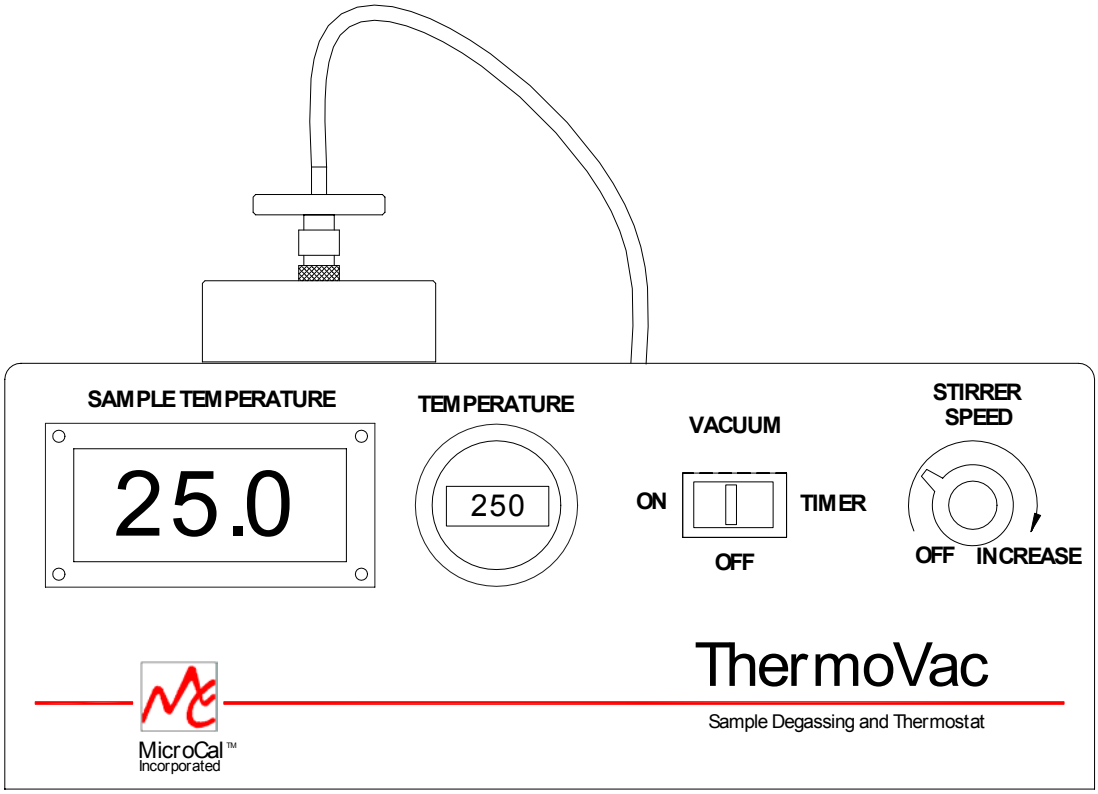
ThermoVac

To facilitate degassing samples and cleaning the cells, you have been provided with the ThermoVac accessory, a device for thermostating and degassing samples. The unit is capable of thermostating a sample at any temperature from 0 to 80 °C, pulling a vacuum of 28.4 inches of mercury and stirring the sample using small magnetic stir bars.



ThermoVac Accessories

The ThermoVac and accessories may include, but are not limited to the items listed below. A list of the actual items shipped with your order will be included in the documentation included with your shipment.

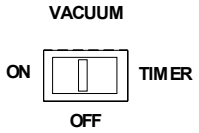
Quantity	Description
1	ThermoVac
3	Stir Bars (Small)
3	Stir Bars (Medium)
2	In-line filters
5	Test Tubes (Small) – for conserving sample volume
5	Test Tubes with Cap (Medium)

1	Test Tube Holder
1	Flask with Hose & Luer Lock Connector
2	Fuses (1A/250V) 5x20mm Slo-Blo
1	A.C. Mains Power Cord

Front Panel Controls

VACUUM

The ThermoVac is capable of pulling a maximum vacuum of 28.4 inches of mercury. If the VACUUM switch is pushed to the right the vacuum pump will turn on and remain on for approximately 8 minutes, then the pump will shut off. If you desire to remove the vacuum before the preset time you must push the switch to the OFF position. When the switch is pushed to the left the vacuum pump will remain on until it is manually turned off.



