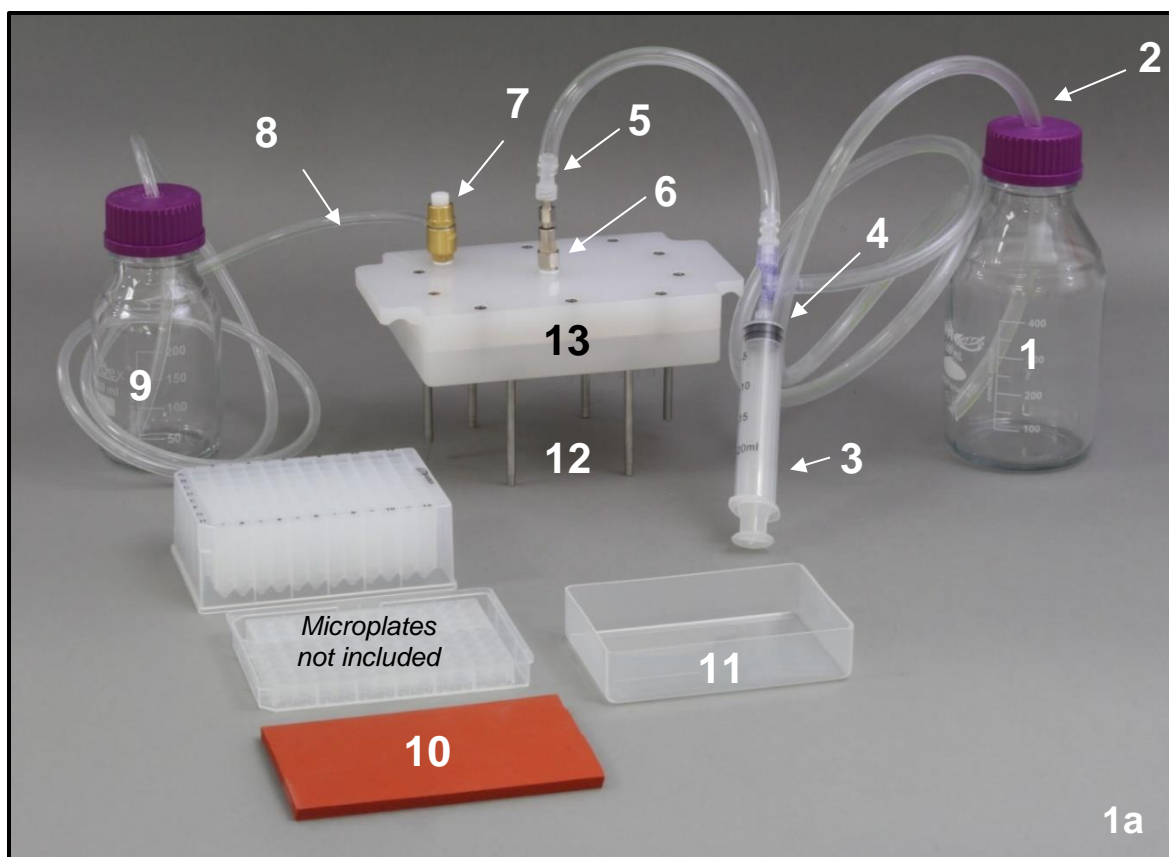


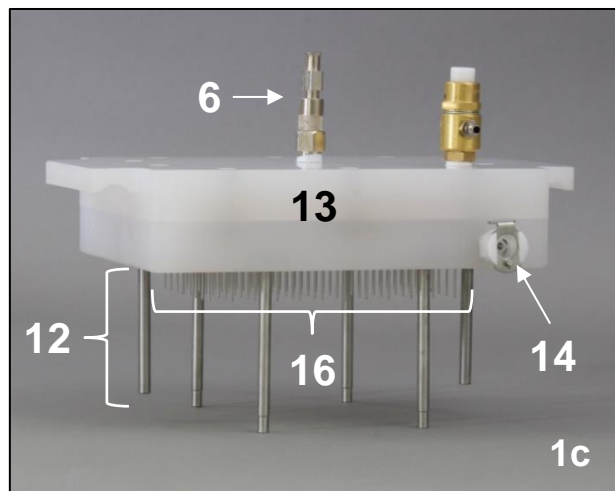
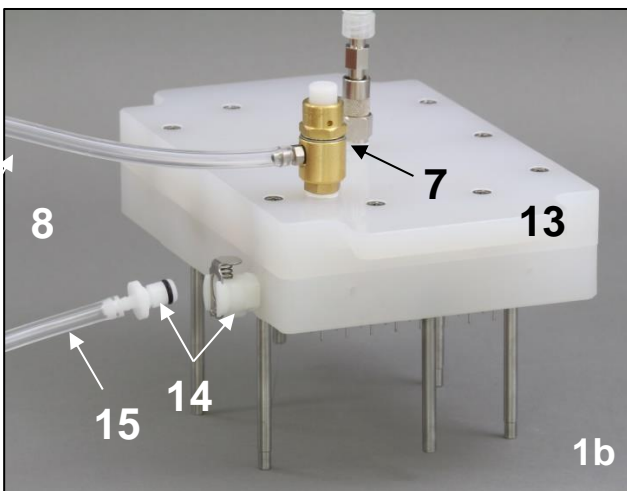
**VP 178BJD-HH DISPENSING MANIFOLD: CARE AND USE**



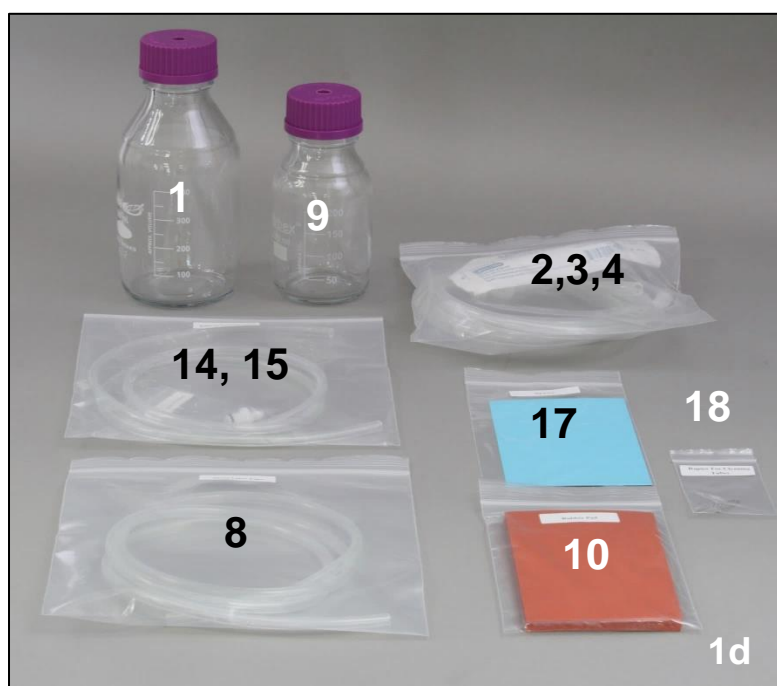
**Figure 1a. Parts of the VP 178BJD-HH Dispensing Manifold**

**PARTS GUIDE**

1 – Source Bottle (500ml) with Cap	7 – Bleed Valve	13 – Polypropylene Manifold Body
2 – Source Tubing (Tygon 2375, (1/4" ID, 3/8" OD)	8 – Bleed Valve Tubing (Tygon 2375, (1/8" ID, 1/4" OD)	14 – Quick Connect Fitting
3 – Syringe (20ml)	9 – Bleed Valve Collection Bottle (250ml) with Cap	15 – Tubing to Vacuum Trap (Tygon 2375, 1/8" ID, 1/4" OD)
4 – Two-Way Valve for Syringe	10 – Silicone Rubber Pad	16 – Stainless Steel Dispensing Tubes
5 – Luer Lock Tubing Fitting	11 – Wash Tray (VP 421)	17 – Spacer
6 – Luer Lock Fitting	12 – Support/Guide Rods	18 – Rapier



