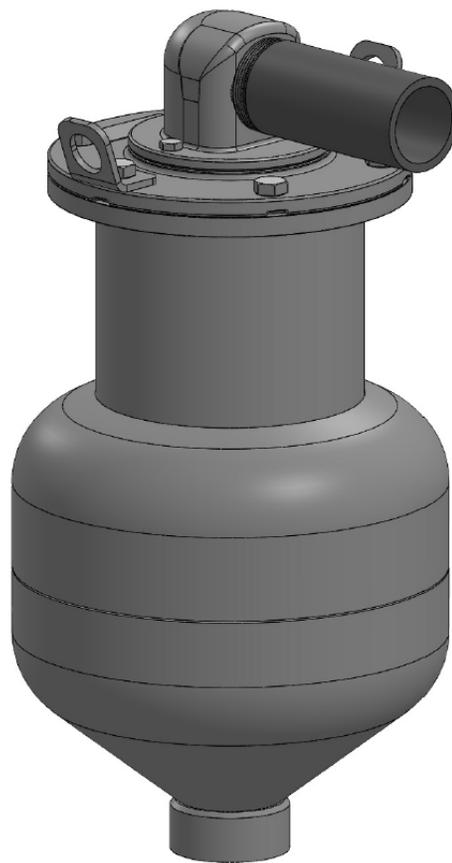


# APCO ASU-SCAV & ASU-CAV SINGLE BODY COMBINATION AIR VALVES



Instruction D12039  
December 2015

## Instructions

These instructions are for use by personnel who are responsible for the installation, operation and maintenance of DeZURIK valves, actuators or accessories.

## Safety Messages

All safety messages in the instructions are identified by a general warning sign and the signal word CAUTION, WARNING or DANGER. These messages indicate procedures to avoid injury or death.

Safety label(s) on the product indicate hazards that can cause injury or death. If a safety label becomes difficult to see or read, or if a label has been removed, please contact DeZURIK for replacement label(s).

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### **⚠WARNING**

**Personnel involved in the installation or maintenance of valves should be constantly alert to potential emission of pipeline material and take appropriate safety precautions. Always wear suitable protection when dealing with hazardous pipeline materials. Handle valves which have been removed from service with suitable protection for any potential pipeline material in the valve.**

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## Inspection

Your DeZURIK product has been packaged to provide protection during shipment; however, items can be damaged in transport. Carefully inspect the unit for damage upon arrival and file a claim with the carrier if damage is apparent.

## Parts

Replaceable wear parts are listed on the assembly drawing. These parts can be stocked to minimize downtime. Order parts from your local DeZURIK sales representative or directly from DeZURIK. When ordering parts please provide the following information:

**If the valve has a data plate:** please include the 7-digit part number with either 4-digit revision number (example: 9999999R000) or 8-digit serial number (example: S1900001) whichever is applicable. The data plate will be attached to the valve assembly. Also, include the part name, the assembly drawing number, the balloon number and the quantity stated on the assembly drawing.

**If there isn't any data plate visible on the valve:** please include valve model number, part name, and item number from the assembly drawing. You may contact your local DeZURIK Representative to help you identify your valve.

## DeZURIK Service

DeZURIK service personnel are available to maintain and repair all DeZURIK products. DeZURIK also offers customized training programs and consultation services. For more information, contact your local DeZURIK sales representative or visit our website at [DeZURIK.com](http://DeZURIK.com).

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### Description

The APCO ASU Combination Air Valve is specially designed for use with Clean or Dirty Service, Municipal or Industrial Fluids or Slurries. It releases large quantities of air when initially filling the pipeline, and will close automatically with liquid level rise. While the pipeline is under pressure, the valve will perform the air release function. As air collects in the valve, the float will drop and allow small pockets of air to exit the system through the air release orifice. The air release mechanism is patented technology and uses a balanced piston to open the air release orifice. Under vacuum conditions, the float and vacuum disc will drop, allowing air to re-enter the pipeline.

### Handling and Storage

The combination air valve is packaged and shipped with the float in the 'Closed Position' to prevent damage during shipping and handling. Remove packaging material from the valve inlet before installation.

Lifting the valve improperly may damage it. Do not fasten lifting devices to piping or attached components. Lift the valve with the lifting device attached to the two lifting lugs (A28) located on the cover (A8). Each lifting lug is rated to lift 100 lbs. See Figure 1 for part identification.

If installation will be delayed, place valve indoors in secure, weather tight storage. If temporary outside storage is unavoidable, make sure a vermin proof rain cover (water shedding tarp, etc.) is secured around/over the valve to keep off rain and mud. Skid and set the valve on a flat, solid, and well drained surface for protection from ground moisture, runoff and pooled rain water.

### Installation

See Figure 1 for Typical Installation.

- The combination air valve is not fitted with a shut off valve for isolating the valve from the main for inspection and backflushing. Ensure there is a shut off valve installed for isolating the valve from the main.
- The combination air valve and valve vault should have adequate drainage and be sufficiently protected from possible freezing conditions.
- It is recommended the combination air valve outlet be piped to a drain, particularly when installed within a pumping station, to prevent the danger of flooding due to malfunction or clogging.