TEMPERATURE

Use this dial to set the temperature, in °C, for thermostating the sample chamber. The rightmost digit sets the temperature value in tenths of a degree.

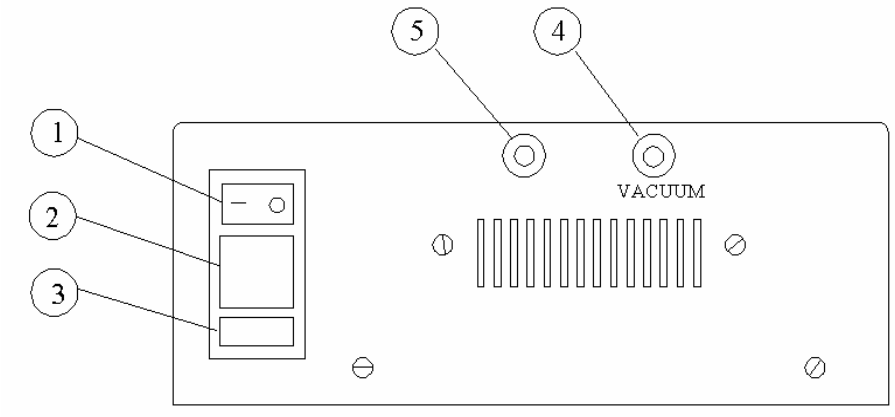
SAMPLE TEMPERATURE

Displays the current temperature of the sample chamber.

STIRRER SPEED

This switch will activate a rotating magnetic field that will stir your sample when a small magnetic stir bar is placed in the tube containing your sample. You may adjust the speed of the Stirrer motor from 0 RPM (OFF) to the maximum speed of 800 RPM (full turn clockwise).