**Figures 1b and 1c. Parts of the VP 178BJD-HH Dispensing Manifold (see Parts Guild on p.1)**



**Figure 1d. Accessories for the VP 178BJD-HH Dispensing Manifold with Syringe (as shipped, see Parts Guild p.1))**

**IMPORTANT NOTE:**

**The Dispensing Manifold is chemically resistant to some common laboratory solvents (such as ethanol, methanol, isopropanol) but not all (acetone or chloroform, for example). Please contact V&P Scientific if there are questions regarding chemical resistance of the Manifold to the liquid to be dispensed.**

## SETUP

### Part 1 – Setting up Syringe Filling System

1. Connection of Source Bottle and Syringe Filling System to Manifold.
  - a. Attach the shorter piece of tubing that is attached to the Two-Way Valve (4) to the Luer Lock Fitting (6) on the top of the Manifold Body (13) using the Luer Lock Tubing Fitting (5) as shown in Figure 1a.
  - b. Attach the Syringe (3) to the Two-Way Valve (4) as shown in Figure 2.

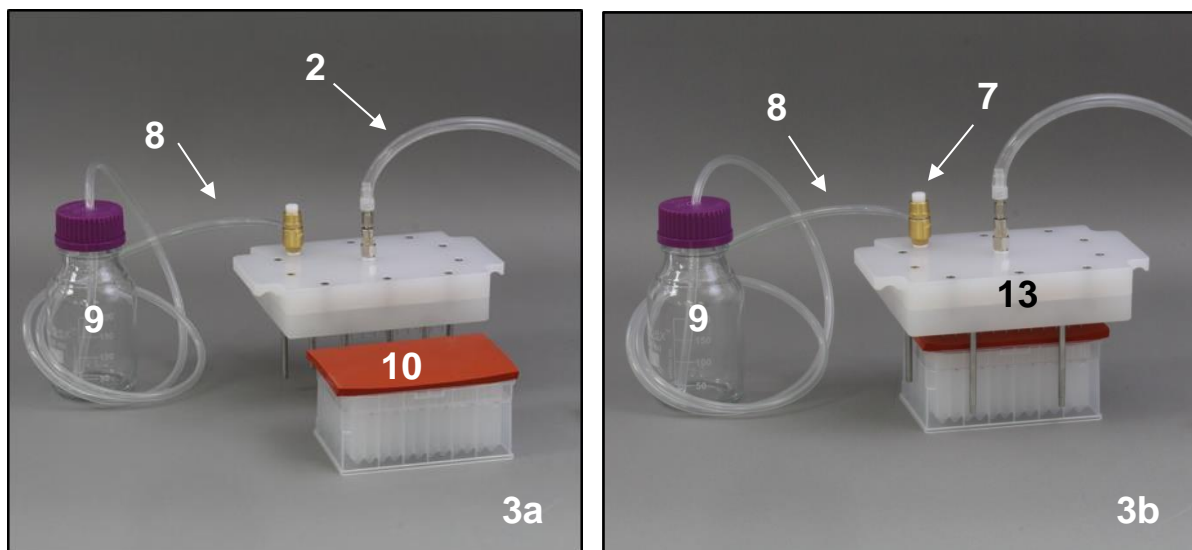


**Figure 2. Parts of the Syringe Filling System for Manifold Priming and Dispensing**

- c. Insert the other end of the Manifold Source Tubing (2) into the hole in the Source Bottle Cap (1) and down into the Source Bottle (1) as shown in Figure 1a. If the Source Tubing does not fit loosely in the hole, unscrew the Cap slightly so a vacuum does not form in the Source Bottle.
  - d. When operating, make sure the liquid level in the Source Bottle (1) does not fall below the bottom of Source Tubing or air will enter the system.

