

GROVE

MITY-MITE BACK PRESSURE REGULATOR

MODELS 90 & 91

OPERATING AND MAINTENANCE INSTRUCTIONS

I. Introduction

Mity-Mite Back Pressure Regulators are of the air dome type, designed to maintain a constant upstream pressure.

Control pressure ranges and operating temperatures are as follows:

BASIC MODEL	RATED BACK PRESSURE CONTROL RANGE	MAXIMUM TEMPERATURE
90W	10 - 2000 psi, Hycar diaphragm	150 °F.
91LW	25 - 400 psi, Teflon diaphragm	200 °F.
91W	100 - 2000 psi, Teflon diaphragm	200 °F.
91XW	100 - 3000 psi, Teflon diaphragm	200 °F.

All basic models may be used to control either gases or liquids. The dome, however, must always be loaded with air or other gas.

II. Operation

The diaphragm and the nozzle part of the Mity-Mite body form a variable orifice similar in action to the valve and valve seat in other types of regulators.

Dome pressure acts over the exposed area of the diaphragm to seat it on the nozzle. When upstream pressure exceeds the desired level, it pushes the diaphragm up off the nozzle. The flow of fluid through the regulator relieves the pressure in the upstream system. As the upstream pressure drops off, the diaphragm moves down to reduce or shut off the flow, so that upstream line pressure is held constant.

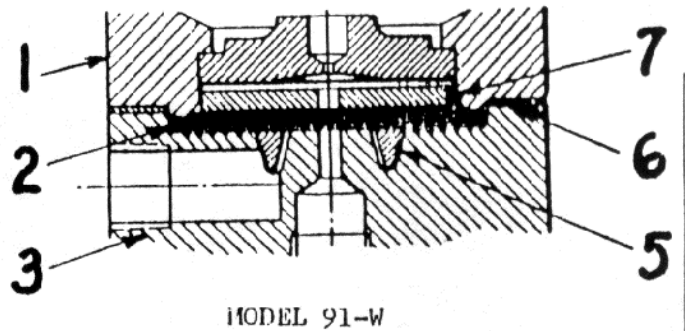
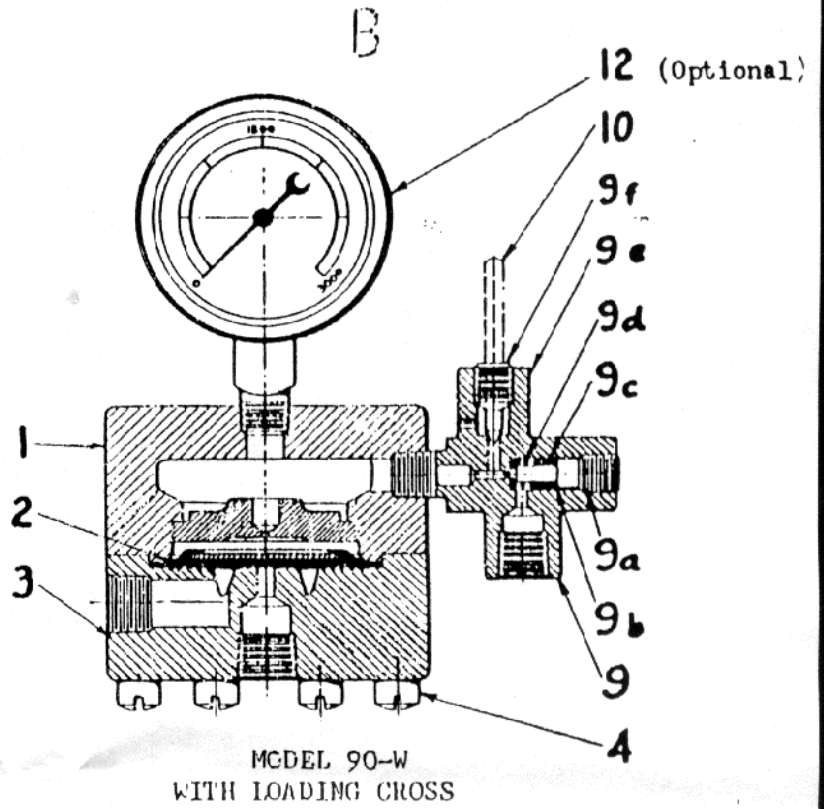
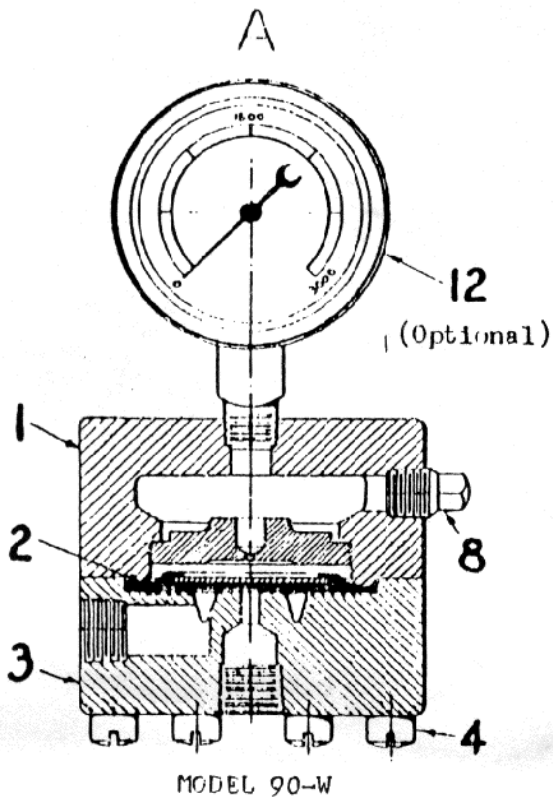
Due to internal design, the actual pressure in the dome will vary slightly from the back pressure setting. This does not affect the regulating action. The dome should be loaded so as to produce the desired back pressure as shown on a gage in the upstream line.

