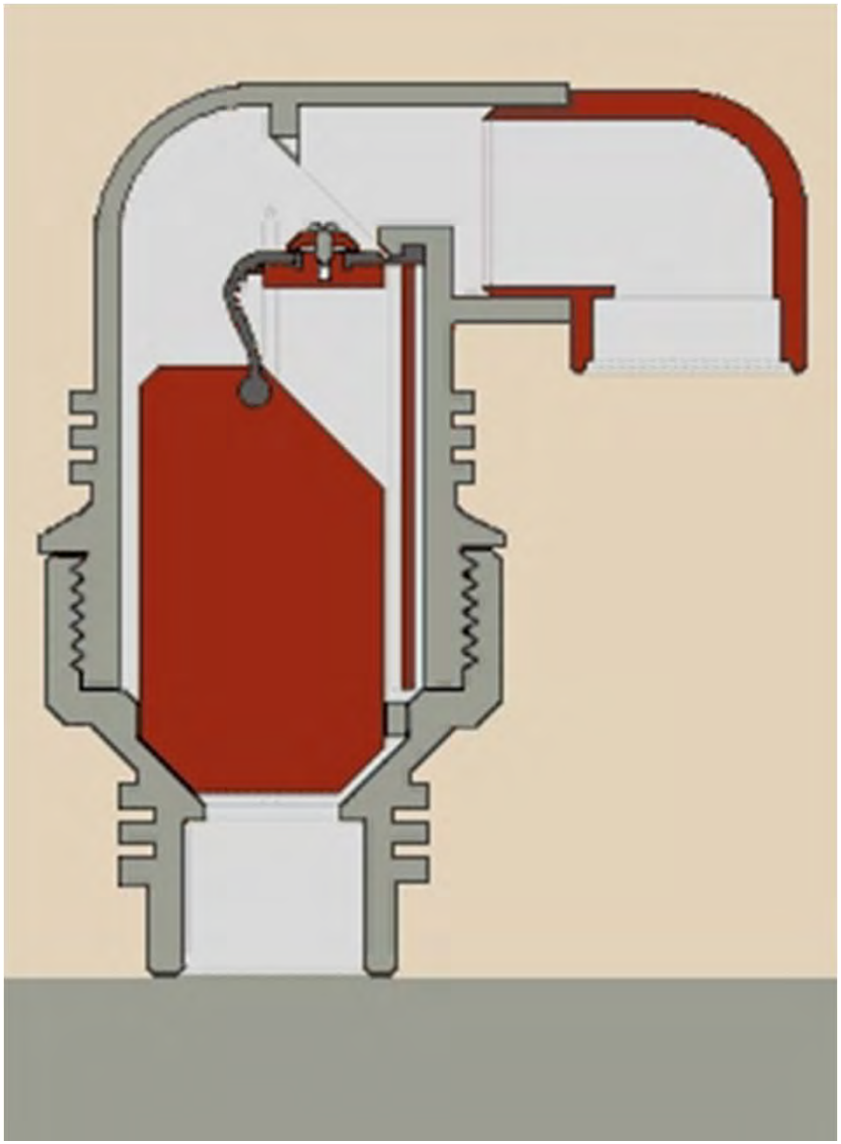


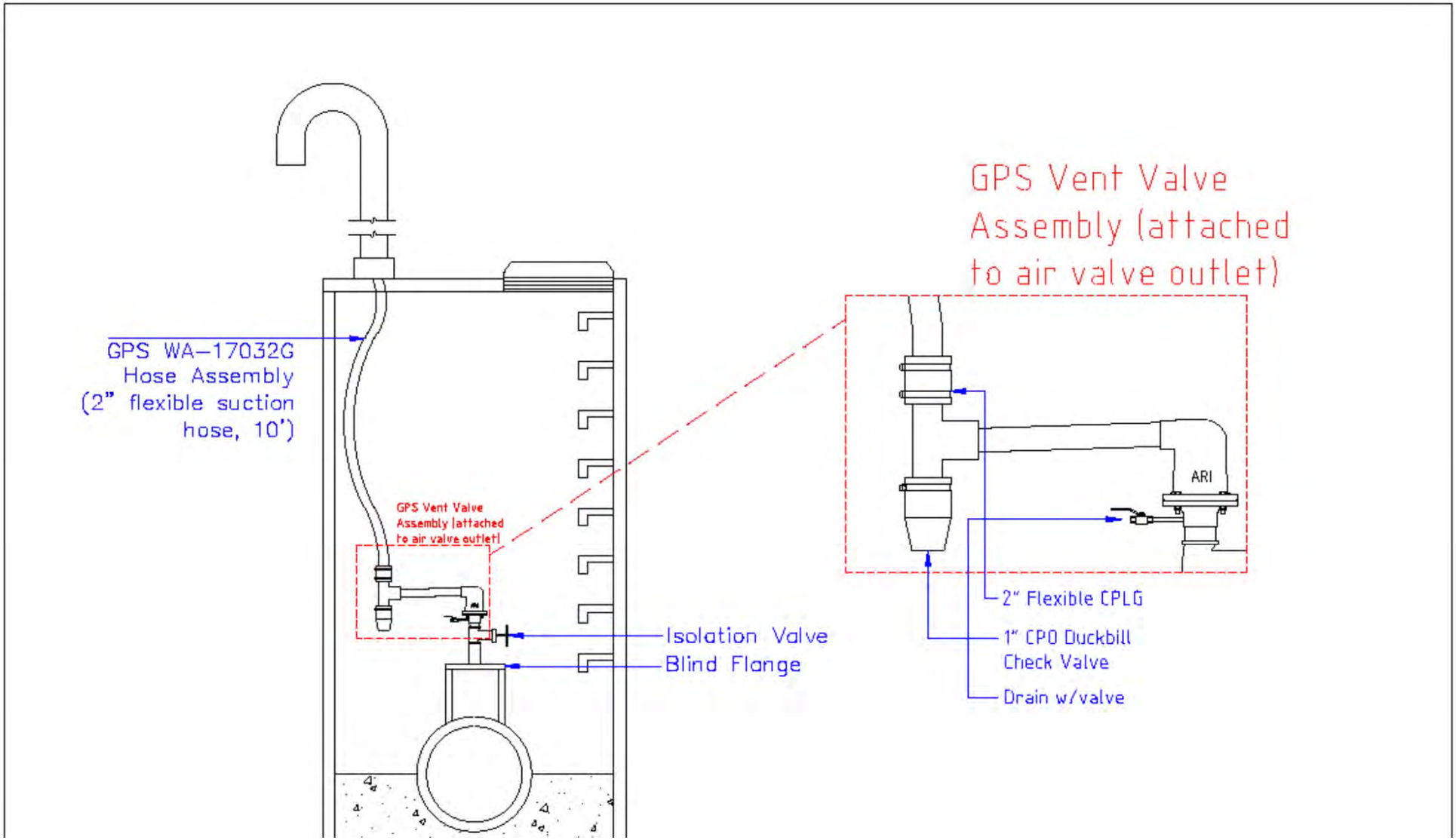




3 Types of Air Valves

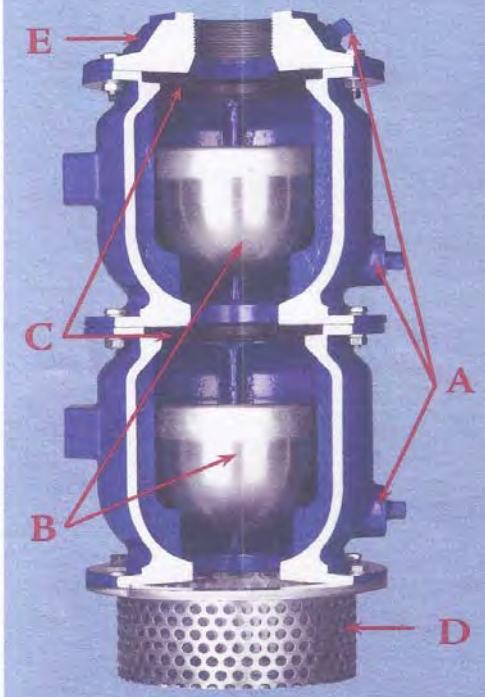





GPS WA–17032G
Hose Assembly
(2" flexible suction
hose, 10')
GPS Vent Valve
Assembly (attached
to air valve outlet)
Isolation Valve
Blind Flange
GPS Vent Valve
Assembly (attached
to air valve outlet)
ARI
2" Flexible CPLG
1" CPO Duckbill
Check Valve
Drain w/valve

VAL-MATIC®

FLOOD SAFE



Dual Chambers for Added Protection
Chambers constructed of Ductile Iron and coated with Fusion Bonded Epoxy on interior and exterior.

