

Model 112B Powreactor Regulator FINAL ASSEMBLY AND TESTING INSTRUCTIONS

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Scope

These instructions outline procedures to be followed by the factory when assembling and testing the Model 112B Powreactor Regulator with balancing valve, external or internal dome loading.

Special Tools and Equipment

Refer to Table A for tools and assembly torques.

Test medium and equipment are shown in Test Procedures.

Lubricants must be compatible with cleaning requirements; refer to shop job.

Assembly Procedure

A. CLEANING

Make sure all parts have been cleaning and inspected in accordance with the applicable specifications, as shown on the shop job.

B. LUBRICATION

Using lubricant compatible with cleaning requirements, apply sparingly to the following parts:

1. Threads on the following:
 - Dome Capscrews (or studs) . . . 8
 - Port Fittings 71, 72
 - Body Plug 29
 - Dome and body needle valves . . . 1, 74
 - Dome plug 19
2. Sliding Surfaces:
 - Pushrod 14
 - Valve 30

NOTE:
Check valve surface for scratches. Polish with emery cloth as required.

CAUTION:
Use soft jaws in vice. Be sure parts are lubricated per "part B" prior to assembly.

3. All O-Rings

C. ASSEMBLY

1. Clamp flat faces of body (24) in vice.
2. Install O-rings (73) on port fittings (71 (72) and screw into body. Torque per Table A.
3. Install backup ring (61) and O-ring (17) on body plug.
4. Inspect valve (30) for scratches. Polish with emery cloth as required.
5. Install valve in valve seat bushing (32). Then install seat washer (94), seat O-ring (59), seat (92) and retainer (95).
6. Slide on the valve seal (36) and O-ring (35), back up ring (89), and valve spacer (93).
7. Drop the valve spring (4) in the body plug and install the above sub-assembly. Position the valve seat bushing O-ring (96). Push down on seat retainer, insert the sub-assembly into the body plug until valve seal and O-ring are fully captivated.
8. Hold the body upright and screw in body plug hand tight.
9. Invert body and clamp in vice on body O.D. such that the port fittings stop on the vice jaws.
10. Torque body plug per Table A.

11. Turn body over, clamping in the same fashion, and install pushrod (14) (if not already installed).
12. Set the diaphragm plate (28) in place. Push down on the diaphragm plate, stroking the valve, to see that the valve operates freely.
13. Place diaphragm (23) in body; insert dowel pin (13); screw in studs (if applicable).
14. Insert passage O-ring (18) in dome plate (26) and position on body, aligning dowel pin with proper hole.
15. Install dome O-ring (9) and dome (27).
16. Secure dome capscrews (8) (or nuts depending on design), tightening in a diametrically opposed manner per Table A.
17. Install dome plug (19) and O-ring (10).
18. Install supply and loading needle valves, (74) and (1), respectively.

CAUTION:
Do not over torque needle valves. (30 in-lb max.)
Needle valves are not interchangeable.
See assembly drawing.

19. Back out supply valve (74) off its seat 2 turns.
 20. Position bushing (76) and tighten the lock nut (77).
- Assembly is now complete.

Test Procedure

A. TEST SET-UP

Equipment:

1. Pressure gauge, inlet
2. Inlet block valve
3. External load valve
4. Pressure gauge, outlet
5. Outlet block valve
6. Regulator being tested

1. Install regulator in test set-up shown in Figure 1.
2. Determine maximum rated inlet and outlet pressure ratings.

CAUTION:
Maximum pressure ratings may be limited
by end connections. If uncertain,
contact engineering.

B. LEAK TEST, DOME VENTED

1. Vent dome. Close the supply and loading needle valves.
2. Check rated inlet valve and body plug leak:
 - a. Apply rated inlet pressure to inlet port.
 - b. Check for leak to outlet and around body plug.
 - c. If not leaks are detected, proceed to LEAK TEST, DOME LOADED.
 - d. If outlet leak is detected, vent all pressure and re-torque body plug. If the leak persists, remove the body plug. Inspect valve seat unit, valve, O-rings (bushing, seat, valve), body plug, and body for damage.
 - e. If the body plug leak is detected, inspect body plug threads, O-ring, and O-ring sealing surface of body.

C. LAK TEST, DOME LOADED

1. Apply maximum rated inlet pressure to inlet port.
2. Load dome, allowing small bleed through outlet line, until outlet gage shows maximum rated outlet pressure.
3. Close outlet stop valve.
4. Check exterior of regulator for leaks with a bubble solution.
5. If not leaks are detected, proceed with REGULATOR PERFORMANCE TEST.
6. Correct leaks as follows: Discard and replace defective parts.

- a. Junctures between dome plate, dome, and body and heads of capscrews:

Vent pressure. Inspect dome O-ring, passage O-ring, and diaphragm. Be Sure the capscrews are torqued per Table A.

- b. Dome loading needle valves:

Remove and inspect surfaces. Do not exceed 30 in-lb. torque in closing these needle valves.

D. REGULATOR PERFORMANCE TEST

1. Apply maximum rated inlet pressure to inlet port.
2. Load dome with needle valves to produce about 10% of the rated outlet pressure.
3. Slowly open and close outlet stop valve to check regulating action, hysteresis.

4. Check the valve seat and diaphragm operation:
 - a. Slowly close outlet stop valve. Outlet lock-up pressure should stabilize after a few seconds.
 - b. If lock-up pressure creeps up, re-check valve seat assembly.

Note:

If ambient temperature is much greater than the regulator body temperature, the lock-up pressure may creep up as the temperature of the regulator rises.

- c. If set pressure drops off, check diaphragm, dome O-ring seal, and dome loading system.

5. Load dome to maximum rated outlet pressure and repeat performance test points 3 and 4.
 - a. If no leaks are detected, proceed with LEAK TEST WITH DOME VENTED (RECHECK).

E. LEAK TEST WITH DOME VENTED (RECHECK)

1. Vent dome and outlet.
2. Check inlet valve and body plug leak:
 - a. Apply rated inlet pressure to inlet port.
 - b. Check for leak to outlet line and around body plug with bubble solution (Snoop).

This completes the final assembly and acceptance test of the RedQ Model 112B Powreactor Regulator.

Table A. Assembly Tools and Torques for Model 112B

PART NAME	PART NO.	THREAD SIZE	WRENCH SIZE OR TOOL NO.	ASSEMBLY TORQUE
VALVES, INT. DOME LOAD.				
Needle, Supply	20526	5/16-24 UNF	5/32 Hex key	30 in-lb. max.
Needle, Dome	20527	5/16-24 UNF	5/32 Hex key	30 in-lb. max.
Lock Nut	N66-55171	5/16-24 UNF	9/16 Hex	10 ft-lb.
	12816-1	5/16-24 UNF	_ Hex	10 ft-lb.
DOME PLUG				
An 814-4C Tbg	035-08065-4	7/16-20 UNF	11/16 Hex	24 ft-lb.
BODY PLUG				
Balancing Valve	143-20008	1" - 12" UNF	1-1/4 Hex	50 ft-lb.
DOME BOLTING				
Capscrews	Various	_ -20 NF	3/8 Hex key	50 ft-lb.
Studs	Various	_ -20 NF		Hand Tight
Nut	Various	_ -20 NF	_ Hex	50 ft-lb.
		5/8-11 NC	15/16 Hex	100 ft-lb.
PORT FITTING				
Inlet/Outlet	Various	1-5/16-12 UN	1-1/2 Hex	150 ft lb.

Assembly torque is same for either aluminum or stainless steel body.

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