



**APCO CSV-1600 SURGE  
CHECK VALVE**

Instruction **D12022**  
January 2013

# DeZURIK

## APCO CSV-1600 Surge Check Valves

---

### Instructions

These instructions provide installation, operation and maintenance information for APCO CSV-1600 Surge Check Valves. They are for use by personnel who are responsible for installation, operation and maintenance of APCO CSV-1600 Surge Check Valves.

### Safety Messages

All safety messages in the instructions are flagged with an exclamation symbol and the word Caution, Warning or Danger. These messages indicate procedures that must be followed exactly to avoid equipment damage, personal injury or death. Safety label(s) on the product indicate hazards that can cause equipment damage, personal injury or death.

Safety label(s) on the product indicate hazards that can cause equipment damage, personal 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 APCO CSV-1600 Surge Check Valve has been packaged to provide protection during shipment; however, it 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

Recommended spare parts are listed on the assembly drawing. These parts should be stocked to minimize downtime. Order parts from your local DeZURIK sales representative, or directly from DeZURIK. When ordering parts please choose from the following:

**If the valve has a DeZURIK APCO nameplate** please include the 7-digit part number and 4-digit revision number (example: 9999999R000) located on the data plate 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 nameplate visible on the valve**, please include Valve Model number, the part name, and item number from the assembly drawing. You may contact your local DeZURIK APCO 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 [www.dezurik.com](http://www.dezurik.com).

**Table of Contents**

Description - - - - -	4
Handling and Storage - - - - -	4
Installation - - - - -	4
Fusion/Powder Coated Valves - - - - -	4
Maintenance - - - - -	5
<i>Disassembly Procedure</i> - - - - -	5
<i>Assembly Procedure</i> - - - - -	5
Operation - - - - -	6
Drawings - - - - -	6

# DeZURIK

## APCO CSV-1600 Surge Check Valves

---

### Description

APCO CSV-1600 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, flow-disc and compression spring. The surge check unit will operate on the inter-phase between the kinetic energy and relative velocity flows of air and water. After air passes through and water rushes into the surge check, the disc 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. The surge check orifices are adjustable for regulation in the field to suit operating conditions.

### 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, 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 assembly on a flat, solid, and well drained surface for protection from ground moisture, runoff and pooled rain water.

### 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.



**CAUTION!**

**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/Powder Coated Valves

---



**CAUTION!**

**Valves with fusion/powder coated exterior paint require flat washers to be installed under the flange nuts when installing the valve to the pipeline flange to prevent the paint 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 Figure 1 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 (7).
4. Remove seat (2) by slamming plug (3) against the seat to jar it loose. 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 and seat. Also, it may be helpful to turn the seat against the body to allow the seat retaining ball (6) to fall out of the groove. Check if center guide boss is worn out.
5. Lift plug (3) and spring (4). Check for bent or worn out stem.
6. Remove retaining ring (5B) and bushing (5A).
7. Clean all surfaces before re-assembly. Replace all defective parts.

### ***Assembly Procedure***

1. Install the parts inside the body (1) in the following order:
  - a. Bushing (5A) and retaining ring (5B) at the center of the hub.
  - b. Spring (4) centering on the bushing (5A).

**Note:** If conical spring, smaller diameter of spring should fit the outside diameter of bushing.

- c. Plug (3) with the concave side facing upward.
- d. Seat (2) and seat retaining ball (6). Tighten seat retaining screw (7) 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.

# DeZURIK

## APCO CSV-1600 Surge Check Valves

### Operation

The Surge Check Unit operates on the interphase between the kinetic energy in the relative velocity flows of air and water. The Surge Check is a normally open valve, spring loaded, so that air passes through unrestricted. When water rushes into the Surge Check unit, the disc begins to close against the spring tension 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 and immediately have full re-entry flow of air into the pipeline before a vacuum can form.