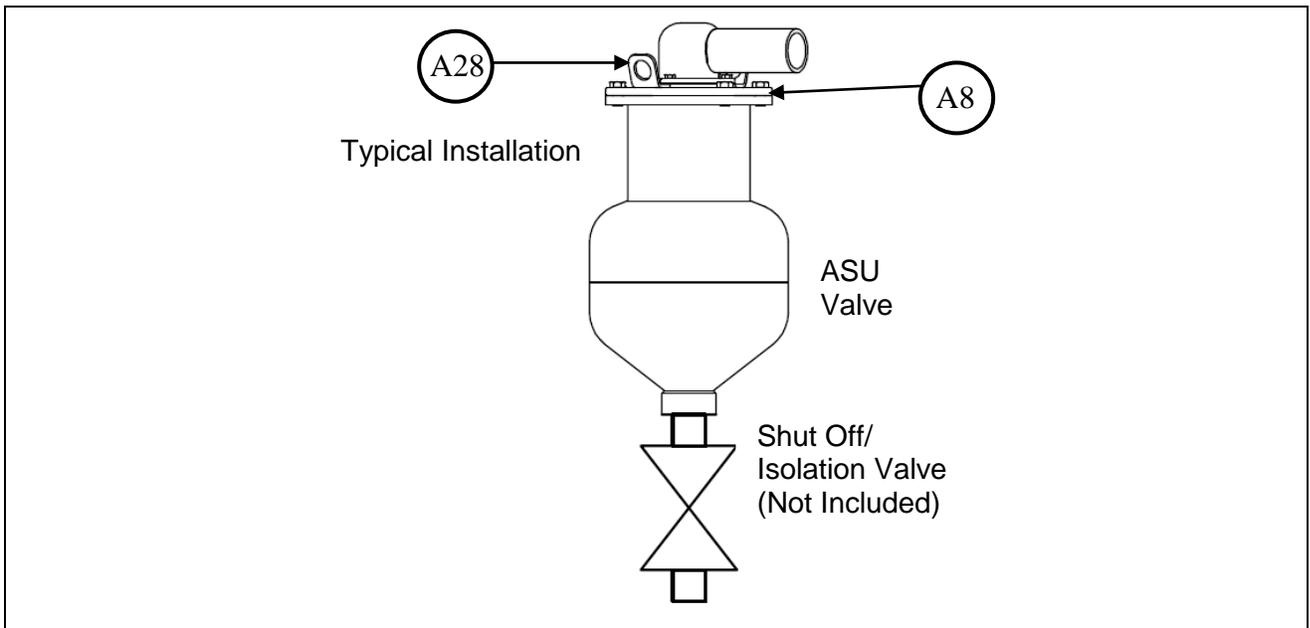
**APCO ASU Single Body Combination Air Valves**

Figure 1 – Typical Installation

## Maintenance/Backflushing

For sewage waste media service, the valve should be backflushed to prevent grease and scum buildup inside the valve which can prevent the valve from operating properly. Valves can be ordered with the optional backflushing attachments.

The valve should be backflushed 6 months after the initial operating date. If the initial backflushing process only takes a few minutes to clean the valve, the next backflushing can be scheduled in 12 months. If the initial backflushing process takes 15 minutes or longer to clean the valve, the next backflushing should be scheduled in 3 months.

See Figure 6 for Optional Backflush Attachment Parts Identification on the ASU-SCAV style.

### ***Backflushing to Force Main and Valve Interior Inspection***

See Figure 2 through Figure 6 for part identification.

If clean water service is available, its pressure must be at least 15 psi (103 kPa) higher than the main pressure to prevent wastewater from back flowing into the clean water line.

Valves **(with optional Backflush Attachment)** may be flushed back into the force main as follows:

1. Leave the Isolation Valve open.
2. Connect the Hose Assembly (F04) to Shutoff Valve (F02).
3. Connect clean water source to Hose Coupling (F03), turn on water source, open Shutoff Valve (F02) and backflush for 2 – 3 minutes (or as long as it takes to flush out all the sediment).
4. After backflushing, close the water source, Isolation Valve, and Shutoff Valve (F02).
5. Remove Hose Assembly (F04) from Shutoff Valve (F02) and relieve pressure in valve by slowly opening Shutoff Valve (F02).



**WARNING!**

**Servicing the Air Valve while the pipeline is under pressure can cause personal injury or equipment damage. Relieve pipeline pressure or shut off isolation valve before servicing the Air Valve.**

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6. Remove cover bolts (A10) and remove the cover (A8).

**Note:** All internals are attached to the valve cover.

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**WARNING!**

**Do not completely remove pipe plugs or cover screws while the valve is under pressure.**

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7. Visually inspect the valve interior. If grease deposits interfere with the valve operation, scrape out grease deposits.
8. If the valve was leaking through the Outlet Port during backflushing, fully clean valve and install new O-ring kit.
9. Replace cover (A8) and cover bolts (A10).  
**Note:** If cover O-ring (A11) is damaged, replace cover O-ring.
10. Close Shutoff Valve (F02).
11. Slowly open Isolation Valve to place valve back in service.

