

VAL-MATIC®

Air Valves

**Pacific Northwest
Annual Section Conference**

VAL-MATIC®

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Air Valves

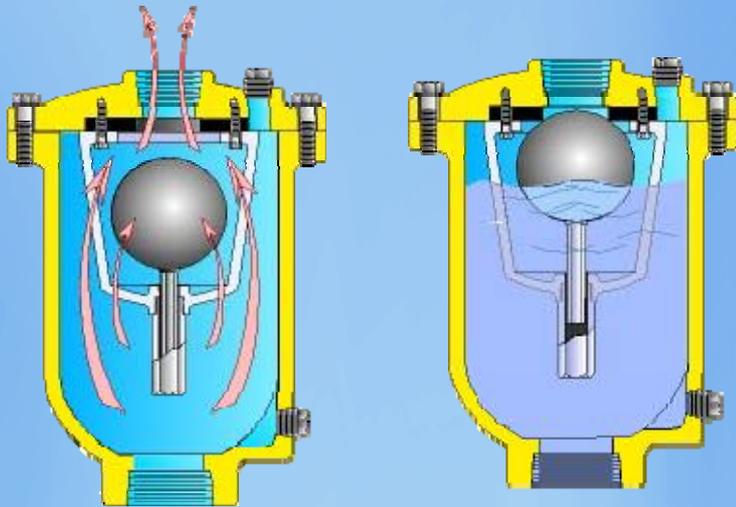
Types of Air Valves

- ARV - Air Release Valves**
- AVV - Air/Vacuum Valves**
- CAV - Combination Air Valves**

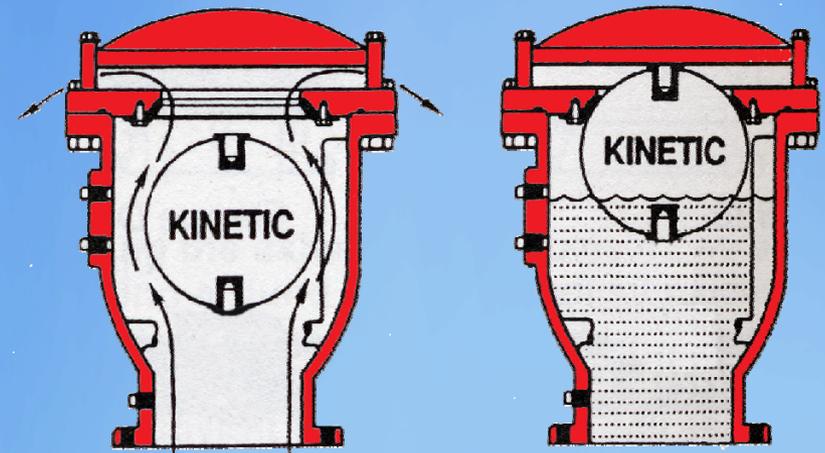
Air Valves

Conventional vs. Kinetic

Conventional



Kinetic



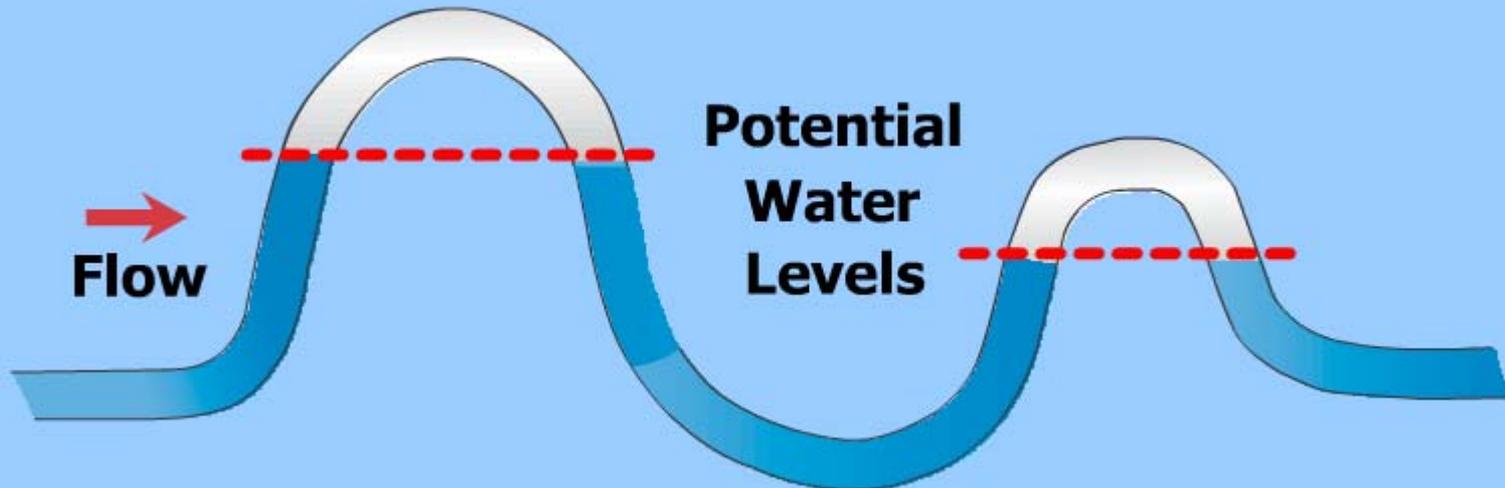
Air Valves

Why Air Valves

Initial Line Filling

Pump Start Up

Large Amounts of
Air Exhaust



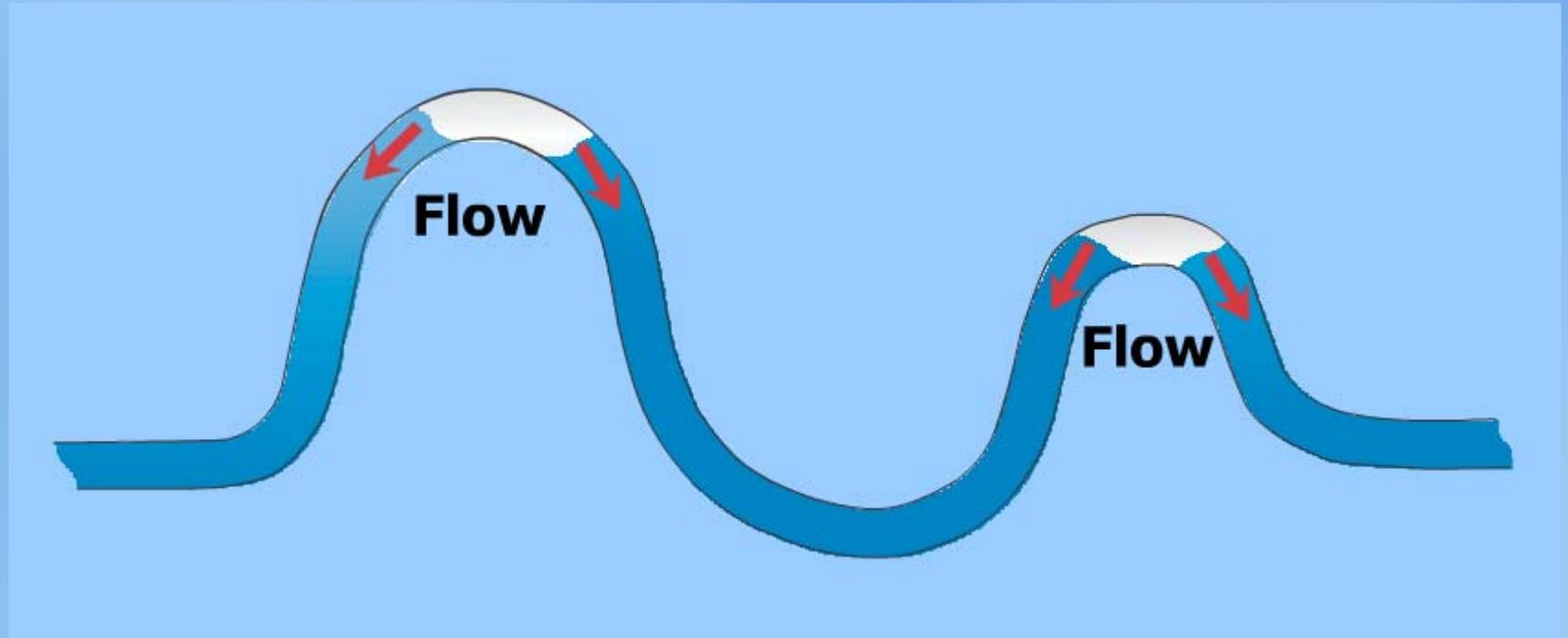
Air Valves

Why Air Valves

Pump Stop



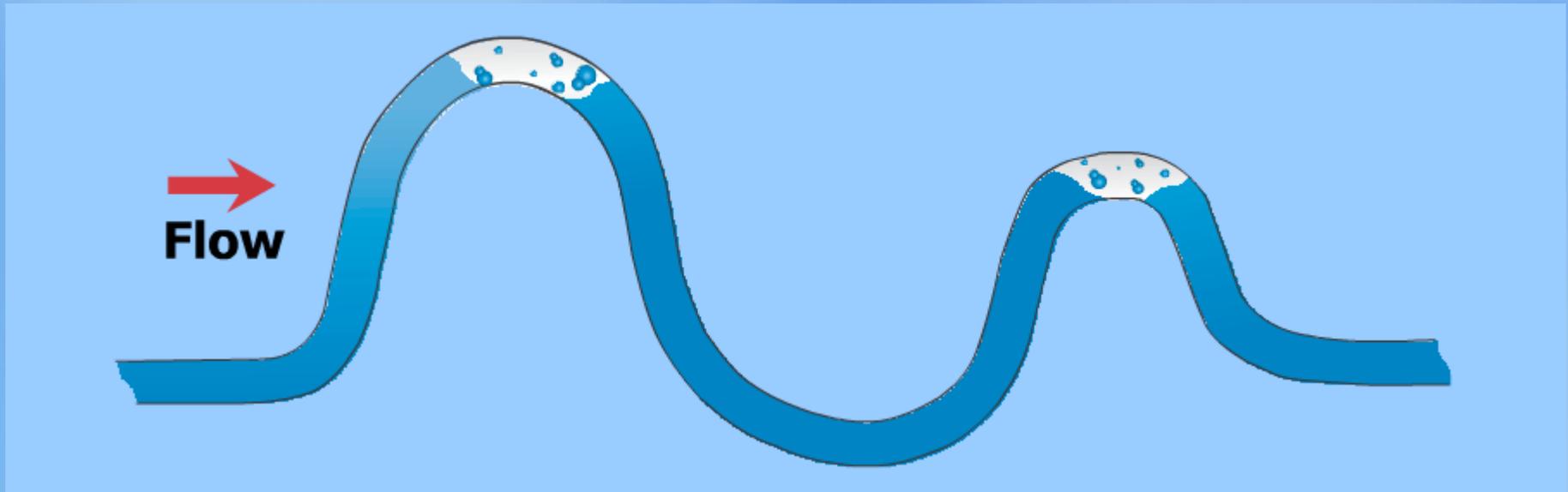
Large Amounts of Air
Intake Vacuum Protection



Air Valves

Why Air Valves

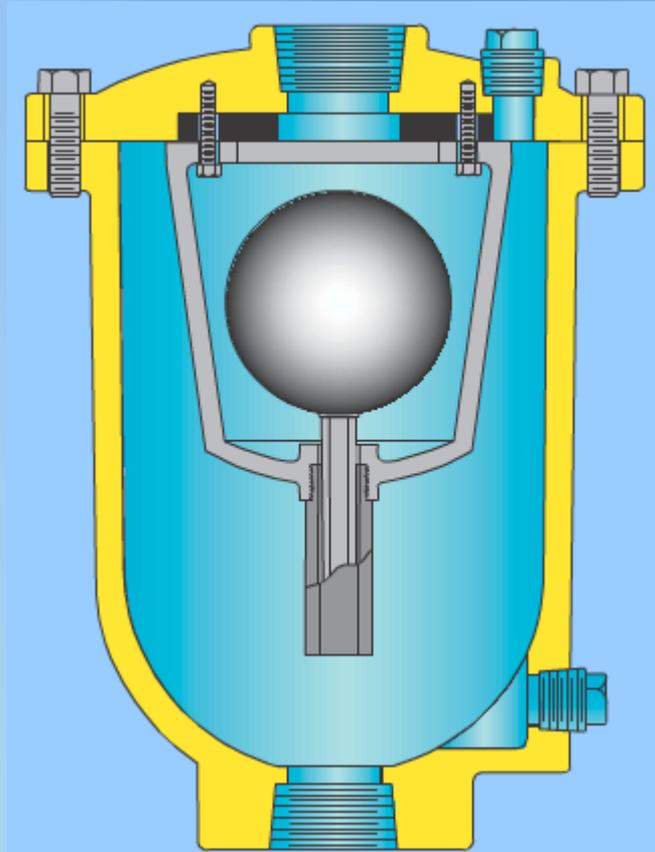
Pumping → Small Amounts of Entrained Air at High Points



