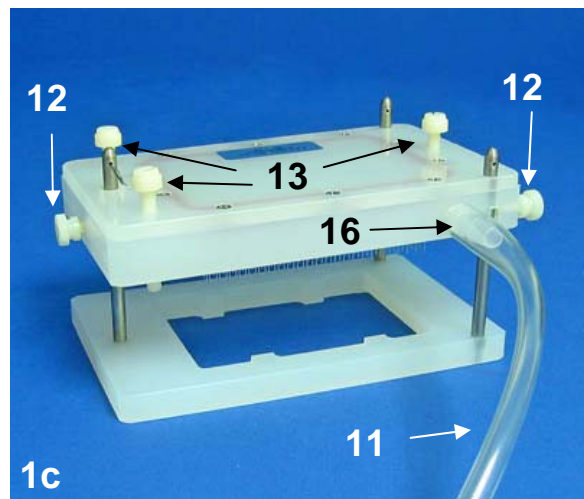
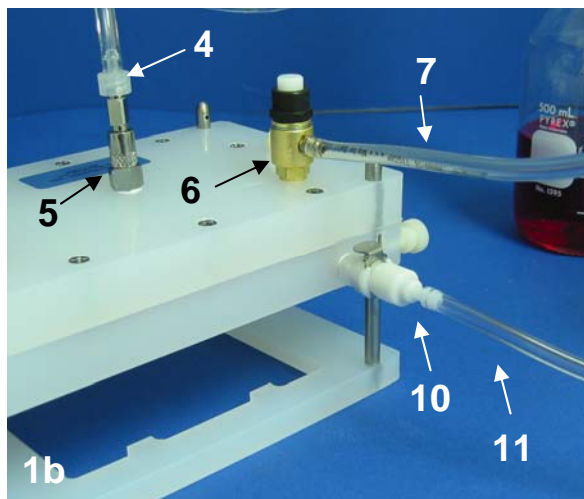
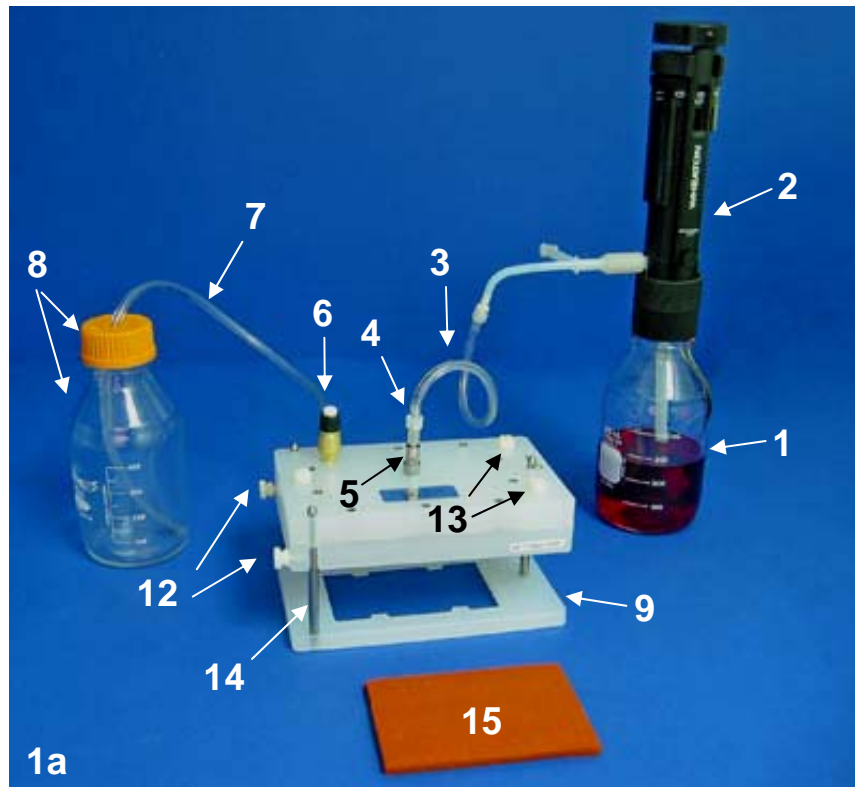
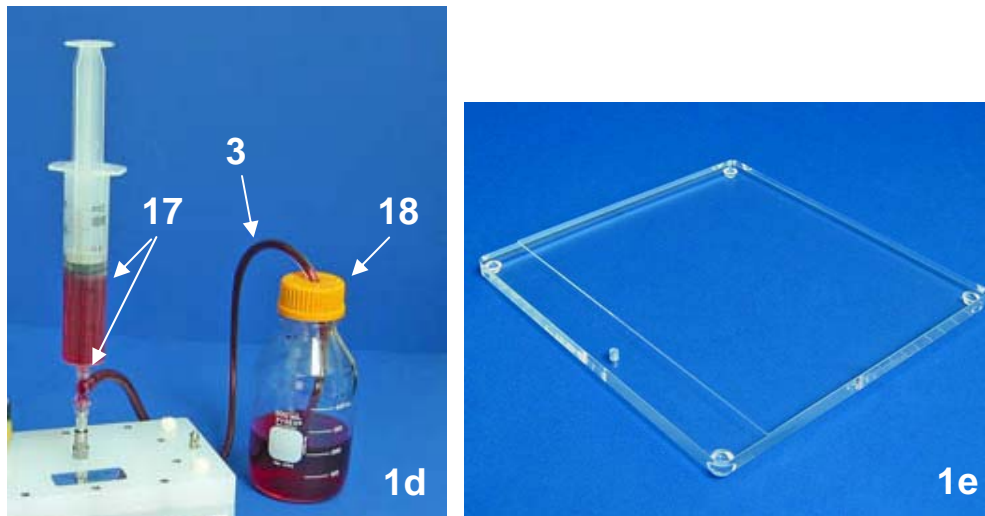


