



## APCO ASU COMBINATION AIR VALVE

- Design
- Operation
- Performance



## Innovative Air Valve Technology

The APCO ASU Combination Air Valve introduces an innovative concept in air valve technology. Proven with extensive field experience on tough applications, the ASU valve has demonstrated improved performance, reduced maintenance and lower cost for overall reliability on clean fluids or sewage and dirty service applications.

The APCO ASU Combination Air Valve is single body combination valve available in sizes 1-6" as standard. Larger sizes on application.

## Unique, Multi-Stage Operation

The unique venting design provides varied and predictable air flow over a wide range of air release and air/vacuum conditions. A large diameter Air/Vacuum Disc provides high volume air flow for rapid venting during pipeline filling and allows high volumes of air to enter the pipeline during draining. During normal pipeline flow conditions, the dual-range air release design prevents air build up and resultant flow restrictions under changing conditions and through the full flow range.

## Universal Valve Design, Wide Operating Range & Low Pressure Sealing Down to 2 psi

Venting design and technology allows application on an almost universal range of flow conditions with effective sealing and operation available in two pressure ranges: 2 psi to 150 psi or 2 psi to 300 psi for high pressure service.

## Meets AWWA C-512 Performance Specifications

The ASU Combination Air Valve meets performance requirements of the AWWA C-512 standard "Air Valves for Water & Wastewater Service."



## All Stainless Steel Construction

The ASU Combination Air Valve is ideally suited to corrosive conditions with a 316 Stainless Steel body and float. Internal parts are corrosion resistant high strength stainless steel.

## Light Weight, Low Profile Body Design

The compact design of the ASU Combination Air Valve allows installation in piping systems with limited space and in vaults with low ceiling heights. Fabricated ASU construction meets full pressure class ratings and minimizes weight for ease of installation and for retrofit replacement of other air valves.

## Matched Inlet & Outlet Sizes

The equal size inlet and outlet area of the ASU valve fully meets the defined requirement of AWWA C-512 providing high capacity and a broad operating range. The ASU Combination air valve is available with flanged or threaded NPT inlet connections.





### **Reliability Without Constant Maintenance**

Clean interior design and the direct shaft mounted float eliminates troublesome linkages that can lead to frequent maintenance. The light weight, one-piece internal assembly can be easily lifted out of the valve body by the top cover.

The shape of the upper valve body creates an air compression chamber to limit fluid level and solids interference. The funnel shaped lower body reduces solids buildup on sewage or other services where solids may interfere with operation, yet it still allows for maximum outflow and self-cleaning.

For applications where standard practice calls for periodic maintenance, back flush ports are strategically located for ease of flushing with an optional back flush kit.

### **Larger Sizes, Higher Pressures**

Valves to 300 psi are available in sizes 1" through 4" with 150 psi valve sizes available through 6" as standard. Contact DeZURIK for information and recommendations on other sizes and pressures.

### **Float Shape Designed for Stability**

The unique float shape reduces the ballistic effect of high speed liquid flow into the valve, further adding to float stability. The float shaft is fully guided to provide smooth, long lasting operation.

### **No Troublesome Linkage**

Unique disc air release venting concept eliminates linkages that can foul on dirty service applications.