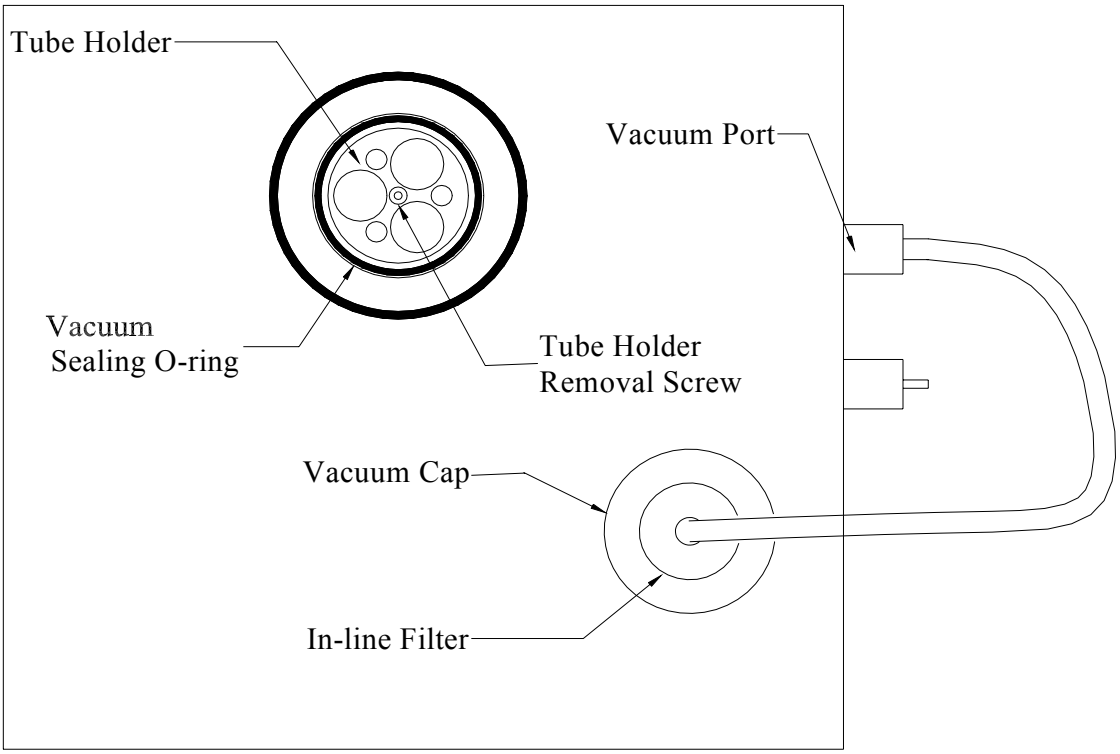
Rear Panel



1. Power Main Switch
2. 2 Power Fuses
3. IEC Inlet Power Recepticle
4. Vacuum Port
5. Pressure Port

Degassing Samples

Top View of ThermoVac



To degas the solutions, before placing them into the cells or injection syringe, please due the following.

- Turn on the Power Main Switch.
- Set the desired temperature for the solution.
- Place your solution to be degassed into a test tube, add a small stir bar and place the tube into one of the open cylinders of the Tube Holder insert.

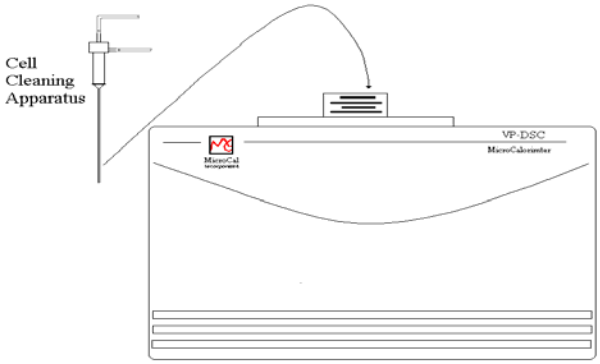
  Please Note: To conserve sample for loading into the injection syringe, use the small test tubes provided with the ThermoVac.

  If you wish to use a tube or beaker larger than will fit into the Tube Holder you may remove the Tube Holder by simply lifting it up. Due to the tight fit of the Tube Holder, it may be difficult to lift the Tube Holder out of the sample chamber, in this case you may use a 3/32" hex (Allen Key) wrench to turn a screw , located at the bottom of the center hole of the Tube Holder, to lift the Tube Holder out.
- Turn the stirring on and adjust the speed.
- Turn on the vacuum. Push the switch to the right to activate the vacuum for a preset (ca. 8 minutes) duration. Push the switch to the left if you wish to manually control the time for the vacuum.
- Place the Vacuum cap on top of the sealing o'ring. The sound of the vacuum pump will change pitch to indicate the vacuum has sealed the Cap to the o'ring. Once the vacuum has sealed, the Vacuum Cap will be held firmly in place, till the vacuum pump shuts off.

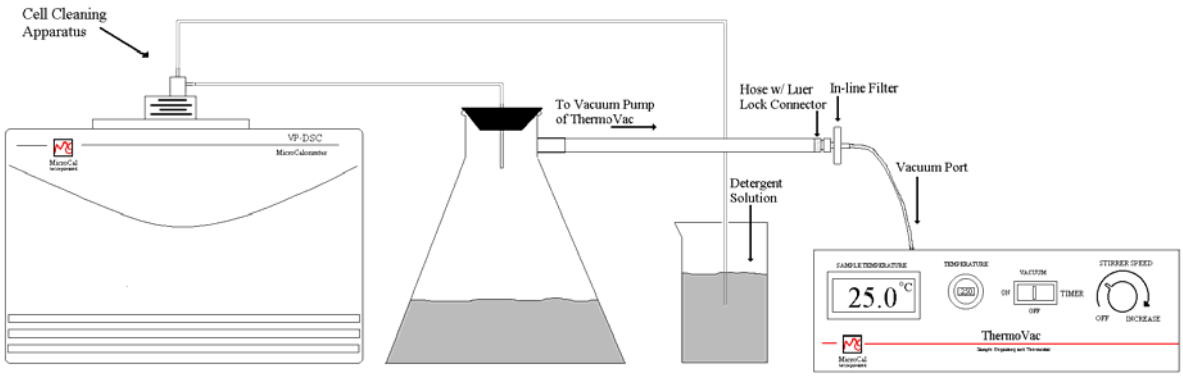
  For the first few minutes after the vacuum pump is turned off, the vacuum in the sample degassing chamber may remain fairly tight making the removal of the Vacuum Cap difficult. During this period, the easiest way to release the vacuum is to remove the tubing from the rear Vacuum Port or to twist off (turn counter-clockwise) the in-line filter.

