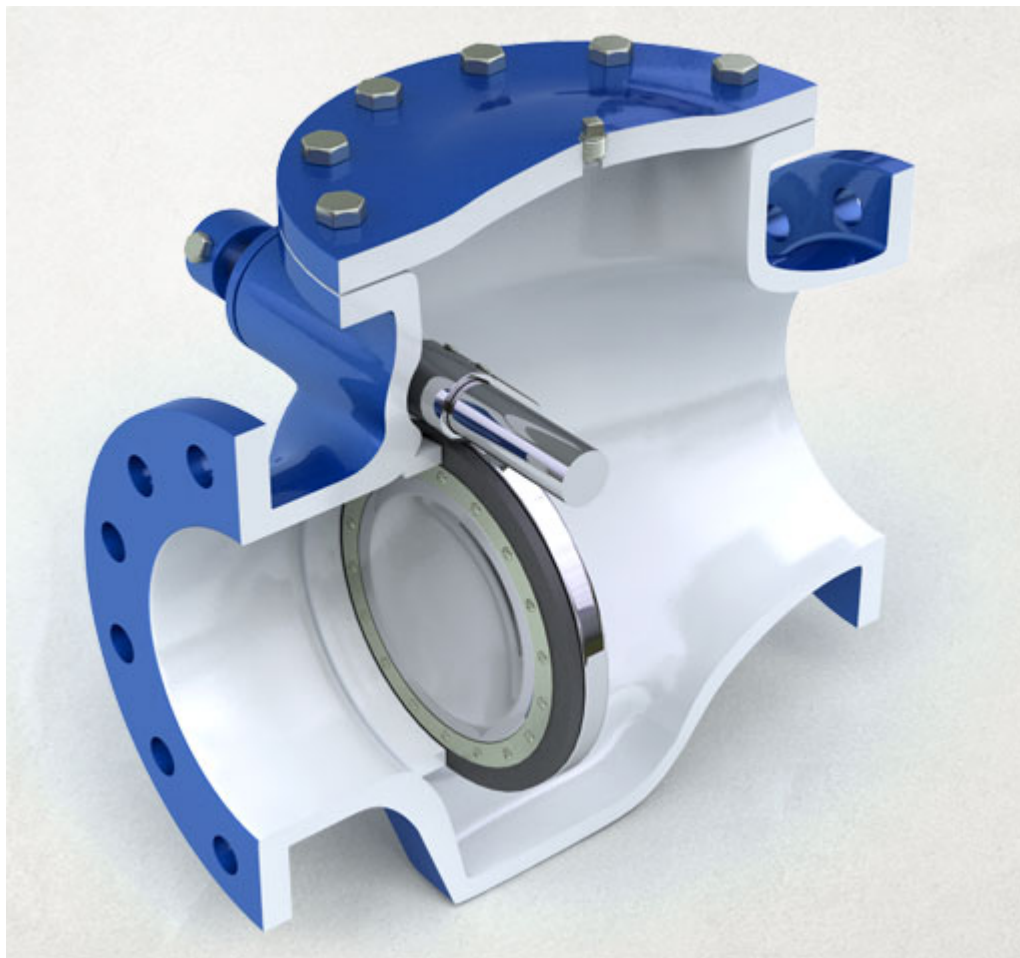




APCO CVS-6000 CONVERTIBLE SWING CHECK VALVES



Instruction **D12009**
December 2012

DeZURIK

APCO CVS-6000 Convertible Swing Check Valves

Instructions

These instructions provide installation, operation and maintenance information for APCO CVS-6000 Convertible Swing Check Valves. They are for use by personnel who are responsible for installation, operation and maintenance of APCO CVS-6000 Convertible Swing 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 CVS-6000 Convertible Swing 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.

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APCO CVS-6000 Convertible Swing Check Valves

Description

A swing check valve consists of a valve body, a bonnet, and a disk that is connected to a hinge. The disk swings away from the valve-seat to allow flow in the forward direction, and returns to valve-seat when upstream flow is stopped, to prevent backflow.

