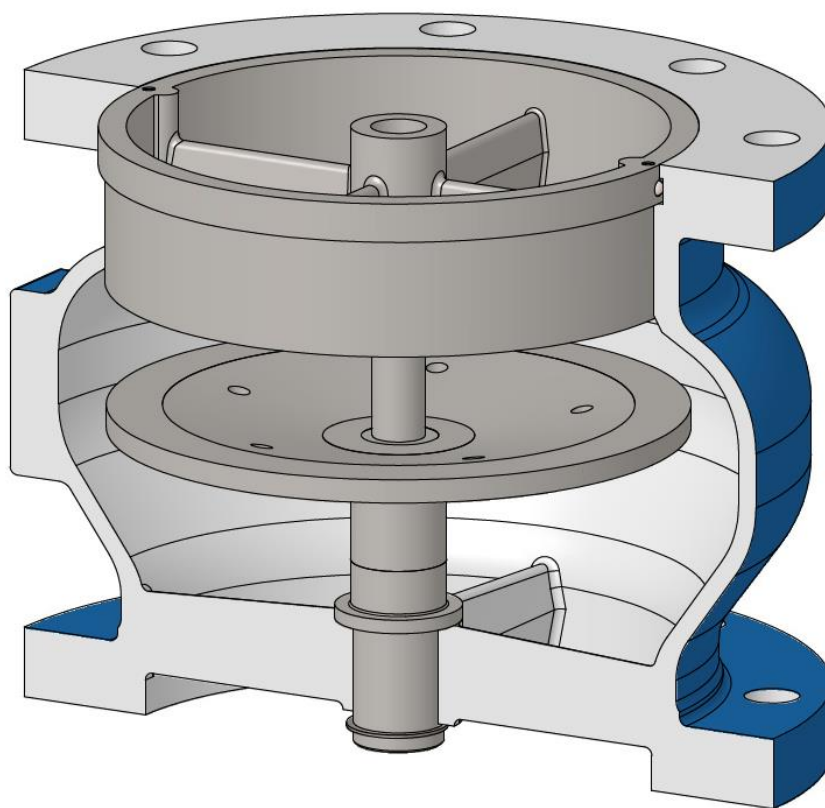


APCO CSV-1600A SURGE CHECK VALVES



Instruction **D12050**
March 2023

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).

⚠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.

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.

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Description

APCO CSV-1600A Surge Check Valve is designed for installation to the inlet of the existing Air/Vacuum Valve on the line. It consists of a body, seat and plug. After air passes through and water rushes into the surge check, the plug starts to close, reducing the rate of flow of water into the air valve by means of throttling orifices in the disc to prevent water hammer in the air valves. If necessary, flow can be controlled in the field by installing NPT plugs into the orifices of the valve plug.

Handling and Storage

Lifting the valve improperly may damage it. Do not fasten lifting devices through the seat opening in the body. 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.

If installation will be delayed, refer to **Form 1454 – Recommended Long & Short-Term Storage Procedures**.

Installation

The Surge Check Valve should always be installed in a vertical position. An isolation valve between this unit and the transmission (pipeline) system is recommended.

- Before installation, remove foreign material such as weld spatter, oil, grease, and dirt from the pipeline.
- Prepare pipe ends and install valves in accordance with the pipe manufacture's instructions for the joint used.

NOTICE

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

- Tighten the flange bolts or studs in a crisscross pattern and minimum of four stages.

Fusion Bonded Epoxy Coated Valves

NOTICE

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

The APCO Surge Check Valve is automatic in operation and requires very little maintenance. It should always be installed in a vertical position.

A semi-annual visual inspection for leakage is recommended. A malfunction of the Surge Check Valve can be identified by a substantial amount of spillage through the exhaust port during pump start-up. Should a malfunction occur, the following steps should be taken to repair the valve:

Disassembly Procedure

See Figures 1 & 2 for part identification.

▲WARNING

Servicing the Surge Check 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 Surge Check Valve.

