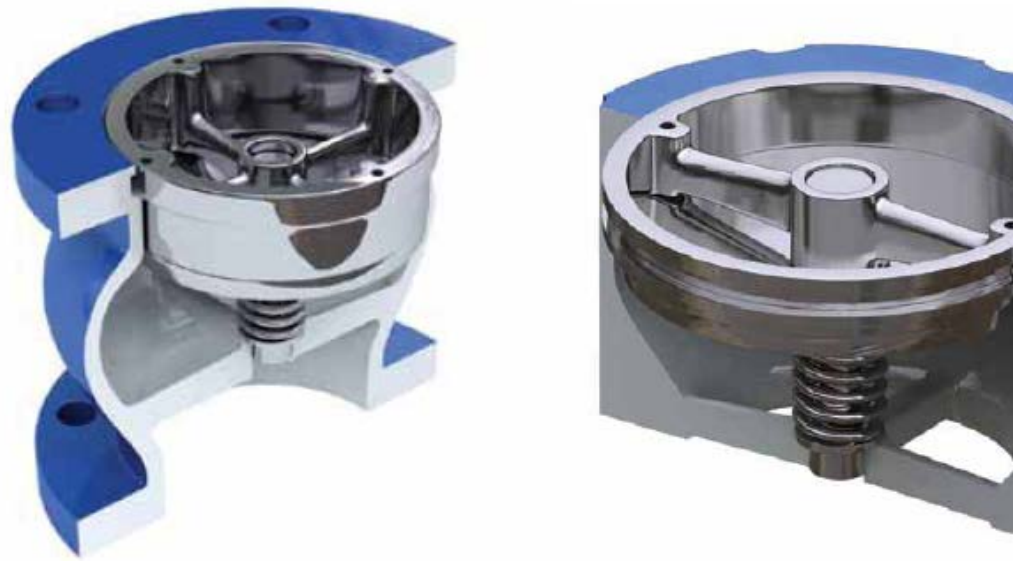


# APCO CSC-300A WAFER & CSC-600A GLOBE STYLE SILENT CHECK VALVES



Instruction D12045  
July 2019

## 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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## **APCO CSC-300A Wafer & CSC-600A Globe Style Silent Check Valves**

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### Description

A silent check valve consists of a valve body, seat, plug, spring, and bushing. The center guided, spring-loaded valve plug moves away from the valve-seat to allow flow in the forward direction. The plug designed to open at approximately ¼ to ½ psi (2-3 kPa), which means when a pump is shut down a silent check valve will completely close while there is still positive head on the inlet side of approximately ½ psi (3 kPa). Because of this, reverse flow, which is a major cause of water hammer, is prevented.

### Handling and Storage

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#### **WARNING!**

**DO NOT** fasten lifting devices through the seat (A2) opening in the body or using a tapped hole stem of the plug (A3). Lifting this valve this way is unsafe as the seat retaining screws (A7) and ball (A6) are not designed carry the weight of the valve. Lifting the valve improperly may damage it.

**Lift the valve with slings, chains or cables fastened around the valve body, or fastened to bolts or rods through bolt holes in the flanges.**

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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 equipment to keep off rain and mud. Skid and set the assembly on a flat, solid, and well drained surface for protection from ground moisture, runoff and pooled rain water.

## APCO CSC-300A Wafer & CSC-600A Globe Style Silent Check Valves

### Installation

The APCO CSC Silent Check Valve may be installed in a horizontal or vertical position (with the flow upward).

- Before installation, remove foreign material such as weld spatter, oil, grease, and dirt from the pipeline.
- A “Full Face” Flange and a “Full Face” flange gasket must be used for the Silent Check Valve installation. The “Full Face” flange is necessary to hold the valve seat firmly during operation. See Table A for maximum flange ID. The “Full Face” flange gasket is necessary to seal any potential leak path between the valve body and valve seat. Flexible couplings should not be used with Silent Check Valves.