Lower Chamber
The lower chamber, or primary chamber, prevents contaminated water from continuing past its resilient seat.

Upper Redundant Chamber
The upper chamber is redundant and provides protection against failure of the lower chamber's ability to seal and stop the flow of contaminated water into the air valve or vent outlet.

A. Test Ports
Provides for independent testing of both chambers.

B. Float Checks
All type 316 Stainless Steel for long, trouble free life. Sized to assure rapid closure upon the entry of fluid into the chamber.

C. Resilient Seats
Patented resilient seats are specially designed and formulated by leading rubber chemists to assure drop tight closure at low pressures.

D. Basket Screen
Heavy duty type 304 Stainless Steel screen with flow area 4 times that of the FloodSafe® inlet. Assures full flow of air/vacuum valve while preventing debris from entering. Bayonet mounted for easy removal and inspection.

E. Cover
Coated with NSF 61 Approved Fusion Bonded Epoxy on interior and exterior. Cover port sized to allow for full venting capacity of air valve or vent.

Materials of Construction		
Component		*Material*
Upper & Lower Chambers, Cover		Ductile Iron, ASTM A536 Grade 65-45-12
Upper & Lower Check Floats		Type 316 Stainless Steel
Check Seat		Resilient
Basket Screen		Type 304 Stainless Steel
Coatings	Interior	NSF 61 Approved Fusion Bonded Epoxy
	Exterior	NSF 61 Approved Fusion Bonded Epoxy

Cross Contamination Control:

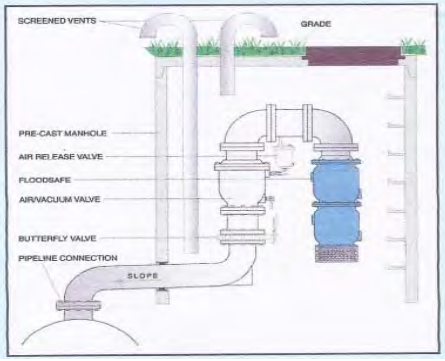
First Backflow Prevention - Now INFLOW Prevention....

Water security is moving beyond gates and locks! Inflow prevention is designed to protect your drinking water just as backflow prevention has done for years. Backflow prevention protects your pipeline from contaminated water becoming drawn in and mixing with potable water due to pressure changes. Inflow prevention protects your drinking water by preventing contaminated water from entering the line through devices such as vault installed air valves and reservoir vents.

Preventing contaminated water from entering potable water systems through air valves and vents has long been a concern. It can happen as a result of floodwater or from more disturbing reasons such as terrorism. Now, through Inflow Prevention, these access points can be protected just as backflow prevention has protected water systems in the past.