Air Valves

Air Valve Types

1. Definition: Air / Vacuum Valve



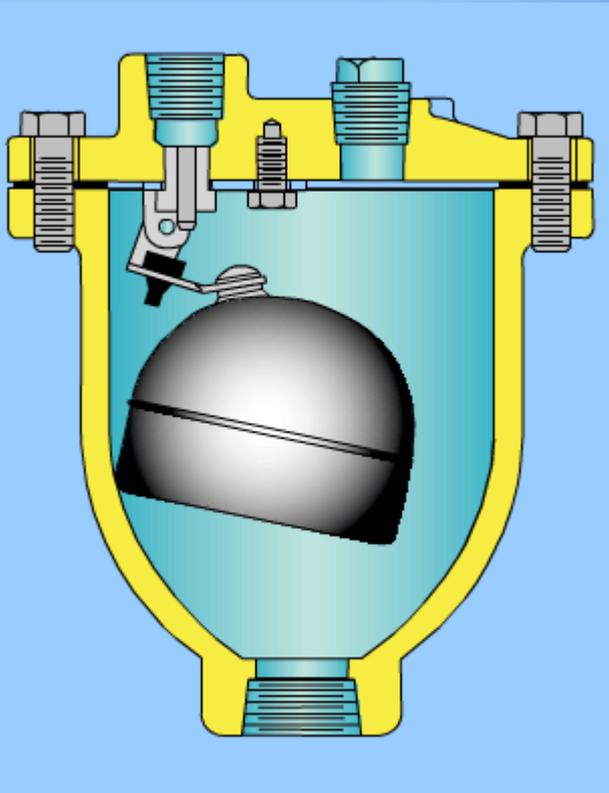
Threaded Inlet

Air Valves

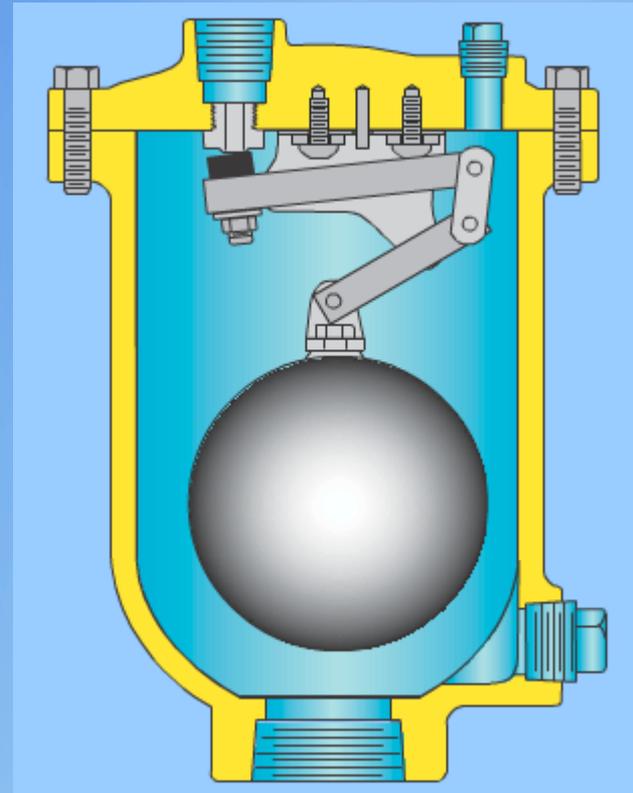
Air Valve Types

2. Definition: Air Release

Simple Lever Type



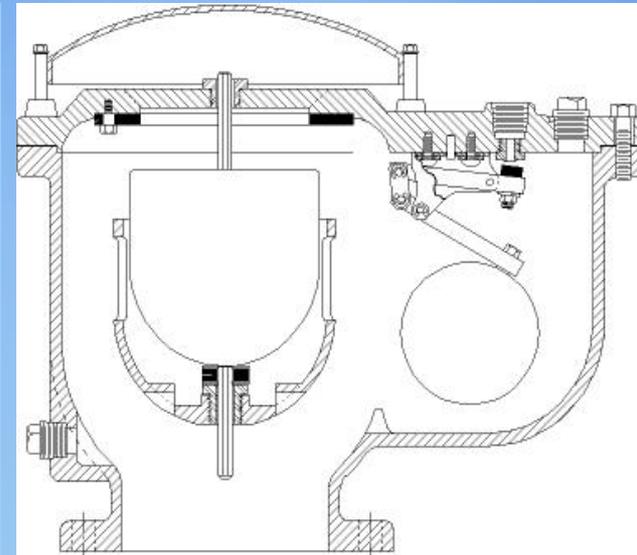
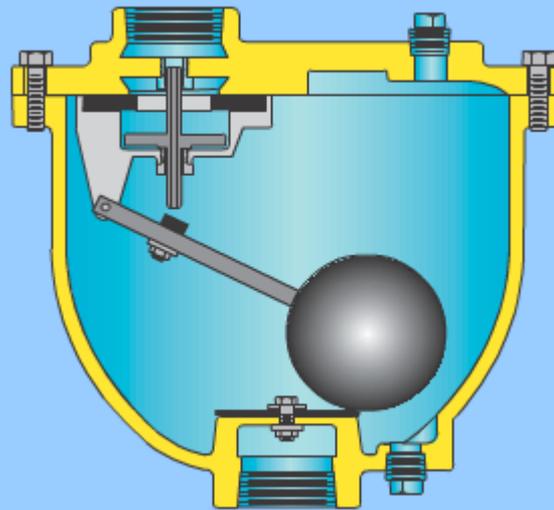
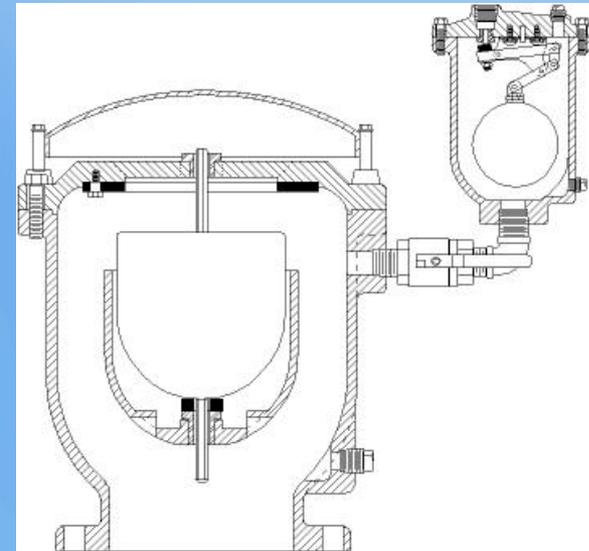
Compound Lever Type



Air Valves

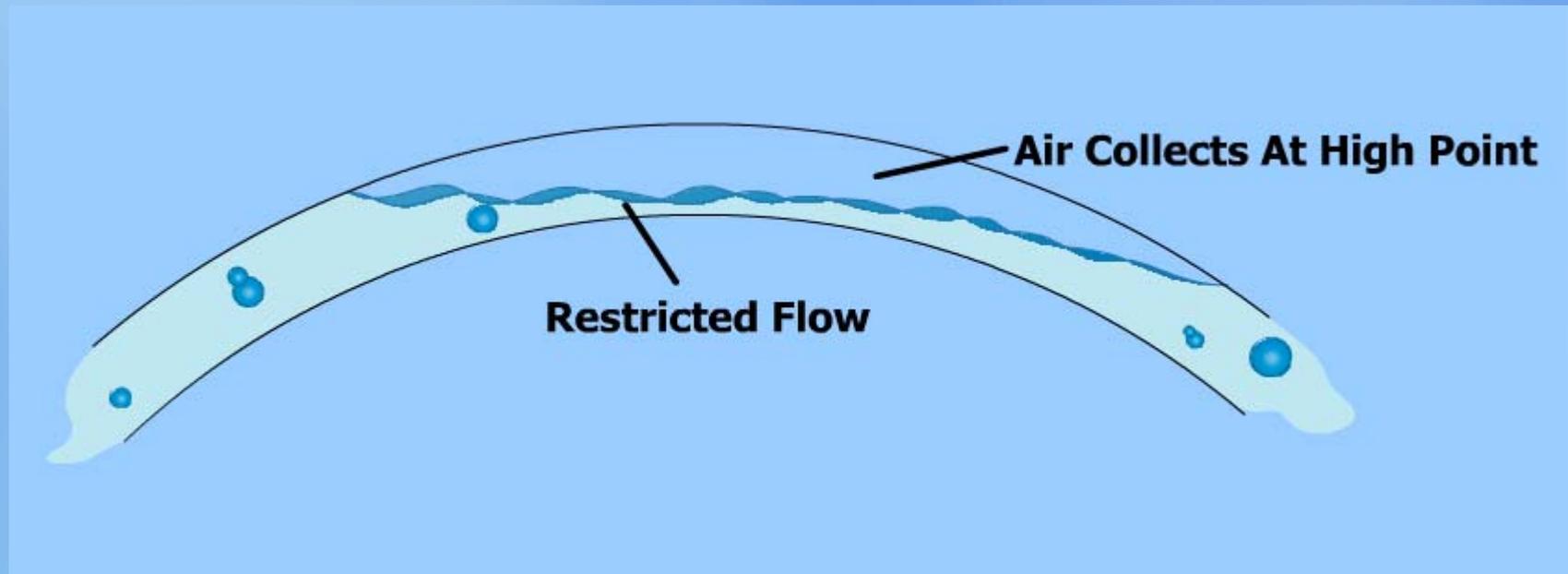
Air Valve Types

3. Definition: Combination Air Valves



Air Valves

Typical Flowing Pipeline Highpoint, Without Air Valve



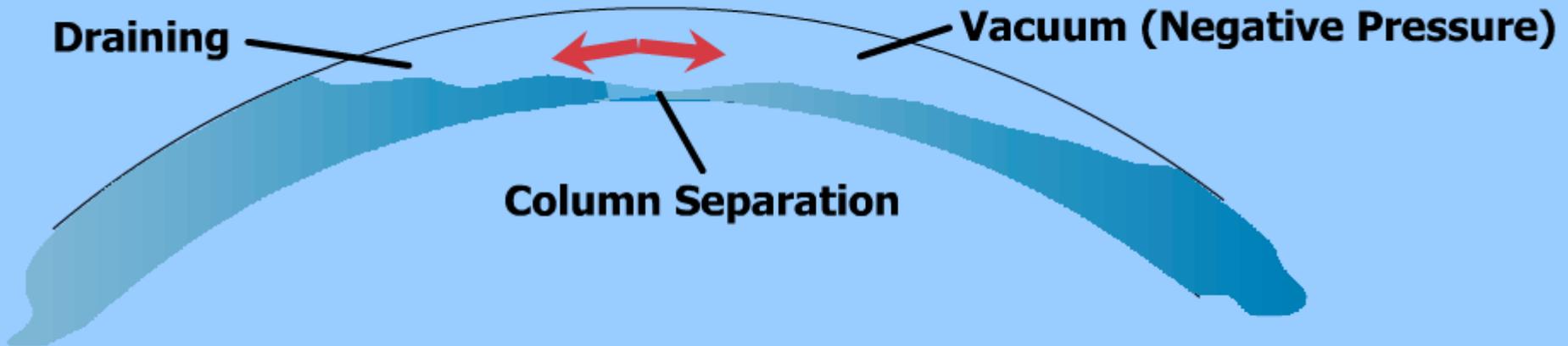
When the large air mass is forced downstream to the next high point, the restriction will cause a velocity change.

This change in velocity may cause a pipeline surge.

