CA-6
Colorimetric Analyzer

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ELECTRO-CHEMICAL DEVICES

Why choose the CA-6 Analyzer?

- Simple
  - Easy Installation
  - Touch Screen Interface
  - User Friendly Menu Structure
  - Easy Process Configuration
- Reliable
  - Rugged Epoxy Powder Coated Cold rolled Steel Cabinet
  - Separate Liquid and Electronics compartments
  - Low Reagent and Loss of sample Alarms
- Cost Effective
  - Low Maintenance
  - Easily Adjustable cycle times to minimize reagent use.

What is the CA-6 Analyzer?

- An On-Line Sequential sampling analyzer.
- Uses Colorimetric or Ion Selective Electrode technology to perform the Analysis.
- Easily adapted to automate most any Laboratory colorimetric analysis using less than 4 reagents.

What is the CA-6?

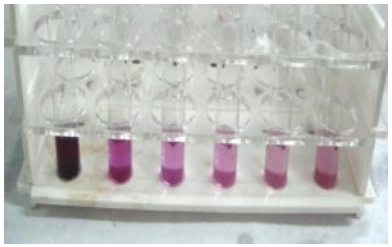
- Rugged, Epoxy Powder Coated, Cold Rolled Steel Enclosure
- Two Separate Lockable Enclosures
  - Electronics Compartment (On Top)
  - Liquids Compartment (On Bottom)
- Wall Mount Design
- Optional Table Top Stand with Reagent Holders

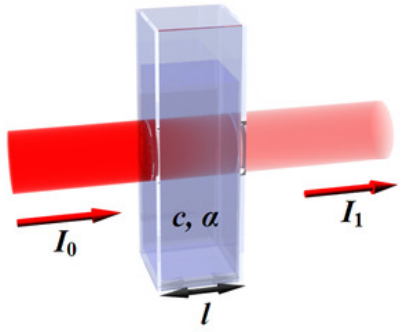
What Does the CA-6 Measure?

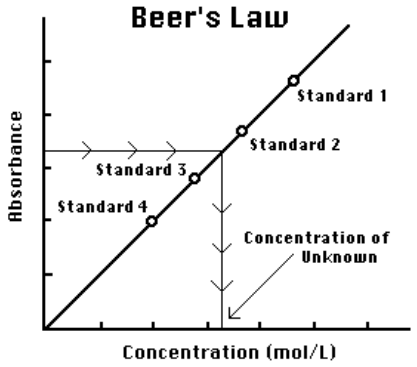
- Aluminum
- Ammonium
- Ammonia
- Chloride
- Hexavalent Chromium
- Copper (Cupric +2)
- Cyanide
- Nickel
- Nitrite
- Total Nitrogen
- Phosphate
- Total Phosphate
- Silica
- Others …

How does it Work?

- Reagent(s) are added to the Sample for Color Formation
- A specific wavelength of light is passed through the Sample (I_0).
- Absorbance (A) is measured.
  - $T = I_1/I_0$, Transmittance
  - $A = -\log_{10} T$
- Concentration is determined using Beers Law.
  - $A = (\alpha)(l)C \rightarrow C = A/(\alpha)(l)$
  - Concentration = A/(molar Absorbtivity)(path length)
- Standards are used to produce a calibration curve