A Solution that Delivers

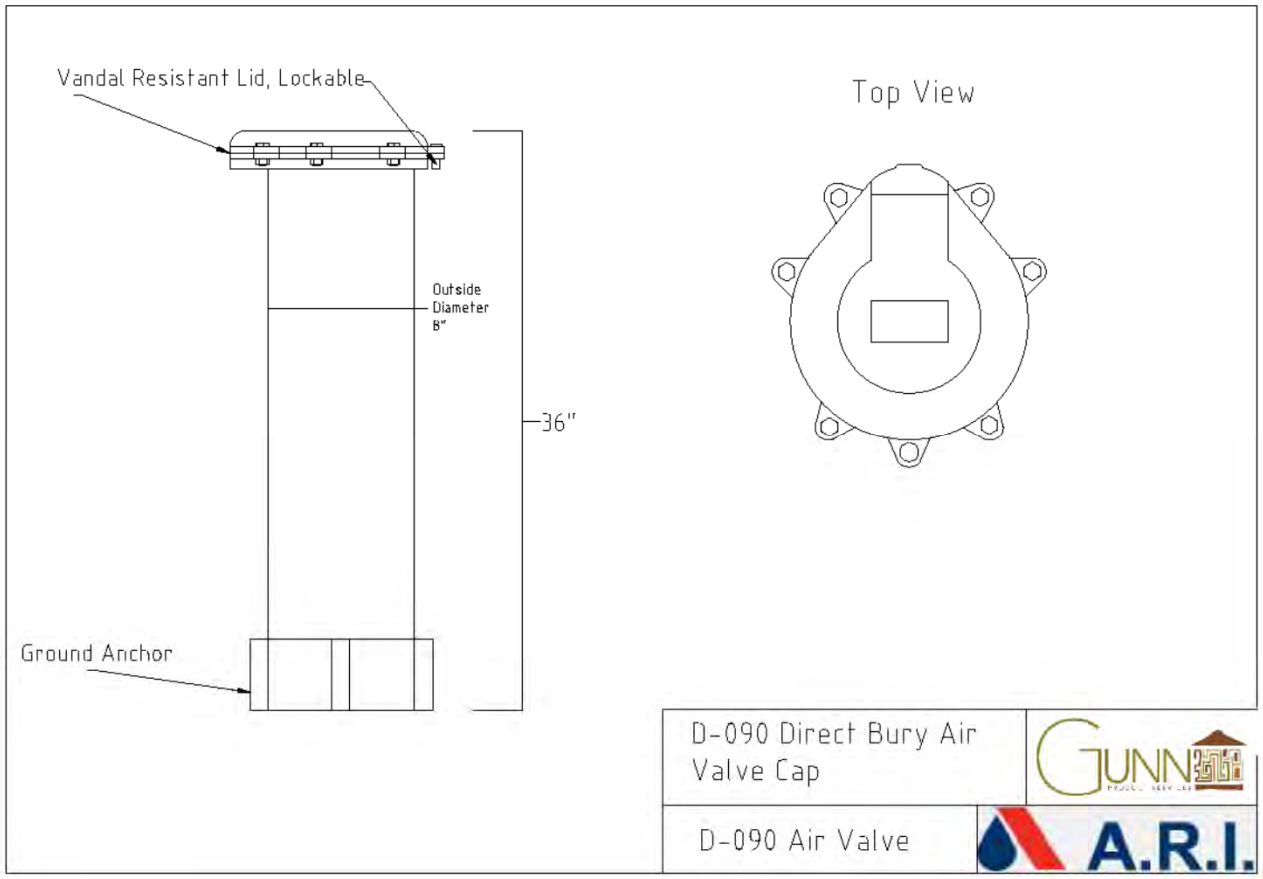
The FloodSafe® inflow preventer is a revolutionary patented system that provides unrivaled vault protection from contaminants. By preventing water from passing through the FloodSafe®, contaminated floodwater or water that has been compromised by intentional tampering are prevented from entering the air valve outlet and are subsequently unable to enter the system. While preventing the system from becoming compromised, the FloodSafe® still allows the air valve or vent to exhaust and admit air to the system. The FloodSafe® is equipped with built in redundancy to give you peace of mind. In the event of failure by the first float check, a second float check prevents contaminated water from reaching the pipeline. Like backflow preventers, the FloodSafe® is a durable, reliable, and critical solution to the integrity of every water system in service today and those being developed for the future. The FloodSafe® is field testable allowing both chambers to be independently tested.



