# ONYX VALVE CO MODEL DEC
# Installation & Maintenance

**OPERATION: (01-10)**

The Onyx series DEC is an electric operated pinch valves. It fails in last position on loss of electric power. The electric motor rotates a bronze drive nut that drives a pair of direct acting pinch bars to close the rubber sleeve bubble tight. Positive opening tabs molded into the sleeve attach to the pinch bars to insure complete opening.

When equipped with a positioner, the DEC is an efficient, reliable modulating control valve.

**TESTING:**

All Onyx pinch valves are tested to customer specifications before shipment. Unless otherwise specified, all valves are shipped assembled with all actuator limit switches, torque switches, and positioner fully adjusted and calibrated.

**STORAGE**

Correct storage procedures extend valve life. The rubber sleeve in the valve is perishable. Ideal storage conditions are 50˚F and 60% relative humidity.

1. Keep valves and spare sleeves as cool as possible. They can be stored in an unheated area, but allow maximum ventilation in storage areas subject to high ambient summer temperatures. Truck trailers and storage sheds become incredibly hot during summer months. Avoid such locations.

2. Avoid sunlight. Ultra-violet light accelerates the deterioration of rubber. Leave the valve in its box. If not feasible to box the valve, cover the sleeve with black plastic.

3. Avoid ozone. DO NOT STORE valve near active electrical equipment. For long-term storage, coat the face and inside the sleeve twice yearly with silicone spray or liquid.

**INSTALLATION:**

1. Safety considerations.

    a) Leakage: Consider the possibility of flange leakage due to improper tightening of flange bolts. Pinch valves handle abrasive fluids; it may be reasonable to expect the sleeve to eventually wear out. Precautions should be taken where liquids may spray out or drip down onto electrical equipment or plant personnel, or combustible fluid may drain into a dangerous area.

    b) After shut down: Pinch valves can hold pressure in a system for a considerable length of time. Means should be provided to safely relieve pressure and drain lines.

2. **Flanges:** Onyx pinch valves are designed to work with standard ANSI 150# (or 300#) **flat face** flanges. No gasket is required; the sleeve face *is* the gasket. Be careful when using Victaulic type flanges, as the grooving machine often leaves a sharp edge inside the flange. This sharp edge will cut the rubber valve sleeve causing premature sleeve failure. Make absolutely sure that the inside edges of mating flanges are filed or ground smooth. Valve flanges have through holes and are designed to have an ANSI hex (not heavy hex) nut behind the flange. Flange bolts must be inserted from the mating flange side.

2. Allow a long straight run into and out of throttling valves. A good rule of thumb is 10 to 20 pipe diameters up stream, and 3 to 5 pipe diameters down stream. (See Fig. 1)

4. Locate the valve where it can be reached for service and sleeve replacement. Allow access by technicians who may have to calibrate automatic valves. Allow access to the auxiliary hand wheel.

