INSTRUCTION MANUAL

CVS Series 2275
Dump Valve

The CVS Controls Series 2275 is a versatile and economical pneumatic control valve for use in high or low pressure applications. The compact design allows for installation where space is limited. Typical on/off control process includes liquid service on separators and dehydrators.

Features 1 Inch screwed NPT end connections on a T Style body, which may be adjusted with plug for flow through or angle flow direction.

Standard NACE capable: LCC body, stainless steel trim. Optional Carbide trim available.

Can be used with either Fail Open or Fail Closed, non-adjusting actuator.

CVS Series 2275 – Fail Closed Actuator

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SPECIFICATIONS

Construction: Standard 1 Inch, LCC, T Style, NPT Body - 3600 psi working pressure.

Trim: Stainless Steel Trim standard, optional Carbide Trim available.

CVS Series 2275 – Standard NACE (MRO175 2002)

Actuator: Size 9 (35 sq in), Fail Close (4 springs) or Fail Open (2 springs)

Temperature Limits: -40°F to 180°F (-40°C to 82°C) standard construction.

Flow Coefficients:

Maximum Flow Coefficients Cv			
Orifice Size	Flow Direction	Flow Coeffcient – Cv (fully open position)	
		Globe Flow	Angle Flow
.125”	Under Seat Over Seat	.85 .91	.93 1.2
.25”	Under Seat Over Seat	2.6 3.0	2.8 3.5
.375”	Under Seat Over Seat	3.5 3.9	4.8 5.1
.50”	Under Seat Over Seat	5.5 5.5	5.6 6.0

Max Differential Pressures:

Size 9 Actuator - Maximum Differential Pressures				
Orifice Size	Flow Direction	Supply Pressure	Non Adjustable Actuator	
			Direct Acting	Reverse Acting
.125”/.25”	Under Seat	20 30	3200 3600	3600 3600
	Over Seat	20 30	3600 3600	2100 2100
.375”	Under Seat	20 30	1200 3600	2100 2100
	Over Seat	20 30	3600 3600	3600 3600
.50”	Under Seat	20 30	300 1600	1150 1150
	Over Seat	20 30	3600 3600	3600 3600

INSTALLATION

- ****Note:** Prior to installation, inspect the CVS Series 2275 valve and actuator assembly for any visible damage or debris.
- **Always follow proper safety and lockout procedures** when installing and/or performing any required maintenance or repairs.
- **Never exceed pressure and temperature limits.** Refer to data tag on the valve assembly.

Follow proper piping procedures when installing the CVS Series 2275. For NPT threaded bodies, use TFE tape or thread sealant on external pipe threads.

Typical installation is inline with the actuator vertical, above the valve body.

Note flow directions and install accordingly, flow over seat, or flow under seat.

1. Connect actuator supply using 1/4-18 NPT connection on diaphragm housing. For reverse acting actuator, connection is on the lower diaphragm housing. For direct acting actuator, the actuator supply connection is on the upper diaphragm housing. Use proper tubing procedures to ensure short run of tubing to reduce possible control signal lag.
2. Cycle the actuator several times to check for proper valve operation and movement as noted by the travel indicator (26) on the diaphragm housing.
3. Travel indicator movement varies pending trim size selected for the process.

MAINTENANCE – CVS Fail Closed Actuator

- **Always follow proper safety and lockout procedures** when installing and/or performing any required maintenance or repairs.
- **Isolate the Valve from the process.**
- **Relieve process pressure and vent actuator supply pressure.**

1. Remove actuator supply tubing.
2. Remove 12 of Hex Cap Screw (30), and Hex Nut (31) to separate the upper and lower diaphragm housings.
3. Remove Upper Diaphragm Housing (36), set aside and remove Springs (35).
4. Remove the Upper Hex Nut (28) from the Valve Stem (9) by holding the lower Hex Nut (28) in place while removing the upper.
5. Lift Diaphragm Plate (21) up enough in order to use a wrench on the Hex Nut (28) under the Diaphragm Plate. While securing the Hex Nut under the Diaphragm Plate, you may remove the Hex Nut on the top of the Diaphragm Plate to separate from the Valve Stem. Once Upper Hex nut is removed, the Lockwasher (29) and Spring Retainer (34) may be removed. Lift off the Diaphragm Plate, remove O-Ring (27), Actuator Diaphragm (17) and Washer Bearing (25). Inspect and replace if required.