Handling and Storage

Lifting the valve improperly may damage it. Do not fasten lifting devices to attached components 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

- APCO CVS-6000 Convertible Swing Check Valve may be installed in a horizontal or vertical position (with the flow upward). In either case, if the CVS-6000-CLW valve is ordered, the Counterweight Arm (44) should be set 25°-30° below the horizontal line. Unless otherwise specified, the CVS-6000-CLW valves are shipped for horizontal installation.
- 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.

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/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

Disassembly Procedure

See Figure 1 and Figure 2 for part identification.

**WARNING!**

These valves may open or close, swinging the counterweight/spring loaded arm 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. Relieve the pressure in the pipeline.
2. If it is necessary to remove valve from pipeline, set valve standing on its inlet flange.
3. **CVS-6000-CLW valves only:** Support counterweight (29), then unscrew counterweight set screw (36) and remove counterweight assembly (44).

CVS-6000-CLS valves only: Disconnect spring (59) from spring lever arm (44).

4. Loosen nut (56) holding counterweight arm assembly to pivot shaft (13) and remove counterweight arm assembly.
5. Remove cover (2) by unscrewing cover bolts (4).
6. Unscrew disc arm set screws (14).
7. Remove pivot shaft cover (15) and seal retainer (37) at both ends of the shaft.
8. Pull pivot shaft from the right side of the valve (facing inlet).
9. Remove bushing (12), key (33), and seals (17) & (18).
10. Remove disc pin retaining rings (41) and pull out disc pins (8).
11. Pull out disc arm (9).
12. Remove disc seat (6) and seat retaining ring (31) by unscrewing all screws (32).
13. Unscrew the seat retaining screws (40) located inside the body seat ring (5).
14. Evenly pry the body seat ring (5) out of the body (1).

Maintenance *(Continued)*

Assembly Procedure

1. If valve is removed from pipeline, set body standing on its inlet flange.
2. Install body seat seal (43) groove of body seat ring (5).
3. Install body seat ring (5) evenly inside the counter-bore of the body (1) until it bottoms out.
4. Screw and tighten the body seat ring set screws (40) into the body seat ring (5).
5. Set disc (10) with seat side up, install disc seat (6) and disc seat retaining ring (31) and fasten with disc seat retaining screws (32).
6. Connect disc arm (9) assembly to disc (10) by inserting disc pins (8) and secure with disc pin retaining rings (41).
7. Set disc (10) and disc arm (9) assembly on top of body seat ring (43).
8. Slip the pivot shaft flanged bushing (12) on the pivot shaft (13) with the flanged side against shaft (13) collar.
9. Insert pivot shaft key (33) in keyway on pivot shaft (13).
10. Install pivot shaft (13) from right side of body (1) through disc arm (9) until pivot shaft collar is flush with body.
11. Insert pivot shaft straight bushing (11) into the body (1) at the other end.
12. Insert pivot shaft seal (17) and pivot shaft cover seal (18) in their respective grooves.
13. Insert pivot shaft seal retainer (37) on pivot shaft cover and install on both ends of pivot shaft (13). Screw on pivot shaft cover screws (16).
14. Install gasket or O-ring (3) and cover (2), then fasten with cover screws (4).
15. **CVS-6000-CLW valves only:** Insert counterweight arm key (if provided) on pivot shaft (13) and slip counterweight arm assembly in place. Set arm at an angle approximately 25° - 30° below horizontal axis and secure with lever arm bolts (55) and Nuts (56).
16. **CVS-6000-CLS valves only:** Insert counterweight arm key (if provided) on pivot shaft (13) and slip counterweight arm assembly in place. Reconnect spring (59) to spring lever arm (44).
16. **CVS-6000-CLW valves only:** Install counterweight (29) at desired setting and secure with set screws (36).