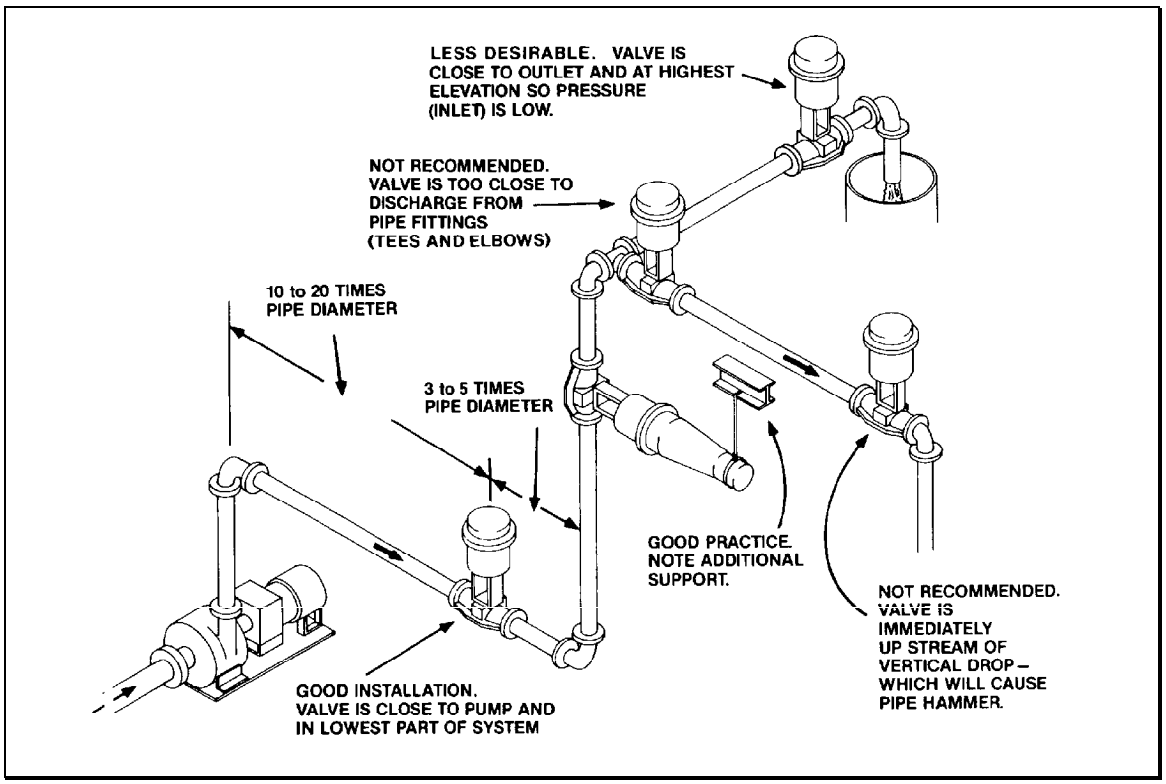



***Fig 1***

5. Be sure pipeline is clean. Foreign material left in the pipeline can damage valves. Clean the mating flanges of adjacent pipe. Remove any old gasket material.

6. Inspect the valve before installation. Report any shipping damage before installation. DO NOT INSTALL A VALVE KNOWN TO HAVE BEEN DAMAGED IN SHIPMENT. Check inside the valve to make sure no foreign objects are present.

7. Pinch valves can be installed in any position with flow in either direction. On the model

DEC pinch valve, ***the actuator moves as the valve operates.*** Actuator travel equals half nominal valve size, e.g.: on a 4" valve, the actuator moves 2 inches.

If the valve is installed with stem horizontal, outboard support is required.

You must provide an outboard support with sufficient travel to accommodate the actuator travel.

i) Do not install valve next to a source of extreme heat.

8. Close valve prior to installation. Make sure adjacent pipe is properly aligned. Adjacent pipe must have sufficient travel to insert valve and draw tight to compress sleeve faces; valve will not stretch. Add an expansion joint if necessary to obtain required free play. Make certain adjacent pipe has sufficient free play to allow removal and reinstallation of the valve. (Flange gaskets are not required, but may be used for spacers if necessary.)

   ii) Coat faces of valve sleeve with silicone lubricant to facilitate installation and later removal of the valve and to preserve the resiliency of the rubber.

9. Bolt valve into pipeline. Snug up the bolts gently in a criss cross pattern. It may be necessary to re tighten bolts later after the rubber has taken set.

10. IMPORTANT - INSTALL SUFFICIENT PIPE SUPPORTS TO ISOLATE VALVE BODY FROM EXCESSIVE FORCES.

11. Connect power and control wiring to appropriate terminals inside the actuator wiring compartment. Refer to wiring diagram supplied with valve actuator for correct wiring sequence.

**Warning!**

High voltages may be present inside the electric actuator.

Turn off all power before proceeding with wiring.

All wiring must be performed by a qualified electrician in accordance with local and national electrical codes. Failure to heed this warning could result in injury, death, and/or damage to equipment.

Refer to instruction manual supplied with actuator for details of operation related to the electric actuator.

## MAINTENANCE

1. Visually inspect valve periodically.
2. Lubricate valve once a year. Coat stem (#7) and guide rods (#23) where they pass through the bearings (#2G, 2H, 22) with grease. If valve is in a dusty environment, grease may cause dust to stick to the stem; use light oil.

## SLEEVE REPLACEMENT

1. Relieve process pressure and drain process line. Open pinch valve
2. Turn off electric power. Disconnect electric lines. Label and record connections so the valve can be reconnected in the same manner.
3. Remove valve from process line.
4. Disconnect any accessories attached to the stem.
5. Keep the valve in the open position.