Air Valves

Column Separation, Typical Pipeline Highpoint

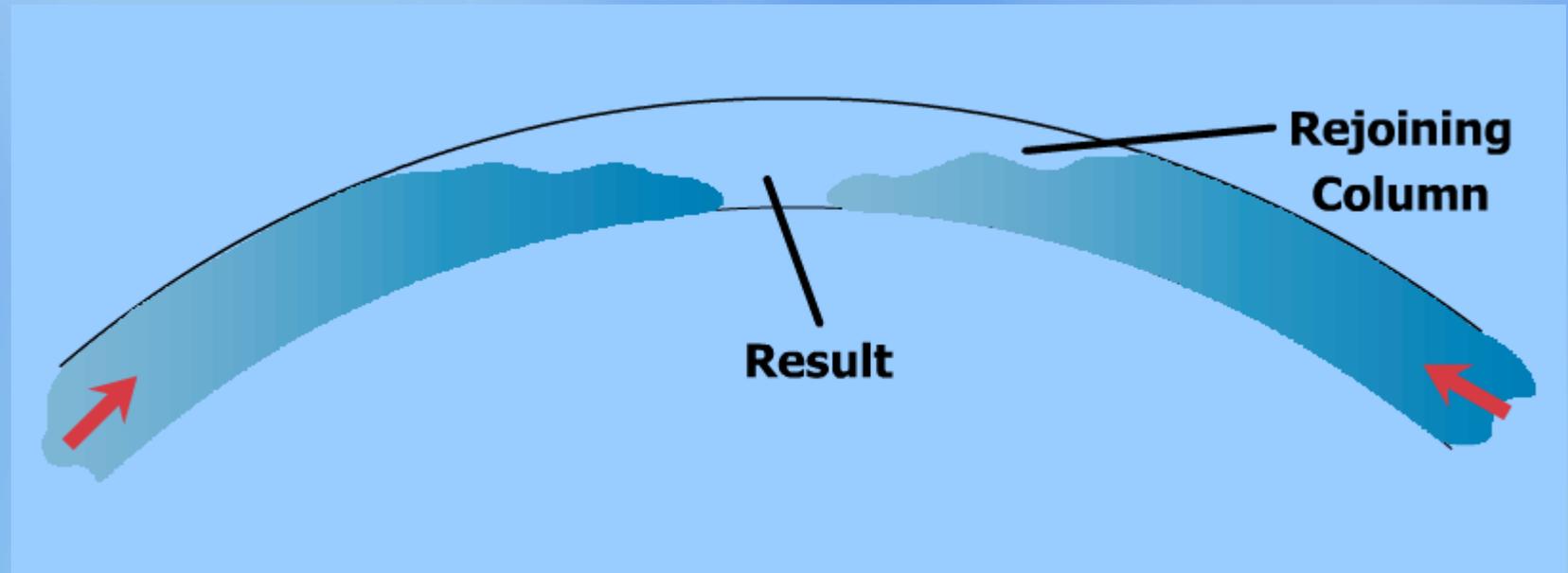
1. System Shuts Down (Power Failure, Pump Failure, etc.)
2. As Water Drains, A Vacuum Forms at High Point.



Air Valves

Column Separation, Typical Pipeline Highpoint

3. The Two Columns Are Drawn Together By Vacuum...



As columns rejoin, surge may take place causing system damage.

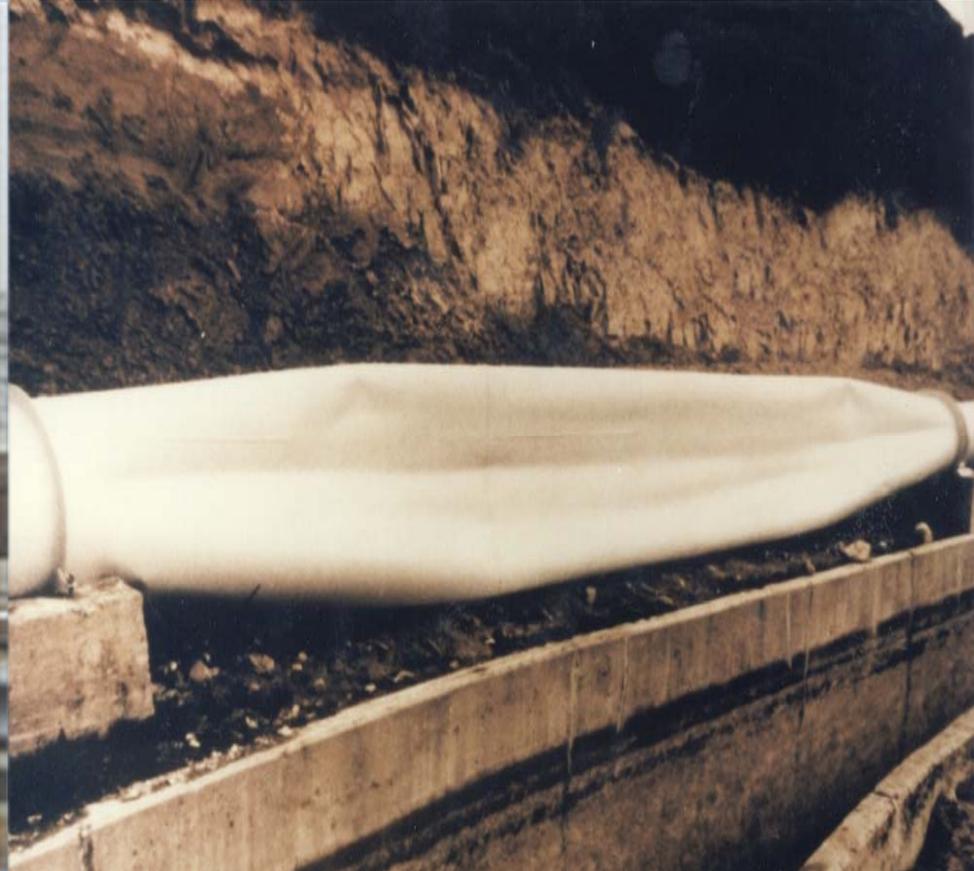
Air Valves

Folsom Lake, Sacramento, CA

300 feet of a 42" water pipeline collapsed on itself as a vacuum was created when it was dewatered.

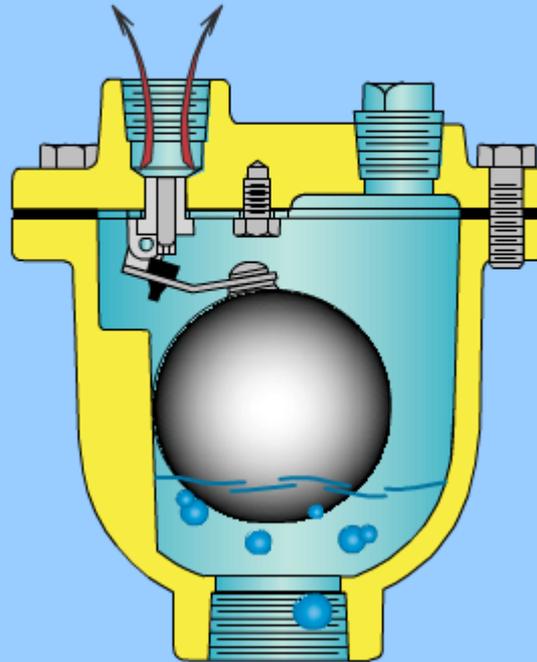


Air Valves



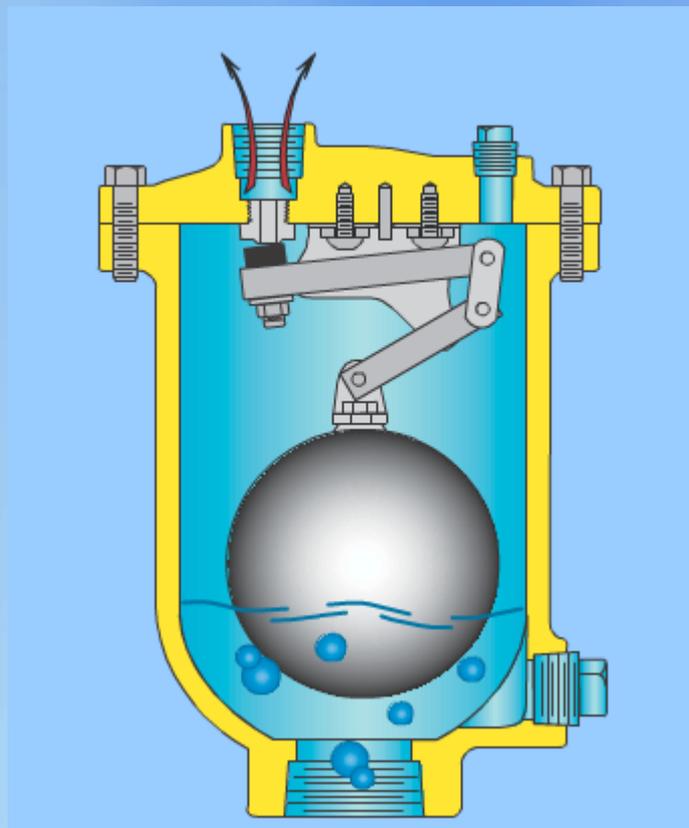
Air Valves

Simple Lever Air Release Valve



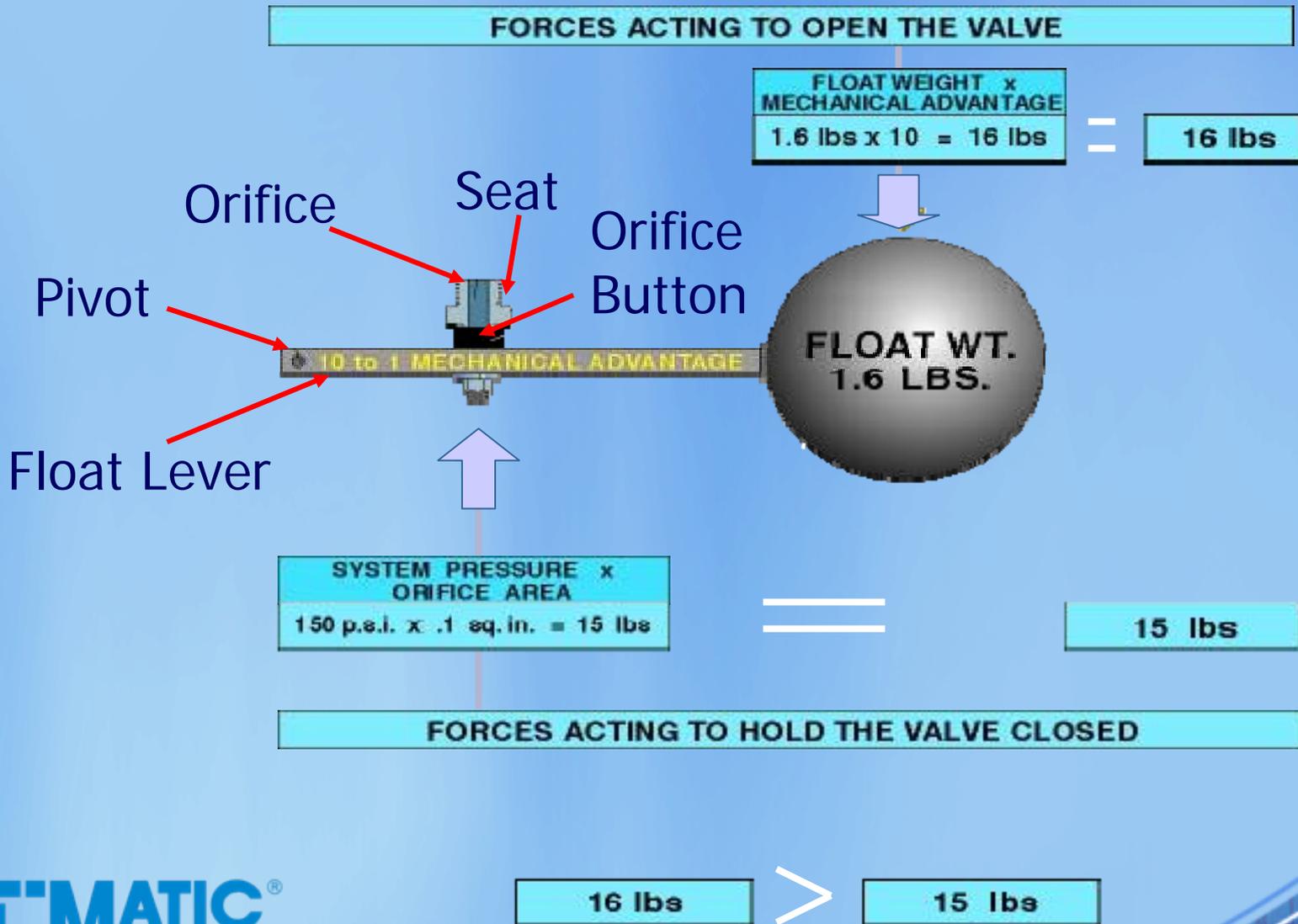
Air Valves

Compound Lever Air Release Valve



Air Valves

Why An Air Release Valve Opens During System Operation



Air Valves

Operation of Air / Vacuum Valves

Open:

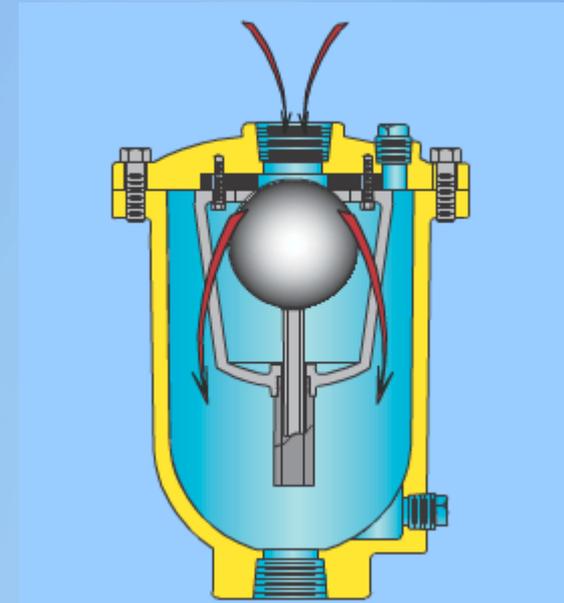
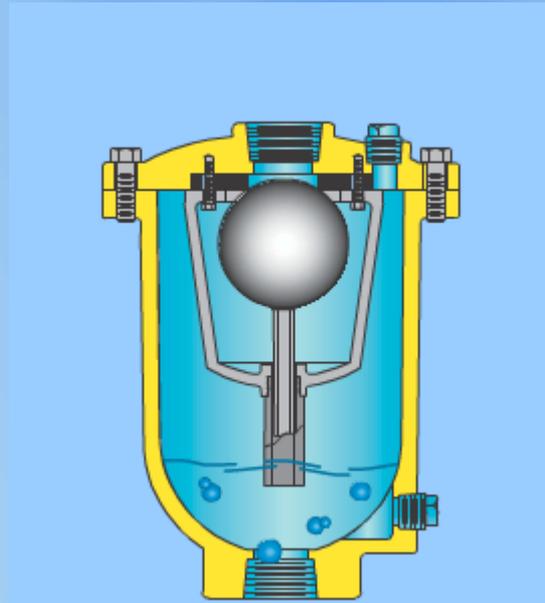
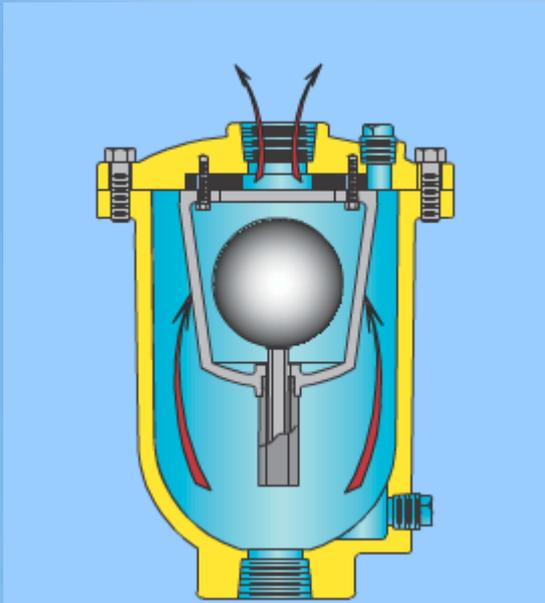
Air exhausted during pipeline fill

Closed:

Pipeline under pressure

Open:

Air enters during pipeline draining

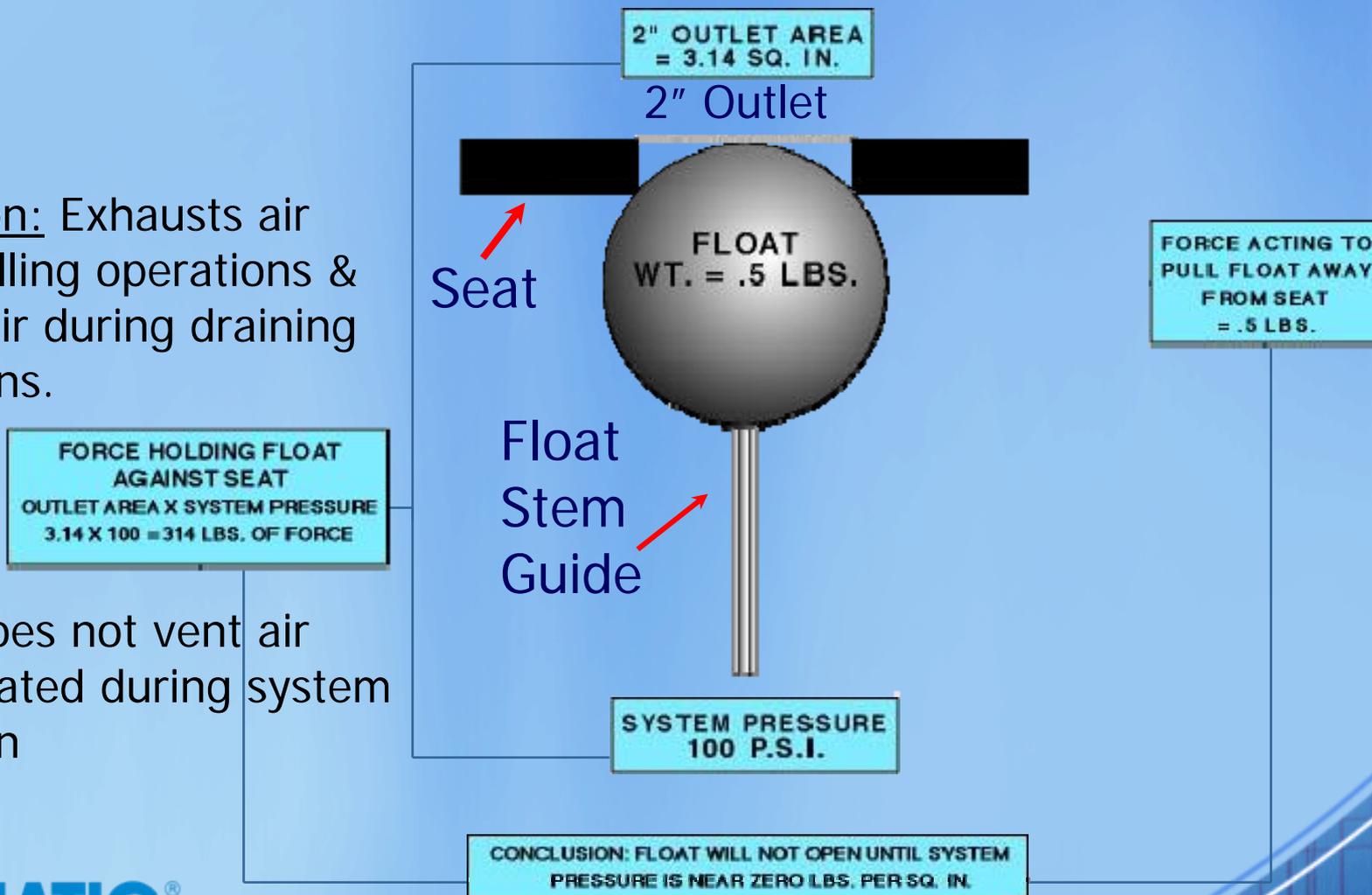


Air Valves

Why An Air / Vacuum Valve Stays Closed Under Pressure

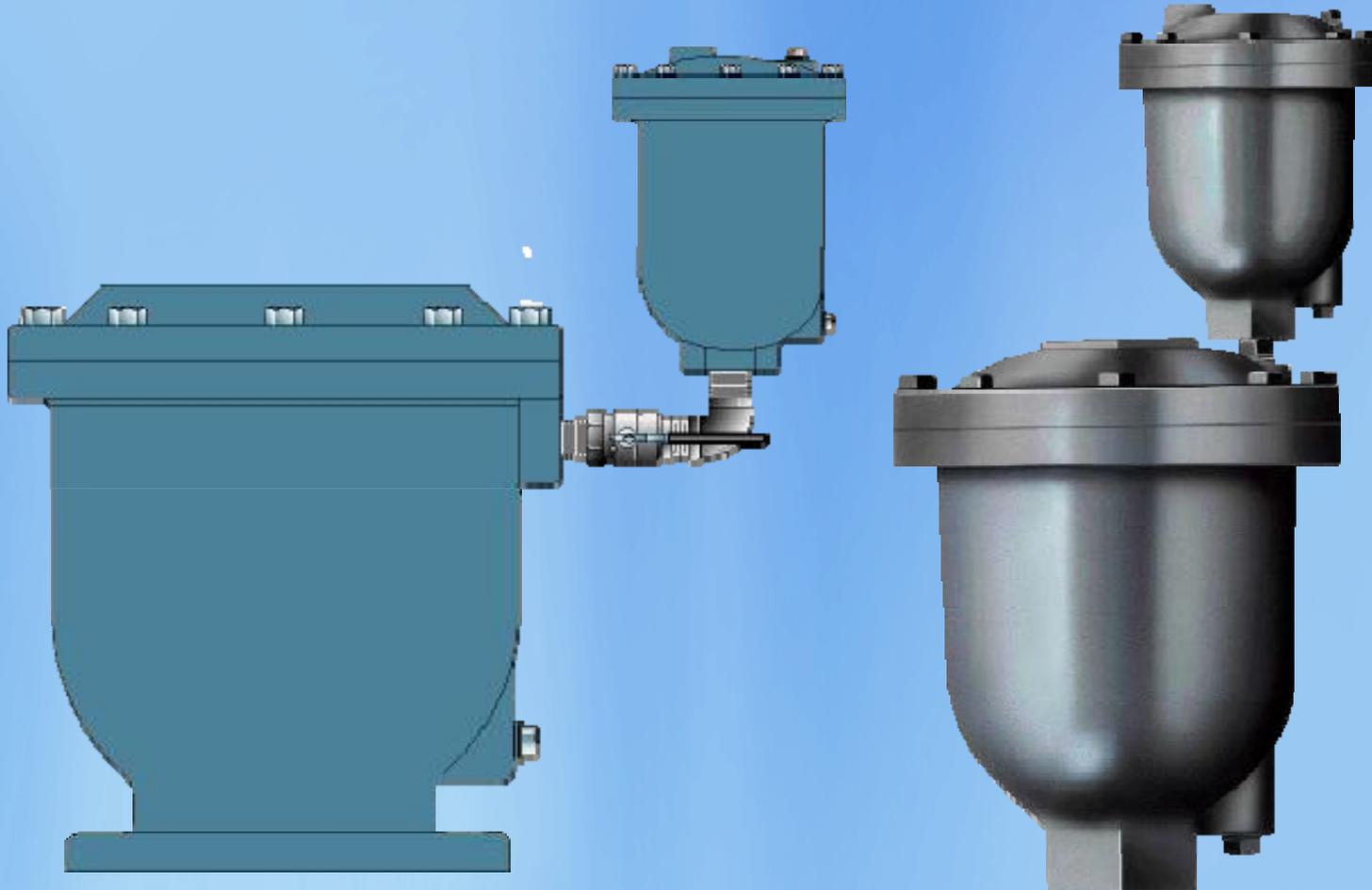
Operation: Exhausts air during filling operations & admits air during draining operations.

