



# APCO SRA-3000 SURGE RELIEF ANGLE VALVES

Instruction D12037  
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# DeZURIK

## APCO SRA-3000 Surge Relief Angle Valves

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### Instructions

These instructions provide installation, operation and maintenance information for APCO SRA-3000 Surge Relief Angle Valves. They are for use by personnel who are responsible for installation, operation and maintenance of APCO SRA-3000 Surge Relief Angle 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.**

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### Inspection

Your APCO SRA-3000 Surge Relief Angle 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).

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## APCO SRA-3000 Surge Relief Angle Valves

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### Description

The APCO SRA-3000 Angle Surge Relief Valve is designed to protect pipelines against excessive overpressures. It is basically spring loaded “pop-off” type valve which will open quickly when system pressure exceeds setting of springs and will close slowly at an adjustable rate when system pressure returns to normal.

The APCO SRA-3000 Angle Surge Relief Valve is held closed against normal line pressure by means of the externally mounted spring(s), which are preset at the factory to crack open approximately 5% above relief pressure specified by the customer.

The APCO SRA-3000 Angle Surge Relief Valve is also provided with a Flow Control Valve (35) and an Oil Reservoir (20) to control the rate of closure of the valve. The rate of closure may be adjusted in the field to suit the particular hydraulic conditions of the system to reduce potential back pressure surge and water hammer.

### Handling and Storage

Lifting the valve improperly may damage it. Do not fasten lifting devices to the cylinder or 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 SRA-3000 Angle Surge Relief Valve may be installed in any position with the oil reservoir always mounted vertically. The discharge can be piped back to the wet well or to the atmosphere.
- 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.
- Tighten the flange bolts or studs in a crisscross pattern and minimum of four stages.

### Fusion/Powder Coated Valves

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#### **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.**

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## Maintenance

Through the course of operation, the dashpot piping must be checked for leaks. The oil level in the Oil Reservoir should always be up to the oil fill port (street elbow).

The SRA-3000 Angle Surge Relief Valve is also provided with a drain plug located at the back side of the valve body for draining purposes or checking any leaks through the valve seat. It will be necessary to open the drain plug from time to time to drain any water that might have accumulated.

Recommended Oils: Exxon SAE 20, Mobil DTE 24, Castrol Hyspin 32.

### ***Disassembly Procedure***

See Figure 2 for part identification.



#### **WARNING!**

**Servicing the Surge Relief 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 Relief Valve.**

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1. Relieve pipeline pressure or shut off isolation valve at inlet to Surge Relief Valve.
2. Unscrew air breather cap (19) and replace it with a pipe plug to prevent oil from spilling out of oil reservoir (20) during disassembly procedure.
3. Disconnect spring (24), cylinder (33) and cover-spacer (2) assemblies from stem (11) by removing cover-spacer screws (27) from body (1) and unscrewing coupler (21) from stem (11).
4. With the coupler (21) unscrewed from the stem (11), slide the spring (24), cylinder (33) and cover-spacer (2) assemblies off the body (1) and stem (11).
5. Lift the stem (11) and disc (10) assembly out of the body (1) and unscrew disc retaining screw (12) and disconnect disc from stem.
6. Unscrew bushing retaining screws (9) and remove bushing retaining ring (8).
7. Remove bushing (4) by pushing it out from the top of cover (2).
8. Remove body seat ring (5) by unscrewing body seat retaining screws (30).
9. Evenly pry body seat ring (5) out of body (1).
10. Remove disc seat (6) and disc seat retaining ring (31) by unscrewing all disc seat ring screws (32).

### **Maintenance** *(continued)*

#### **Assembly Procedure**

See Figure 2 for part identification.