***Backflushing to Atmospheric or Vacuum Tank***

See Figure 2 through Figure 6 for part identification.

If clean water service is not available, with 15 psi (103 kPa) higher than the main pressure, backflush through Drain Valve (F06) into an atmospheric or vacuum collection tank.

Valves (**with optional Backflush Attachment**) may be flushed back into tank by:

1. Close Isolation Valve.
2. Connect Drain Valve (F06) to an atmospheric or vacuum collection tank.  
**Note:** If a vacuum collection tank is used, a pipe plug with a ¼" hole in it may be inserted into the outlet port of the Air and Vacuum Valve to limit the amount of air drawn back into the vacuum tank.
3. Open Drain Valve (F06).
4. Connect the Hose Assembly (F04) to Shutoff Valve (F02).
5. Connect clean water source to Hose Coupling (F03), turn on water source, open Shutoff Valve (F02) and backflush for 2 – 3 minutes (or as long as it takes to flush out all the sediment).
6. After backflushing, close the water source, Isolation Valve, and Shutoff Valve (F02).

**WARNING!**

**Servicing the Air Valve while the pipeline is under pressure can cause personal injury or equipment damage. Relieve pipeline pressure or shut off isolation valve before servicing the Air Valve.**

7. Remove Hose Assembly (F04) from Shutoff Valve (F02) and relieve pressure in valve by slowly opening Shutoff Valve (F02).

**WARNING!**

**Do not completely remove pipe plugs or cover screws while the valve is under pressure.**

8. Remove cover bolts (A10) and remove the cover (A8).  
**Note:** All internals are attached to the valve cover.
9. Visually inspect the valve interior. If grease deposits interfere with the valve operation, scrape out grease deposits.
10. If the valve was leaking through the Outlet Port during backflushing, fully clean valve and install new O-ring kit.
11. Replace cover (A8) and cover bolts (A10).  
**Note:** If cover O-ring (A11) is damaged, replace cover O-ring.
12. Close Shutoff Valve (F02).
13. Slowly open Isolation Valve to place valve back in service.

***Disassembly Procedure***

See Figure 2 through Figure 6 for part identification.



**WARNING!**

**Servicing the Air Valve while the pipeline is under pressure can cause personal injury or equipment damage. Relieve pipeline pressure or shut off isolation valve before servicing the Air Valve.**

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1. Relieve pipeline pressure or shut off isolation valve at inlet to Air Valve.



**WARNING!**

**Do not completely remove pipe plugs or cover screws while the valve is under pressure.**

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2. Loosen pipe plug (A25) in body (A1) or open drain valve (F06) to relieve internal pressure. Do not completely remove pipe plug while the valve is under pressure.
3. Remove the cover bolts (A10) and the cover (A8).  
**Note:** All internals are attached to the cover.
4. Inspect the inside of the body (A1) for debris buildup. If there is enough debris to interfere with the float (A2) movement, clean the inside of the body.
5. If the cover O-ring (A11) is damaged, remove the O-ring and clean the flange surfaces of the cover (A8) and body (A1). Install new O-ring (A11).
6. Inspect the sealing surface of the vacuum disk (A12) for nicks, wear, or sediment coating from the chemicals in the media. Clean the sealing surface if dirty.
7. Check for proper float movement.
8. Remove clevis pin (A13) and remove float (A2) and float shaft (A3) from the cover assembly. Inspect the sealing area (upper section) of the float shaft for damage. Clean the float shaft if dirty.
9. Remove the vacuum disk sub-assembly and separate by unthreading piston (A17) from piston stem (A14).
10. Inspect piston stem (A14) sealing surface for damage. Clean the sealing surface if dirty.
11. Remove O-ring (A20) and backup ring (A21) from the top end of the piston stem (A14).
12. Remove the outlet (A15) from the cover (A8).
  - a. ASU-CAV Valve: Remove the upper pressure cap (A9) and lower pressure cap (A34) from the cover (A8). Remove O-rings (A20), O-rings (A22) and backup ring (A21) and check for damage.
  - b. ASU-SCAV Valve: Remove the top cap (A9) from the cover (A8). Remove O-ring (A20) and O-ring (A22) and check for damage.
13. Inspect the float (A2) to insure it is not damaged or that it does not have liquid in it.
14. Clean all surfaces before re-assembly.

### ***O-ring Kit***

The O-ring kit is recommended to have on hand when a valve is inspected or repaired. The kit includes A11, A13, A18, A19, A20, A21, and A22. For part A11, the kit includes the O-ring for the 1"-2" valve and the O-ring for the 3"-4" valve. Only use the A11 O-ring that fits your valve.

### ***Full Rebuild Parts***

For a complete rebuild, it is recommended to replace vacuum disc (A12) and piston stem (A14). These parts only need to be replaced if the seals are worn or damaged. Replace all O-rings included in the O-ring Kit.

Another option for a complete rebuild is to order the replacement valve less body. This replacement valve includes all the internal components and the valve cover, but does not include the body.