Operation

The CVS-6000 Convertible Swing Check Valve prevents back flow of the media on pump shut down or power failure. It offers unobstructed flow through area. This advantage is accomplished in design by locating the pivot point of the disc well outside its periphery, thus it is possible for the entire disc to lift clear of the flow area. This is a very desirable feature when pumping raw sewage.

As service requirements change, the CVS-6000 Convertible Swing Check Valve can be converted to any of the following models:

1. CVS-6000-AC – Cushioned Swing Check Valve Air Cushioned Side Mounted
2. CVS-6000-BMB – Cushioned Swing Check Valve Oil Control Bottom Buffer
3. CVS-6000-OC – Cushioned Swing Check Valve Oil Control Side Mounted

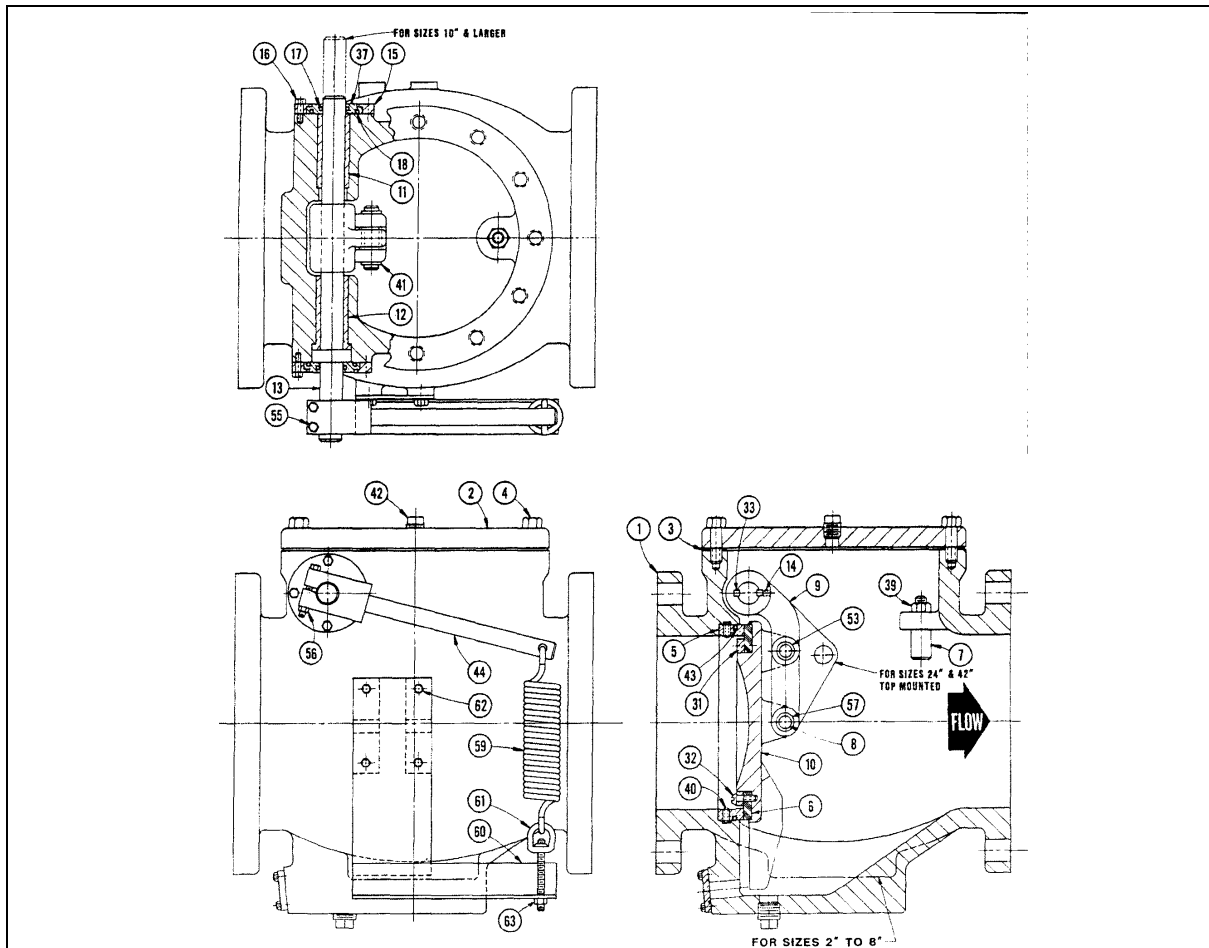
Note: Kits for any of the above conversions can be supplied for field installation.