1. Install body seat ring (5) with body seat seal (14) in its groove evenly inside the counterbore of the body until it bottoms out. Replace seal as necessary.
2. Screw and tighten the body seat retaining screws (30).
3. Install bushing (4) with seals (26) in cover-spacer (2) until it bottoms out. Replace seals as necessary.
4. Install bushing retaining ring (8) and fasten with bushing retaining screws (9).
5. Install disc seal (7) in groove of stem (11). Replace seal as necessary.
6. Install disc (10) to stem (11) and fasten with disc screw washer (13) and disc retaining screw (12).
7. Attach disc seat (6) and disc seat retaining ring (31) to disc (10) and fasten with disc seat ring screws (32).
8. Place stem (11) and disc (10) assembly in body (1).
9. Replace cover seal (3) in groove of body (1). Replace seal as necessary.
10. Slide the spring (24), cylinder (33) and cover-spacer (2) assemblies onto the stem (11) and body (1).
11. Connect stem (11) to coupler (21) and secure cover-spacer (2) to body (1) with cover-spacer screws (27).
12. Unscrew pipe plug from oil reservoir (20) and replace air breather cap (19).
13. Open isolation valve on inlet to Air Valve. Valve is now back in service.

### **Operation**

Helical compression spring (24) holds the disc (10) closed. When the system pressure rises above the set pressure on the spring, disc moves freely open, raising the piston inside the cylinder (33), allowing oil from the reservoir (20), to enter below the piston. As the system pressure drops below the surge valve setting, disc starts controlled closing, pushing the cylinder piston downward, and forcing oil from the bottom of the cylinder. When disc closes, it does so at a slow controlled rate regulated by the flow control valve. (Restrict the control valve for slower closing, open for faster closing).

## Start-up Procedure



### **WARNING!**

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

**Workers must be cautious when working around these valves.**

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

1. Check oil level in the Oil Reservoir by removing the pipe plug on top of the street elbow located on the side. Oil level should be flush with the elbow otherwise, follow 'Oil Filling Procedure". Oil reservoir should always be mounted vertically regardless of valve installation position.
2. Turn Flow Control Valve three (3) complete turns counterclockwise from fully closed position. The control arrow should be pointing away from the cylinder. See "Adjustment of Flow Control Valve".
3. Start pump.
4. Check for leaks on the valve body seat by removing the drain plug from the back of the valve body. If leak exists, tighten springs simultaneously until leak stops.

## Spring Adjustment

Spring is adjusted at factory for specified pressure relief setting. To increase relief pressure setting, turn down each nut (22) one full turn at a time. To decrease relief pressure setting, loosen each nut one full turn at a time.

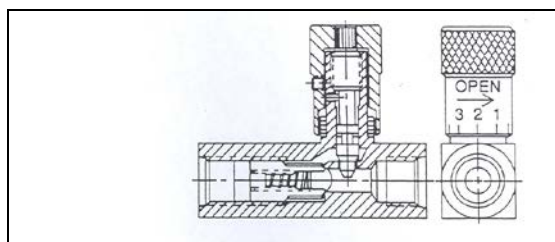
## Oil Filling Procedure

1. Shut down pump.
2. Remove pipe plug located on the side of the Oil Reservoir.
3. Fully open Flow Control Valve. (Make note of setting before turning knob).
4. Fill Oil Reservoir slowly until oil level is flush with the street elbow and then replace pipe plug.

## Adjustment of Flow Control Valve

The Flow Control Valve has a micrometer type adjustment which incorporates a color coded reference scale to simplify setting, resetting and adjusting.