### ***Assembly Procedure***

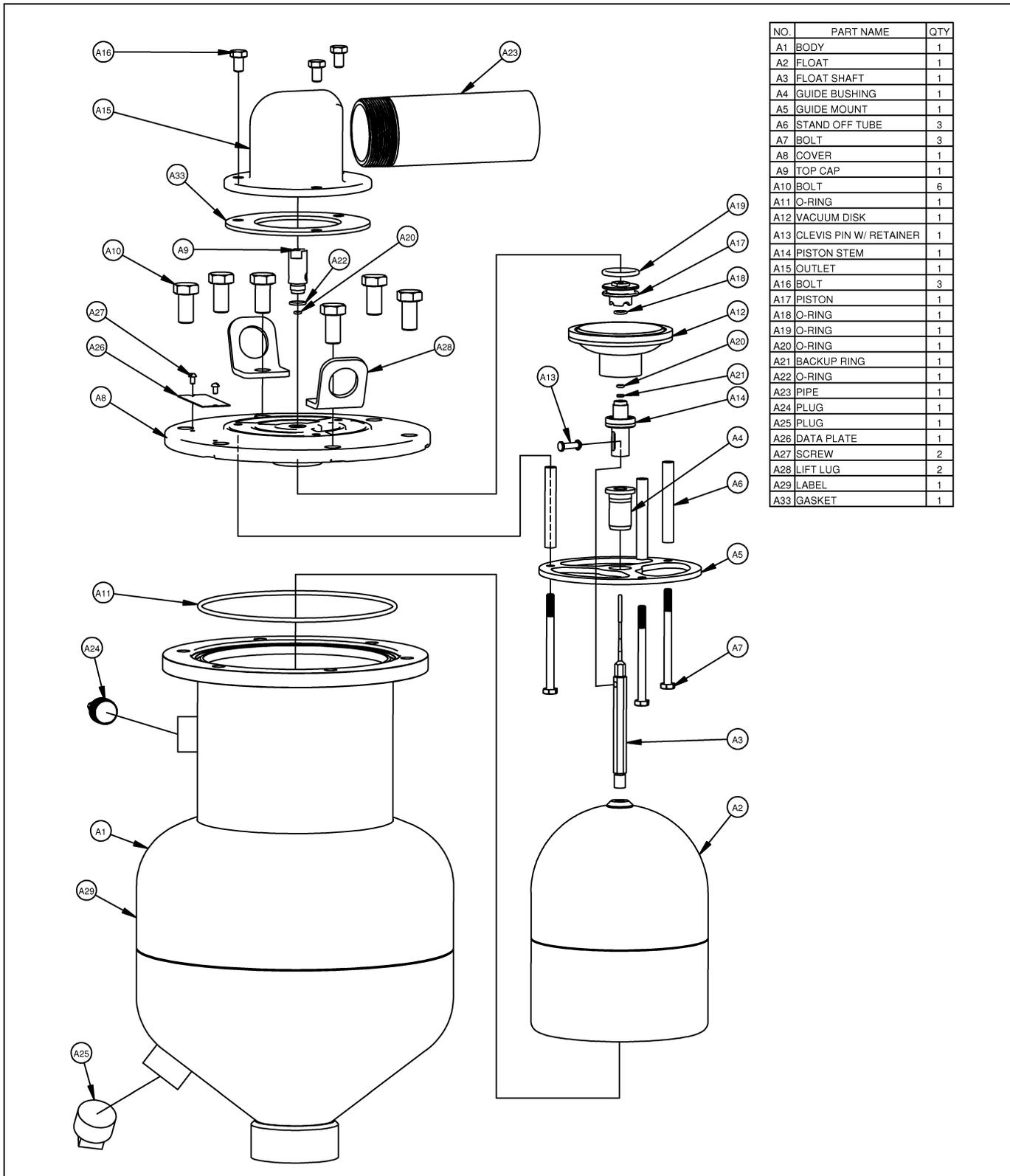
See Figure 2 through Figure 5 for part identification.

1. If an O-ring kit is being used, replace all old parts with the new parts.
2. Lubricate all O-rings with an O-ring grease.
3. Re-assemble in the opposite order as the disassembly procedure.
4. Ensure the cover O-ring (A11) is installed properly. Assemble the cover (A8) to the body (A1). Tighten the cover bolts (A10) opposite each other in rotation.
5. If valve has the optional Backflush Attachment, ensure Shutoff Valves (F02) and (F06) are closed.
6. Slowly open the Isolation Valve. The valve is now back in service.

## **Operation**

APCO ASU Combination Air Valves are specially designed for use with Clean or Dirty Service, Municipal or Industrial Fluids or Slurries. It releases large quantities of air when initially filling the pipeline, and will close automatically with liquid level rise. While the pipeline is under pressure, the valve will automatically perform the air release function. As air collects in the valve, the float will drop and allow small pockets of air to exit the system through the air release orifice. The air release mechanism is patented technology and uses a balanced piston to open the air release orifice. Under vacuum conditions, the float and vacuum disc will drop, allowing air to re-enter the pipeline.