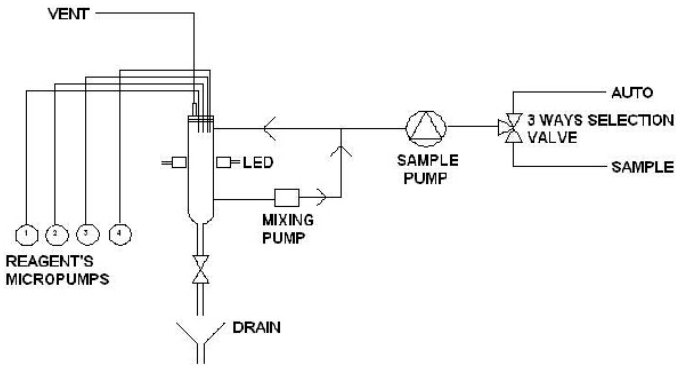


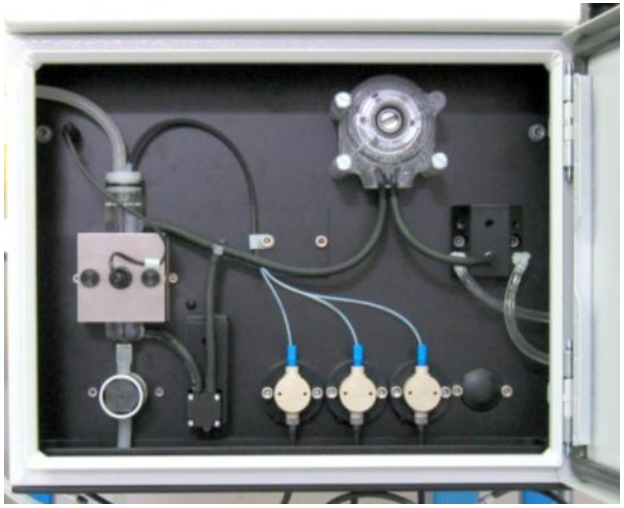




How does it Work?

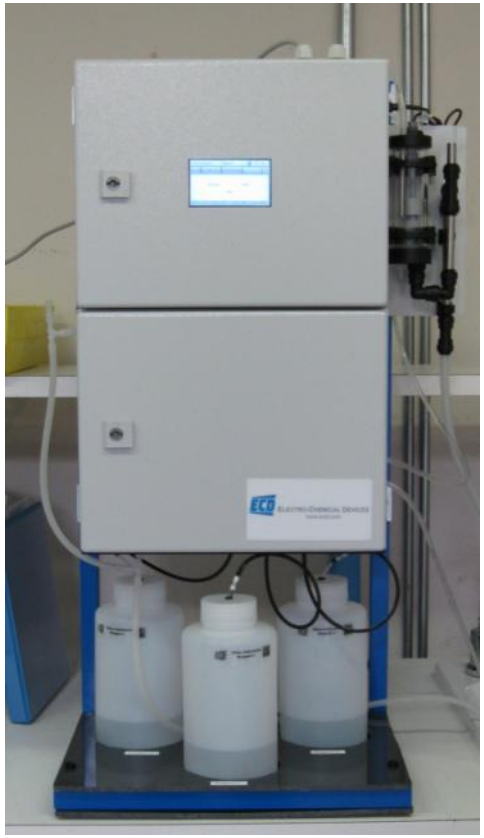
- Typical CA-6 Sequence
  - Colorimetric Cell Drained, Rinsed, Filled (3X), Sample
  - Reagents Added
  - Mixing and Wait
  - Reference Measurement
  - Color Forming Reagents Added
  - Mixing and wait
  - Measurement taken, Absorbance and Concentration Calculated
  - Drain, Rinse, Sample
  - Wait (adjustable time for setting analysis frequency).





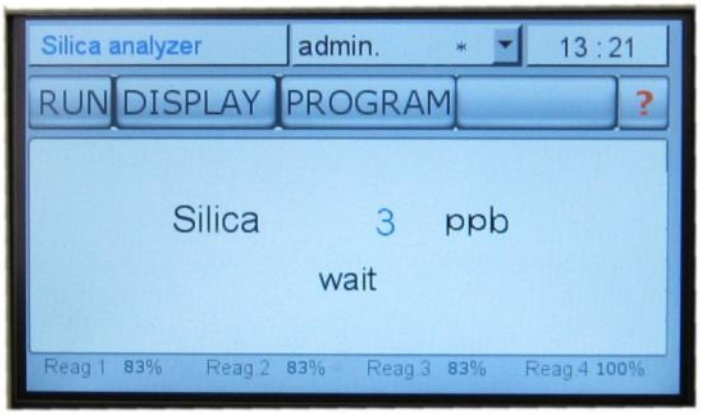
Specifications

- Method
  - Photometric differential absorbance
- Measuring Range
  - Dependent on the specific colorimetric measurement
- Response Time
  - Dependent on the specific colorimetric measurement
- Repeatability
  - Better than 2% of absorbance value with the turbidity less than 80 NTU
- Drift
  - < 2% of absorbance value per month
- Operating Temperature
  - -5° - 50 ° C (20 ° - 120 ° F)
- Outputs
  - 4-20 mA
  - (2) Alarm Relays