**Care and Use of VP 174AD-PCR and VP 174A-PCR**



**Figure 1. (1a and 1b) Parts of the VP 174AD-PCR Dispensing Manifold. (1c) Parts of the VP 174A-PCR Aspiration Manifold.**



**Figure 1. (1d) Parts of the VP 174AD-PCR Dispensing Manifold.  
(1e) Positioning Plate for PCR Heat Block.**

### PARTS GUIDE

1 – Source Bottle	7 – Bleed Tube	13 – Z Height Set Screws
2 – Bottle Top Dispenser	8 – Collection Bottle and Cap	14 – Guide Poles
3 – Manifold Feed Tube	9 – Base	15 – Rubber Pad
4 – Luer Hose Fitting	10 – Quick Connect Fitting	16 – Vacuum Tube Connect Fitting
5 – Male Luer Fitting (with Female Adapter)	11 – Tube to Vacuum Trap	17 – Syringe and Two-Way Valve
6 – Bleed Valve	12 – Thumb Screws for Z Height Adjustment	18 - Source Bottle Cap For Syringe

### ACCESSORIES for VP 174AD-PCR

20cc Syringe	Manifold Feed Tubing	Two-Way Valve
Quick Connect Fitting	Bleed Tubing	Rapier for Cleaning Needles
Rubber Pad	Silicone Grease and Swabs	Luer Hose Fitting
Omni Tray with Lid		