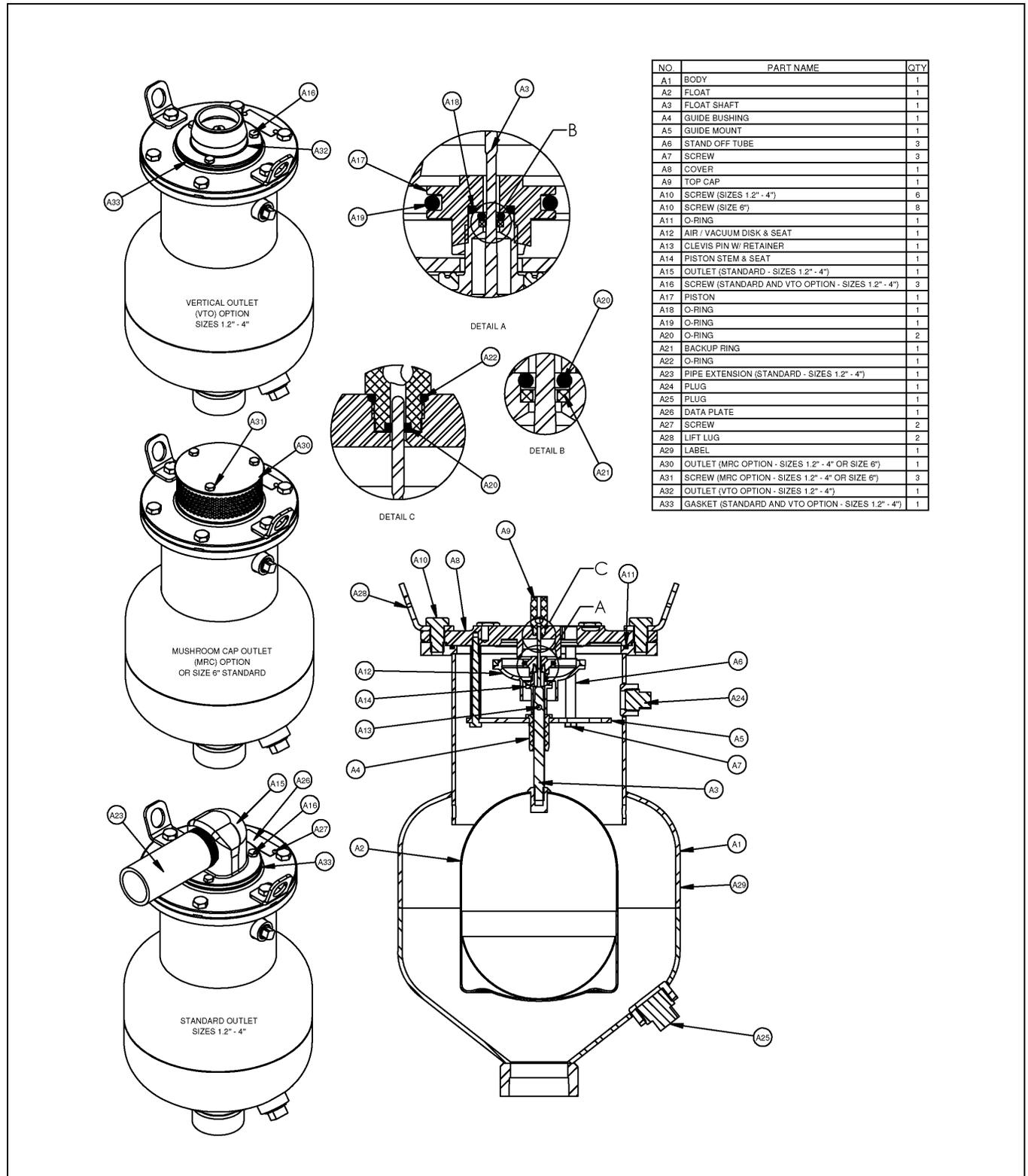
Drawings



**Figure 2: ASU-SCAV Part Identification (Exploded View)**

**APCO ASU Single Body Combination Air Valves**

**Drawings (Continued)**



**Figure 3: ASU-SCAV Part Identification**

Drawings (Continued)