Note: Does not vent air accumulated during system operation



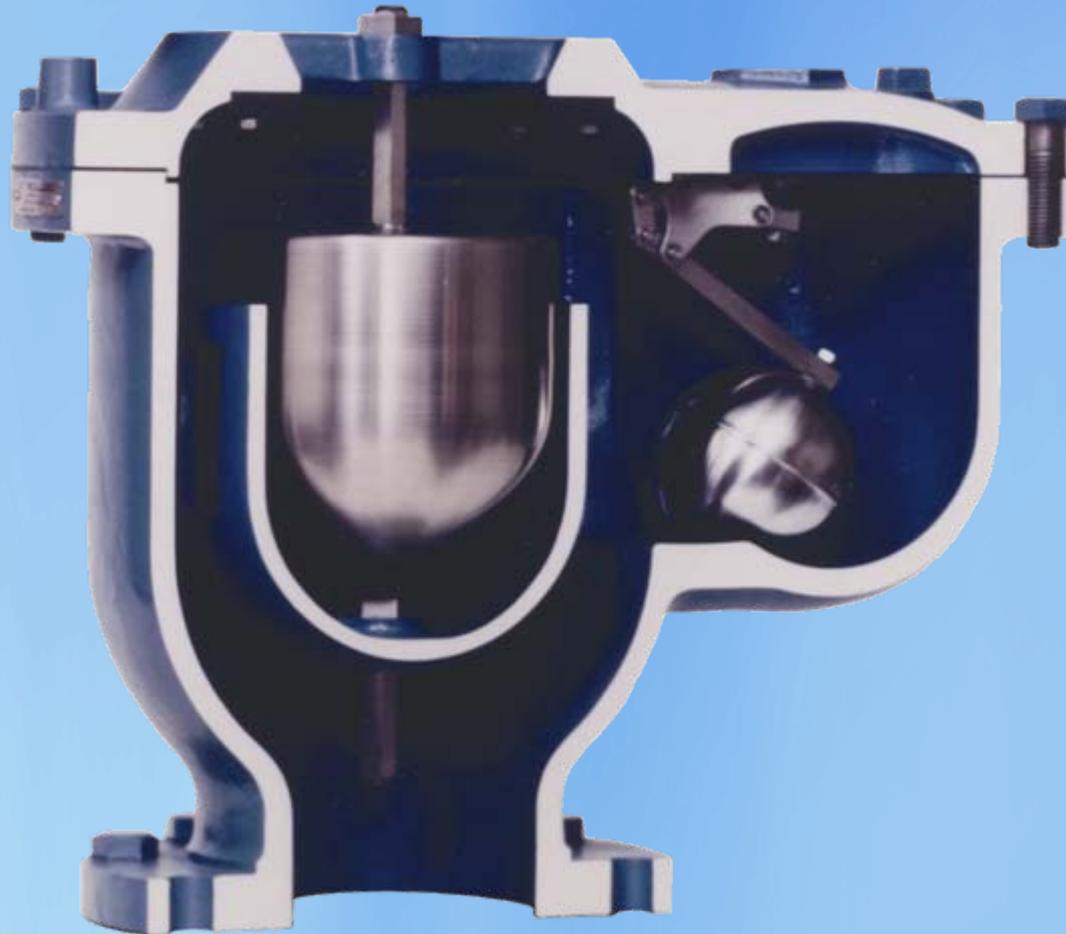
Air Valves

Combination Air Valves



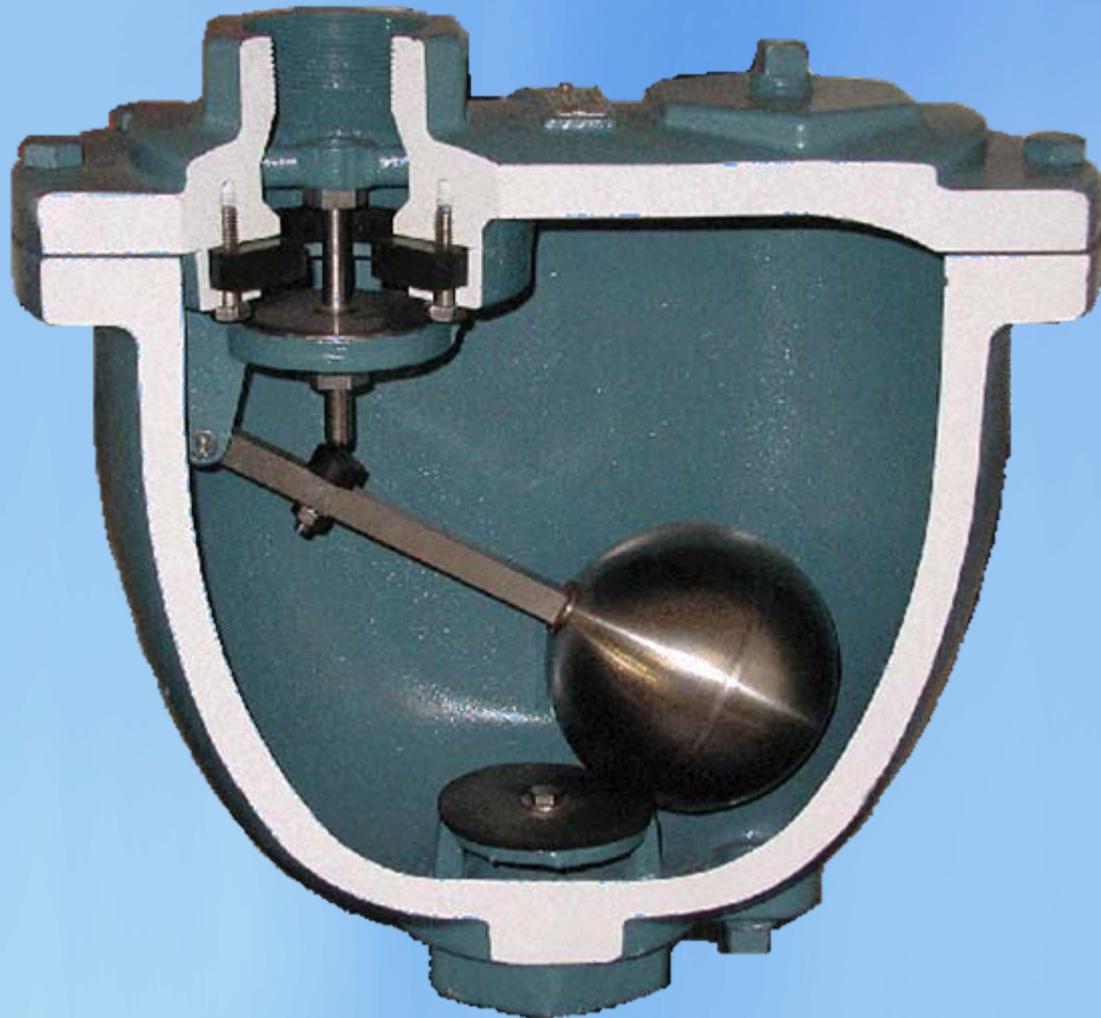
Air Valves

Single Body, Dual Float Combination Air Valve



Air Valves

Combination Air Valve

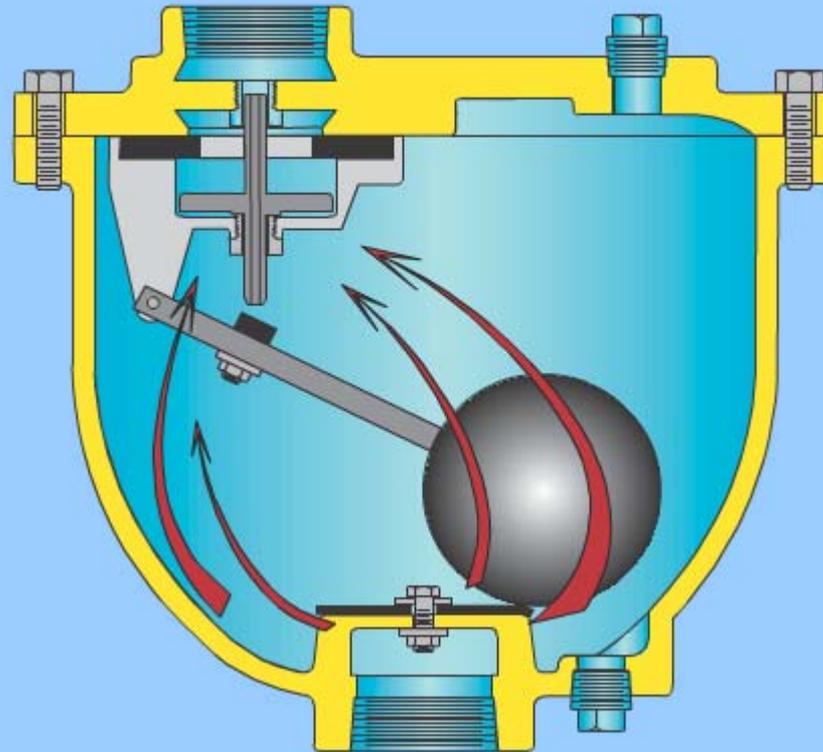


Air Valves

Operation Of Combination Air Valves

Open:
Air exhausted
during pipeline
fill

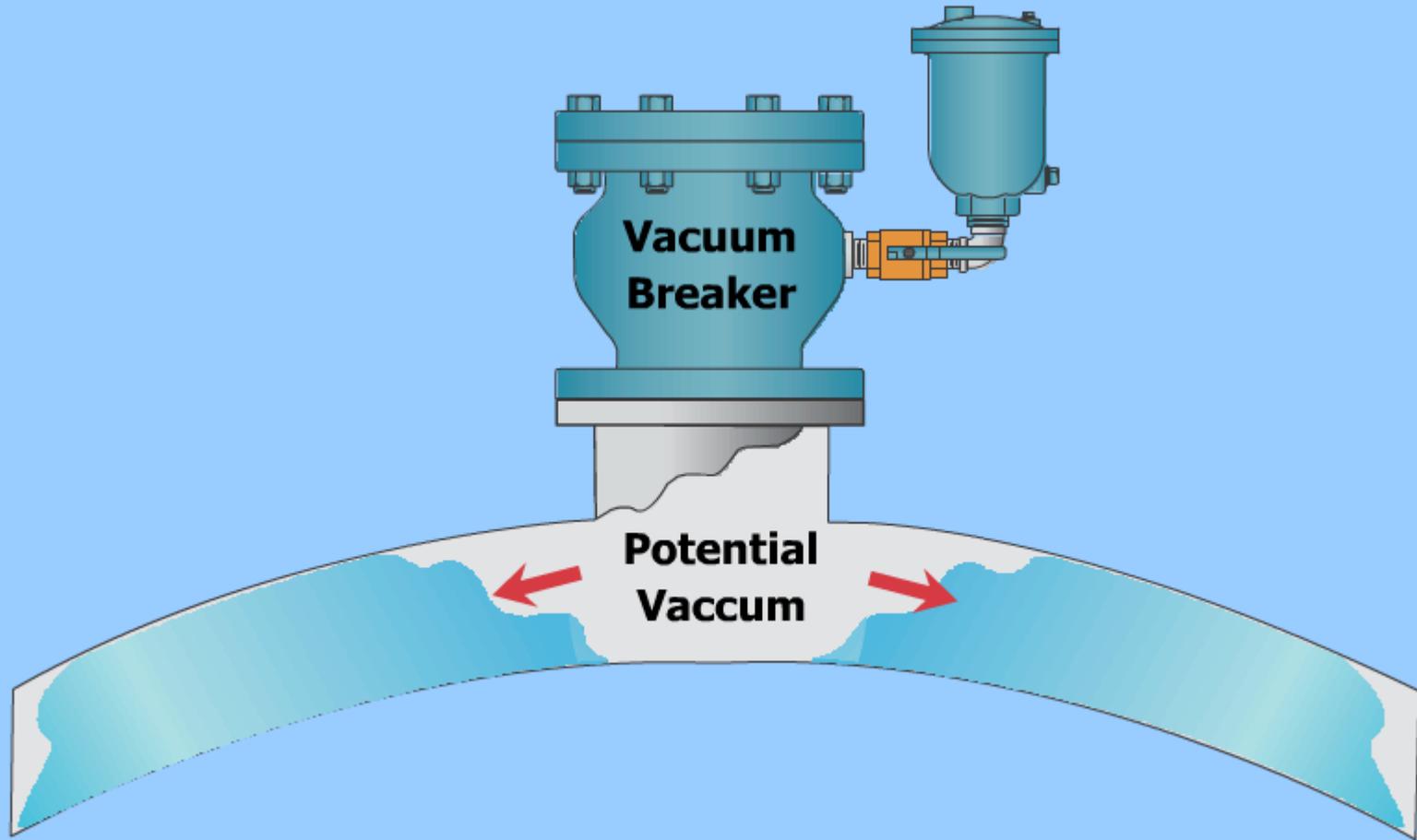
**Pipeline Under
Pressure:**
Accumulated air
continually
released



