

## OPERATION AND MAINTENANCE

### MODEL 873-dome REGULATOR

The model 873-dome is a piston type dome loading regulator. It utilizes a balanced poppet design for high flow and minimum effect of inlet pressure on outlet pressure. The poppet assembly is contained in a cartridge with internal filtration for easy in-field changing. The regulator is self venting but is optionally available without the vent.

### SPECIFICATIONS

- Maximum inlet pressure 6000 PSI (40 MPa)
- Outlet pressure 0 to 6000 PSI
- Flow coefficient ( $C_V$ ) 0.8  
(equivalent to 0.23" orifice)
- Rise of outlet pressure with drop of inlet pressure 3 PSI/1000 PSI
- Materials - body and cap - aluminum  
internals - brass, stainless,  
seals, - KEL-F, Viton
- Fittings 1/4" FNPT inlet  
1/2" FNPT outlet
- Size 3" dia x 4.1" lg

### INSTALLATION

Use a suitable pipe thread sealant such as teflon tape on inlet and outlet threads. Avoid over torquing pipe thread. Normal torque applied with a 6 or 8 inch long wrench is ample. Use ample teflon tape - 3 or 4 turns, not 1 or 2 turns. The inlet is on the left when facing the adjusting knob with the two gage ports upward. An optional panel mounting nut is available (part no. 952). This nut permits mounting the regulator using a 1.25" hole in a panel or plate. The regulator is NOT shipped oxygen clean and should NOT be used for oxygen service as provided. Consult the factory for details on oxygen service. The 1/2" port is the outlet. The 1/4" port adjacent to the 1/2" port is the outlet gauge port. The other two 1/4" ports are the inlet and inlet gauge ports. Either of these ports can be used as the inlet. Connect the inlet to the source gas such as a high pressure storage tank. The outlet is adjusted by dome pressure. AN OUTLET GAUGE AND RELIEF VALVE SET NO HIGHER THAN RATED OUTLET PRESSURE SHOULD BE CONNECTED TO THE OUTLET. A 1/2" NPT SIZE RELIEF VALVE SHOULD BE USED FOR FULL PROTECTION. IF THE INLET PRESSURE CAN EXCEED 6000 PSI A RELIEF VALVE SHOULD ALSO BE INSTALLED AT THE INLET TO PREVENT EXCEEDING 6000 PSI.

### OPERATION

Outlet pressure is adjusted by applying pressure to the dome port. (refer to drawing) When reducing the pressure the regulator will self vent via the vent hole near the cap. This is normal. When reducing set pressure reduce pressure to below the new setting then increase pressure to the new setting. Typically dome pressure is supplied by a small, low flow, hand loading regulator having the desired pressure range. Aqua Environment 415 series regulators can be used. TO AVIOD POSSIBLE PISTON CHATTER USE .016 TO .020 ORFICE AT DOME PORT.

### MAINTANENCE & REPAIR

**CAUTION** As with any regulator or valve, particulates or moisture can plug or freeze the internal filter or valve seat. This can occur when upstream dryers are not changed or remain unused for long periods allowing corrosion materials to accumulate. In critical applications where it is important not to lose flow, a larger particulate filter should be used upstream. Also an orifice such as the Aqua model 796 should be used downstream. This reduces the tendency to freeze when moisture is present. Consult factory for details. The user should establish time intervals for changing the valve cartridge, filter and upstream dryers based on experience and service conditions. No representation is made herein as to time intervals as each use is unique. Back-up systems should be used in very critical applications since field maintenance is hard to insure. The poppet cartridge 895 is a factory assembled item and should be replaced if required and not disassembled unless absolutely necessary. Spare cartridges are available at a nominal cost and should be kept on hand if rapid repairs are required. IN ALL CASES THE UNIT CAN BE RETURNED TO THE FACTORY OR DEALER FOR REPAIR UNDER WARRANTY IF APPLICABLE OR AT A NOMINAL CHARGE. Maintenance or repairs should only be done by qualified personnel in a clean environment by following the drawings and parts lists herein.