   Disassemble valve bonnet assembly (#2) by removing bonnet bolts, nuts, and washers (#2A, 2B, 2C).
6. Separate upper and lower bonnet halves (#2).
7. Remove positive opening tabs from lower pinch bar (#10) by removing bolts, nuts and washers (#8A, 8B, 8C).
8. Remove the lower pinch bar by removing hex nuts (#23A) from the guide rods (#23).
9. Turn **the manual hand wheel override** of electric actuator clock wise to push the sleeve clear of the upper bonnet. If the valve is equipped with POF tabs, drive the pinch bar out far enough to access the POF hardware.
10. If sleeve (#1) is provided with positive opening tabs (integrally molded tabs bolted to the pinch bar), follow steps 'a' through 'e' below. If no positive opening tabs are provided, proceed directly to step 11.

    a) Remove bolts, nuts and washers that secure the positive opening tabs to the pinch bars (#8A, 8B, 8C). The sleeve (#1) is now free from the pinch bars (#9 & 10). Discard old sleeve. Prepare new sleeve for installation.

    b) Punch holes through the positive opening tabs using a gasket or pliers type punch. The

diameter of the holes in tabs should be approximately equal to hole diameter in pinch bar.

c) Positive opening tab holes must be in proper alignment with respect to the flange face holes, or there will be hell to pay when you reinstall the 10.

d) Replace tab bolts, nuts and washers (#8A, 8B & 8C). Use flat washers on every hole. If you replace bolts (#8A), cut or grind flush with nut (#8C) so bolts do not puncture sleeve in closed position.

e) Trim the tabs even with the top surface of the pinch bar.

11. Coat the stem (#7) where it passes through the bearing with a light application of grease or machine oil.

12. Insert new sleeve and reattach the lower pinch bar. Replace the nuts on the guide rods.

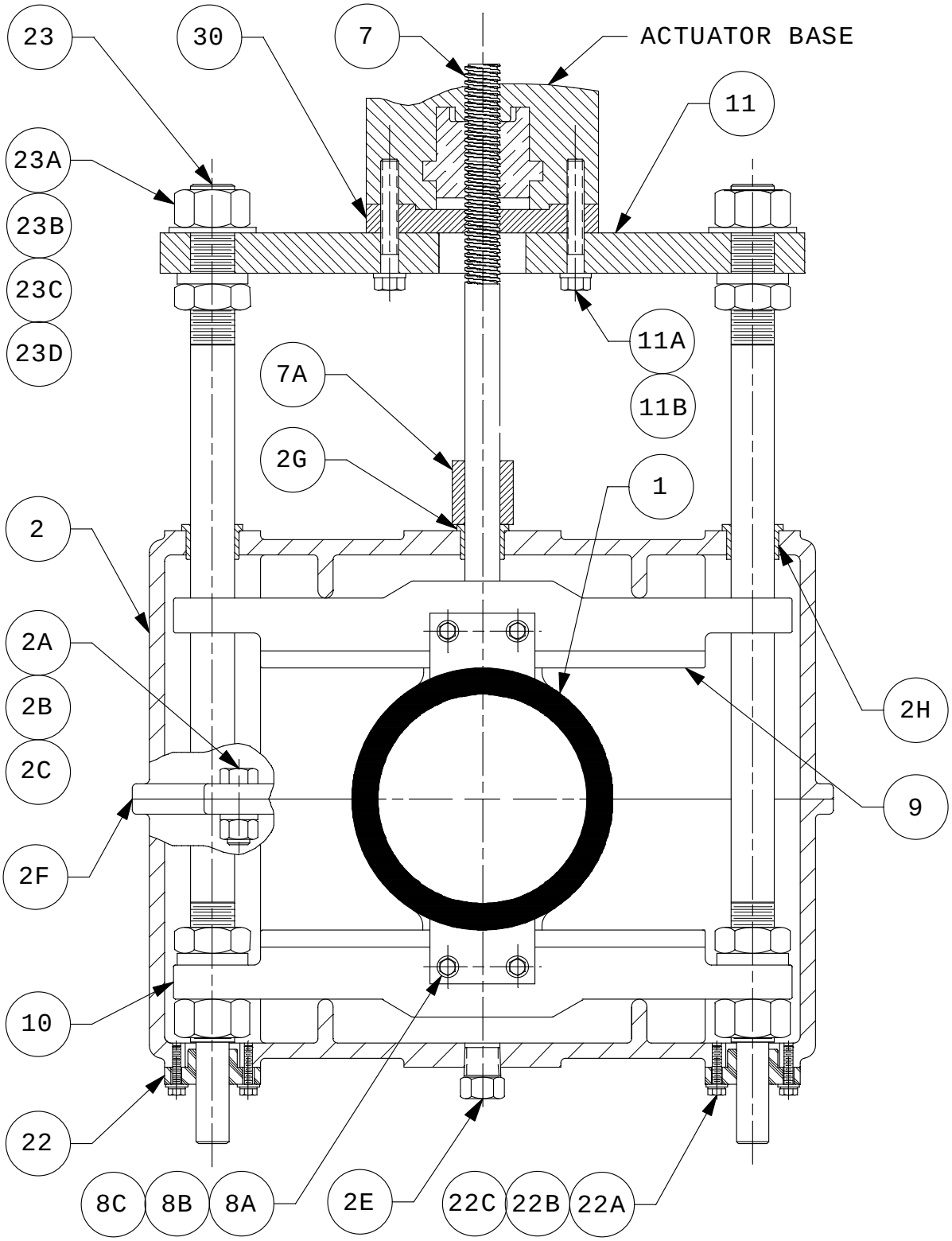
13. Replace the lower bonnet. Apply a coat of valve seal to the mating flanges of the bonnet halves. Bonnets are matched and must be oriented as they were originally or guide rods will not line up properly.