MAINTENANCE – CVS Fail Closed Actuator

6. If required, the Lower Hex Nut may be removed from the Valve Stem by using the 2 Hex Nuts previously removed to prevent the Valve Stem from turning by locking them on the Valve Stem threads.
7. Note position of the actuator supply input on the Lower Diaphragm Housing prior to removing the Housing Lock Nut (10).
8. Once the Housing Locknut is removed, the Lower Diaphragm Housing (16), and Seat O-Ring (32) may be removed and inspected.

Inspect all components for wear or damage and replace as required.

Reassemble in reverse order. Verify operation as described in the Installation Portion on the previous page.

Torque Values:
Item 28 - Hex Nut – Jam Nut to Diaphragm Plate – 10 ft lb (14Nm)
Item 28 – Hex Nut – Upper Jam Locking Nut – 7 ft lb (10Nm)
Item 30, 31 – Hex Cap Screw/Hex Nut (Diaphragm Housing Bolts) – 30 ft lb (41Nm)

MAINTENANCE – CVS Fail Open Actuator

1. Remove actuator supply tubing.
2. Remove 12 of Hex Cap Screw (30), and Hex Nut (31) to separate the upper and lower diaphragm housings.
3. Remove Upper Diaphragm Housing (36) and set aside.
4. Remove the Upper Hex Nut (28) from the Valve Stem (9) by holding the lower Hex Nut (28) in place while removing the upper.
5. Lift Diaphragm Plate (21) up enough in order to use a wrench on the Hex Nut (28) under the Diaphragm Plate. While securing the Hex Nut under the Diaphragm Plate, you may remove the Hex Nut on the top of the Diaphragm Plate to separate from the Valve Stem. Once Upper Hex Nut is removed, the Lockwasher (29) and Washer Bearing (25) may be removed.
6. Lift off the Actuator Diaphragm (17), remove O-Ring (27). Inspect and replace if required.
7. Remove Spring Retainer (34), and Springs (35).
8. If required, the Lower Hex Nut may be removed from the Valve Stem by using the 2 Hex Nuts previously removed to prevent the Valve Stem from turning by locking them on the Valve Stem threads.
9. Remove Housing Lock Nut (10), the Lower Diaphragm Housing (16) and Seat o-Ring (32) may now be removed.

Inspect all components for wear or damage and replace as required. Reassemble in reverse order and refer to Torque Values listed above.

MAINTENANCE – CVS Series 2275 Valve Body

- **Always follow proper safety and lockout procedures** when installing and/or performing any required maintenance or repairs.
- **Isolate the Valve from the process.**
- **Relieve process pressure and vent actuator supply pressure.**

The following instructions allow for trim removal inspection and maintenance, without requiring complete disassembly of the actuator. The valve body may remain installed inline.

Fail Closed Actuator Only:

1. Connect supply to Lower Diaphragm Housing (16) inlet.
2. Increase supply pressure to 30psgi in order to cycle the actuator to the open position and raise the Valve Plug (2)

Fail Closed and Fail Open Actuator:

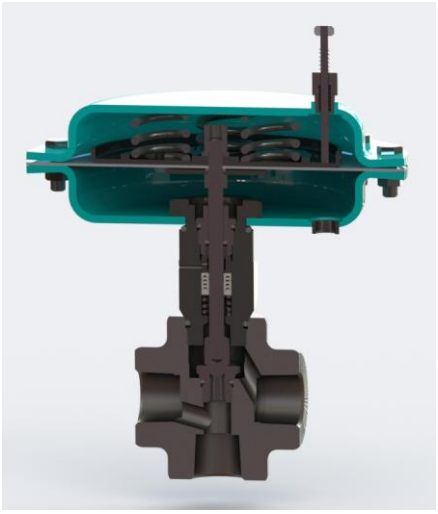
3. Remove the Bonnet (4) from the Valve Body (1) by turning the bonnet counter clockwise.