If leakage occurs through the regulator or out the regulator vent, allow the inlet and outlet pressure to equalize by shutting off the inlet. If leakage continues after the inlet and outlet equalize the vent seat 5 or piston seal 14 are leaking. Replace these. If leakage stops when the inlet and outlet pressure equalize the poppet cartridge item 1 is leaking. Replace this.

**ASSEMBLY & DISASSEMBLY -  
MODEL 873-dome REGULATOR**

ITEM	QTY	PART NO.	DESCRIPTION
1	1	895	poppet assy
2	1	893	body
3	1	922-1	cap (non vented)
	1	922-1V	cap (vented)
4	1	923-1	piston (non vented)
	1	923-1V	piston (vented)
5	1	946-1	vent seat (vented)
	1	1035-1	seat- not vented
6	2	921	seal retainer (vented only)
7	1	953-1	tube (vented only)
8	1	876-9D	spring
9	1	876-10D	seal 2-006 90V (vented)
10	1	876-11D	seal 2-131 90V
11	1	876-15	seal (2-010) Vit. 90
12	2	876-27	seal (2-135) Vit. 90
13	1	876-16	seal (2-020) vit. 90
14		979-dome	REPAIR KIT - includes items 1,5,9,10,11,12,13 (for non vented delete 9

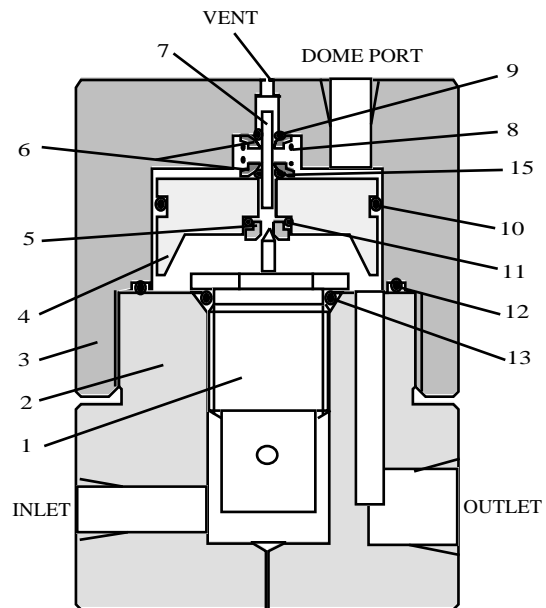
and  
replace item 5 with 1035 seat)

15	1	876-007D	seal 2-007 90V(vented)
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**NOTES**

1. Technical bulletin - 874  
895 poppet cartridge assy - drw 896
2. Use Dow silicone grease 111 or equivalent on threads. Use Cristo-lub MCG 121 on seals. Use Slick 50 EP grease or equivalent on bearings 11 and 12 and on threads between items 7 and 9.
3. **ASSEMBLY**
  - a. Clean all parts and insure there are no visible chips or particulates.
  - b. Inspect vent seat 5 under 10X magnification at sealing edge. Wipe clean as required.
  - c. Install cartridge 1 with seal 16 in housing
  2. Torque to 10 to 20 ft lbs.
  - d. Install seal 10 on piston 4. Pack heavily with Cristo-lub MCG 121.
  - e. (Vented only) Assemble two seals item 9, two seal retainers 6, and spring 8 on tube 7 as shown.
  - f. (vented only) Place this assembly into recess in cap 3 as shown then install piston 4 into cap. Insure tube 7 engages in hole of piston 4.
  - g. Install seal 12 in cap as shown.

- h. Install seal 11 and seat 5 into piston as shown.
  - i. Screw cap 3 and body 2 together. Hold cap 3 downward so seat 5 does not fall out during assembly. Torque to 10 to 20 ft lbs using a strap wrench or by hand.
4. PART NUMBERS - FOR VENTED VERSION - 873-DOME V; FOR NON VENTED VERSION - 873-DOME NV
5. For non vented do not drill out items 3 nor 4. (drilled out items 3 and 4 are designated by a -1. Delete items 6,7,8,9 and 11 and use p/n 1035-1 as item 5



- h. Lubricate cylinder walls of item 3 and seal 10 on piston then install piston 4 as shown