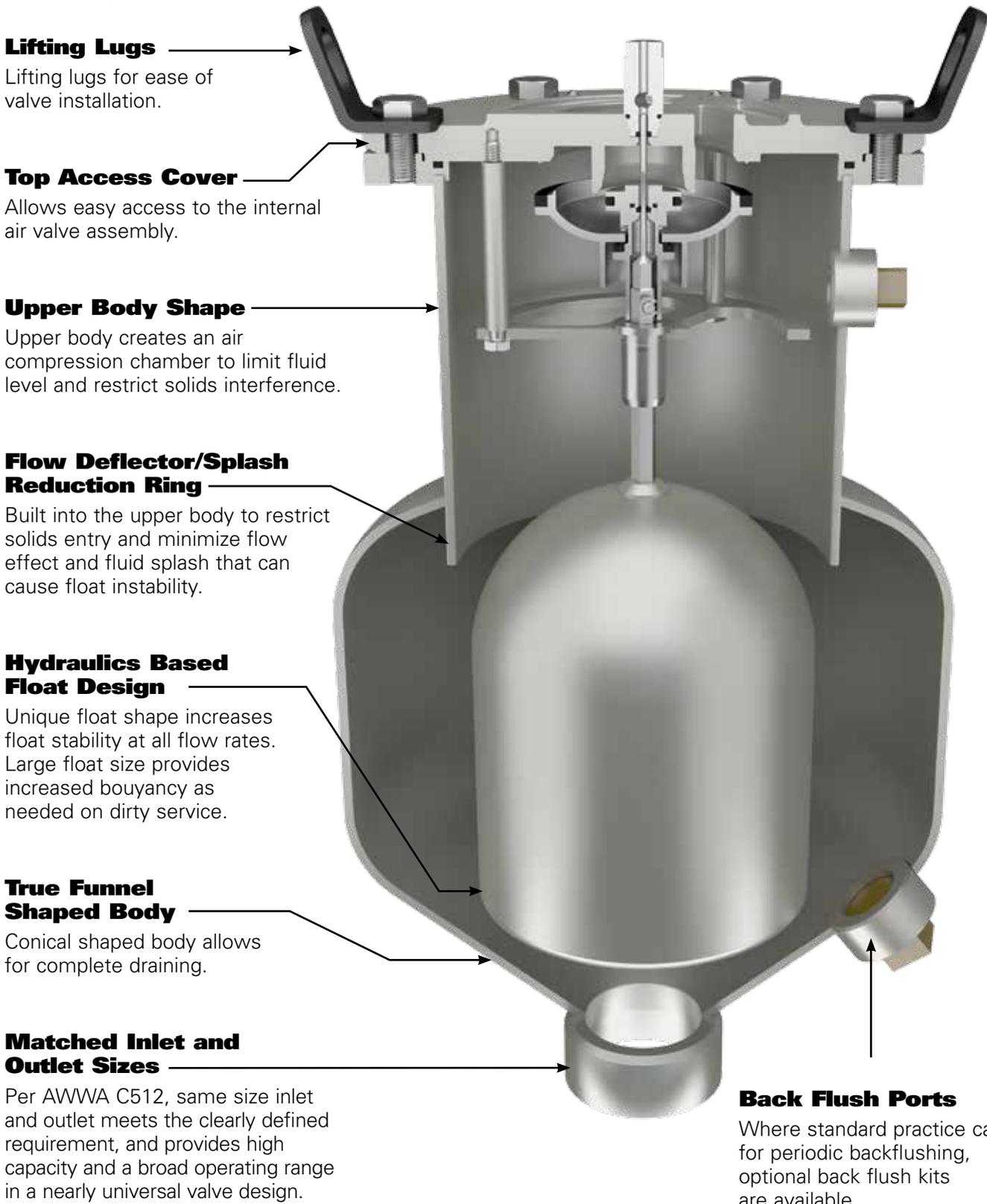


### **For Water/Wastewater or Industrial Service**

All materials and seals are proven as long life components for continuous duty service. Seals and all parts are suitable for use on water, wastewater or industrial media containing hydrocarbons, chemicals, solvents and volatiles. Recommendations available on application.

# Problem Solving Design for Improved Performance & Reliability on Dirty Service Applications

Innovative air release technology provides improved valve performance and operating capability with characteristics specifically designed to deal with clean fluids or media with the presence of grit, solids and grease.



## Lifting Lugs

Lifting lugs for ease of valve installation.

## Top Access Cover

Allows easy access to the internal air valve assembly.

## Upper Body Shape

Upper body creates an air compression chamber to limit fluid level and restrict solids interference.

## Flow Deflector/Splash Reduction Ring

Built into the upper body to restrict solids entry and minimize flow effect and fluid splash that can cause float instability.

## Hydraulics Based Float Design

Unique float shape increases float stability at all flow rates. Large float size provides increased bouyancy as needed on dirty service.