Using the ThermoVac for Cleaning the DSC Cells

- The ThermoVac may be used to flush copious amounts of Detergent solution followed by a thorough rinse with distilled water.
- Insert the long needle into the Sample cell and push down carefully until the o'ring has sealed.



- The end of the upper tubing of the Cell cleaning Apparatus is immersed into a beaker of 200-400 ml of detergent cleaning solution.
- The end of the lower tubing is connected to a one liter vacuum flask through the #8 rubber stopper.
- The side arm of the vacuum flask is attached to the Vacuum Port of the ThermoVac. Your Setup up should look like below.



- Turn on the ThermoVac vacuum pump. The vacuum will pull the detergent solution from the beaker, through the cell and into the waste flask. **NOTE: DO NOT ALLOW THE VOLUME OF FLUID IN THE WASTE FLASK TO ACCUMULATE SUCH THAT IT WOULD RISE UP TO THE LEVEL OF THE SIDE ARM AND BE SUCKED INTO THE THERMOVAC'S VACUUM PUMP. THIS MAY CAUSE THE PUMP TO BECOME DAMAGED.**

- Once sufficient detergent solution has passed through the cell, the hose is removed from the solution, rinsed free of detergent using a plastic wash bottle, and then placed into another beaker containing ca. 200-300 ml of water for rinsing.

- After rinsing with water, remove the tube from the rinse water and allow time for the vacuum to drain the fluid out of the hoses, then remove the cleaning apparatus from the cell.

- Remove the remaining water from the cell by using a long needle syringe.

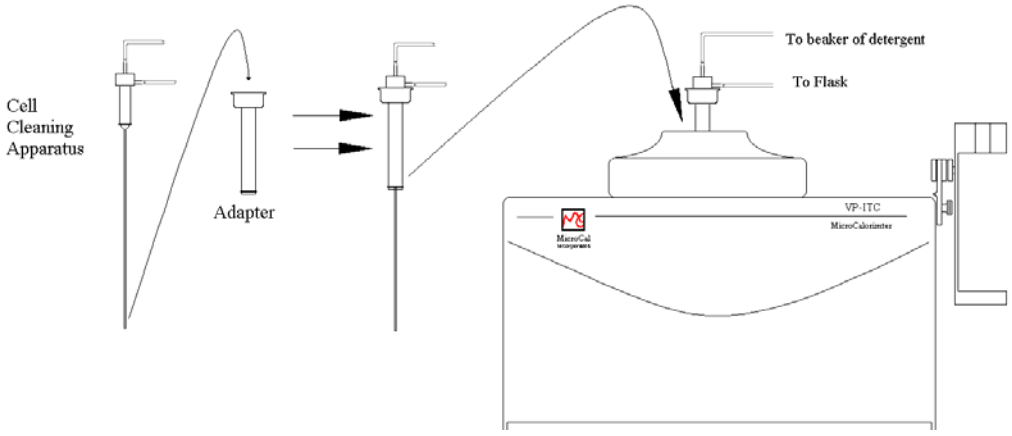
We do not recommend drying the cell before filling with your sample solution, but it should be rinsed twice with the buffer you are using for the experiment. Finally, it should be completely drained and filled with your sample solution in the manner described earlier.

