Air-to-Open Spring-to-Close Pneumatic

Angle Valves

ESVP-038 thru 200
CSVP-038 thru 200
AIVP-075 thru 200
CAIVP-075 thru 200
ILVP-038 thru 200
CLVP-038 thru 200
ESVP-038T thru 200T
CSVP-038T thru 200T
STVP-075
CSTVP-075
Air-to-Open Spring-to-Close Pneumatic Angle Valves

Unpacking
Inspect the shipping box before unpacking. Any damage should be reported to the transportation company upon receipt. Remove the valve from the box. Visually inspect the valve, making sure that the flange faces are in good condition. Apply 40-80 psig at the 1/8 inch NPT tapped hole located on the black center plate of the valve to make sure the valve operates smoothly before installation.

Installation Instructions
Determine that the valve and adjacent plumbing in the vacuum system will be adequately supported when installed. Make sure that the mating flanges are inline, parallel and the correct distance apart to minimize straining of the valve body. Remove the flange covers and wipe the flanges and the gasket with a lint free wipe. With O-ring seal flanges, apply a light film of vacuum grease to the O-ring prior to installing in the flange groove. Proceed with the installation while making sure that no foreign particles enter the valve. Where applicable, lightly grease the flange bolts with a high temperature anti-seize compound. Carefully tighten around the flange in a 180° alternating pattern until the flanges are in contact and the bolts are snug. Valves will work equally well in any orientation. In addition, vacuum can be on either side of the poppet and still maintain a vacuum tight seal. However, it is recommended that valves are installed with the poppet facing the process to prevent contaminating the valve internals.

Operating Instructions
To ensure trouble free use, keep the valve clean and free from contaminants. The air supply pressure should not exceed 80 psig. The bakeout temperature of the valve should not exceed that of the elastomer that is used in it. See table below for maximum recommended bakeout temperatures.

### Valve Position

<table>
<thead>
<tr>
<th>Valve Position</th>
<th>Open</th>
<th>Closed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pneumatic</td>
<td>120°C</td>
<td>280°C</td>
</tr>
<tr>
<td>Manual</td>
<td>150°C</td>
<td>100°C</td>
</tr>
</tbody>
</table>

Pneumatic Hook-up
Air-to-open, spring-to-close, pneumatic valves are to be used with 3-way air solenoid valves. The air solenoid can be purchased separately as a kit with installation instructions and hardware. As an option, Nor-Cal can provide a pneumatic valve with the appropriate air solenoid in various voltages pre-installed. Or, the valve may be connected by an air line to an air solenoid in a remote location. The instructions below are for the hook-up of a valve with a pre-installed air solenoid. If the valve is connected to a remote air solenoid, simply connect the air line from the OUT port of the air solenoid to the 1/8 inch NPT hole on the black valve center plate using an appropriate fitting.

1. Connect a 60-80 psig air supply to the IN port of the air solenoid using Teflon tape on all fittings to ensure a leak-tight connection. For continued trouble free operation, it is recommended that an air filter and lubricator be used in the air line system.
2. Check the air solenoid name plate to confirm its electrical specifications. Attach the appropriate power source to the air solenoid.
3. Energizing the air solenoid will cause the valve to open, de-energizing the air solenoid will cause the valve to close.

Recommended Service Intervals
Service intervals are based on the number of cycles (open-close-open) a valve can be safely operated under clean conditions without any maintenance. Nor-Cal recommends that these valves be inspected for wear, and O-rings and bellows be replaced as necessary after 250,000 cycles. Process induced contamination and bake-out temperatures above 150°C may shorten service intervals significantly. After service is completed these valves can again be operated for the specified number of cycles.

---

**CAUTION:** The air actuator sold under this agreement is spring loaded. Any unauthorized disassembly of the air cylinder assembly will void the warranty, and any improper disassembly and maintenance is potentially dangerous. Do not dismantle the valve until you shut off the air supply to the air solenoid and disconnect the air supply line that is connected to the valve’s center plate (4). Refer to the illustration and recommended service intervals sections before installing a repair kit. Please contact Nor-Cal to check on the warranty status prior to proceeding.

Viton® and Kalrez® are registered trademarks of DuPont Dow Elastomers. Lubriplate® is a registered trademark of Fiske Brothers Refining Company.
Repair Instructions

**Tools Required**

- **3/8" to 1"**
  - 7/16" open end wrench
  - 7/16" Socket
  - .050" ball driver
- **1 1/2"**
  - 3/16" ball driver
  - 9/16" socket
  - 7/16" open end wrench
  - .050" ball driver
- **2"**
  - 5/32" ball driver
  - 9/16" socket
  - 7/16" open end wrench
  - .050" ball driver

**Procedure**

Make sure that the valve internals that are subject to vacuum remain clean. Use lint free wipes as necessary and keep seals free of contaminants.

