



CRYOGENIC VALVES  
VACUUM COMPONENTS

C2-LARGEACTINST

**INSTALLATION, MAINTENANCE AND OPERATING INSTRUCTIONS  
C2000 and C3000 SERIES CRYOGENIC  
VALVES W/ PNEUMATIC CYLINDER ACTUATORS  
1-1/2" THROUGH 2"**

**INSTALLATION**

1. Disassemble valve before welding into piping system. Retract stem, put air (100 psig) under cylinder piston to get seat seal off of valve seat. Remove bonnet bolts and withdraw inner valve assembly from body. Take care of loose seals and sealing surfaces and keep all parts clean.
2. Install valve in system and **allow adequate time to cool off after welding before re-installing inner valve.**
3. To re-install inner valve, pressurize the actuator again prior to inserting the inner valve assembly. Insert assembly into top of valve body taking care not to bump the seat seal. Be sure all bonnet seals are in place and set bonnet into cavity. Align bolt holes, lube bolts with anti seize compound and install bolts.
4. Hand tighten bolts, be sure stem is backed out of valve so seat seal is not in contact with seat prior to tightening flange bolts. Cross torque bonnet bolts keeping flange parallel to bonnet top. Depressurize cylinder.
5. With bonnet assembly in place, the inner line can be leak checked for vacuum integrity.

**MAINTENANCE**

**REPLACING THE PLUG ASSEMBLY AND SEAT SEAL**

1. With inner valve assembly out of the body, you can remove the plug assembly. It is not necessary to remove the plug from the stem if you are only changing the seat seal (advance to step 3). Grip the plug in a soft jaw vice or proper sized collet and unscrew the plug lock nut. This will release the plug from the stem assembly. (It is important to take care of the finish on the outside diameter of the plug so do not use pliers or other serrated style holding devices.)
2. Clean the plug lock nut threads and put on a small amount of thread lock fluid. Screw the plug lock nut into the new plug and tighten. With the new plug gripped in the soft jaws, re-tighten the nut.
3. To replace the seat seal, remove the seat seal retainer screws while the plug is held stationary and lift off the retainer and old seat seal.
4. After cleaning the end of the plug and the threads, replace the seat seal and install the retainer and retainer screws. Place a small amount of thread locker on the screws prior to installation and torque in place .
5. Re-install the inner valve assembly into the valve body as instructed in **Installation step 3** above.



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## REPLACING THE STEM AND BONNET SEALS

1. With the inner valve assembly removed as discussed above, remove the actuator and withdraw the stem through the bottom from the bonnet. Remove the packing nut and push out the packing and packing follower. Take care not to scratch the bore of the packing journal.
2. Replace the packing and the o-rings on the packing follower. Re- insert the stem into the bonnet taking care not to injure the packing or o-ring seal faces and re-install the actuator. After installation on the valve, tighten the packing nut to assure a tight seal.

**ACTUATOR REBUILD:** See manufacturers service manual for instructions.

## OPERATION

### ACTUATED VALVE

1. The actuator is either normally closed (NC) or normally open (NO). NC is also sometimes referred to as air to open (ATO) and NO is air to close (ATC).
2. All NC/ ATO actuators require air pressure under the piston to open the valve. Upon removal of the air pressure, a spring will close the valve. Installation and operation of an actuated valve will require air pressure at the actuator. Frequently the air pressure is provided through a 3 or 4 way solenoid or a remote pressure source. (See solenoid installation and service instructions)
3. If a positioner or other instrumentation is used, consult the suppliers instructions for information on actuating the valve.
4. Actuated valve adjustment. The actuator will stroke from closed to fully open over a preset pressure range of 0 to 100 psig or 0 to 150 psig (See the label on the actuator for the range setting). With the valve assembled, apply pressure to the cylinder. The valve will reach maximum lift at either 100 psig or 150 psig (See the label on the actuator for the range setting).
5. Stem adjustments should be done with pressure under the piston to take the spring load off the stem. To adjust the stroke and seat pre load, loosen the stem adjustment lock nut and extend or retract the actuator stem length until the following stroke is attained: 1-1/2" stroke is 7/8", 2" stroke is 1". Re-tighten the lock nut after the adjustment is complete.

## SOFT GOODS KITS

Valve soft goods kits include all seals and packings and are available for all valve sizes. Soft goods for pneumatic cylinders or diaphragm actuators are available. Consult the factory for pricing and availability.



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