Closed:
Pipeline under
pressure

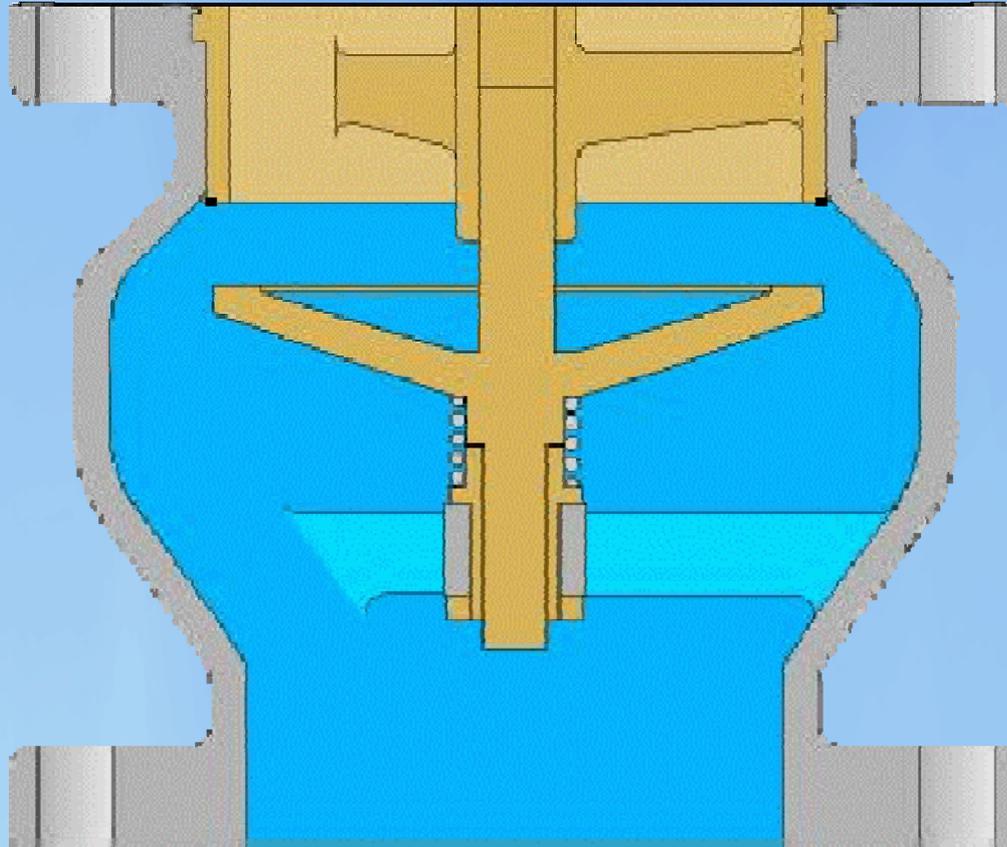
Open:
Air enters
during
pipeline
draining

Air Valves



Air Valves

Vacuum Breaker



Air Valves

Well Service Air Vacuum Valve



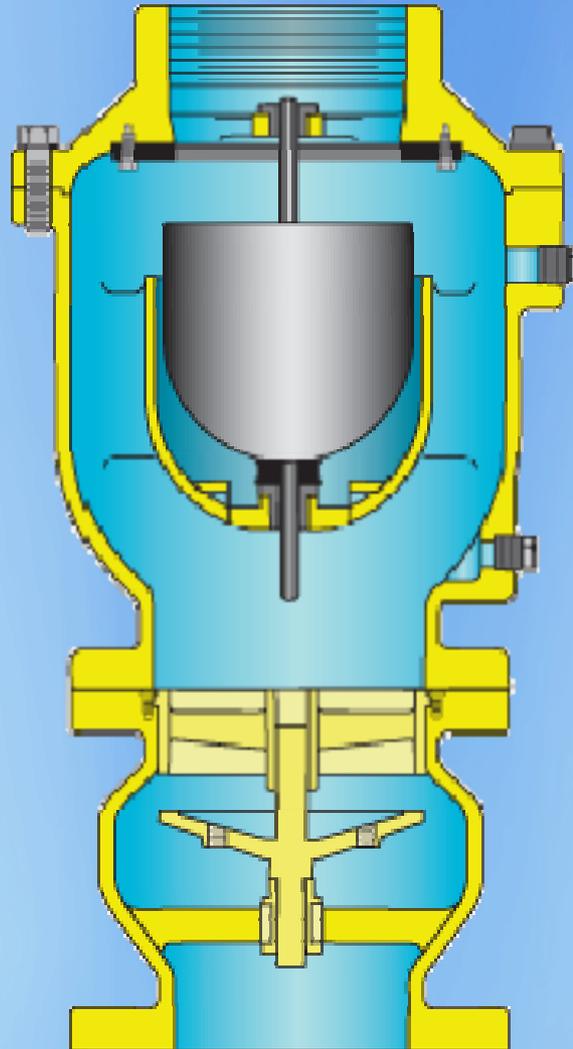
Air Valves

Dual Port Throttling Device



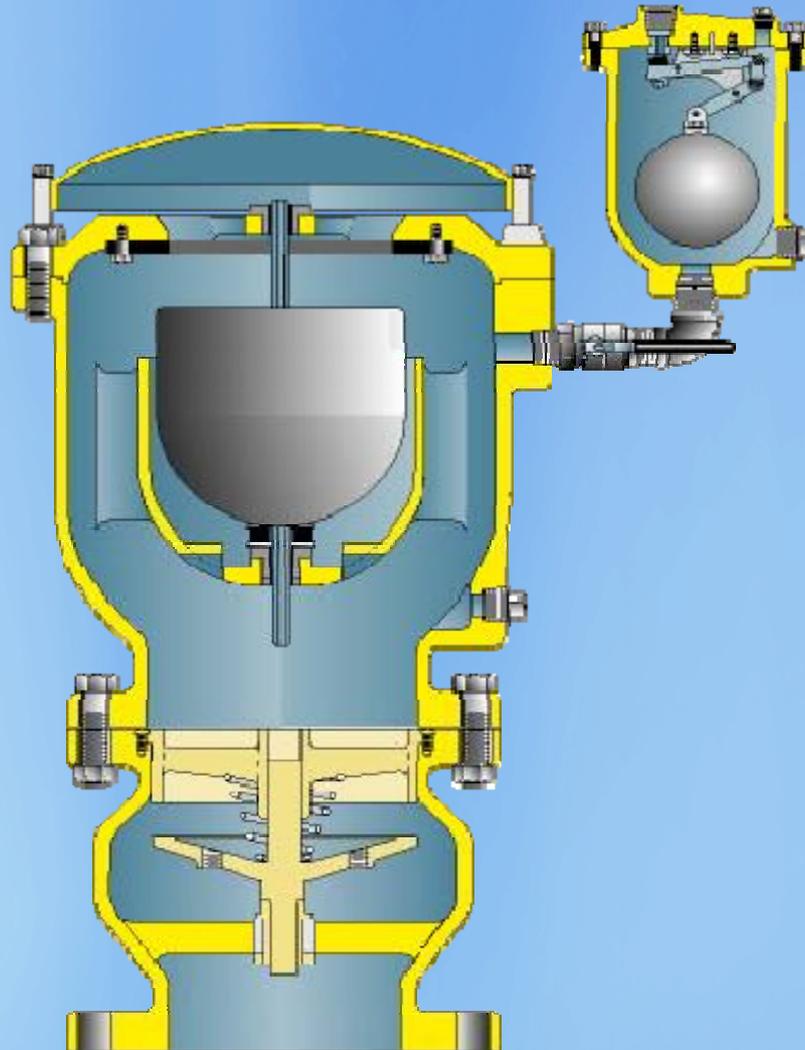
Air Valves

Surge-Suppression



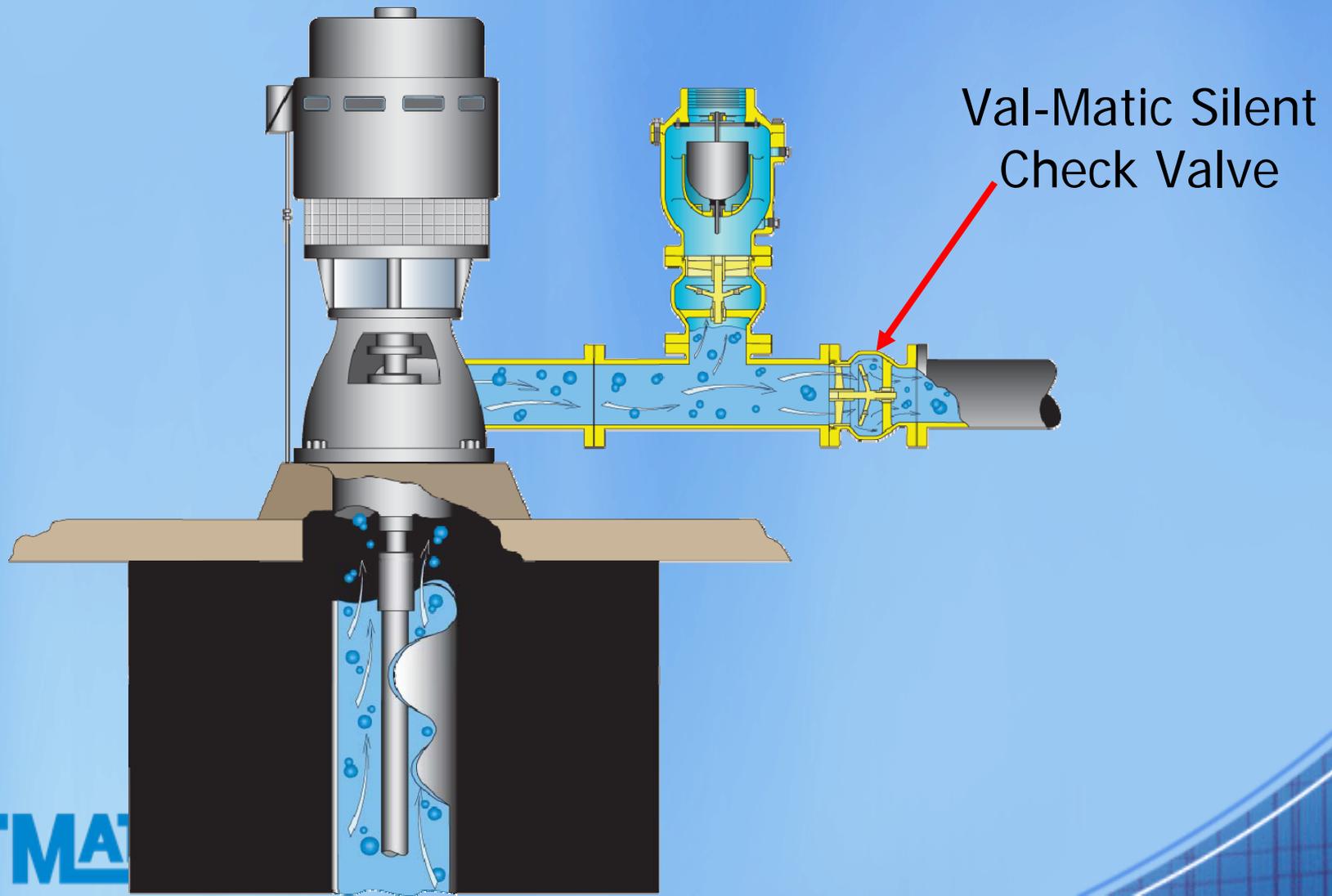
Air Valves

Combination Air Valve With Surge-Suppression Device



Air Valves

Well Service Air Valve With Surge-Suppression



Air Valves

Vacuum Priming Valves

Operational Highlights

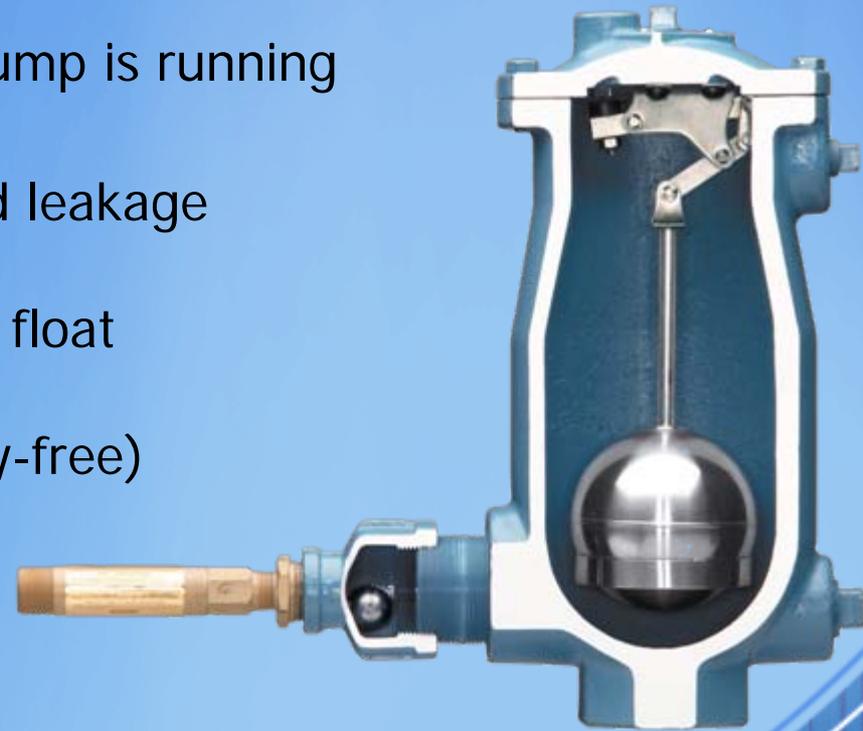
- Allows the extraction of air from the pump housing and suction piping
- Float rises and closes the pricing valve to prevent fluid from flowing into the vacuum priming system
- Continues to release air while the pump is running