Fail Closed Only:

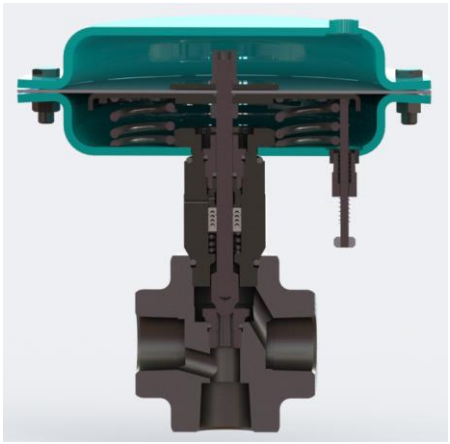
4. Vent the supply pressure to the Actuator Assembly to drop the Valve Plug and Drive Pin (33) to the bottom of the bonnet.

Fail Closed and Fail Open Actuator:

5. Remove Drive Pin (33) using a punch tool or similar. Take care not to score valve plug or bend valve stem.
6. Turn Valve Plug (2) counter clockwise to remove from the Valve Stem (9)
7. The Valve Seat (3) and Seat O-Ring (12) may be removed from the Valve Body (1) for inspection by using a 1” socket over the Valve seat and turning counter clockwise.



ATO / Fail Closed Sectional View



ATC / Fail Open Sectional View

1. Inspect Valve Plug and Seat for signs of wear and damage from erosion. Certain minor abrasions may be able to be repaired, while excessive damage will most likely affect operation and sealing capabilities of the valve. Utilize magnifying glass to ensure surface finish is acceptable, or is in need of replacement component.

2. Now inspect the Plug and Seat for sealing irregularities. With the Plug and Seat together, determine if any gaps are visible on the seating surface by holding to light and looking through seating area. If light is visible, it is an indication the seating surface may have wear or damage. Again, determine if surfaces may be restored by re-lapping, or if a replacement component is required.

3. The Stem surface should be inspected, and show no signs of scratches, wear or damage. Specifically inspect the Stem area around the Packing and O-Ring areas. Repair or replace as required.

Restoring Trim – Lapping

Clean and dry all components prior to lapping.

1. Select appropriate lapping compound based on trim materials in the application.

2. Apply small amount of lapping compound to three separate areas on seating surface of the plug. Do not use too much lapping compound as it may cause uneven surface lapping.

3. Fit the Seat and Plug together and rotate the Plug or Seat in a back and forth motion.

4. Once complete, clean and inspect the surfaces for any signs of wear or damage again. Reseat the Plug and Seat once again and inspect for gaps as mentioned in trim inspection above.

5. Determine if re lapping is required or if replacement parts are needed.

MAINTENANCE – CVS Series 2275 Valve Body/Trim– Reassembly

1. Apply lubrication and install O-Ring (12) onto Valve Seat (3).
2. Install Valve Seat (3) back into the Valve Body (1) and secure.

Fail Closed Actuator

3. Vent supply pressure in order to extend the Valve Stem (9) out bottom of Bonnet (4).

Fail Closed and Fail Open Acting Actuator:

4. Install Valve Plug (2) onto Valve Stem (9) until the Drive Pin hole is aligned with holes on the stem.
5. Install the Drive Pin (33) in order to secure the Valve Plug to the Valve Stem.

Fail Closed Actuator:

6. Apply supply pressure in order to raise the Valve Plug and Stem into the Bonnet prior to installing the Actuator Assembly back onto the Valve Body.