### III. Dome Loading Procedure

All Model 90 and 91 back pressure regulators are of the externally dome loaded type and must be charged from an external source of gas pressure. The dome of the standard regulator has a 1/4" FNPT gauge connection in the top surface and a 1/8" FNPT plugged side connection to receive the dome charging line. Although a dome gauge is recommended to prevent dome overpressure during the charging operation, this gauge is not supplied with the regulator. Loading crosses and manifolds are available but must be ordered separately. Illustrations on sheet 3 show suggested methods of dome loading as follows:

- a. This is the regulator as it is supplied when no loading device is ordered. To place in service, plug, Item 8, is removed and the customer provided dome charging equipment attached. Although a gauge may be mounted on the top of the dome, as shown, the true back pressure setting must be obtained by reference to a gauge in the upstream line. If a dome gauge is not used, this port must be tightly plugged.
- b. When ordered with the regulator, Grove Loading Cross, 100-00801 is attached to the regulator as shown. The charging supply connection to this loading cross is 1/8" FNPT. Loading needle valve, piece 9a, admits pressure to the dome while needle valve, piece 9f, permits bleeding excess pressure from the dome. Both needle valves are adjusted by hexagonal Allen wrenches provided with the loading cross. When the loading pressure has been adjusted to obtain the proper back pressure setting, both needle valves must be tightly closed.

GROVE MODELS 90 AND 91 BACK PRESSURE REGULATORS



W-90-BU-1  
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10/18/62 PV.

Appr. *PA*

W-94-800-1

Sheet 1 of 3

GROVE  
ASSEMBLY INSTRUCTION

MITY-MITE REDUCING REGULATORS, ALL STYLES

ACCEPTANCE TEST PROCEDURES

I. Scope

This procedure covers acceptance tests performed at the factory on Mity-Mite pressure reducing regulators, including both internally and externally dome loaded styles, and relieving models.

II. Test Set-Up

1. Mount Mity-Mite in test set-up as shown in Figure 1.
2. Note that dome loading line is used only on externally loaded domes.
3. Test pressures are maximum inlet and outlet pressures as shown on the Mity-Mite nameplate.