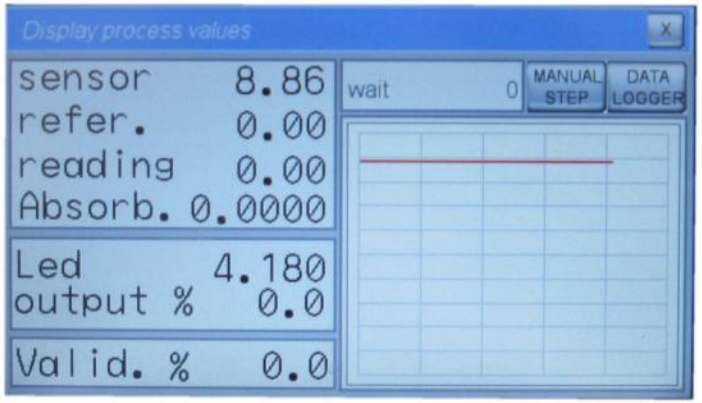
Touch Screen Display

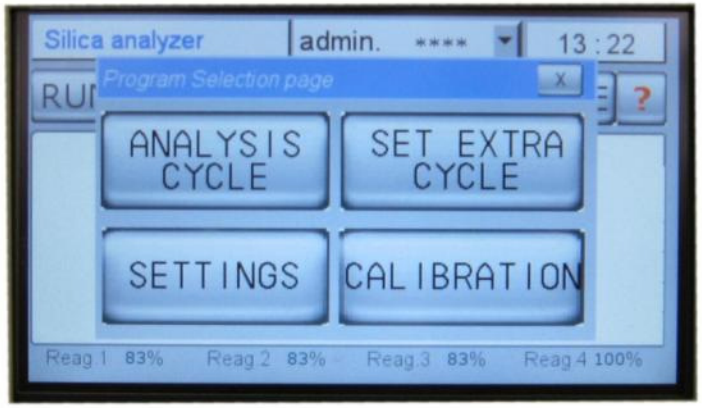
- Home Screen
  - Parameter and live Status
  - Menu Choices
  - Reagent Status
  - Password Entry
  - Help (?)
- Run Screen
  - Start On Line is continuous measurement
  - Cycles to Run sets a defined number of cycles
  - Emergency Stop stops the analyzer



Touch Screen Display

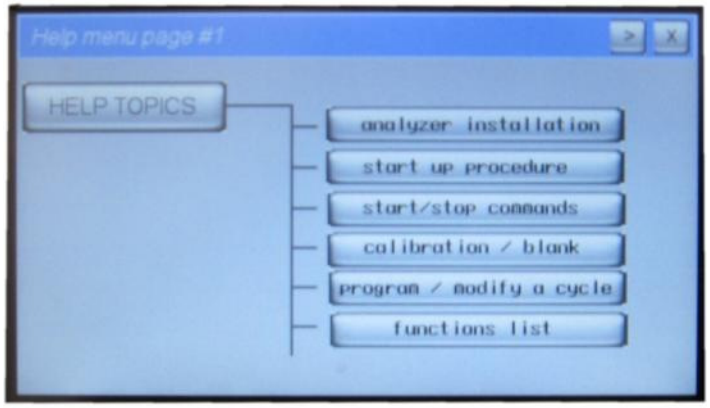
- Display Screen
  - Provides Live readings
  - Graphical Display
  - Current Step and Time
- Program Screen
  - Analysis Cycle, 30 step Program
  - Set Extra Cycle, 30 step Program
  - Settings sets Analysis to Extra Ratio, On/Off Alarm & 4-20 mA
  - Calibration sets Blank (zero pt.) and Factor (slope)