Fail Closed and Fail Open Acting Actuator:

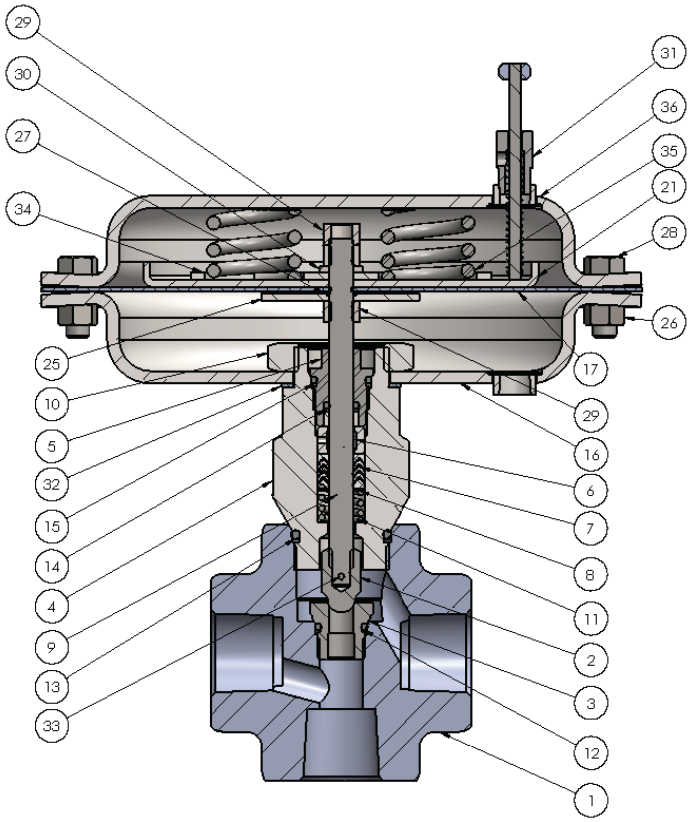
7. Lubricate the Bonnet O-Ring (13), and install onto Bonnet.
8. Reinstall the actuator assembly into the Valve Body by screwing clockwise.

Fail Closed Actuator:

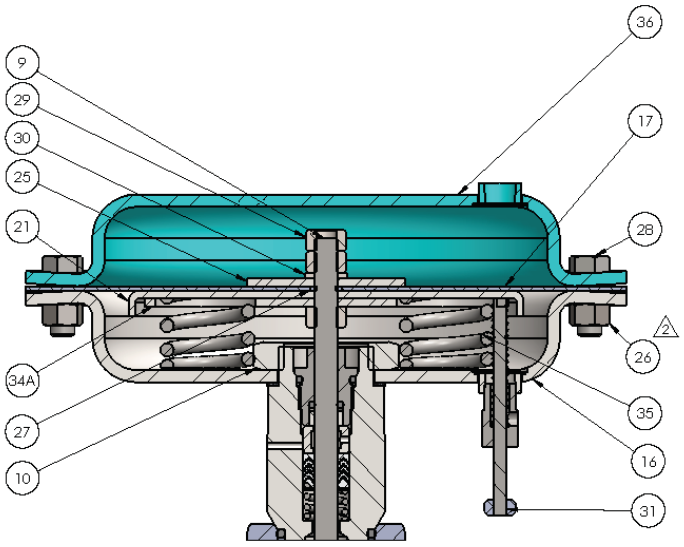
Pressure may now be vented from the actuator assembly.

Once complete, cycle the actuator several times to verify valve operation and movement as noted by the Travel Indicator on the diaphragm housing.