1. Relieve pipeline pressure or shut off isolation valve before servicing the Surge Check Valve.
2. Remove the Air/Vacuum Valve from the Surge Check Valve.
3. Loosen seat retaining screws (S06).
4. Remove seat (S02). In some cases, it may be necessary to use penetrating oil or rust solvent to loosen the rust that may have formed between the body (S01) and seat (S02). Also, it may be helpful to rotate the seat in the body to break loose the seat retaining ball (S07). Check if the bore through the center of the seat (S02) is worn.
5. Lift and remove plug (S03). Inspect plug assembly (S03) for any bent or worn features.
6. Remove bushing retaining ring (S11) and bushing (S05).
7. Clean all surfaces before re-assembly. Replace all defective parts.

Assembly Procedure

1. Install the parts inside the body (S01) in the following order:
 - a. Bushing (S05) and bushing retaining ring (S11) into the center bore of the body (S01).
 - b. Plug (S03) with the concave side facing upward.
 - c. Seat (S02) and seat retaining ball (S07). Tighten seat retaining screw (S06) when flush with flange face.

Note: When assembled, make sure that both ends of plug stem are completely engaged in their respective guides in both open and closed positions. Plug should freely move when activated.

2. Attach the Air/Vacuum Valve to the Surge Check Valve.
3. If valve was removed from pipeline, place valve in pipeline, and open isolation valve on inlet to Air Valve. Valve is now back in service.

Flow Adjustment

Flow allowed through the closed valve can be adjusted by installing NPT plugs into orifices on the plug (S03).

ASME Class 125/150 valves sized 3-12" (80-300mm):

- Orifices will require tapping prior to installing NPT plugs.
- See *Table 1: Orifice NPT Plug Sizes* for appropriate tap size. Orifices are proper size to receive NPT tap.
- Tap orifice to appropriate size.
- Install NPT plugs in orifices until desirable flow conditions are met.

ASME Class 125/150 valves sized 14-24" (350-600mm) and ASME Class 250/300 valves sized 3-24" (80-600mm):

- Supplied from the factory with threaded orifices.
- See *Table 1: Orifice NPT Plug Sizes* for appropriate NPT plug size.
- Install NPT plugs in orifices until desirable flow conditions are met.

Valve Size (in/mm)	Orifice NPT Plug Size	
	ASME Class 125/150	ASME Class 250/300
$\frac{3}{80}$	* 1/8" NPT	1/8" NPT
$\frac{4}{100}$	* 1/8" NPT	1/8" NPT
$\frac{6}{150}$	* 1/8" NPT	1/8" NPT
$\frac{8}{200}$	* 1/8" NPT	1/8" NPT
$\frac{10}{250}$	* 1/8" NPT	1/8" NPT
$\frac{12}{300}$	* 1/4" NPT	1/4" NPT
$\frac{14}{350}$	1/4" NPT	1/4" NPT
$\frac{16}{400}$	1/4" NPT	1/4" NPT
$\frac{18}{450}$	3/8" NPT	3/8" NPT
*ASME Class 125/150 sizes 3-12" (80-300mm) valves will need to be tapped prior to NPT plug installation.		