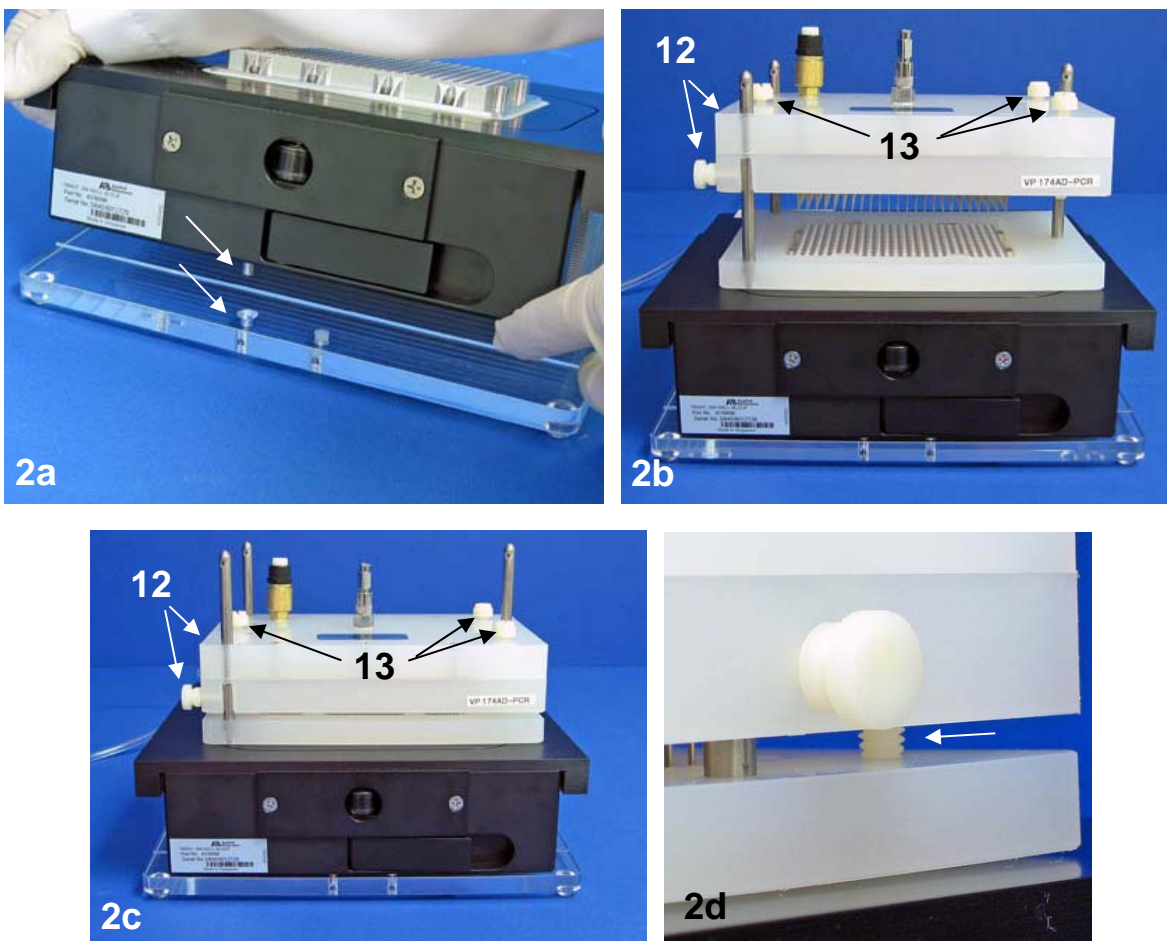
### ACCESSORIES for VP 174A-PCR

Vacuum Tubing	Silicone Grease and Swabs	Rapier for Cleaning Needles
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## SETUP PART 1

### Setting Space Between Manifold Tubes And Bottom Of PCR Heat Block Wells (Figure 2)

1. Make sure all manifold tubes are clear by aspirating distilled water from a microplate. If any tubes are clogged use the rapier (provided) to clean them out. See "Cleanup" section for more details.
2. Place PCR Heat Block on Positioning Plate as shown in Figure 2a. Loosen the three Thumb Screws (12) and slide the Manifold up the Guide Poles (14).