**Table A: Mating Flange ID**

Valve Size	Maximum Mating Flange ID	Valve Size	Maximum Mating Flange ID
3" (80mm)	3-3/8" (86mm)	16" (400mm)	16-1/2" (419mm)
4" (100mm)	4-3/4" (121mm)	18" (450mm)	18-3/4" (476mm)
6" (150mm)	6-1/2" (165mm)	20" (500mm)	20-5/8" (524mm)
8" (200mm)	8-1/2" (216mm)	24" (600mm)	24-3/4" (629mm)
10" (250mm)	10-3/4" (273mm)	30" (750mm)	29-1/2" (749mm)
12" (300mm)	12-7/8" (327mm)	36" (900mm)	36" (914mm)
14" (350mm)	14-3/4" (375mm)	42" (1100mm)	42" (1067mm)

- Prepare pipe ends and install valves in accordance with the pipe manufacturer's instructions for the joint used.



#### **CAUTION!**

**Do not deflect the pipe-valve joint. Minimize bending stresses in the valve end connection with pipe loading.**

**If excessive seat leakage occurs during start-up, recheck the installation and eliminate any distortion to the valve body.**

- Ensure the valve and pipeline flanges are concentric to ensure proper flange sealing and seat leakage control.
- Tighten the flange bolts or studs in a crisscross pattern and minimum of four stages.

### Fusion Bonded Epoxy Coated Valves



#### **CAUTION!**

**Valves with fusion bonded epoxy coated exterior paint require flat washers to be installed under the flange nuts when installing the valve to the pipeline flange to prevent the coating from cracking or chipping.**

### Maintenance

It is suggested that these valves, which do not require routine scheduled maintenance, be included as part of the normal facility equipment inspections for any malfunction while under normal usage conditions.

### ***Disassembly Procedure***

For part identification, see Figures 1A or 1B for CSC-300A wafer style valves and Figures 2A or 2B for CSC-600A globe style valves.



#### **WARNING!**

**These valves may open or close without warning due to flow changes from pumps starting and stopping. Servicing these valves while the pipeline is under pressure can cause personal injury or equipment damage.**

**Relieve pipeline pressure and lockout the pumps before servicing the valve.**

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1. Relieve the pressure in the pipeline.
2. Remove valve from line.
3. Lay valve down with inlet face upward.
4. Remove the seat
  - a. **For valve sizes 1-2.5" (25-65 mm) with threaded seat:**

Unthread seat (A2) from body (A1). The body may need to be secured to be able to break the seat loose.
  - b. **For valve sizes 3-30" (80-750 mm):**

Using a 1/8" hex wrench/key, remove seat retaining screws (A7) which hold seat retaining ball (A6) in place. Rapidly push down and release plug (A3) a few times to shake loose seat retaining ball from ball groove and knock out seat (A2).
  - c. **For 36-42" valves (900-1100 mm):**

36-42" (900-1100 mm) valves do not have a seat retaining ball, simply remove the 4 socket head cap screws holding in the seat.
5. Remove plug (A3), spring (A4), and bushing (A5) from body (A1).
6. For 30-42" (750-1100 mm) valves, the plug's seating surface is a bolted on ring that can be replaced. To remove plug ring, remove the retaining screws (A14) holding the plug ring (A12) and seal (A13) in place.

### ***Assembly Procedure***

1. With the inlet facing upwards, install the bushing (A5), spring (A4), and plug (A3) into body (A1).
2. Install the seat
  - a. **For valve sizes 1-2.5" (25-65 mm) with threaded seat:**

Ensure threads on body (A1) and seat (A2) are clean and free of debris. Thread seat (A2) into body (A1).

b. **For valve sizes 3-30" (80-750 mm):**

Install seat retaining balls (A6) into the outside diameter of the seat (A2). Hold the seat (A2) down flush with the flange face and install seat retaining screws (A7).

c. **For 36-42" (900-1100 mm) valves:**

Install seat (A2) into the body and install the 4 seat retaining screws (A7).