Because a small amount of the buffer used for final rinsing will adhere to the walls of the cell and act to dilute your sample solution, you may wish to correct for this by lowering your sample concentration by 2% if you measured concentration before the sample was introduced into the cell.

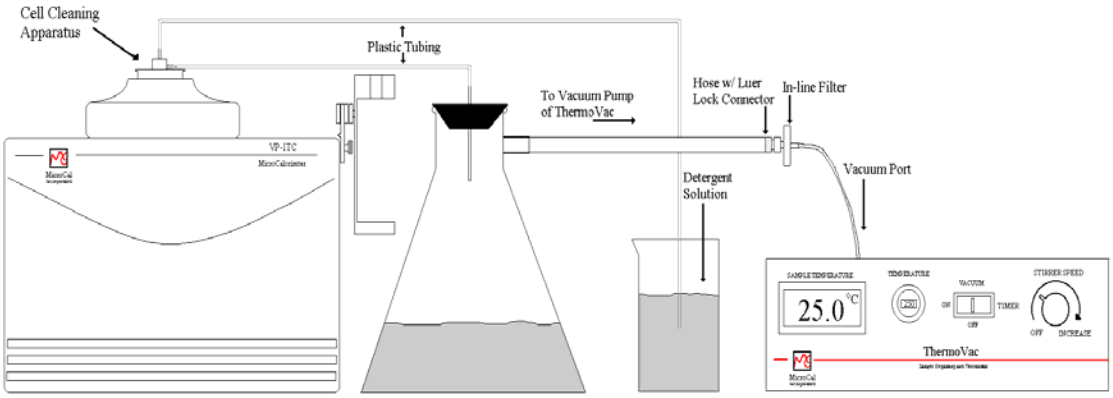
Using the ThermoVac for Cleaning the ITC Sample Cell

The ThermoVac may be used to flush copious amounts of Detergent solution followed by a thorough rinse with distilled water.

- Insert the Cell Cleaning Apparatus into the Adapter, until the top flange is touching the top of the Adapter (see below).
- Insert the long needle into the Sample cell and push down carefully until the o'ring has sealed, as shown below.



- The end of the plastic tubing from the upper tube of the Cell cleaning Apparatus is immersed into a beaker of 200-400 ml of detergent cleaning solution.
- The end of the plastic tubing from lower tube is connected to a one liter vacuum flask through the #8 rubber stopper.
- The side arm of the vacuum flask is attached to the Vacuum Port of the ThermoVac. Your Setup up should look like below.



- Turn on the ThermoVac vacuum pump. The vacuum will pull the detergent solution from the beaker, through the cell and into the waste flask. **NOTE: DO NOT ALLOW THE VOLUME OF FLUID IN THE WASTE FLASK TO BECOME SUCH THAT IT WOULD RISE UP TO THE LEVEL OF THE SIDE ARM AND BE SUCKED INTO THE THERMOVAC'S VACUUM PUMP. THIS MAY CAUSE THE PUMP TO BECOME DAMAGED.**
- Once sufficient detergent solution has passed through the cell, the plastic tubing is removed from the solution, rinsed free of detergent using a plastic wash bottle, and then placed into another beaker containing ca. 200-300 ml of water for rinsing.
- After rinsing with water, remove the plastic tubing from the rinse water and allow time for the vacuum to drain the fluid out of the plastic tubing, then remove the cleaning apparatus from the cell.
- Remove the remaining water from the cell by using a long needle syringe.

We do not recommend drying the cell before filling with your sample solution, but it should be rinsed twice with the buffer you are using for the experiment. Finally, it should be completely drained and filled with your sample solution in the manner described earlier.

Because a small amount of the buffer used for final rinsing will adhere to the walls of the cell and act to dilute your sample solution, you may wish to correct for this by lowering your sample concentration by 2% if you measured concentration before the sample was introduced into the cell.