## True Funnel Shaped Body

Conical shaped body allows for complete draining.

## Matched Inlet and Outlet Sizes

Per AWWA C512, same size inlet and outlet meets the clearly defined requirement, and provides high capacity and a broad operating range in a nearly universal valve design.

## Back Flush Ports

Where standard practice calls for periodic backflushing, optional back flush kits are available.

# Multi-Stage Operation Provides Dual-Range Air Release

## High Capacity Multi-Stage Operation

Features high capacity air venting and inflow during filling and draining; dual range air release during normal pipeline flow conditions.

## Air/Vacuum Disc

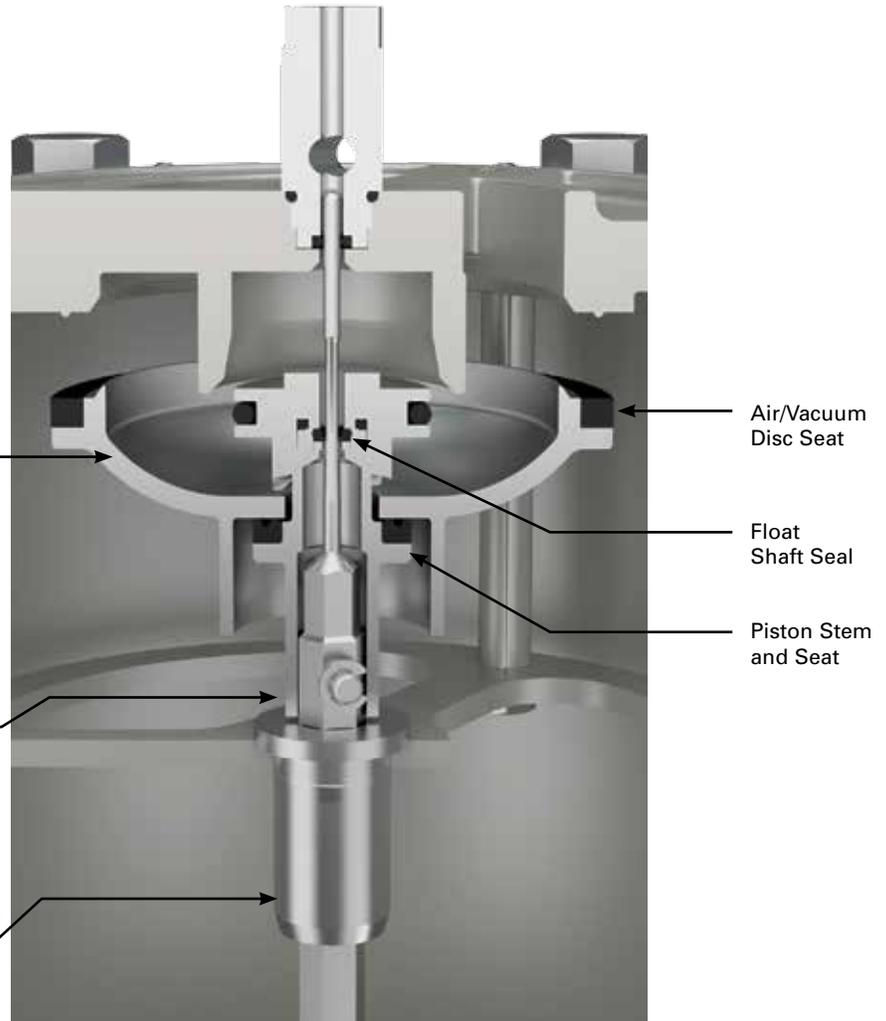
The unique Air/Vacuum Disc opens to assure high flow air venting during pipeline filling and for quick vacuum relief during pipeline draining.

## No Troublesome Linkage

The internal design of the ASU valve eliminates troublesome linkage that can trap solids and interfere operation and affect reliability

## Guided Float Shaft

The float shaft is fully guided to provide smooth, long-life operation. Guides prevent float misalignment and contact with the valve body.