3. With seat (A2) securely held in place, install valve in line making sure the flow arrow on the body is pointing in the direction of flow.

**Note:** Full face gasket on the inlet side of the valve (seat side) must be used to completely cover the gap between the seat and the body to provide a leak-free and pressure tight joint.

### ***Installing or Replacing the Resilient Seat O-Ring***

Removing the o-ring from the groove is very difficult to do without damaging the o-ring. Do not remove the o-ring unless you need to replace it and have a new one on hand to install.

Installing the o-ring is easiest when it is done in two stages, first by hand, then rolling a round tool to press the o-ring completely into the groove.

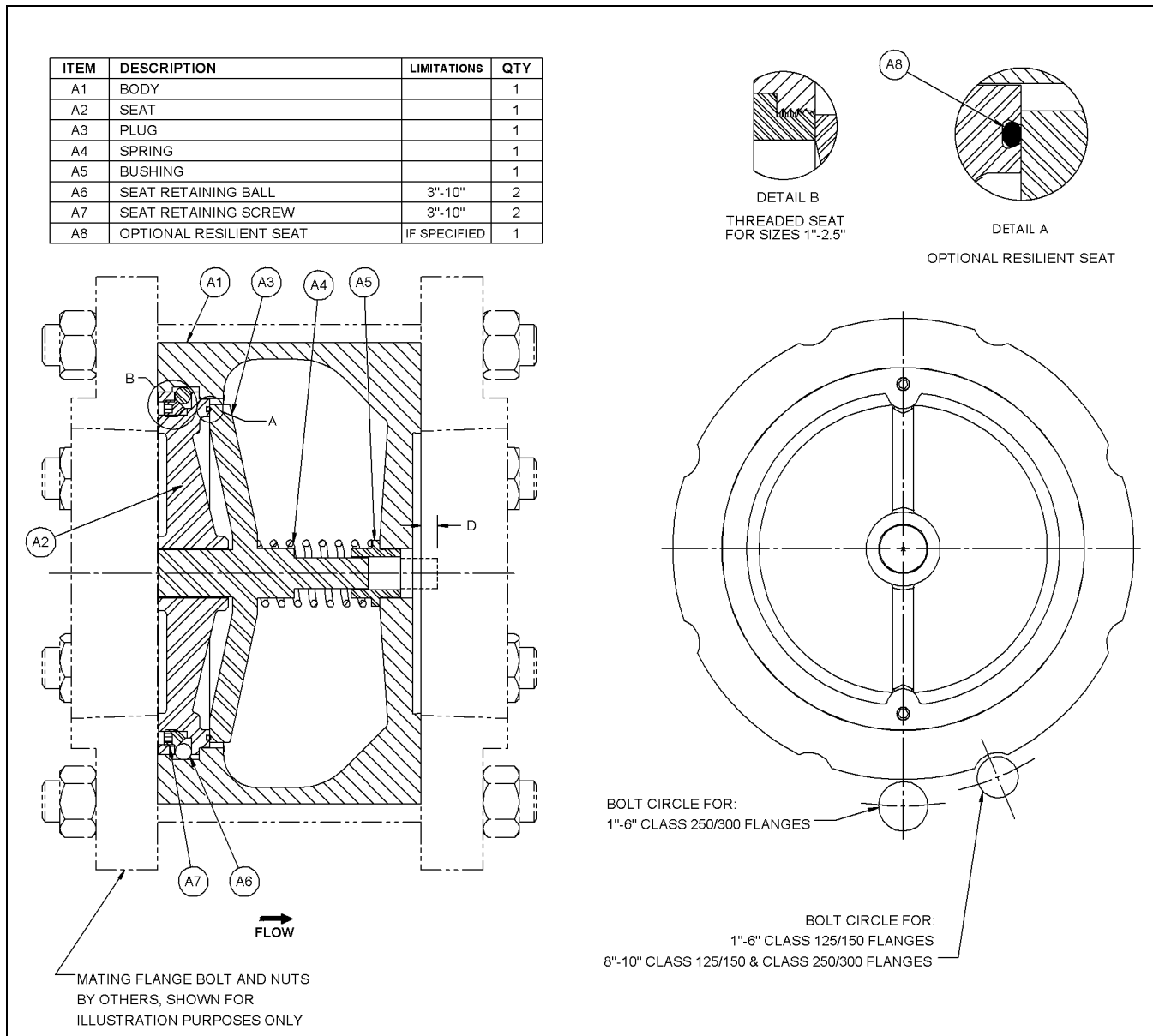
1. Ensure the o-ring groove is free of debris and place the o-ring over the groove.
2. Press the o-ring into groove by hand making an effort not to stretch the o-ring.