## Part 2 - Bleeding Air from Manifold to Prime for Dispensing

1. If connected to the Vacuum Trap (as in Figure 5), make sure Quick Connect Fitting (14) is *disconnected* before bleeding air from the system (Figure 1c shows it on the back of Manifold Body). To disconnect, press on the metal tab on the Quick Connect Fitting part that is screwed into the Manifold Body (13) and pull on the part with the tubing (15) attached. Once separated, a valve in the part of the Quick Connect Fitting on the Manifold Body is closed.
2. Place the Bleed Valve Collection Bottle (9) beside the Manifold (Figures 1a and 3). Connect one end of the Bleed Tubing (8) to the Bleed Valve (7) and insert the other into the hole in the Collection Bottle Cap and into the Collection Bottle (9).
3. Place Rubber Pad (10) on top of a 96 deep well microplate that has a flat bottom microplate on top and upside down (Figure 3a). Lower the Manifold body until the Dispensing Tubes (16, Figure 1c) are pressed slightly into the pad (Figure 3b).
4. To hold in position press down on top of Manifold body (13) with moderate force. Maintain enough pressure on the Dispensing Tubes (16) to prevent liquid from coming out when bleeding air from the Manifold.



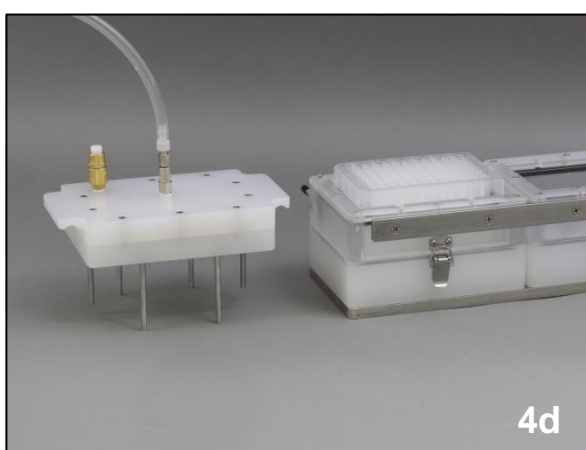
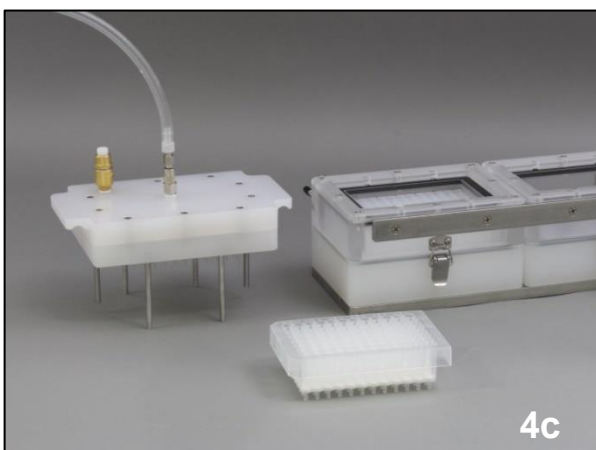
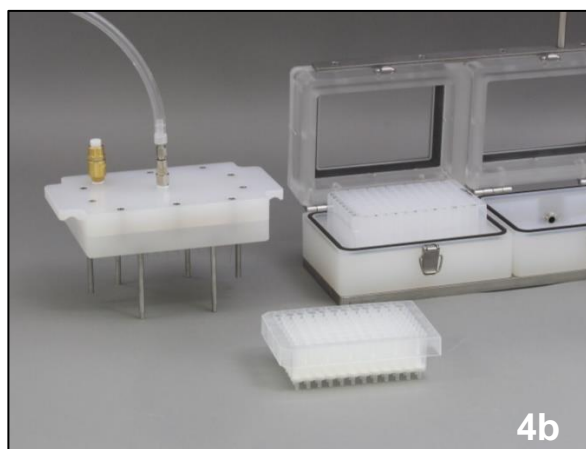
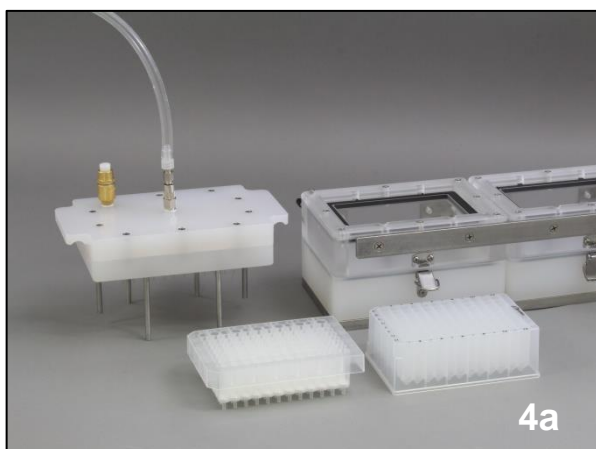
**Figure 3 (a-b). Use of Silicone Rubber Pad to Block Dispensing Tubes when Bleeding Air from Manifold during Priming Step (part 2)**