## Outlet Configurations

ASU outlet configurations in all valve sizes are designed for full rated air flow.



### Standard Outlet - Threaded 90° Elbow

Furnished with pipe extension with drip line beyond the valve body.



### Optional Vertical Threaded Outlet (VTO)

Outlet is threaded to allow plant piping of discharge. The VTO must be specified.



### Optional Mushroom Cap (MRC)

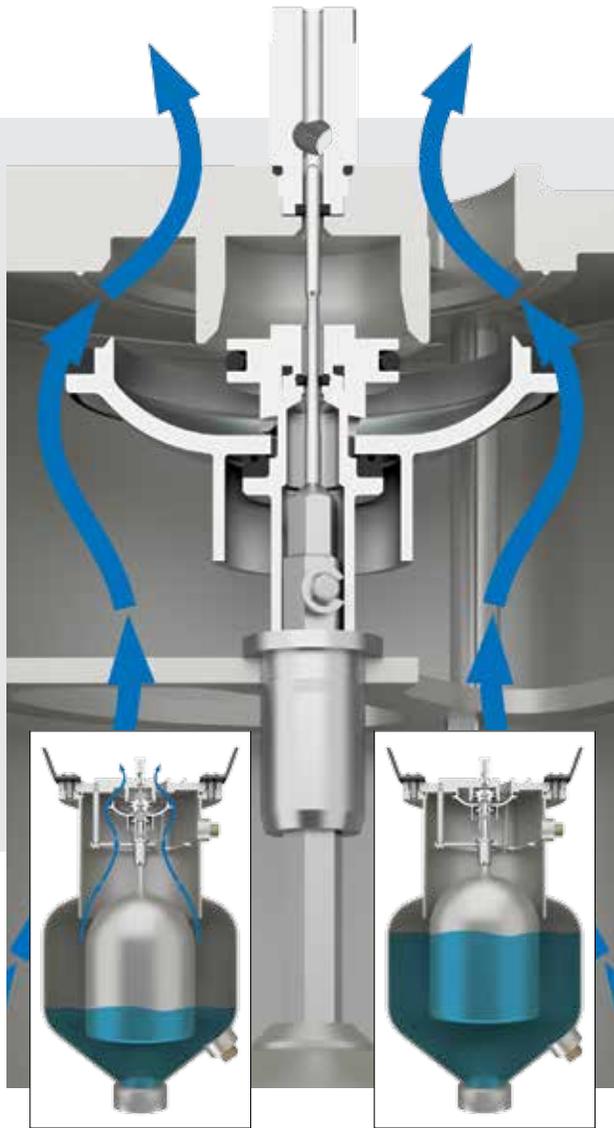
Screened vertical outlet keeps debris from entering the valve outlet. The MRC must be specified.

# Valve Operation

## Unique Combination Air Valve Technology

The patent pending design of the ASU Combination Air Valve features multi-stage air release operation and air/vacuum service provided by the Air/Vacuum Disc.