## **Operation**

A silent check valve consists of a valve body, seat, plug, spring, and bushing. The center guided, spring loaded valve plug moves away from the valve-seat to allow flow in the forward direction. The plug designed to open at approximately  $\frac{1}{4}$  to  $\frac{1}{2}$  psi (2-3 kPa), which means when a pump is shut down a silent check valve will completely close while there is still positive head on the inlet side of approximately  $\frac{1}{2}$  psi (3 kPa). Because of this, reverse flow, which is a major cause of water hammer, is prevented.

**APCO CSC-300A Wafer & CSC-600A Globe Style  
Silent Check Valves**

Drawings

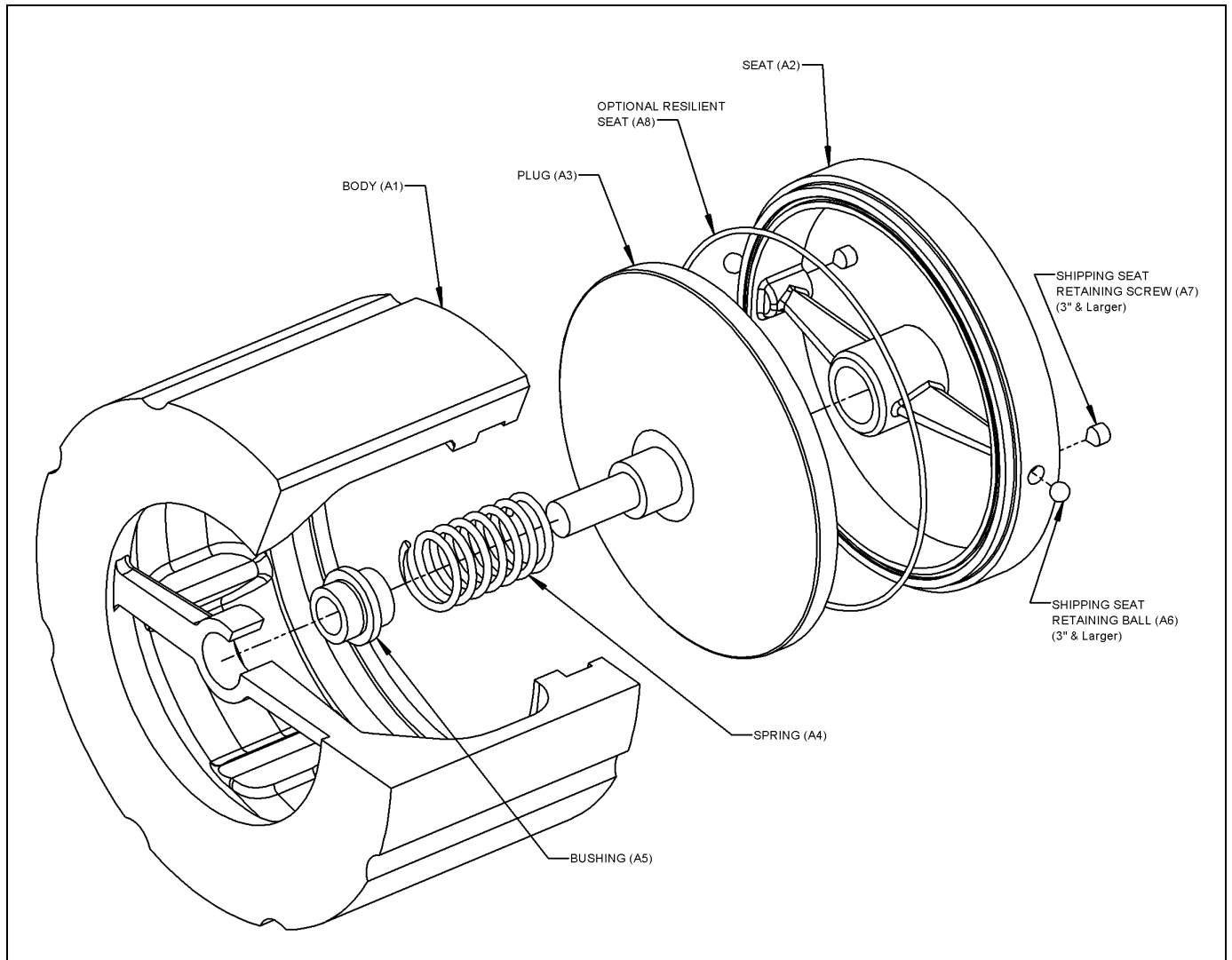


**Figure 1A – CSC-300A Wafer Style Silent Check Valve (2D Cross Section)**



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**APCO CSC-300A Wafer & CSC-600A Globe Style  
Silent Check Valves**

**Drawings** *(Continued)*

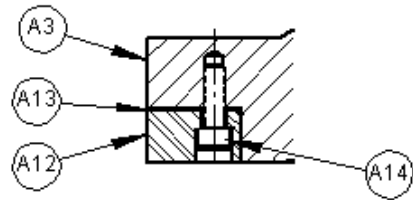


**Figure 1B – CSC-300A Globe Style Silent Check Valve (Exploded View, 3" & Larger)**

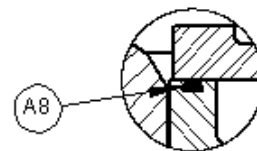
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## APCO CSC-300A Wafer & CSC-600A Globe Style Silent Check Valves

ITEM NO.	DESCRIPTION	LIMITATIONS	QTY.
A1	BODY		1
A2	SEAT		1
A3	PLUG		1
A4	SPRING		1
A5	BUSHING		1
A6	SEAT RETAINING BALL	3-30"	2
A7	SEAT RETAINING SCREW	3-30"	2
		36-42"	4
A8	OPTIONAL RESILIENT SEAT	IF SPECIFIED	1
A12	PLUG RING	30-42"	1
A13	PLUG RING SEAL	30-42"	1
A14	PLUG RING RETAINING SCREW	30"	20
		36-42"	36



30-42" PLUG DETAIL  
DUCTILE IRON PLUG (A3) WITH  
STAINLESS STEEL PLUG RING (A12)