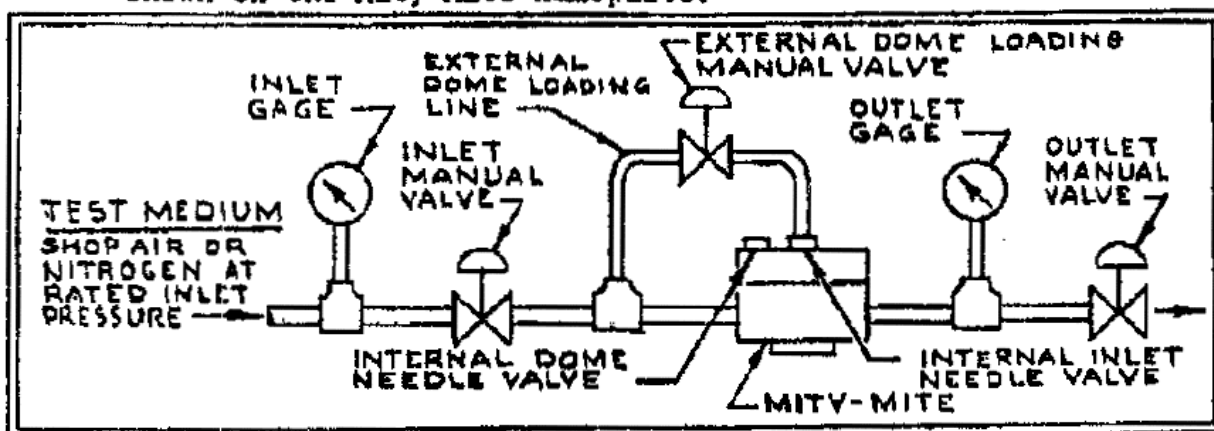


FIGURE 1. ACCEPTANCE TEST SET-UP

III. Test Procedure

A. INLET LEAK TEST, DOME VENTED

1. On internally dome loaded styles, close inlet needle valve and open dome needle valve.
2. On externally dome loaded styles, vent dome to atmosphere.
3. Check inlet regulator valve and body plug leak:
  - a. Admit rated inlet pressure to inlet port of Mity-Mite.
  - b. Apply bubble fluid to body plug and outlet manual valve.
  - c. There shall be no bubbles.

CONTINUED ON NEXT PAGE

## III. (continued)

## B. DOME LOADING

1. Load internally loaded domes as follows:
  - a. With rated inlet pressure applied to inlet port, and inlet needle valve closed, set outlet manual valve to allow small flow through Mity-Mite.
  - b. Close dome needle valve first, then open inlet needle valve.
  - c. Slowly re-open dome needle valve, to get maximum rated outlet pressure on the outlet gage.
  - d. Close dome needle valve first, then close inlet needle valve.
2. Load externally loaded domes as follows:
  - a. With rated inlet pressure applied to inlet port, and Mity-Mite dome vented, set outlet manual valve to allow small flow through Mity-Mite.
  - b. Connect dome loading line.
  - c. Slowly open dome loading manual valve, to get maximum rated outlet pressure on the outlet gage.
  - d. Close dome loading manual valve.

## C. LEAK TESTS, DOME LOADED

1. With maximum rated pressure on both inlet and outlet side of Mity-Mite, slowly close outlet manual valve.
2. Outlet pressure shall stabilize within a few seconds and remain steady.
3. Apply bubble fluid to all exterior fittings and ports of Mity-Mite.
4. There shall be no bubbles.

## D. FUNCTIONAL TEST

1. Open outlet manual valve and re-close smoothly several times to check regulating action.
2. Outlet pressure shall return to set level and remain steady.
3. On relieving models (94R, 94RW, 94RR), close outlet manual valve and bleed dome gradually, to check relief action as dome pressure drops below outlet locked-up pressure.

Grove Mity Mite Needle Valve Controls - set with Allen wrench