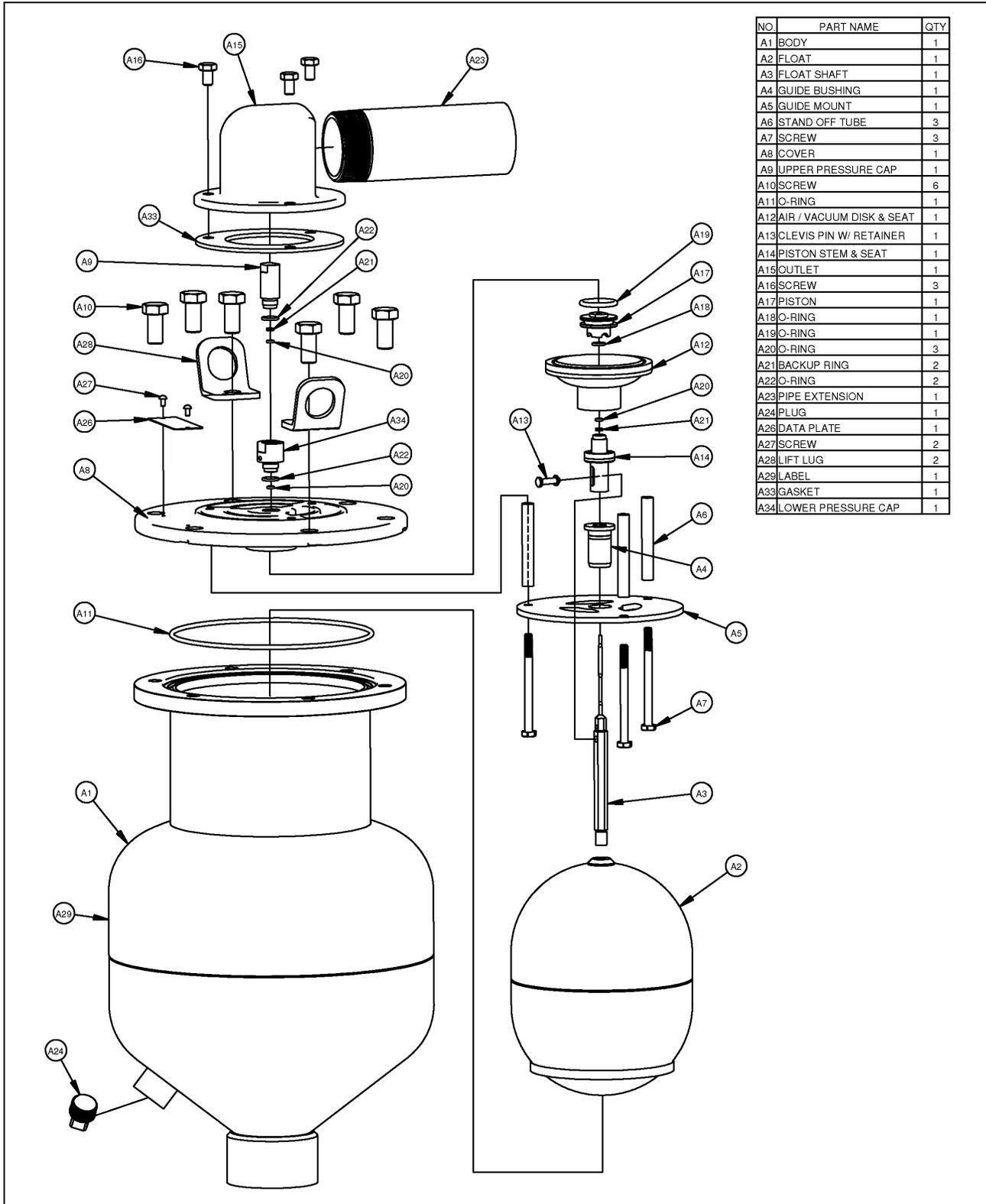
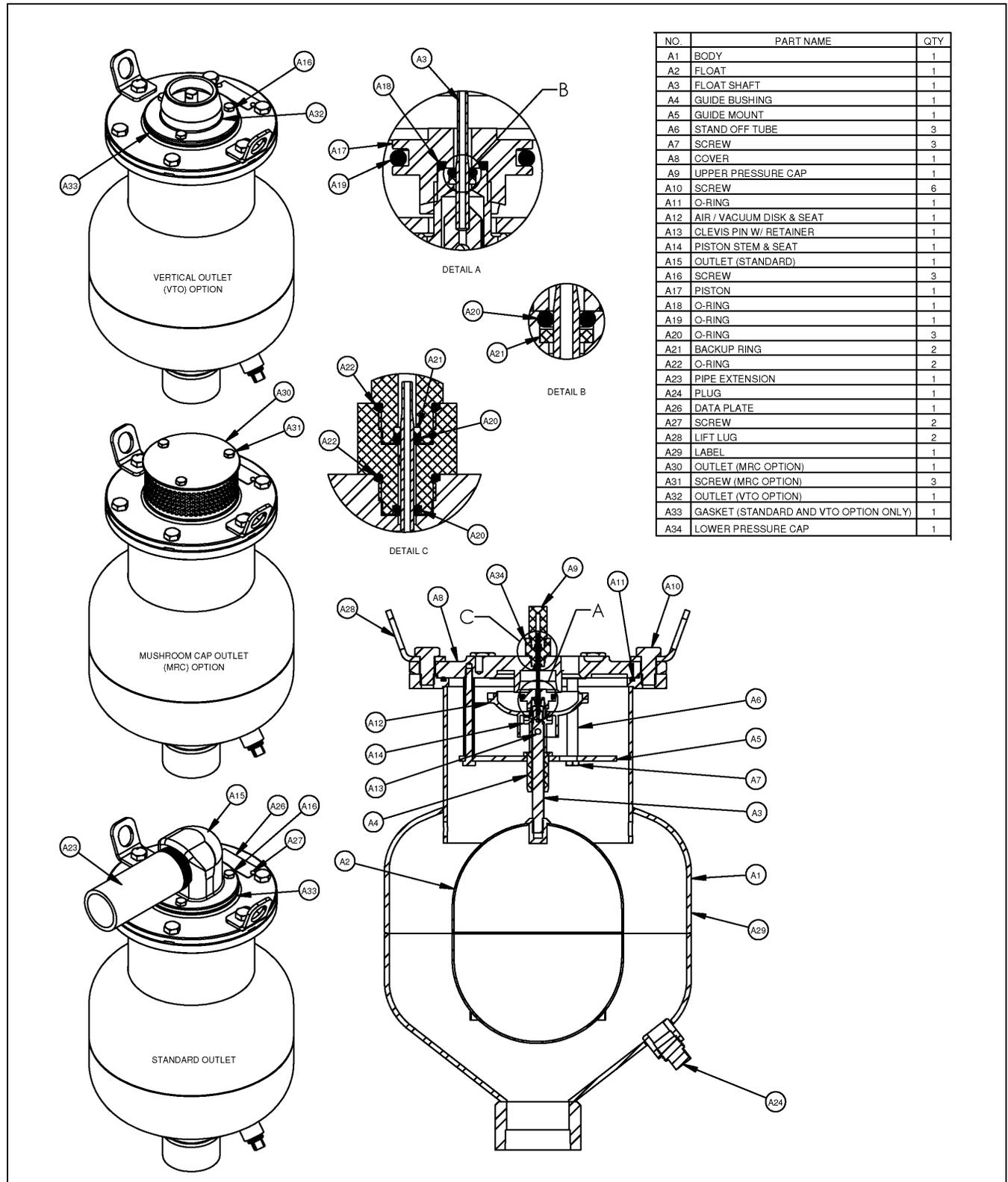