DETAIL B

OPTIONAL RESILIENT SEAT

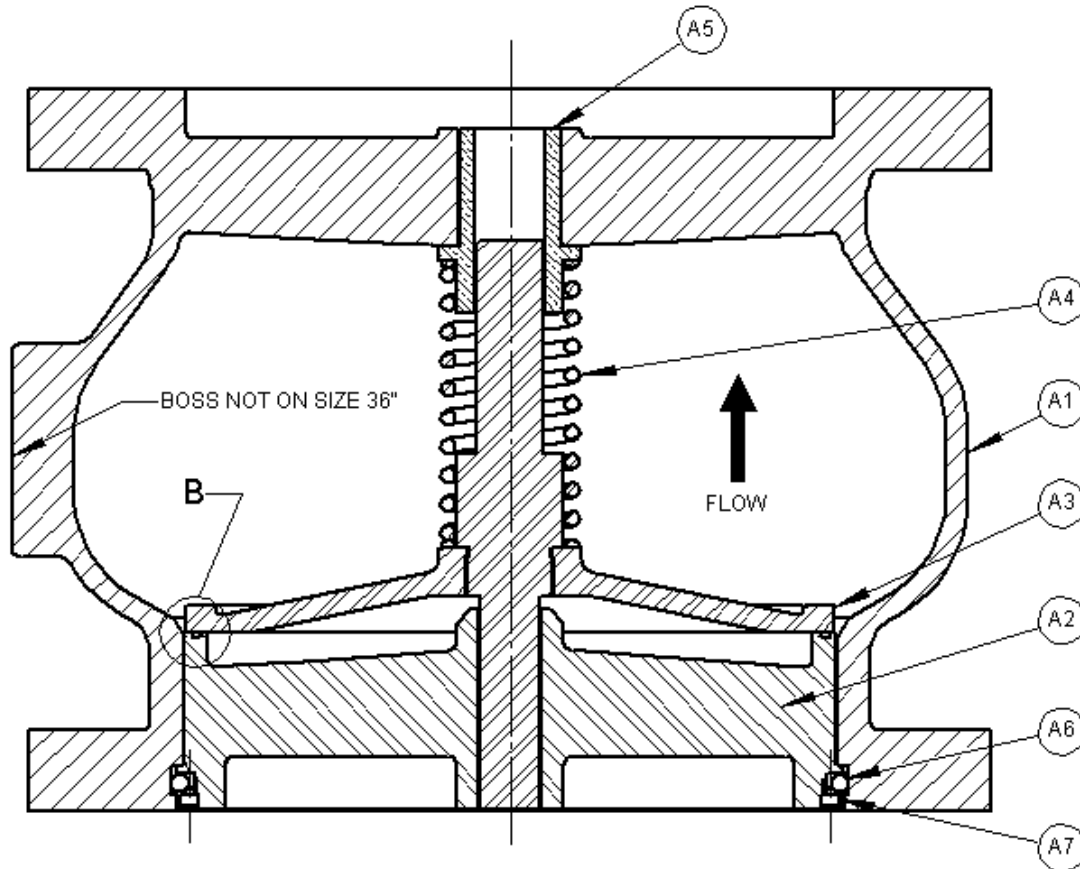