**Figure 2. Use of Z Height Set Screws in Manifold Set-up Part 1.**

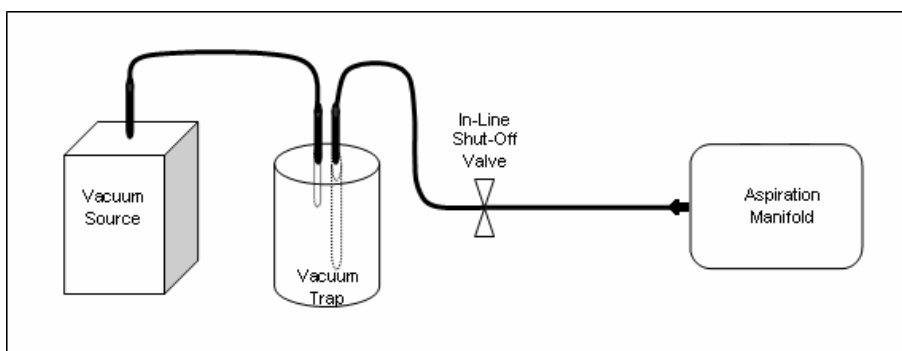
3. Place the Manifold on top of PCR Heat Block as in Figure 2b.
4. Make sure that the three Z Height Set Screws (13) are not set longer than metal tubes of the Manifold.
5. Note: perform this step very carefully so that the metal tubes not scrape on the metal PCR heat block! Loosen the three Thumb Screws (12) and slide the Manifold down the Guide Poles (14) until the tubes rest on the bottom of the wells of the PCR Heat Block (Figure 2c). Tighten the Thumb Screws to lock the Manifold into place.

6. While in this down position, move the Z Height Set Screws (13) so that the bottom of each screw touches the manifold base (9) as shown in Figure 2d. Loosen the three Thumb Screws (12), and turn the Z Height Set Screws (13) not more than one quarter clockwise turn. Re-tighten the Thumb Screws (12).
7. Lift the Manifold from the PCR Heat Block. The VP 174AD-PCR is now configured such that the tubes will be slightly above the bottom of the wells when dispensing.

## SET-UP PART 2

### Bleeding Air From Dispense Manifold (Figures 3 and 4)

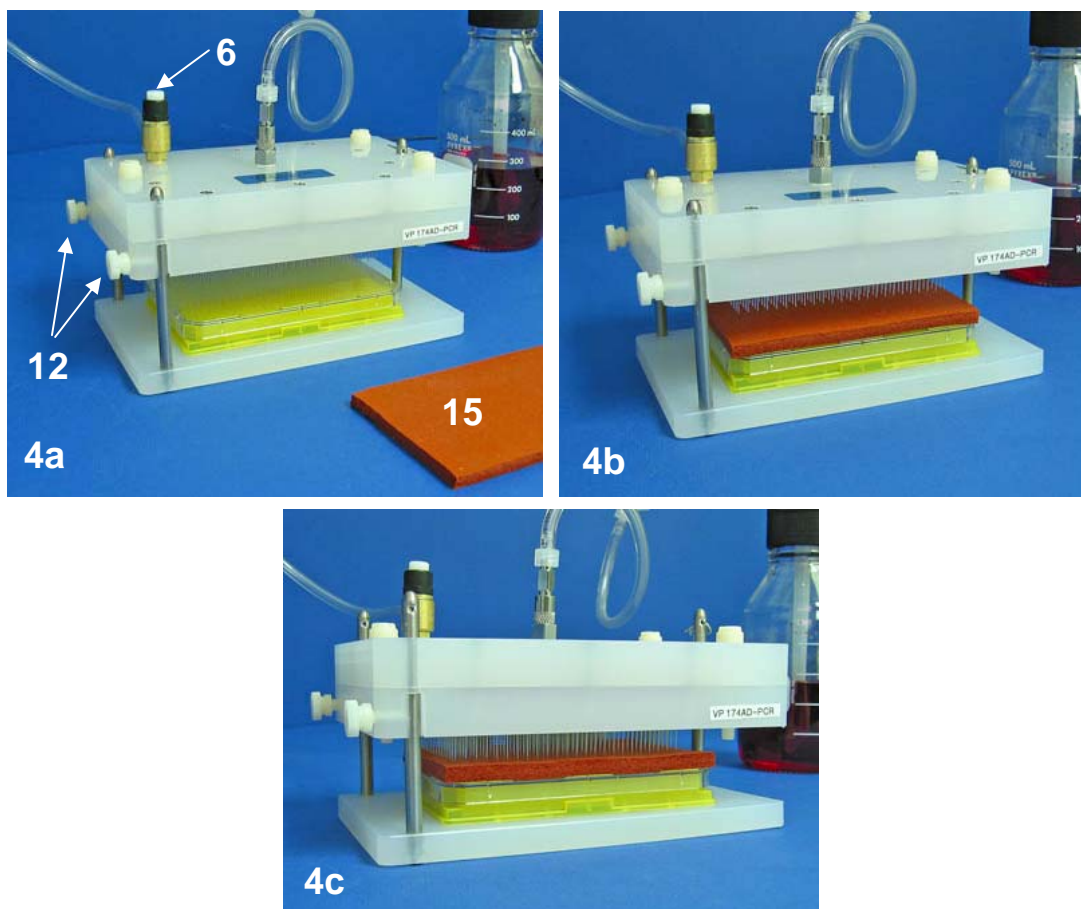
1. Attach one end of a vacuum hose to the nozzle Quick Connect Fitting (10) on the Manifold (Figure 1c) and other end to a shut-off valve connected to a vacuum source (Figure 3). It is recommended that a vacuum trap be placed between Manifold and vacuum source.