### Drawings

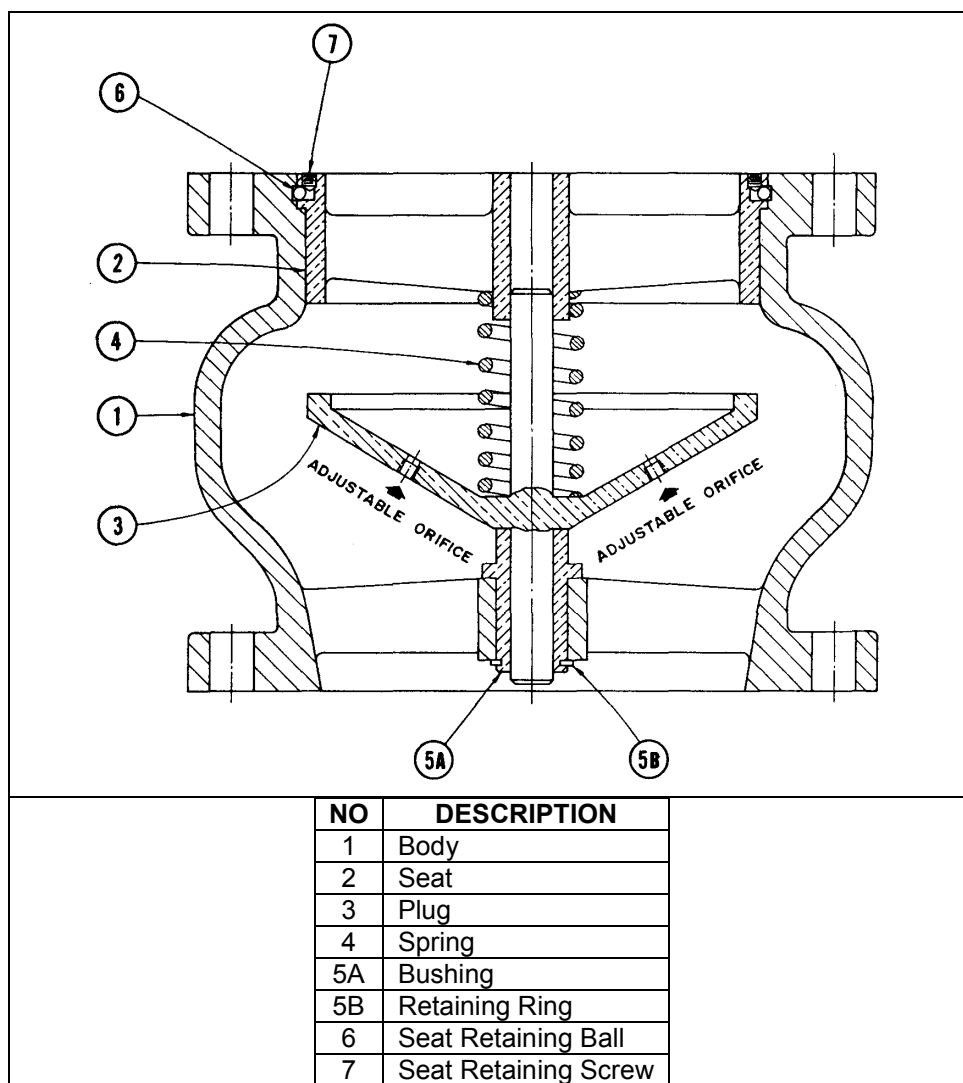


Figure 1: CSV-1600 Surge Check Valve

## Guarantee

Products, auxiliaries and parts thereof of DeZURIK, Inc. manufacture are warranted to the original purchaser for a period of twenty-four (24) months from date of shipment from factory, against defective workmanship and material, but only if properly installed, operated and serviced in accordance with DeZURIK, Inc. recommendations. Repair or replacement, at our option, for items of DeZURIK, Inc. manufacture will be made free of charge, (FOB) our facility with removal, transportation and installation at your cost, if proved to be defective within such time, and this is your sole remedy with respect to such products. Equipment or parts manufactured by others but furnished by DeZURIK, Inc. will be repaired or replaced, but only to the extent provided in and honored by the original manufacturers warranty to DeZURIK, Inc., in each case subject to the limitations contained therein. No claim for transportation, labor or special or consequential damages or any other loss, cost or damage shall be allowed. You shall be solely responsible for determining suitability for use and in no event shall DeZURIK, Inc. be liable in this respect. DeZURIK, Inc. does not guarantee resistance to corrosion, erosion, abrasion or other sources of failure, nor does DeZURIK, Inc. guarantee 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 DeZURIK, Inc. 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 install and operate said products and parts according to instructions furnished by DeZURIK, Inc., or misuse, modification, abuse or alteration of such product, accident, fire, flood or other Act of God, or failure to pay entire contract price when due shall be a waiver by you of all rights under this warranty.

The foregoing guarantee 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 DeZURIK, Inc. Factory 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 DeZURIK, Inc., despite anything to the contrary contained in the purchase order or represented by any agent or employee of DeZURIK, Inc., in writing or otherwise, notwithstanding, including but not limited to implied warranties.

Metric fasteners should not be used with ASME Class 150/300 bolt holes and flange bolt patterns. If you use metric fasteners with ASME Class 150/300 bolt holes and flange bolt patterns, it may lead to product failure, injury, and loss of life. DeZURIK Inc. disclaims all liability associated with the use of metric fasteners with ASME Class 150/300 bolt holes and flange patterns, including but not limited to personal injury, loss of life, loss of product, production time, equipment, property damage, lost profits, consequential damages of any kind and environment damage and/or cleanup. Use of metric fasteners with ASME Class 150/300 bolt holes and flange bolt patterns is a misuse that voids all warranties and contractual assurances. If you use metric fasteners with ASME Class 150/300 bolt holes and flange bolt patterns, you do so at your sole risk and any liability associated with such use shall not be the responsibility of DeZURIK, Inc. In addition to the foregoing, DeZURIK's Manufacturer's Conditions apply.

THE FOREGOING REPAIR AND REPLACEMENT OBLIGATIONS ARE IN LIEU OF ALL OTHER WARRANTIES, OBLIGATIONS AND LIABILITIES, INCLUDING ALL WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE OR OF MERCHANTABILITY OR OTHERWISE, EXPRESSED OR IMPLIED IN FACT OR BY LAW, AND STATE DEZURIK, INC.'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.

## Limitation of liability

LIMITATION OF LIABILITY: IN NO EVENT SHALL DEZURIK, INC. BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES WHATSOEVER, AND DEZURIK, INC.'S LIABILITY, UNDER NO CIRCUMSTANCES, WILL EXCEED THE CONTRACT PRICE FOR THE GOODS AND/OR SERVICES FOR WHICH LIABILITY IS CLAIMED. ANY ACTION BY YOU FOR BREACH OF CONTRACT MUST BE COMMENCED WITHIN 12 MONTHS AFTER THE DATE OF SALE.

## 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)



250 Riverside Ave. N., Sartell, MN 56377 • Phone: 320-259-2000 • Fax: 320-259-2227

*DeZURIK, Inc. reserves the right to incorporate our latest design and material changes without notice or obligation. 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.*