



CRYOGENIC VALVES  
VACUUM COMPONENTS

C2-SMALLACTINST

**INSTALLATION, MAINTENANCE AND OPERATING INSTRUCTIONS  
C2000 and C3000 SERIES  
CRYOGENIC VALVES W/ PNEUMATIC ACTUATORS  
½" THROUGH 1"**

**INSTALLATION**

1. Disassemble valve before welding into piping system. Retract stem, put air under actuator diaphragm (30 psig max) to get seat seal off of valve seat. Unscrew bonnet junction nut 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. **Make sure alignment flat drops over raised key** on top of bonnet rim.
4. Hand tighten bonnet nut. Be sure stem is backed out of valve so seat seal is not in contact with seat prior to tightening bonnet nut. Tighten bonnet nut to approximately 15 ft-lbs torque. After torquing the bonnet nut, the actuator can then be depressurized.
5. The inner line can now 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. (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.) This will release the plug from the stem assembly.
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 screw while the plug is held stationery 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 screw. Place a small amount of thread locker on the screw prior to installation and torque in place .



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5. Re-install the inner valve assembly into the valve body as instructed in **Installation step 3** above.

#### 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 of 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 diaphragm 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 way solenoid or a remote pressure source.
3. If a positioner or other instrumentation is used, consult the supplier's instructions for information on actuating the valve.
4. Actuated valve adjustment. The actuator will stroke from closed to open in a preset pressure range of 3 to 15 psig or 6 to 30 psig. See the label on the actuator for the range setting. With the valve assembled, apply pressure to the diaphragm. The valve should begin to lift at either 3 psig or 6 psig and will reach maximum lift at either 15 psig or 30 psig. Adjust the spring tension screw on the top of the actuator if the settings are not correct.
5. Stem adjustments should be done with pressure under the diaphragm 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: ½" valve stroke is 3/8", 1" stroke is 5/8". 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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