Product Features

- Specifically designed to prevent fluid leakage
- Flow sensitive float
- Stainless steel 316 internal trim and float

Operational Accessories

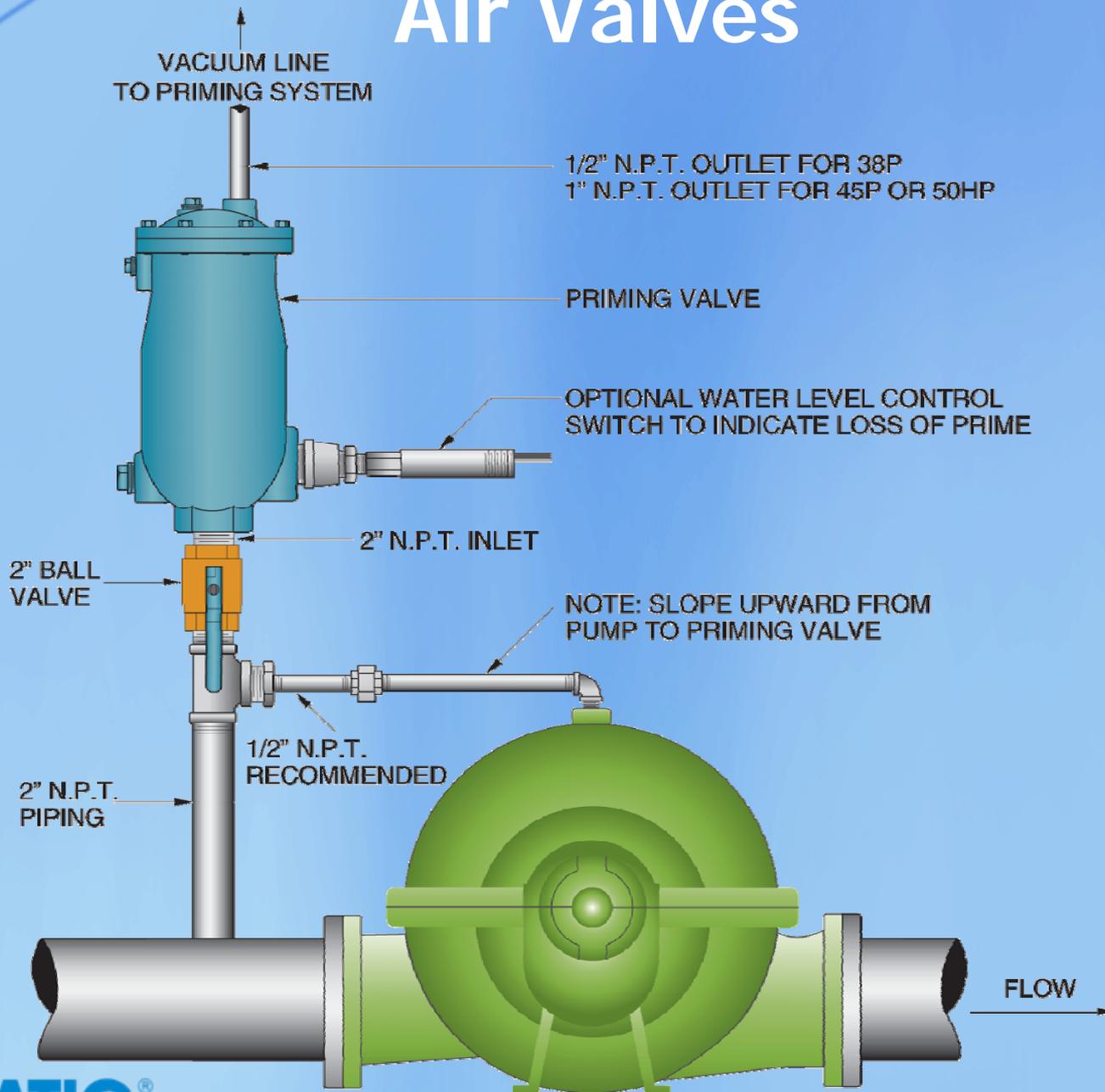
- Water Level Control Switch (Mercury-free)



MATERIALS OF CONSTRUCTION

COMPONENT	MATERIAL
Body and Cover	Cast Iron ASTM A126, Class B
Trim	Stainless Steel, Type 316
Exterior Coating	Universal Alkyd Primer
Orifice Seal	Buna-N

Air Valves



Air Valves

Clean Water vs. Wastewater Valve Applications

- Wastewater Valve
 - Body is expanded to avoid fouling of mechanism
- Globe Bottom
 - Increases float clearance
 - Reduces potential for clogging and float lock-up
- Skirted Float
 - More receptive to media in-rush
 - Helps to prevent clogging.



Model 38
Clean water



Model 48A
Wastewater

Air Valves

Model No. 48A – Wastewater Air Release Valve



Air Valves

Model No. 301A – Wastewater Air Vacuum Valve



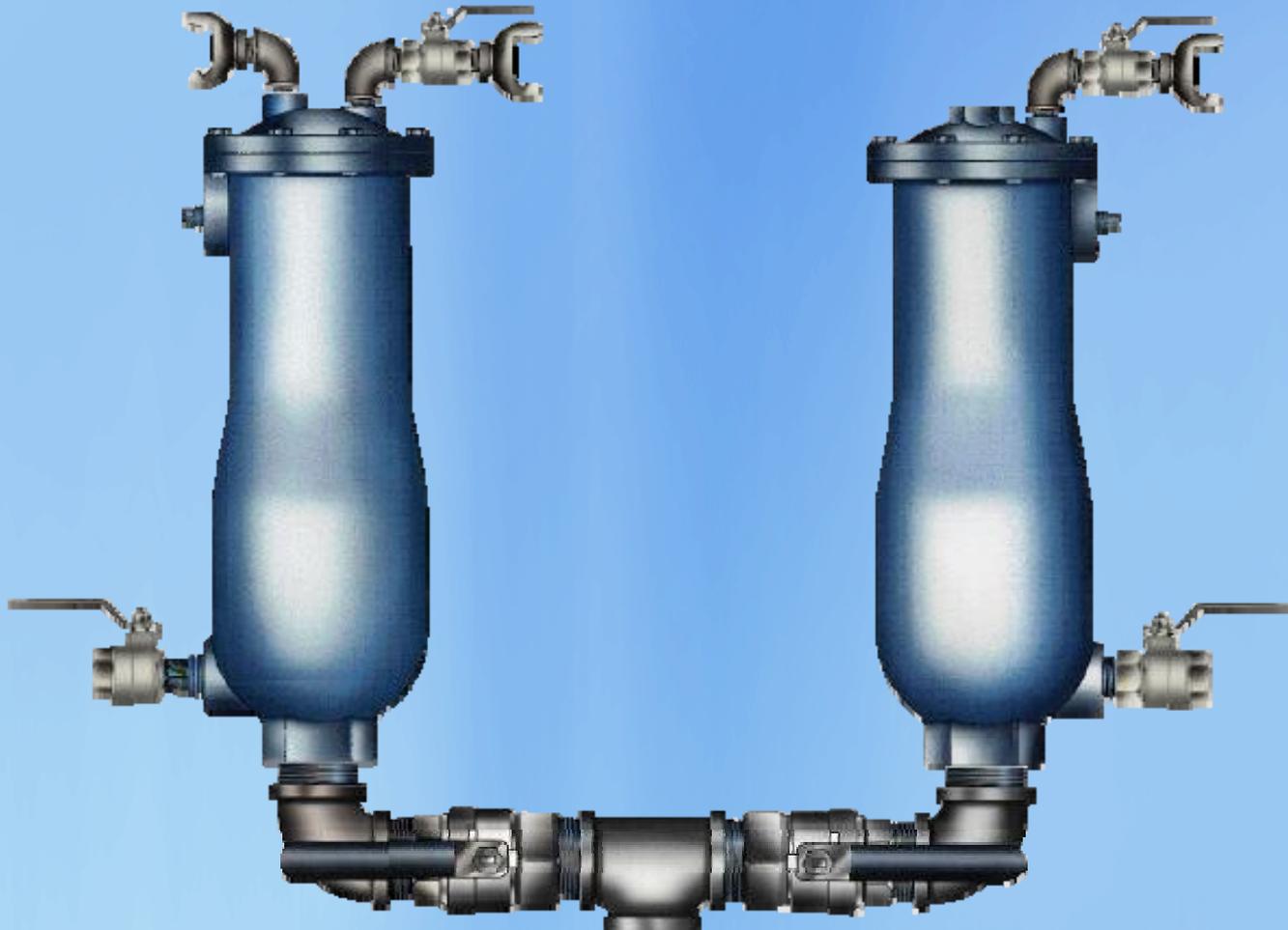
Air Valves

Model No. 801A – Wastewater Combination Air Valve



Air Valves

Combination Wastewater Air/Vacuum With Accessories



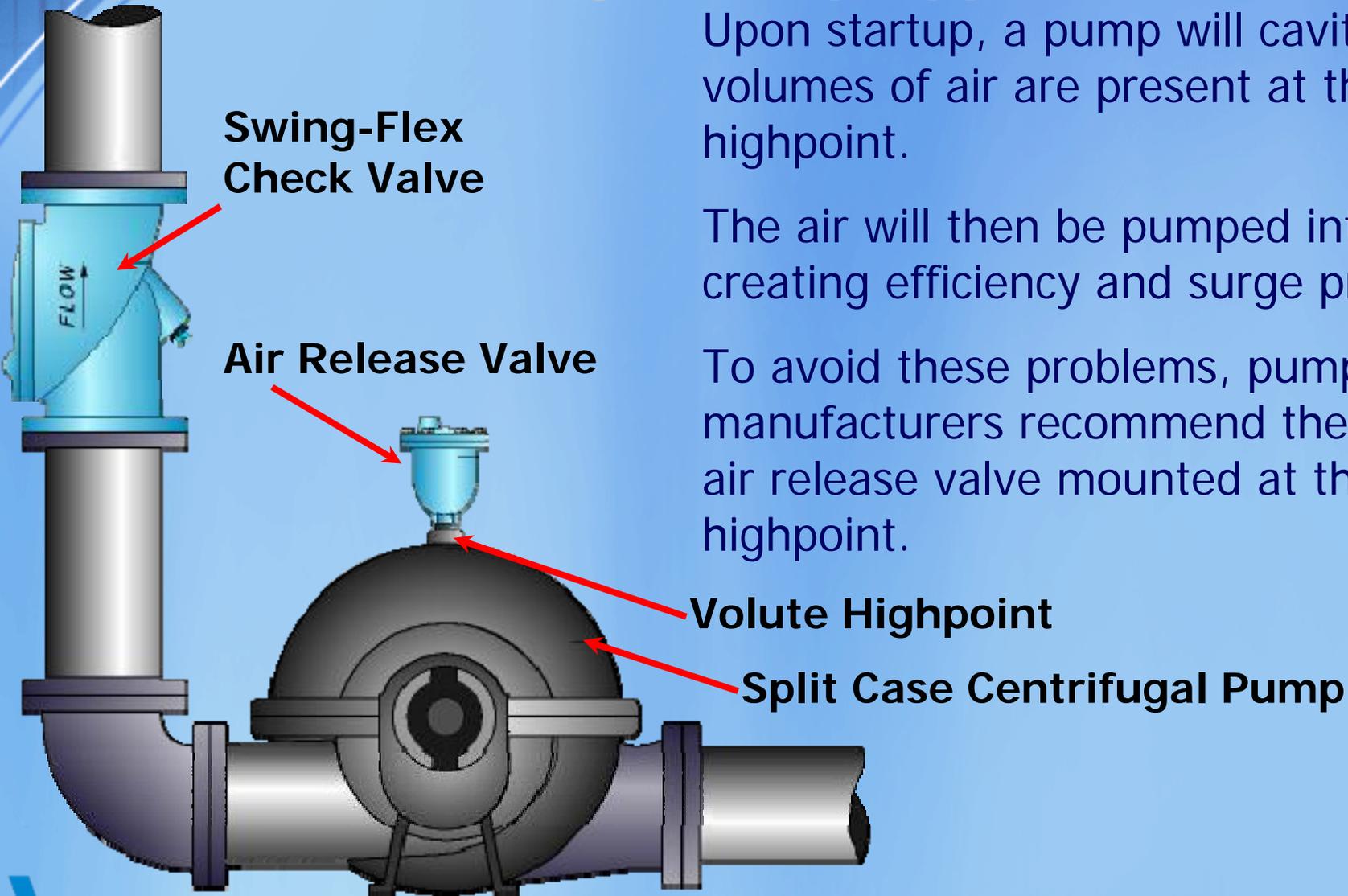
Air Valves

Centrifugal Pump Application

Upon startup, a pump will cavitate if large volumes of air are present at the volute highpoint.