    Replace bonnet hardware (#2A, 2B & 2C).

14. Before restoring power to the valve, check and make sure that the limit switches at both ends of travel are still synchronized correctly. Remove the cover to the limit switch compartment. **Using the manual hand wheel override**, drive the valve to the full closed position. As the valve approaches the seat visually observe the Closed Limit Switch Rotor and make sure that it "turns over" at the correct point. If it doesn't, refer to the actuator instructions and re-set the closed limit. After checking the closed position, again use the hand wheel to drive the valve to the full open position. As the valve approaches the full open stop visually observe the Open Limit Switch Rotor and make sure that it "turns over" at the correct point of travel. If it fails to trip at the correct point, refer to the actuator instruction manual and re-set the open limit switch.

15. After checking the open and closed limit switches for proper operation, it is safe to turn the power back on to the actuator. The valve can now be put back into service.

| Item | Description |
|---|---|
| 1 | Sleeve |
| 2 | Bonnet Assembly |
| 2A | Bolt, bonnet |
| 2B | Lock Washer, bonnet |
| 2C | Nut, bonnet |
| 2E | Plug, bonnet |
| 2F | Sealant, bonnet |
| 2G | Bearing, Stem |
| 2H | Bearing, Guide rod, upper |
| 7 | Valve stem |
| 7A | Mechanical Stop |
| 8A | Bolts, P.O.F. |
| 8B | Washer, P.O.F. |
| 8C | Nuts, P.O.F. |
| 9 | Upper Pinch Bar |
| 10 | Lower Pinch Bar |
| 11 | Yoke |
| 11A | Bolts, Yoke-Actuator |
| 11B | Lock Washers, Yoke-Actuator |
| 22 | Bearing, Guide Rod, Lower |
| 22A | Bolt, Lower Bearing-Bonnet |
| 22B | Flat Washer, Lower Bearing |
| 22C | Lock Washer, Lower Bearing |
| 23 | Guide Rods |
| 23A | Nut, Guide Rod |
| 23B | Washer, Guide Rod |
| 23C | Lock Washer, Guide Rod |
| 23D | Jam Nut, Guide Rod |
| 30 | Spacer, Yoke-Actuator |


23
30
7
ACTUATOR BASE
11
23A
23B
23C
23D
11A
11B
7A
2G
1
2
2A
2B
2C
2H
9
2F
10
22
8C
8B
8A
2E
22C
22B
22A

**Questions?**

**Contact Onyx Valve Co**

**Ph: 856-829-2888 Fax: 856-829-3080**

**e-mail: david@onyxvalve.com**