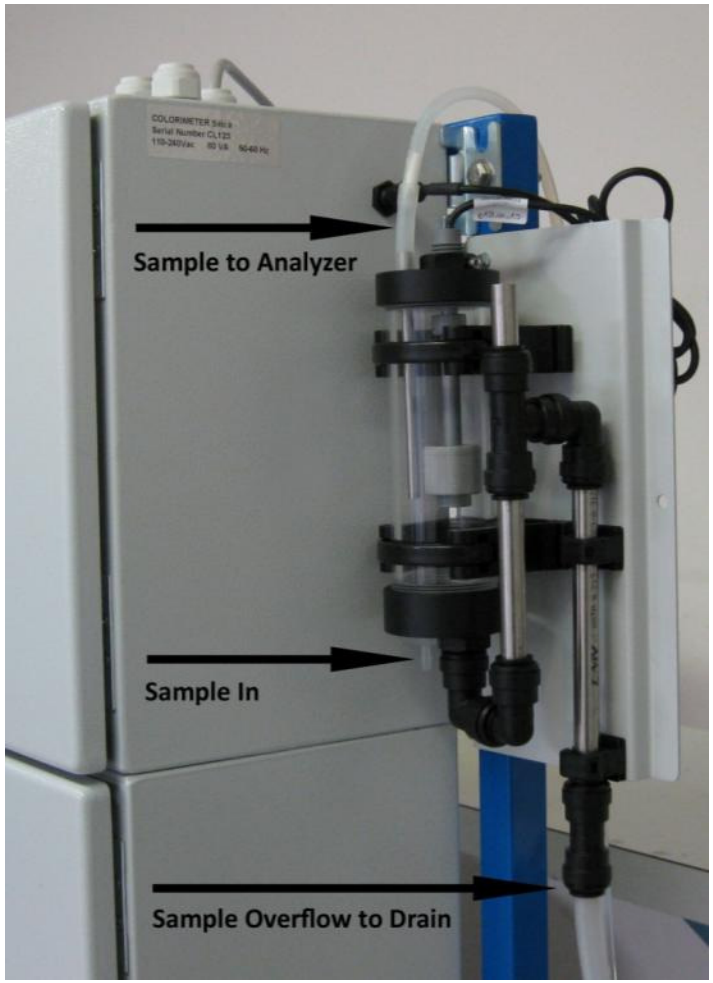
Touch Screen Display

- Service Screen
  - Set 4-20 mA
  - Set Relays
- Help Menu
  - Installation
  - Start Up
  - Start/Stop Commands
  - Calibration
  - Program Cycles
  - Functions List