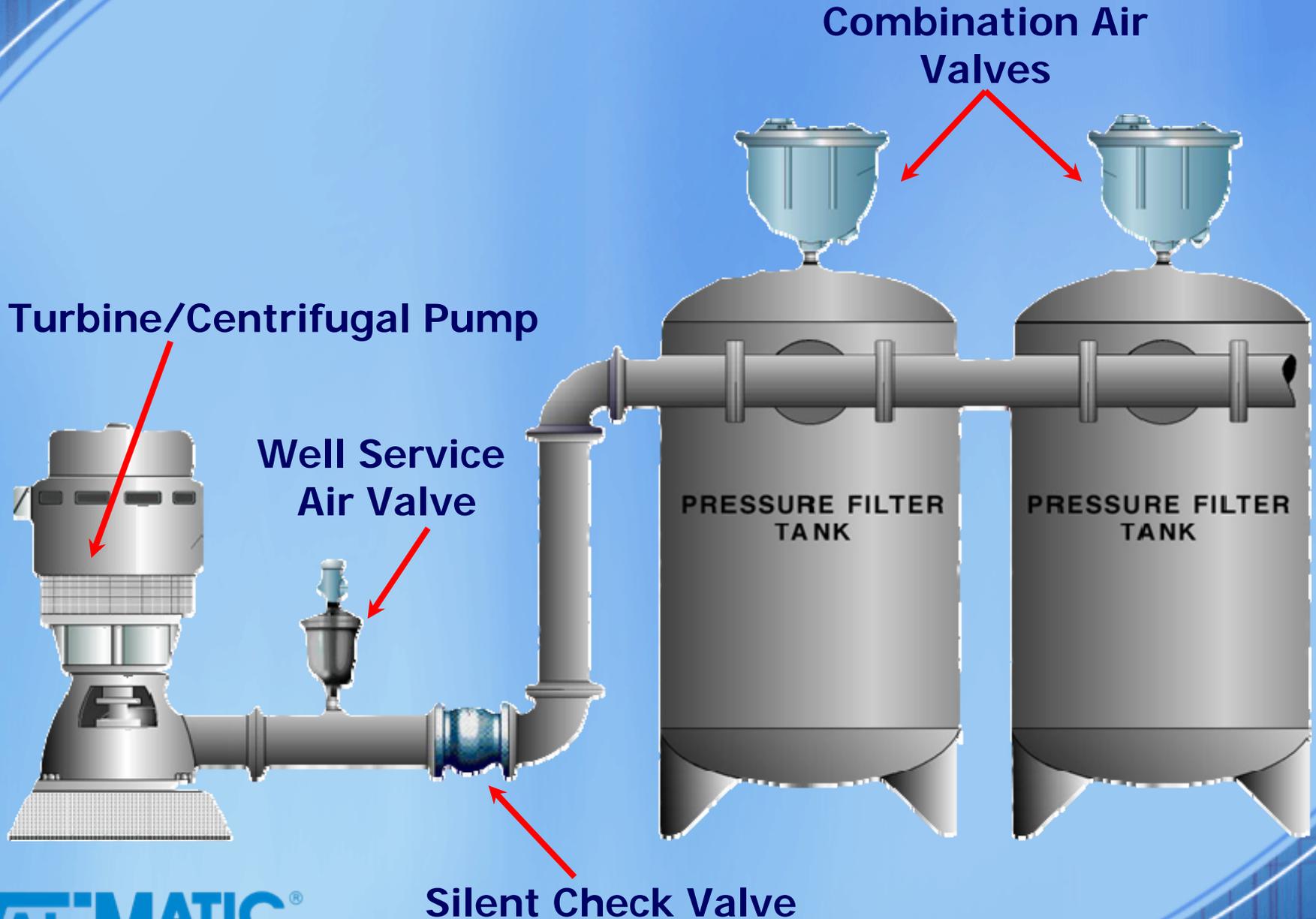
The air will then be pumped into system creating efficiency and surge problems.

To avoid these problems, pump manufacturers recommend the use of an air release valve mounted at the volute highpoint.

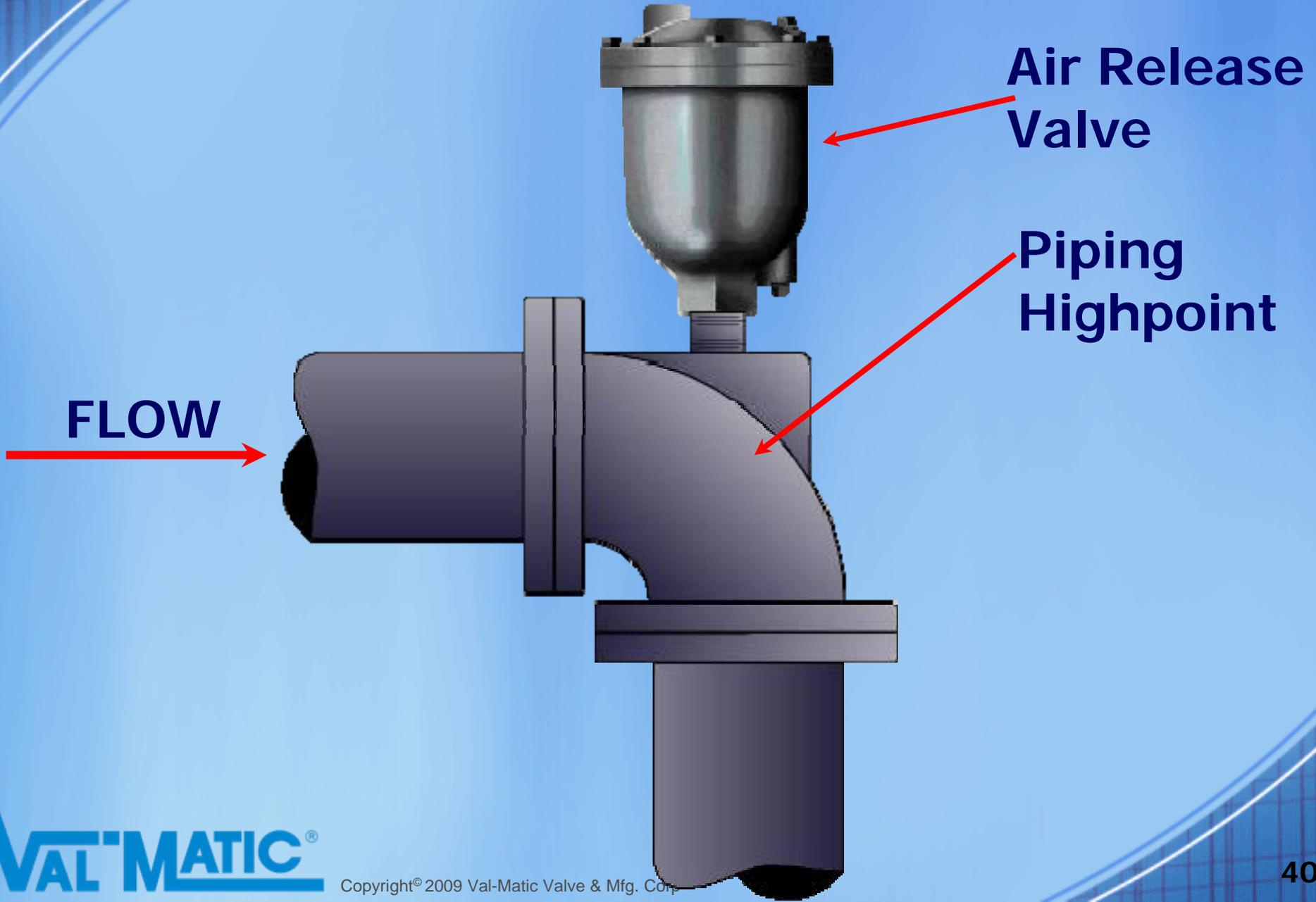


UL / FM Approval

Air Valves



Air Valves



Air Release Valve

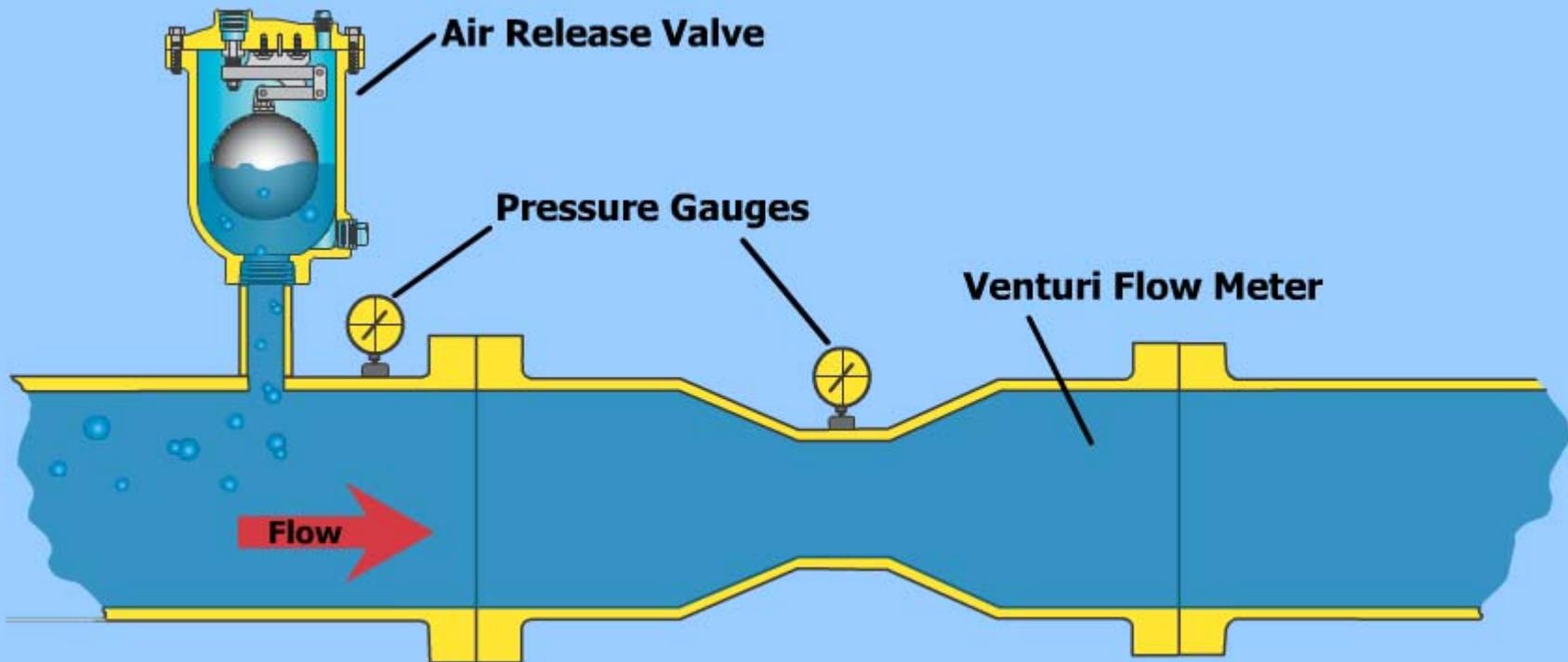
Piping Highpoint

FLOW

Air Valves

Air Valve Venturi Application

Air release valve removes air from line prior to pressure readings to help insure accuracy.



Thank you!