### Pipeline Filling



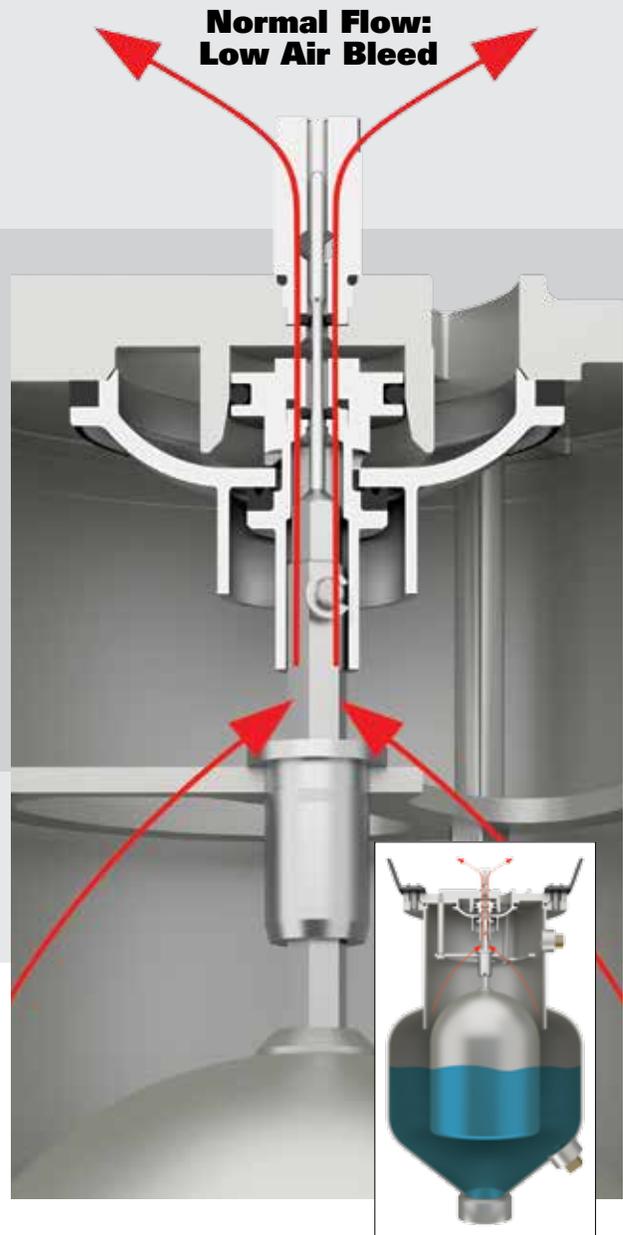
Pipeline Filling

Pipeline Full

During pipeline filling, the Air/Vacuum Disc remains open allowing high volumes of air to escape.

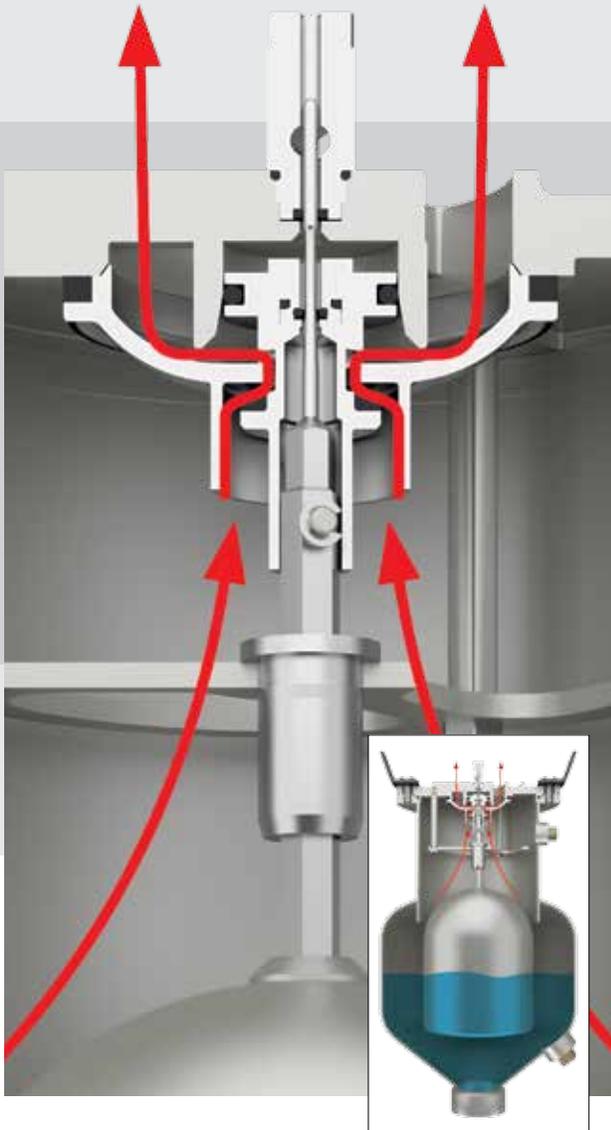
When the pipeline is full, fluid enters the valve which raises the float and lifts the Air/Vacuum Disc into the closed position. Valve is completely sealed; Air/Vacuum Disc seat, piston stem seat and float shaft seals are all in the closed position.