Figure 4: ASU-CAV Combination Air Valve Part Identification (Exploded View)

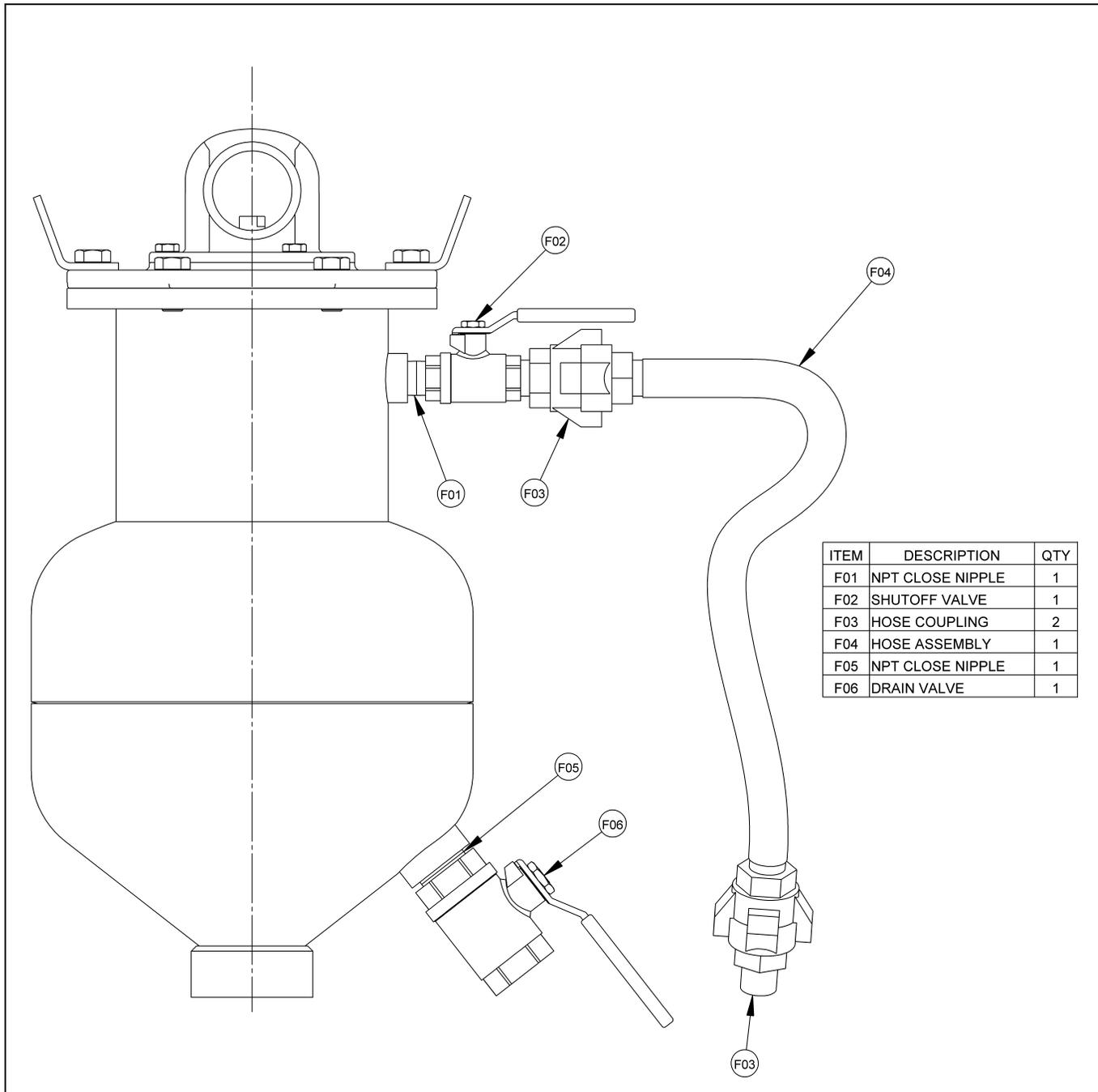
**APCO ASU Single Body Combination Air Valves**