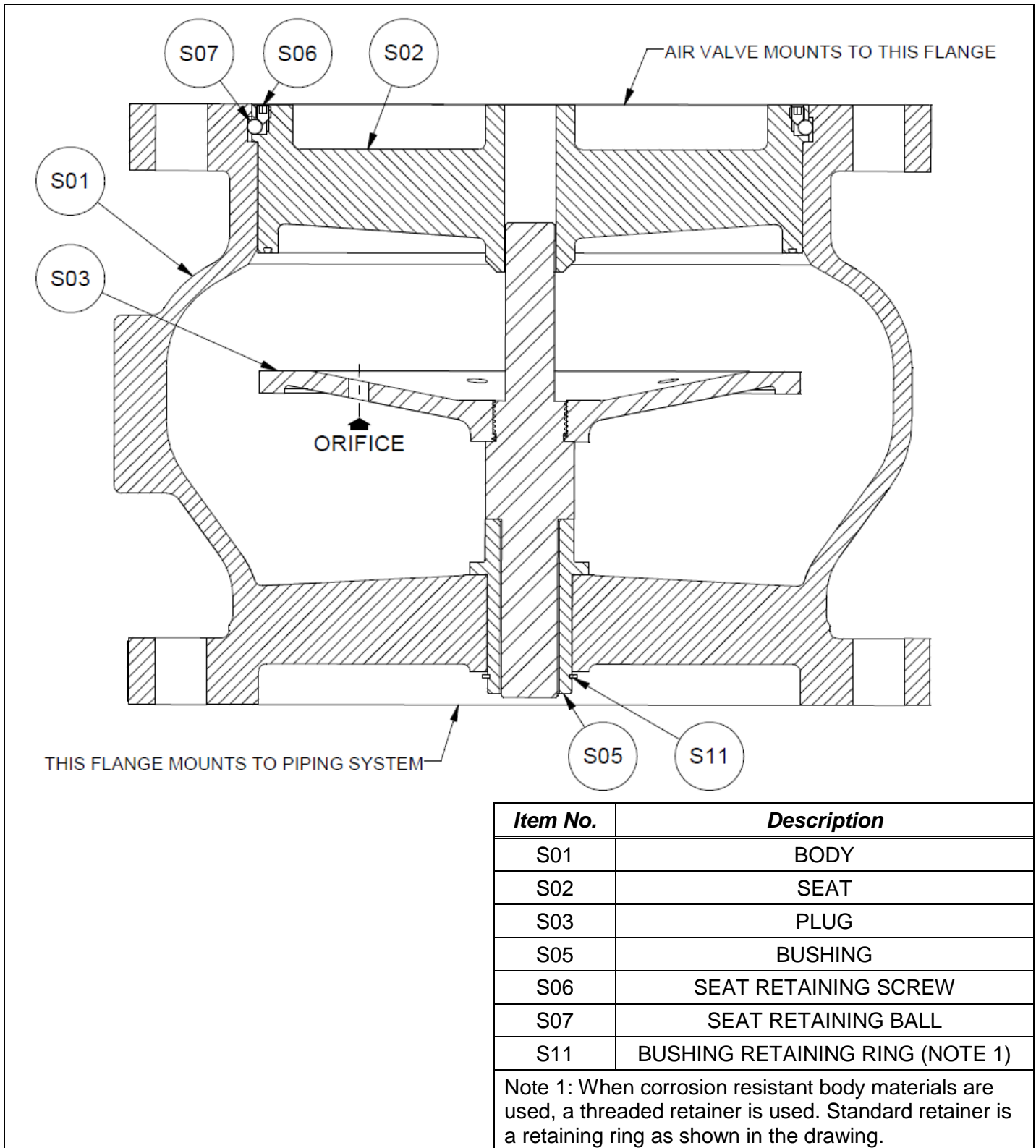
Table 1: Orifice NPT Plug Sizes

Operation

The Surge Check Valve is a normally open valve that air passes through unrestricted. When water rushes into the Surge Check unit, the disc begins to close against the seat and reduces the rate of flow of water into the air valve by means of throttling holes in the disc. This ensures normal gentle closing of the Air/Vacuum Valve regardless of the initial velocity flows involved and minimizes pressure surges when the valve closes.

As soon as the Air/Vacuum Valve is closed, the pressure on both sides of the Surge Check Valve disc equalizes and the disc automatically returns to its open position. This means the Air/Vacuum Valve does not need an incipient vacuum to open, but can open at any time the water level drops and line pressure approaches atmospheric. This will allow immediate full re-entry flow of air into the pipeline before a vacuum can form.

Drawings



<i>Item No.</i>	<i>Description</i>
S01	BODY
S02	SEAT
S03	PLUG
S05	BUSHING
S06	SEAT RETAINING SCREW
S07	SEAT RETAINING BALL
S11	BUSHING RETAINING RING (NOTE 1)

Note 1: When corrosion resistant body materials are used, a threaded retainer is used. Standard retainer is a retaining ring as shown in the drawing.