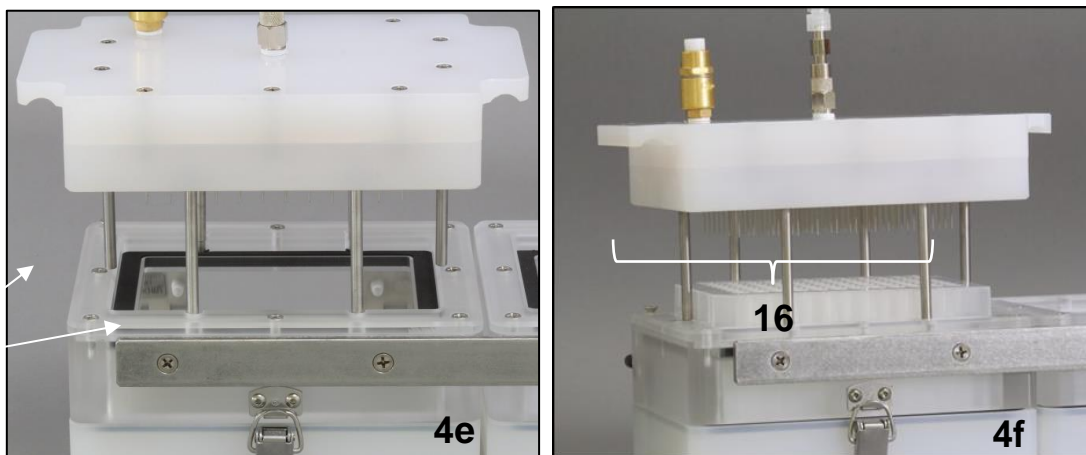
5. Pull plunger of the Syringe (3) to fill it with liquid from the Source Bottle. Depress the top button of the Bleed Valve (7).
6. Depress the plunger of the Syringe (3) with steady force to dispense the liquid while holding down the Bleed Valve button (7). Let go of Bleed Valve button when re-filling the syringe to hold liquid in the Manifold inner chamber.
7. The Manifold has an approximate 150 ml dead volume, so repeat Steps 6-7 several times depending on the volume of the Syringe. Stop when a steady stream of liquid comes out of the Bleed Valve Tubing (8) into the Collection Bottle (9).

8. To rid the Dispensing Tubes of any trapped air, replace the Rubber Pad (10) and microplate with a tip box lid (or other suitable container). Using the Syringe Filling System, forcefully move liquid through Manifold, without pressing the Bleed Valve button, until equal streams of liquid are seen coming from all the Dispensing Tubes (16).

### **PART 3 – Positioning on Filter Plate Vacuum Manifold**

1. Load Collection and Filter Microplates into Vacuum Manifold as shown in Figure 4a-d.
2. Place the primed Dispensing Manifold on top of the Vacuum Manifold as shown in Figure 4e. The Filter Plate is not included to show the position of Support/Guide Rods (12).
3. Position the Dispensing Tubes (16) of the Manifold over the 96 Well Filter Plate by lifting it over the filter plate that is on the Vacuum Manifold (Figure 4f).
4. Important note: Keep the primed Manifold level when moving it to and from the Vacuum Manifold.