Be aware that the Convertible Swing Check Valve is not a silent closing check valve.

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APCO CVS-6000 Convertible Swing Check Valves

Drawings

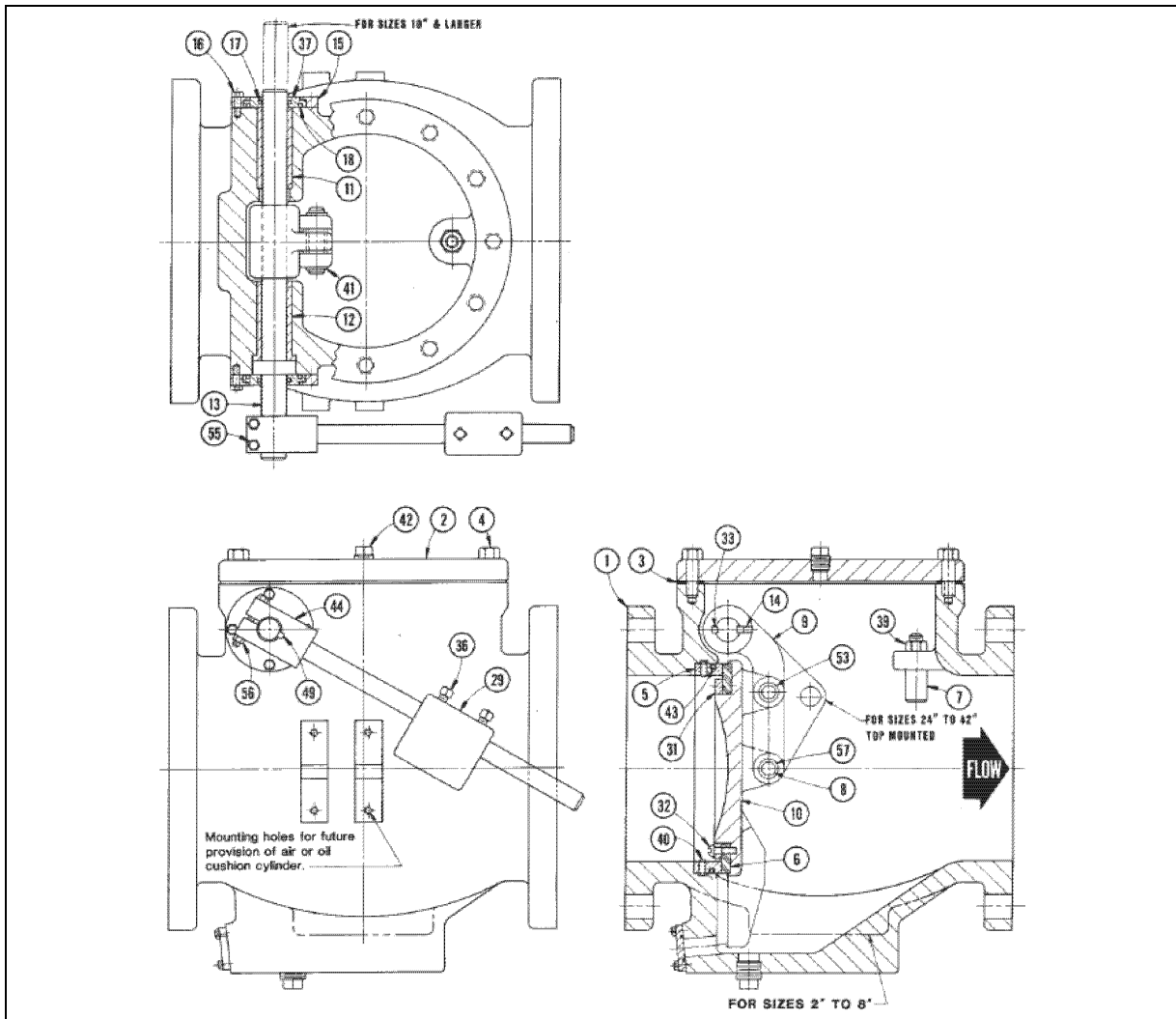


NO	DESCRIPTION	NO	DESCRIPTION
1	Body	32	Seat Retaining Ring Screw
2	Cover	33	Pivot Shaft Key
3	Cover Gasket	37	Pivot Shaft Seal Retainer
4	Cover Bolt	39	Disc Stop Lock Nut
5	Body Seat Ring	40	Seat Retaining Set Screw
6	Disc Seat	41	Disc Pin Retaining Ring
7	Disc Stop	42	Cover Pipe Plug
8	Disc Pin	43	Body Seat Seal
9	Disc Arm	44	Spring Lever Arm
10	Disc	53	Pivot Sleeve Bearing
11	Pivot Shaft Bushing	55	Screw
12	Pivot Shaft Flanged Bushing	56	Nut
13	Pivot Shaft	57	Disc Arm Sleeve
14	Disc Arm Set Screw	59	Spring
15	Pivot Shaft Cover	60	Spring Bracket
16	Pivot Shaft Cover Bolt	61	Eye Bolt
17	Pivot Shaft Seal	62	Screw
18	Pivot Shaft Cover Seal	63	Nut
31	Seat Retaining Ring		

Figure 1 – CVS-6000-CLS Convertible Swing Check Valve with Lever and Spring

APCO CVS-6000 Convertible Swing Check Valves

Drawings (Continued)



NO	DESCRIPTION	NO	DESCRIPTION
1	Body	18	Pivot Shaft Cover Seal
2	Cover	31	Seat Retaining Ring
3	Cover Gasket	32	Seat Retaining Ring Screw
4	Cover Bolt	33	Pivot Shaft Key
5	Body Seat Ring	37	Pivot Shaft Seal Retainer