1. Shut off the air supply to the air solenoid.
2. Remove the air fitting at the center plate (4).
3. Remove the air cylinder (1), apply 30 to 40 lbs. of force against the top of the air cylinder (1) to neutralize the spring (9) while removing the bonnet screws (13).
4. Remove valve internals from the body (7) and inspect body flange O-ring (15) and poppet O-ring (17) and replace if necessary.
5. If the bellows assembly (16) requires replacement, remove the jam nut (11) by first inserting a 7/16" open end wrench in the stem shaft (5) to keep the bellows assembly (16) from rotating while removing the jam nut (11). Remove piston cup (12) and slide off center plate (4). Remove set screw (6) and replace the bellows assembly (16).
6. Replace all O-rings as necessary including the piston cup (12).
7. Apply a light film of high vacuum grease on the O-rings prior to installing them.
8. Apply anti-seize or equivalent on set screw (6) and on bonnet screws (13).
9. Apply Lubriplate® high temperature grease #PTL0161-001 or equivalent on stem shaft (5).
10. Re-assemble the valve in the reverse order.

**Diagram Key**

1. Air Cylinder
2. Stem O-Ring
3. Retaining Plate
4. Center Plate
5. Stem Shaft
6. Set Screw
7. Body
8. Air Filter
9. Air Cylinder Spring
10. Spring Retainer
11. Jam Nut
12. Piston Cup
13. Bonnet Screws
14. Air Cylinder O-Ring
15. Body Flange O-Ring
16. Bellows Assembly
17. Poppet O-Ring

* 2" ID valves are assembled with two Stem O-Rings.

**Warranty**

Products manufactured by Nor-Cal Products Inc. (hereinafter referred to as “Nor-Cal”) are warranted against defects in material and workmanship for a period of twelve (12) months from the date of shipment from Nor-Cal to the buyer. Any modification of the product by the buyer or their agent voids this warranty. Liability under this warranty is expressly limited to replacement or repair (at Nor-Cal’s option) of defective parts. Nor-Cal may at any time discharge its warranty as to any of its products by refunding the purchase price and taking back the products. This warranty applies only to parts manufactured, and labor provided by Nor-Cal within the applicable warranty period and shall be subject to the terms and conditions hereof.

Items such as O-rings, bearings, pins, bellows, etc., by their nature, may not function for one year due to process induced contamination and/or continual cycling; if such items fail to give reasonable service for a reasonable period of time, as determined solely by Nor-Cal, they will be repaired or replaced by Nor-Cal at its election.

All warranty replacement or repair of parts shall be limited to equipment malfunctions which, in the sole opinion of Nor-Cal, are due or traceable to defects in original materials or workmanship. Malfunctions caused by abuse or neglect of the equipment are expressly not covered by this warranty. Nor-Cal expressly disclaims responsibility for any loss or damage caused by the use of its products other than in accordance with proper operating and safety procedures. Reasonable care must be taken by the user to avoid hazards. In-warranty repaired or replaced parts are warrantied only for the remainder unexpired portion of the original warranty period applicable to the parts which have been repaired or replaced.
## Repair Kits

<table>
<thead>
<tr>
<th>Nom ID</th>
<th>Bonnet Type</th>
<th>Kit Part No.</th>
<th>Description</th>
<th>For Valve Model Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/8&quot; VSB</td>
<td>ESV-075-95</td>
<td>O-Ring Kit</td>
<td>ESV-075, ESV-075T, and ILVP-075</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ESV-075-16K</td>
<td>Bellows Assembly</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ESV-075-99</td>
<td>Complete Rebuild Kit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3/8&quot; CSB</td>
<td>CSV-075-95</td>
<td>O-Ring and Gasket Kit</td>
<td>CSV-075, CSV-075T, and ILVP-075</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CSV-075-16K</td>
<td>Bellows Assembly</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CSV-075-99</td>
<td>Complete Rebuild Kit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3/8&quot; VSB</td>
<td>ESV-075-95</td>
<td>O-Ring Kit</td>
<td>ESV-075, ESV-075T, and ILVP-075</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ESV-075-16K</td>
<td>Bellows Assembly</td>
<td>and STVP-075</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ESV-075-99</td>
<td>Complete Rebuild Kit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1&quot; VSB</td>
<td>ESV-075-95</td>
<td>O-Ring Kit</td>
<td>ESV-100, ESV-100T, and ILVP-100</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ESV-075-16K</td>
<td>Bellows Assembly</td>
<td>and STVP-100</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ESV-075-99</td>
<td>Complete Rebuild Kit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1&quot; CSB</td>
<td>CSV-075-95</td>
<td>O-Ring and Gasket Kit</td>
<td>CSV-100, CSV-100T, and ILVP-100</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CSV-075-16K</td>
<td>Bellows Assembly</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CSV-075-99</td>
<td>Complete Rebuild Kit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 1/2&quot; VSB</td>
<td>ESV-150-95</td>
<td>O-Ring Kit</td>
<td>ESV-150, ESV-150T, and ILVP-150</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ESV-150-16K</td>
<td>Bellows Assembly</td>
<td>and STVP-150</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ESV-150-99</td>
<td>Complete Rebuild Kit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2&quot; VSB</td>
<td>CSV-200-95</td>
<td>O-Ring and Gasket Kit</td>
<td>CSV-200, CSV-200T, and ILVP-200</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CSV-200-16K</td>
<td>Bellows Assembly</td>
<td>and STVP-200</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CSV-200-99</td>
<td>Complete Rebuild Kit</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Nor-Cal Products, Inc. • 1967 S. Oregon St., Yreka, CA 96097 • 800-824-4166 or 530-842-4457 • FAX: 530-842-9130 • ncsales@n-c.com • Web: www.n-c.com