**Figure 4. Dispensing Manifold Setup on Microplate Vacuum Manifold**

## **OPERATION**

### **Dispensing Liquid into Filter Microplates**

1. Ensure the Manifold is set up for dispensing (see set-up on previous pages).
2. Position the Dispensing Tubes (16) of the Manifold over the 96 Well Filter Plate by lifting it over the plate while it is on the Vacuum Manifold (Figure 4f).
3. Press down on the Manifold Body with even pressure until the Support/Guide Rods (12) are secure in the notches in the top of Vacuum Manifold and the shorts ones on ends contact the surface (Figure 4e).
4. Draw the desired volume of liquid into the Syringe (3) from the Source Bottle (1):  $\text{volume to draw into dispenser} = \text{volume/well} \times 96 \text{ wells}$ .
5. To dispense, depress plunger of Syringe (3) in a steady motion.
6. After dispensing, either re-load Syringe for another dispense or move Manifold to another Filter Plate.

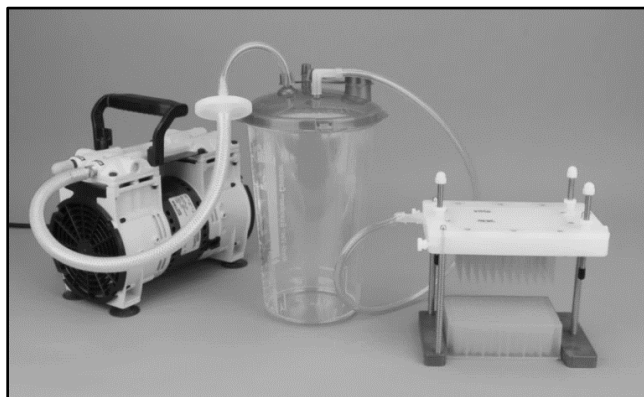
### **IMPORTANT NOTE**

**Dipping the tips of the tubes into a reservoir containing the dispensing liquid will prevent liquid from dripping from the tubes. This is especially important when working with liquids with low surface tensions, such as alcohols and organic solvents. This may be required in between each dispense depending on type of liquid.**

## CARE

### Setup for Aspirating

1. The cleaning procedure for the Dispensing Manifold is to aspirate wash solutions through the Dispensing Tubes (16) and out the Quick Connect Fitting (14). This procedure requires the use of a vacuum source such as a pump or a central or “house” vacuum system.
2. Attach one end of a vacuum hose to the Quick Connect Fitting (14) on the Manifold (Figure 1c) and other end to a vacuum trap, such as VP 561T, to collect aspirated liquid (Figure 5). Then connect to the vacuum source. Addition of a shut-off valve between the vacuum trap and manifold can be helpful.
3. Make sure the Syringe is *connected* to the Luer Lock Fitting (6) on the top of the Manifold before using for aspirating. Alternatively, attach a Luer Lock plug fitting.
4. Make sure all tubes are clear by aspirating distilled water from a microplate. If any tubes are clogged use the rapier (17) to clean them out. See “Cleanup” section for more details.



**Figure 5. Connection to Vacuum Source VP 561 for cleaning by aspiration. VP 561T Vacuum Trap collects aspirated liquids.**

### Cleaning the System by Aspirating

1. Remove liquid from inside Manifold as follows:
  - a. Position a tip box lid such as VP 421 (11) under the Dispense Tubes (16).
  - b. Insert Bleed Tubing (8) in Collection Bottle (9).
  - c. Remove the Source Tubing (2) from liquid or replace Source Bottle (1) with an empty one.
  - d. While depressing the Bleed Valve (7), use the Syringe (3) to pump air into the system until the Bleed Tubing (8) is clear of liquid.
  - e. Liquid collected in Collection Bottle (9) and in tip box lid can be saved for re-use.
2. Set up Manifold as described in “Setup for Aspirating”.
3. Position a tip lid box or other suitable container filled with wash solution (distilled water\* first, then 100% alcohol, for example, isopropanol, ethanol, or methanol) under the Manifold.