**Drawings (Continued)**



**Figure 5: ASU-CAV Combination Air Valve Part Identification**

**Drawings (Continued)**



**Figure 6: ASU-SCAV with Optional Backflush Attachment Parts Identification**

**APCO ASU Single Body Combination Air Valves**

## Troubleshooting

Condition	Possible Cause	Corrective Action
Valve leaks out of Outlet port.	Dirty disc and/or piston stem seal.	Backflush valve. Open for inspection if needed. Additional cleaning may be required.
	Float shaft is dirty or damaged.	Clean float shaft. Replace if damaged.
	Worn valve O-rings.	Rebuild valve with O-ring kit.
	Worn disc seal or piston stem seal.	Rebuild valve with new disc, piston stem and O-ring Kit.
Valve does not perform air release function.	Valve is full of debris.	Backflush valve or open for cleaning.
	Worn valve O-rings.	Rebuild valve with O-ring kit.
	Disc or float is stuck up in the up position	Check for debris and clean valve.

## Limited Warranty

DeZURIK, Inc. ("Seller") manufactured products, auxiliaries and parts thereof that we manufacture for a period of twenty-four (24) months from date of shipment from Seller's factory, are warranted to the original purchaser only against defective workmanship and material, but only if properly stored, installed, operated, and serviced in accordance with Seller's recommendations and instructions.

For items proven to be defective within the warranty period, your exclusive remedy under this limited warranty is repair or replacement of the defective item, at Seller's option, FCA Incoterms 2020 Seller's facility with removal, transportation, and installation at your cost.

Products or parts manufactured by others but furnished by Seller are not covered by this limited warranty. Seller may provide repair or replacement for other's products or parts only to the extent provided in and honored by the original manufacturer's warranty to Seller, in each case subject to the limitations contained in the original manufacturer's warranty.

No claim for transportation, labor, or special or consequential damages or any other loss, cost or damage is being provided in this limited warranty. You shall be solely responsible for determining suitability for use and in no event shall Seller be liable in this respect.

This limited warranty does not warrant that any Seller product or part is resistant to corrosion, erosion, abrasion or other sources of failure, nor does Seller warrant a minimum length of service.

Your failure to give written notice to us of any alleged defect under this warranty within twenty (20) days of its discovery, or attempts by someone other than Seller or its authorized representatives to remedy the alleged defects therein, or failure to return product or parts for repair or replacement as herein provided, or failure to store, install, or operate said products and parts according to the recommendations and instructions furnished by Seller shall be a waiver by you of all rights under this limited warranty.

This limited warranty is voided by any misuse, modification, abuse or alteration of Seller's product or part, accident, fire, flood or other Act of God, or your failure to pay entire contract price when due.

The foregoing limited warranty shall be null and void if, after shipment from our factory, the item is modified in any way or a component of another manufacturer, such as but not limited to; an actuator is attached to the item by anyone other than a Seller factory authorized service personnel.

All orders accepted shall be deemed accepted subject to this limited warranty, which shall be exclusive of any other or previous warranty, and this shall be the only effective guarantee or warranty binding on Seller, despite anything to the contrary contained in the purchase order or represented by any agent or employee of Seller in writing or otherwise, notwithstanding, including but not limited to implied warranties.

THE FOREGOING REPAIR AND REPLACEMENT LIMITED WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, OBLIGATIONS AND LIABILITIES, INCLUDING, BUT NOT LIMITED TO, ALL WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE OR OF MERCHANTABILITY OR OTHERWISE, EXPRESSED OR IMPLIED IN FACT OR BY LAW, AND STATE SELLER'S ENTIRE AND EXCLUSIVE LIABILITY AND YOUR EXCLUSIVE REMEDY FOR ANY CLAIM IN CONNECTION WITH THE SALE AND FURNISHING OF SERVICES, GOODS OR PARTS, THEIR DESIGN, SUITABILITY FOR USE, INSTALLATION OR OPERATIONS. NEITHER ANY PERFORMANCE OR OTHER CONDUCT, NOR ANY ORAL OR WRITTEN INFORMATION, STATEMENT, OR ADVICE PREPARED BY SELLER OR ANY OF OUR EMPLOYEES OR AGENTS WILL CREATE A WARRANTY, OR IN ANY WAY INCREASE THE SCOPE OR DURATION OF THE LIMITED WARRANTY.

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## Sales and Service

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

Web site: [www.dezurik.com](http://www.dezurik.com) E-Mail: [info@dezurik.com](mailto:info@dezurik.com)



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*Design features, materials of construction and dimensional data, as described in this manual, are provided for your information only and should not be relied upon unless confirmed in writing by DeZURIK, Inc. Certified drawings are available upon request.*