ASSEMBLY – CVS Series 2275



Fail Closed Actuator



Fail Open Actuator

NOTE:
* QTY OF #35 FOR 9BA4 IS 4. FOR 9BA2 IS 2

Trim Kit

Consists of: Plug, Seat, Seat Oring and Drive Pin

Trim Kit		Material
.125” Orifice	CVS 490227A001	17-4 SST
.25” Orifice	CVS 490227A002	17-4 SST
.375” Orifice	CVS 490227A003	17-4 SST
.50” Orifice	CVS 490227A004	17-4 SST
.25” Orifice	CVS 490227A021	17-4 SST / TC
.375” Orifice	CVS 490227A022	17-4 SST / TC
.50” Orifice	CVS 490227a023	17-4 SST / TC

ASSEMBLY – CVS Series 2275

ITEM #	PART #	DESCRIPTION	QTY
1	CVS 490227B118	Tee 1” NPT Thread End	1
2	See Table	Valve Plug (Note 3)	1
3	See Table	Valve Seat (Note 3)	1
4	CVS 490227B111	Bonnet	1
5	CVS 490227B110	Retainer Assy	1
6	CVS 490227B112	Lantern Ring	1
7	CVS 490222E220	TFE Packing Set (Note 1)	1
8	CVS 490222E217	Retainer	1
9	CVS 490227B107	Valve Stem, NIT 50	1
10	CVS 490227B109	Housing Lock Nut	1
11	CVS 490222E216	Packing Spring	1
12	CVS 490227B115	Seat O-Ring, HSN (Note 2)	1
13	CVS 490222A131	Bonnet O-Ring, HSN (Note 2)	1
14	CVS 490222A132	Retainer/Stem O-Ring, HSN (Note 2)	1
15	CVS 490227B113	Retainer O-Ring, HSN (Note 2)	1
16	CVS 490227B002	Lower Diaphragm Housing	1
17	CVS 490222A126LT	Actuator Diaphragm, Neo-Nylon	1
21	CVS 490222A116	Diaphragm Plate	1
24	CVS 490222A179	Lower Spring Retainer	1
25	CVS 490222A121	Washer Bearing	1
26	CVSB-0350-0372	Hex Nut	12
27	CVS 490222A142	Diaphragm O-Ring, HSN (Note 2)	1
28	CVSB-0070-0372-0100	Hex Cap Screw	12
29	CVSB-0350-0372	Hex Nut	3
30	CVSB-2175-0370	Lock Washer	12
31	CVS 490222A123	Indicator/Vent	12
32	CVS 490227B108	Bonnet Gasket	1
33	CVS 490227B117	Drive Pin, Grooved. Long 316 SST	1
34	CVS 490222E225	Lower Spring Retainer	1
35	CVS 490222E219	Actuator Spring	4*
36	CVS 490222E224	Upper Diaphragm Housing	1