4. With Dispensing Tubes (16) positioned in wash solution, turn on vacuum to allow the liquid to be aspirated through Manifold and into Vacuum Trap.
5. Tip the Manifold toward the Quick Connect Fitting (14) to ensure all wash solution is removed from the Manifold by the vacuum.
6. Use the vacuum to aspirate 2-4 ~100ml volumes of each wash liquid.
7. After the last wash of alcohol, pull air through the Manifold for 1- 2 minutes by leaving the vacuum on and in-line shut off valve open.
8. It is also recommended that Syringe and tubing be rinsed by distilled water followed by alcohol.

### **Aspirating Liquid from Microplate Wells**

1. The Dispensing Manifold can also be used as an Aspirating Manifold. Aspirating from a microplate can be useful for cleaning as each Dispensing Tube will have a separate wash volume. And Dispensing Tubes that do not aspirate a well can be identified for cleaning with the wire Rapier (19).
2. Set up as described in "Setup for Aspirating".
3. Place 96-well plate filled with wash liquid under the Dispensing Tubes (16) of the Manifold.
4. Turn on vacuum to allow the liquid to be aspirated through Manifold and into Vacuum Trap.
5. Remove the Manifold Dispensing Tubes (16) from the microplate after liquid has been aspirated.
6. Turn vacuum off.

### **Storage**

1. For short-term storage (for 1-2 hours depending on the volatility of the liquid), keep the tips of the stainless steel Dispensing Tubes (16) in the liquid being dispensed or in distilled water (\*not deionized water, see footnote below). This will prevent the liquid from evaporating and leaving material behind that might clog the Dispensing Tubes (16).
2. For long-term storage (more than 1-2 hours) clean the Manifold as described above for "Cleaning by Aspirating".
3. After cleaning, store in a clean dry area.

### **Sterilization**

1. The Manifold can be sterilized by autoclaving or by wiping with a cloth dampened by a dilute bleach solution, followed by a water wipe.
2. Do not autoclave Two-Way Valve (4) or Syringe (3).



**\*Always use distilled H<sub>2</sub>O and not deionized H<sub>2</sub>O in all Manifold procedures. Long term exposure to deionized H<sub>2</sub>O will corrode the Stainless-Steel Dispensing Tubes.**

## **TROUBLESHOOTING**

PROBLEM: Not all microplate wells are being filled evenly.

SOLUTIONS:

1. Use Rapier to clear tubes.
2. Ensure that air is not being introduced into the system:
  - a. Check that the solution being dispensed does not have air bubbles.
  - b. Check that all tubing fittings are tight.
3. Clean system by aspirating as described in Care Section on page 6.

PROBLEM: Not all microplate wells are being aspirated evenly.

SOLUTIONS:

1. Use Rapier to clear tubes
2. Create a greater vacuum.
3. Move the microplate around while aspirating. Sometimes the tubes may be touching the bottom of the wells, which leads to incorrect aspiration.
4. Clean system by aspirating as described in Care Section on page 6.

## **TECHNICAL ASSISTANCE**

If technical assistance is required, contact V&P Scientific, Inc. at 858-455-0643 or [sales@vpsci.com](mailto:sales@vpsci.com).

## **WARRANTY**

V&P Scientific, Inc. warrants this product to be free from defects in material and workmanship when used under normal laboratory conditions for one year. This warranty begins from the date of delivery by V&P Scientific.

In the event this product fails under normal laboratory conditions within the specified period of time because of a defect in material or workmanship, V&P Scientific will, at its option, repair or replace the product. Damage to the product caused by user negligence is not covered.

Please keep the special shipping carton in case the unit needs to be shipped back to V&P Scientific. Please contact V&P Scientific at the address above for return authorization and shipping instructions.

This warranty is made in lieu of other warranties expressed or implied including the warranties of merchantability and fitness for a particular purpose. V&P Scientific shall not be liable for loss or damages arising from the use of these products nor for consequential damages of any kind.