**Figure 3. Manifold Set-up: Connection to Vacuum Source.**

2. Make sure all tubes are clear by aspirating distilled water from a microplate. If any tubes are clogged use the rapier (provided) to clean them out. See “Cleanup” section for more details.
3. Make sure Quick Connect Fitting is *disconnected* before bleeding air from the system. Once disconnected the fitting is closed.
4. Attachment of dispenser, either Syringe or Bottle Top Dispenser (2), to Manifold:
  - a. Syringe method (Figure 1d): Attach the Two Way Valve (17) to the Luer-lock Fitting (5) on the top of the unit using the female adapter. Then attach a Luer-lock Syringe and the Manifold Feed Tube (3) to the Two Way Valve. If unable to read the volume markings on the syringe unscrew the syringe, rotate and screw the syringe back into the Two Way Valve. Insert the Manifold Feed Tube (3) through the hole in the Source Bottle Cap and into the Source Bottle (18). If the Feed Tube does not fit loosely in the hole then the Cap will need to be unscrewed slightly so a vacuum does not form in the Source Bottle. Note: ensure that the level of liquid does not fall below the tube depth or air will enter into the system.
  - b. Bottle Top Dispenser (Figure 1a): Assemble Dispenser according to manufacturer’s instructions. A Luer Hose Fitting (4) is used to connect the Bottle Top Dispenser’s dispensing tubing to the Manifold. The Two Way Valve (17) is not needed.

- Place the Collection Bottle (8) beside the manifold. Place the Bleed Tube (7) in hole in the cap.
- Place red Rubber Pad (15) on top of the Omni Tray with Lid (or a microplate with a lid) and lower the Manifold until all of the Dispense Tubes are pressed slightly into the pad (see Figure 4). To hold Manifold into position tighten Thumb Screws (12) or press down with moderate force. Note that, since opening in Base is designed to fit PCR Heat Block, standard SBS plates will not fit. Microplate must be set on top of Base.