Figure 1: CSV-1600A Surge Check Valve

Drawings (Continued)

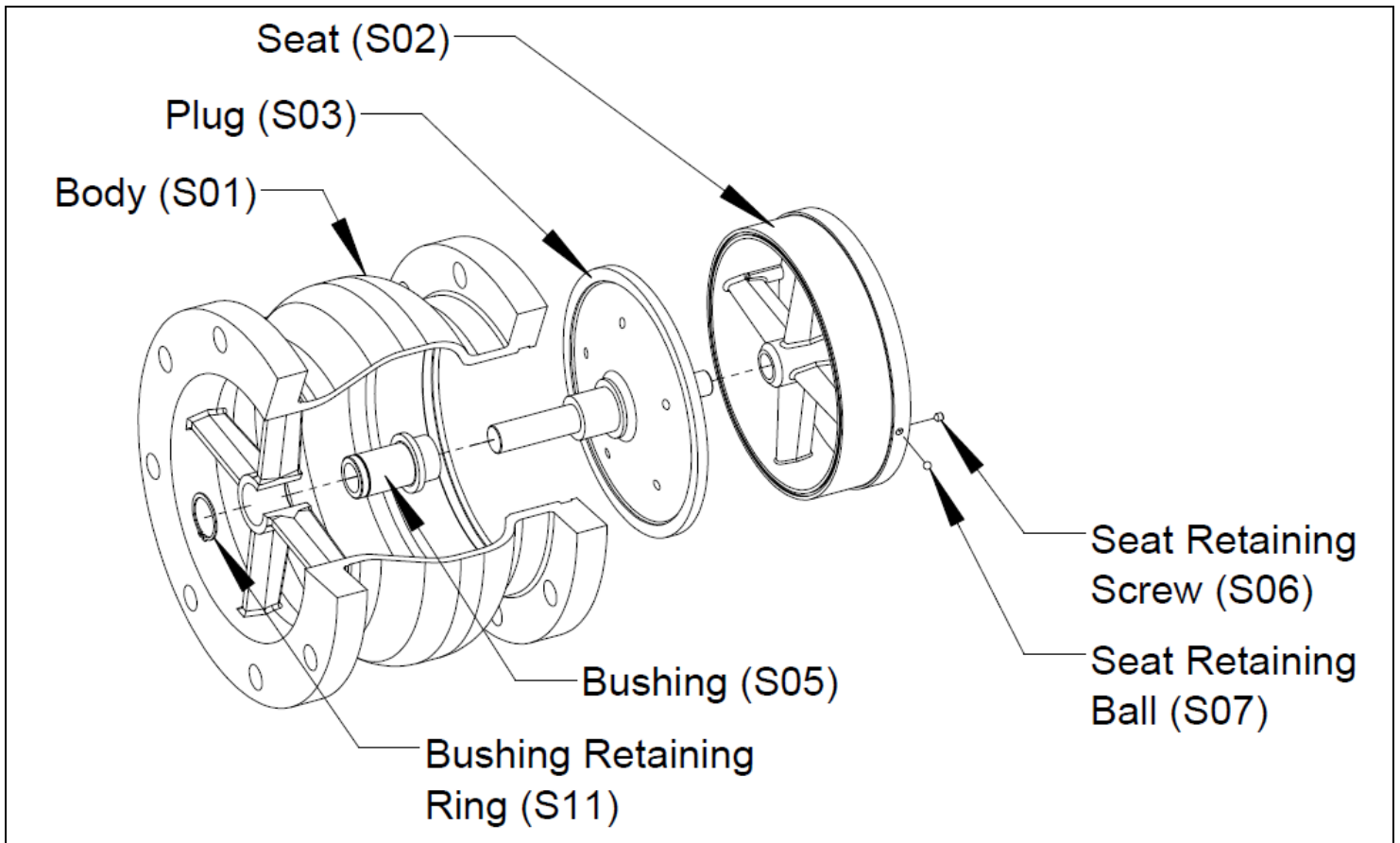


Figure 2: CSV-1600A Surge Check Valve (Exploded View)

Troubleshooting

<i>Condition</i>	<i>Possible Cause</i>	<i>Corrective Action</i>
Valve will not close.	Plug stem may be worn and may have come out of the guide.	Replace Plug.
Valve will not 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.

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Sales and Service

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

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