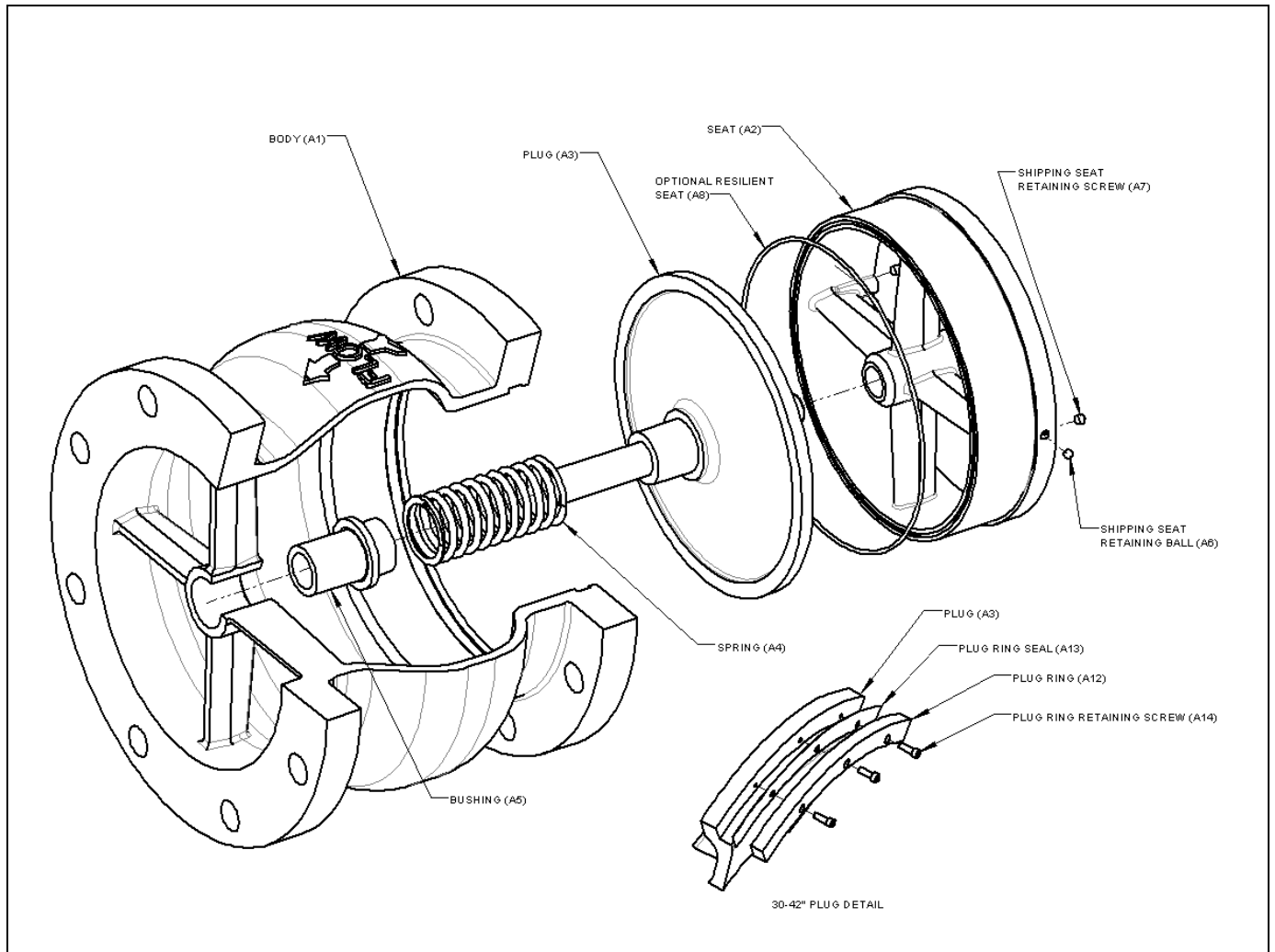