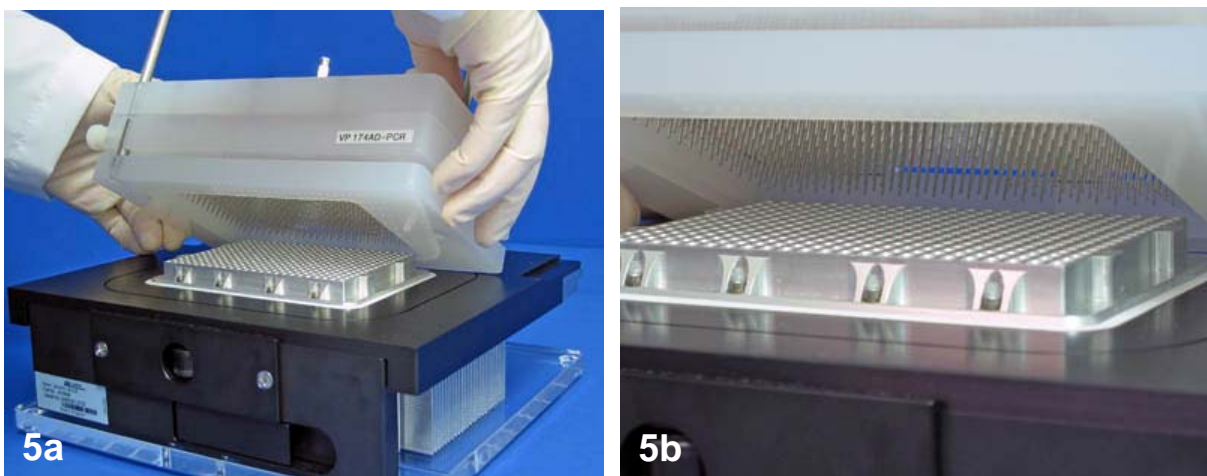
**Figure 4. Use of Rubber Pad in Manifold Set-up Part 2.**

- Lift Syringe/Dispenser plunger to fill with fluid. Depress the Bleed Valve Button (6).
- Compress the Syringe/Dispenser plunger in a steady stroke, and then release the Bleed Valve Button (6) shortly before reaching the bottom of the stroke.
- The Manifold has a 150 ml dead volume, so repeat the previous steps several times depending on the volume of the Syringe/Dispenser. Stop when a steady stream of liquid comes out of the Bleed Tube (7) into the Collection Bottle (8).
- Remove the Red Rubber Pad (15) and lid, leaving the Omni Tray in place. To ensure there is no air remaining in the Metal Dispense Tubes, depress the Syringe/Dispenser plunger vigorously in 10ml increments (without pressing the Bleed Valve Button) until streams of liquid are seen coming from all of the Metal Dispense Tubes.

## OPERATION

### Dispensing Liquid Into 384 Well PCR Heat Block (Figure 5)

1. Make sure Manifold is set up for the desired Z height position (see Set-up Part 1).
2. Make sure Quick Connect Fitting (10) is *disconnected* (once disconnected the fitting is closed).
3. Loosen Thumb Screws and slide the Manifold down until the Z Height Set Screws contact the base. While maintaining firm and even downward pressure, tighten Thumb Screws to hold in place.
4. Place VP 174AD-PCR Dispensing Manifold on top of PCR Heat Block
  - a. Hold Manifold with both hands, one each side.
  - b. Tilt so that back edge of Base and Metal Tubes are visible.
  - c. Position over PCR Heat Block so that back inside edge of Base contacts back edge of block (Figure 5a).
  - d. Position back row of Metal Tubes over back row of wells (Figure 5b).
  - e. Slowly lower Manifold to level position, with Base resting on top of PCR Heat Block platform (Figure 2c).



**Figure 5. Placing Manifold on Top of PCR Heat Block.**

5. Draw the desired volume of liquid into the Syringe or Bottle Top Dispenser (volume drawn into dispenser = volume/well X # of wells).
6. Compress Syringe or Dispenser plunger in a rapid but steady motion.
7. After filling remove the Manifold from the **PCR Heat Block** by lifting straight up.

### Cleaning Dispense Manifold By Aspirating

1. Loosen Thumb Screws and slide the Manifold up so that a tip lid box (or other suitable container) can be placed under the Dispense Tubes. Insert Bleed Tube (7) in Liquid Collection Bottle (8) and remove the Source Tube (3) from liquid or replace Source Bottle with an empty one.