Note 1: Optional Cotton/Nitrile packing available – P/N 1-2222-27/CN

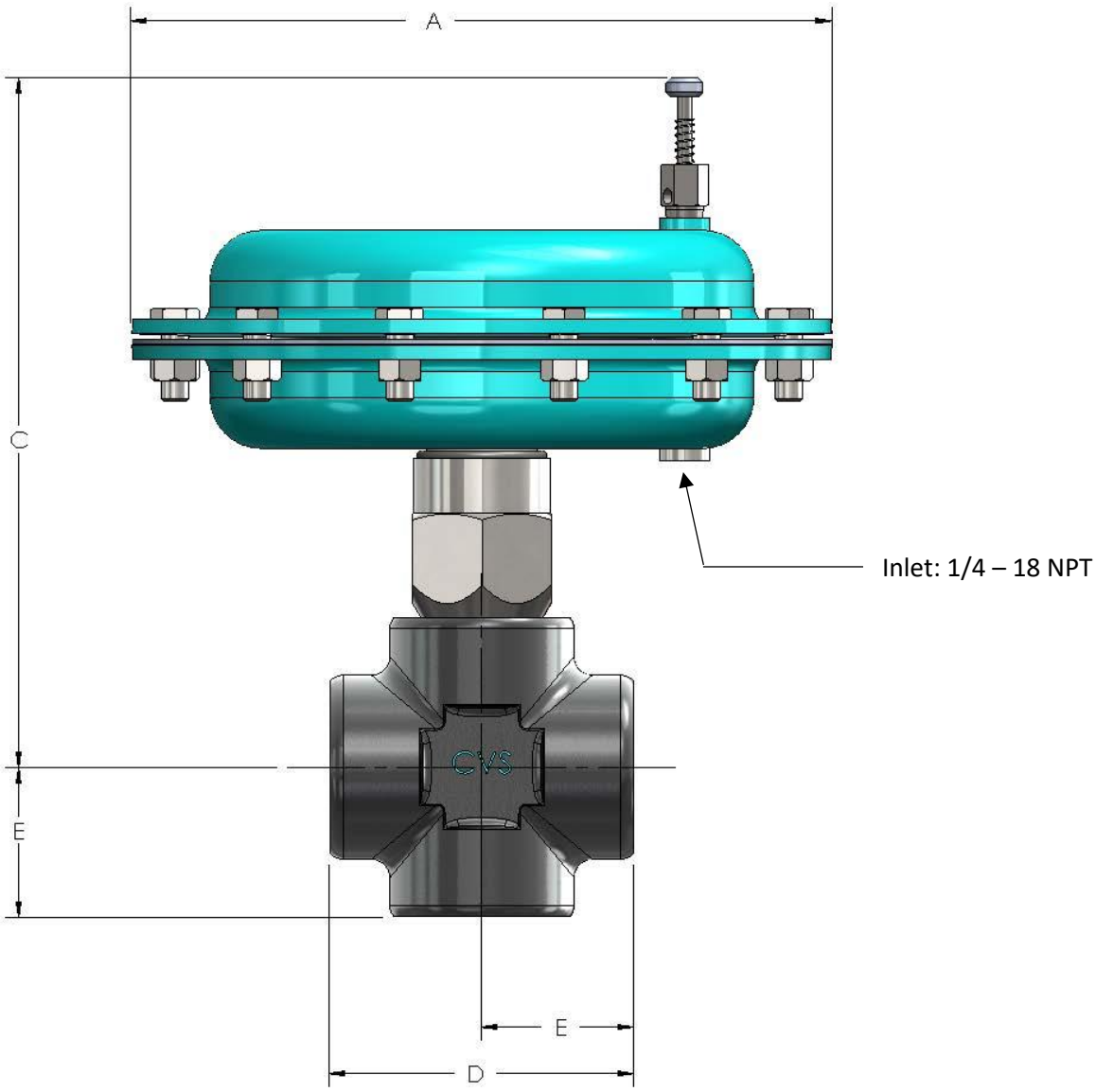
Note 2: Only sold as part of an o-ring kit P/N CVS490227B130

Note 3:Trim Kit, Consists of Plug, Seat, Seat o-ring and Drive Pin – See Table Page 8

Item # 2 – Valve Plug		Material
.125”/.25” Orifice	CVS 490227B100	17-4 SST
.375” Orifice	CVS 490227B101	17-4 SST
.50” Orifice	CVS 490227B102	17-4 SST
.25” Orifice	CVS 490227B121	17-4 SST / TC
.375” Orifice	CVS 490227B127	17-4 SST / TC
.50” Orifice	CVS 490227B119	17-4 SST / TC

Item 3 – Valve Seat		Material
.125” Orifice	CVS 490227B103	17-4 SST
.25” Orifice	CVS 490227B104	17-4 SST
.375” Orifice	CVS 490227B105	17-4 SST
.50” Orifice	CVS 490227B106	17-4 SST
.25” Orifice	CVS 490227B122	17-4 SST / TC
.375” Orifice	CVS 490227B126	17-4 SST / TC

DIMENSIONS – CVS Series 2275



ACTUATOR – Size 9 – CVS Series 2275 (inches)	
A	C
9.50	9.00

SCREWED BODY – CVS Series 2275 (inches)		
Body Style	D	E
Globe	4.125	2.0625
Angle		2.0625

NOTES:

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