Figure 2A – CSC-600A Globe Style Silent Check Valve (2D Cross Section)

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**APCO CSC-300A Wafer & CSC-600A Globe Style  
Silent Check Valves**



**Figure 2B – CSC-600A Globe Style Silent Check Valve (Exploded View)**

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## **APCO CSC-300A Wafer & CSC-600A Globe Style Silent Check Valves**

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### Troubleshooting

<b>Condition</b>	<b>Possible Cause</b>	<b>Corrective Action</b>
Valve will not close.	Plug stem may be worn and may have come out of the guide.	Replace Plug.
Valve leaks excessively from one side of the disc to the other.	“Full Face” Flange or “Full Face” gasket NOT used.	Install valve using a “Full Face” flange and gasket.
	Foreign matter or mineral deposits may be caught between plug and seat.	Remove foreign matter or deposits.
	Seat is worn or damaged.	Repair or replace seat ring.
Valve won't open.	Improper installation.	Flow arrow on valve body should be pointing in direction of flow.
Valve leaks at flange joint.	Loose flange bolting.	Tighten flange bolting.
	Blown flange gasket.	Replace flange gasket.
	Misalignment or damage to field piping and supports.	Adjust misalignment or repair piping or supports.
	Damaged flange face/s or improper flange connections.	Repair flange, replace valve body or adjust flange connections.

## 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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