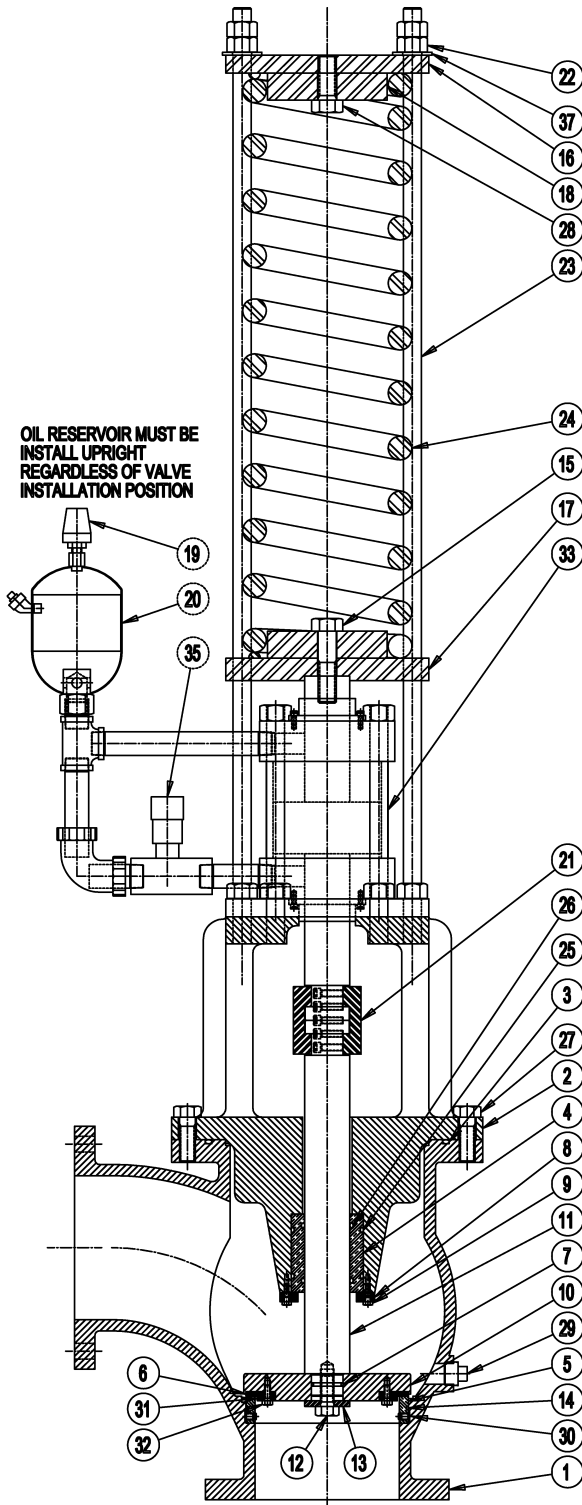
A lock nut or set screw is provided for locking the valve setting. Turning the valve clockwise closes the valve and turning counterclockwise opens the valve and increases rate of closure of Angle Surge Relief Valve.



**Figure 1: Flow Control Valve**

Drawings

CAUTION: MAINTAIN LEVEL WHEN ADJUSTING



OIL RESERVOIR MUST BE  
 INSTALL UPRIGHT  
 REGARDLESS OF VALVE  
 INSTALLATION POSITION

NO	DESCRIPTION
1	Body
2	Cover-Spacer
3	Cover Seal
4	Disc Stem Bushing
5	Body Seat Ring
6	Disc Seat
7	Disc Seal
8	Bushing Retaining Ring
9	Bushing Retaining Screw
10	Disc
11	Stem
12	Disc Retaining Screw
13	Disc Screw Washer
14	Body Seat Seal
15	Pressure Plate Screw
16	Pressure Plate
17	Spring Retainer
18	Spring Guide
19	Air Breather
20	Oil Reservoir
21	Split Collar Coupling
22	Pressure Adjusting Nut
23	Tension Rod
24	Compression Spring
25	Bushing Seal
26	Disc Stem Seal
27	Cover-Spacer Screw
28	Spring Guide Screw
29	Inspection Hole Plug
30	Body Seat Retainer Screw
31	Disc Seat Retainer Ring
32	Disc Seat Retainer Screw
33	Oil Fitted Cylinder
35	Flow Control Valve
37	Adjusting Nut Washer

Figure 2: SRA-3000 Surge Relief Angle Valves



## Troubleshooting

Condition	Possible Cause	Corrective Action
Valve leaks excessively from one side of the disc to the other.	Foreign matter caught between disc and seat.	Clean disc and seat.
	Disc seat and/or body seat ring is worn or damaged.	Replace disc seat and/or body seat ring.
	Springs are loose.	Adjust springs.
Valve leaks at flange joint.	Loose flange bolting.	Tighten flange bolting.
	Blown flange gasket.	Replace flange gasket.
	Miss-alignment or damage to field piping and supports.	Adjust miss-alignment or repair piping or supports.
	Damaged flange face/s or improper flange connections.	Repair flange, replace valve body or adjust flange connections.