How it Works

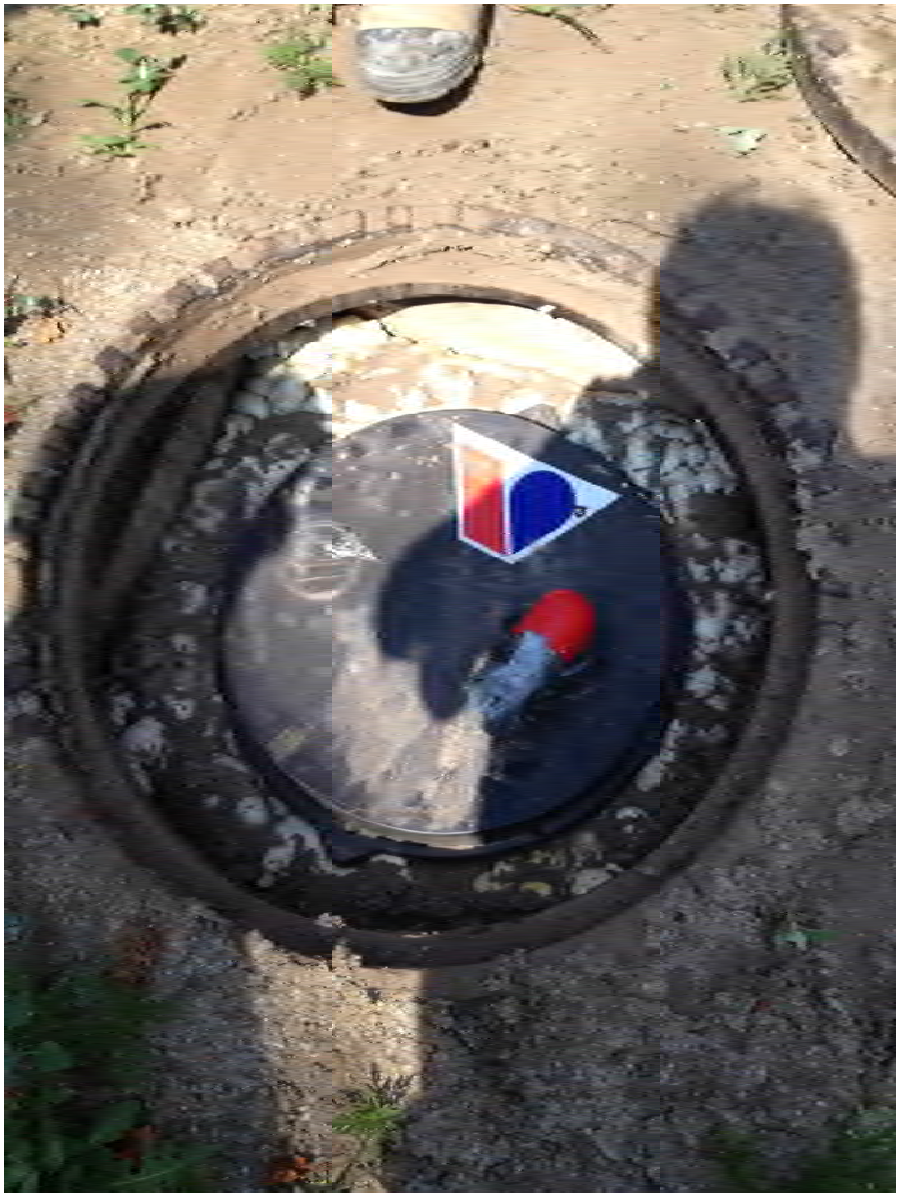
The FloodSafe is piped to the outlet of an air release valve, air/vacuum valve of vent. As water in a flooded area or vault rises, the float check in the lower chamber rises preventing contaminated water from continuing past the chamber. The redundant upper chamber provides a backup in much the same way a backflow preventer works. If contaminated water continues past the seat of the lower chamber, the float check in the upper chamber rises preventing fluid from reaching the air valve outlet. FloodSafe provides greater flow area than an equivalent sized air valve resulting in minimal flow restriction. Consult factory for venting capacities.

Patent No. 5,613,513



D-090 Direct Bury Air Valve Cap

D-090 Air Valve



Inspection and Operational Check

- Now seeing municipalities inspecting their air valves (and chambers) once per year for water service.
- Require much more frequent inspection and cleaning for wastewater valves.

City of Brantford

Procedure for Inspecting Air Valves

City of Brantford (Continued)

- Using the drain valve, open and flush the air release chamber of any stagnant water or debris that may be present.
- Close the isolation valve and check that you have a complete shutdown…..
- After the air/vac chamber has been completely drained, close the drain valve and slowly open the isolation valve.

City of Brantford (Continued)

- The air should freely discharge discharge from the top of the air release assembly and stop when all the air has been exhausted.
- Check to ensure there is no water continuing to drip from the discharge pipe”.

City of Brantford (Continued)

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Traditional Sewage Air Valve