2. While depressing the Bleed Valve (6), use the Syringe or Bottle Top Dispenser to pump air into the system until the Bleed Tube (7) is clear of liquid.
3. Connect the vacuum source through the Quick Connect Fitting (10) on the Manifold (Figures 1c and 3).
4. With vacuum shut-off valve in closed position, turn on vacuum. When sufficient vacuum has been created, open the shut-off valve to allow the liquid to be aspirated out of Manifold.
5. Use the vacuum to aspirate a wash liquid (distilled water first, then 100% alcohol) from a tip lid box or Omni plate bottom through tubes of the Manifold.
6. It is also recommended that Syringe or Bottle Top Dispenser be rinsed by distilled water followed by alcohol. Insert the Source Tube into wash liquid and fill the Manifold as described previously. Then follow steps 3-5 above.

### **Aspirating Liquid From A Microplate Or PCR Heat Block**

1. Connect the vacuum source through the Quick Connect Fitting (10) on the 174AD-PCR Dispense Manifold (Figures 1b and 3) or the Vacuum Tube Connect Fitting (16) on the 174A-PCR Aspiration Manifold (Figures 1c and 3).
2. Fill a 384 well plate with fluid (alcohol or water) and place under the tubes of the Manifold. Lower Manifold so that Metal Tubes almost reach to the bottom of the wells. Secure in place by tightening Thumb Screws. Alternatively, if aspirating a PCR Heat Block, place Aspiration Manifold on top of block platform as described in above in "Manifold Set-up" (Figure 2) as well as "Dispensing Liquid Into 384 Well PCR Heat Block" (Figure 5)
3. With vacuum shut-off valve in closed position, turn on vacuum. When sufficient vacuum has been created, open the shut-off valve to allow the wells to be aspirated.
4. Remove the microplate from the Manifold after it has been aspirated by loosening Thumb Screws and sliding Manifold up. To remove from aspirating a PCR Heat Block, lift Manifold and Base up without loosening Thumb Screws. Close the vacuum shut-off valve.

### **STORAGE**

1. For short-term storage, keep the tips of the metal tubes in the liquid being used or distilled water. This will prevent the liquid from drying and clogging the tubes.
2. For long-term storage, drain the Manifold and aspirate three separate 100 ml distilled water aliquots through the system. **DO NOT USE DE-IONIZED WATER**, as de-ionized water will corrode the stainless steel tubes. Tip the system back and forth after each aliquot to ensure all water is aspirated from the Manifold on each rinse.
3. Aspirate two separate 100 ml aliquots of alcohol (methanol, ethanol or isopropyl alcohol) through the Manifold. Tip the system back and forth to ensure all the alcohol is removed.
4. Pull air through the Manifold for 5 minutes by leaving the vacuum on and shut-off valve open.
5. Store in a clean dry area.

6. To autoclave, simply place the entire system into the autoclave. It is not necessary to remove any parts.

### **TROUBLESHOOTING**

**PROBLEM:** Not all wells being aspirated or not filling all wells evenly.

**SOLUTIONS:**

1. Use rapier to clear tubes.
2. Create a greater vacuum.
3. Rock the manifold slightly while aspirating.
4. Make sure that air is not introduced into system by Syringe or Bottle Top Dispenser.
5. If still not functioning properly, contact V&P Scientific for more technical assistance.

**PROBLEM:** Manifold is not sliding down the Guide Poles smoothly.

**SOLUTION:**

1. Using the Q-Tip and place a small amount of Silicone Grease on each Guide Pole.
2. Apply enough Silicone Grease until the Manifold slides up and down smoothly.

## TROUBLESHOOTING

PROBLEM: Manifold is not sliding down the Guide Poles smoothly.

SOLUTION:

1. Take the Q-Tip and place Silicone Grease on each Guide Pole.
2. Apply the Silicone Grease to the poles until the Manifold slides up and down smoothly.

PROBLEM: Not all wells being aspirated.

SOLUTIONS:

1. Use rapier to clear tubes.
2. Create a greater vacuum.
3. Wiggle VP 174A-PCR while aspirating. Sometimes the tubes may be touching the bottom of the wells which leads to incorrect aspiration.
4. If wells are still not being aspirated, contact V&P Scientific for more technical assistance.