6	Disc Seat	39	Disc Stop Lock Nut
7	Disc Stop	40	Seat Retaining Set Screw
8	Disc Pin	41	Disc Pin Retaining Ring
9	Disc Arm	42	Cover Pipe Plug
10	Disc	43	Body Seat Seal
11	Pivot Shaft Bushing	44	Counterweight Arm Assy
12	Pivot Shaft Flanged Bushing	49	Lever Arm Key
13	Pivot Shaft	53	Pivot Sleeve Bearing
14	Disc Arm Set Screw	55	Lever Arm Screw
15	Pivot Shaft Cover	56	Lever Arm Nut
16	Pivot Shaft Cover Bolt	57	Disc Arm Sleeve
17	Pivot Shaft Seal		

Figure 2 – CVS-6000-CLW Convertible Swing Check Valve with Lever and Weight

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APCO CVS-6000 Convertible Swing Check Valves

Troubleshooting

Condition	Possible Cause	Corrective Action
Shaft seal leaks.	Seal is worn.	Replace seal.
Valve leaks excessively from one side of the disc to the other.	Foreign matter caught between disc and seat.	Fully open valve to remove object.
	Disc seat is worn or damaged.	Replace disc seat.
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.
Valve does not fully close.	Object is wedged between seat and disc.	Fully open valve to remove object.

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Sales and Service

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

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