### Dual Range Air Release



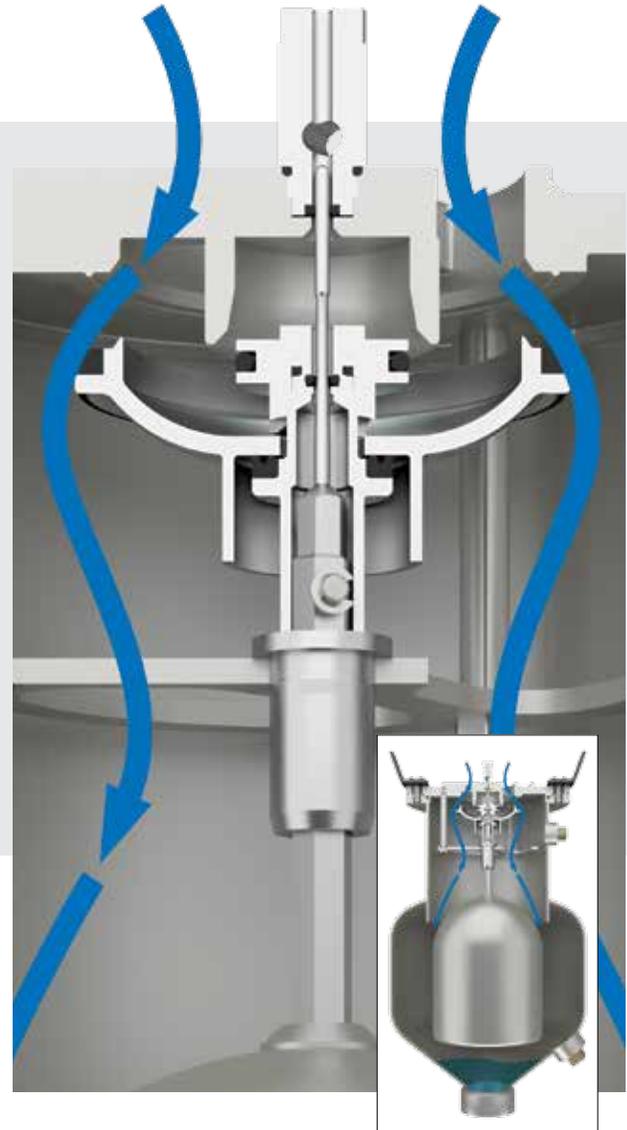
During normal system operation, air escapes from the fluid, collects at high points in the pipeline, and enters the valve. When enough air collects in the valve, it causes the float and float shaft to move down. In this minimal air release mode, the float position allows the valve to release a small amount of air past the float shaft seals. The released air is replaced by fluid entering the valve inlet, raising the float to the valve's closed position.

### Normal Flow: High Air Bleed



If a larger amount of air collects in the pipeline during normal operation and enters the valve, it causes the float and float shaft to move down even farther causing the upper part of the float shaft to seal off the piston chamber. Trapped air continues to accumulate in the piston chamber, causing a pressure imbalance. The piston moves down, allowing the valve to release a larger amount of air past the piston stem and seat.

### Pipeline Draining



When the pipeline is drained, or if a sudden break occurs, the valve quickly opens allowing high volumes of air to enter the pipeline. As fluid level in the valve drops, the float and float shaft move down, which allows the Air/Vacuum Disc to drop down, opening the pathway for high volume air to be pulled through the valve, reducing the risk of pipeline collapse due to excessive vacuum.

## Field-Proven Performance

The APCO ASU Combination Air Valve was developed with 2 years of design and development testing and extensive field experience. In the field, users were consistently impressed with the performance and improved reliability of the ASU, which far exceeded other valves previously installed in the same location.

The ASU resisted clogging from grease, grit and debris meaning less maintenance, improved system reliability with reduced cost.



## Sales and Service

For information about our worldwide locations, approvals, certifications and local representative:

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