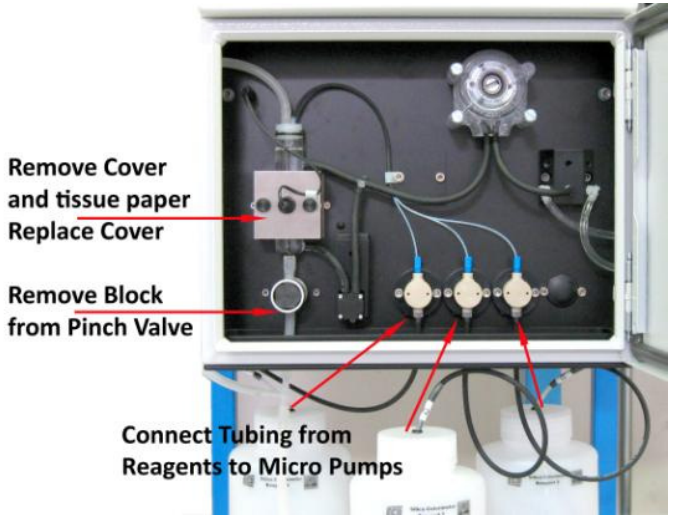
Start Up

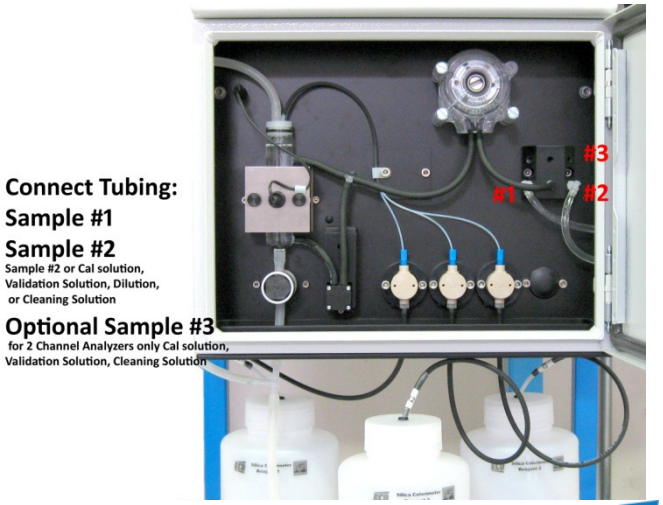
- Place the CA-6 near the sample point.
  - Wall Mount
  - Optional Bench Top Stand
- Mount the Fast Loop Reservoir on the right side of the CA-6
  - Connect Overflow to drain
  - Connect Sample to 3-Way Valve inside analyzer
  - Connect Level switch to Analyzer
  - Supply sample to Fast Loop reservoir
- Prepare Reagents
  - See Section 5 of the Instruction Manual



Start Up

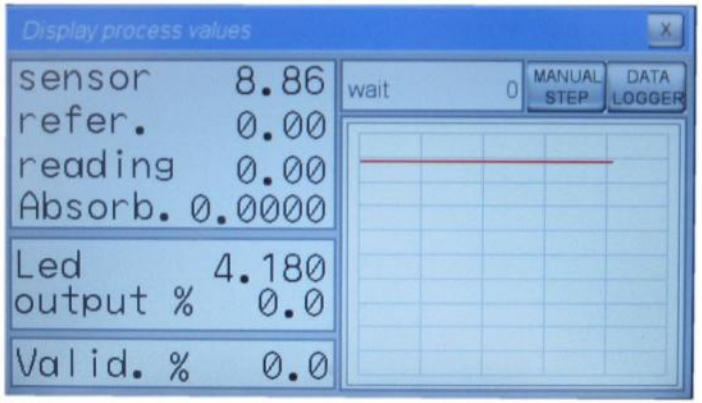
- Open the Liquids Compartment
  - Loosen the thumb screws on the colorimetric cell cover and remove protective tissue paper.
  - Replace the cover
  - Remove the PVC block from the pinch Valve, save for future use.
  - Attach the tubing from the reagent bottles to the Micro Pumps, reagent #1 to Micro Pump #1
  - Connect Sample and Auto Tubing to the Three way Valve
  - Connect Drain tube to a Drain, atmospheric pressure, no restrictions.

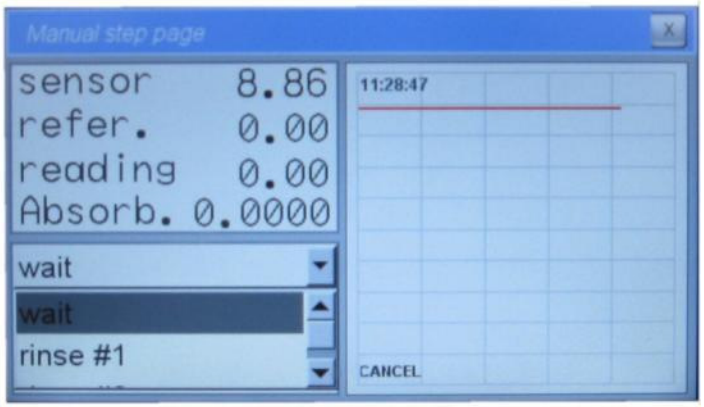




Start Up

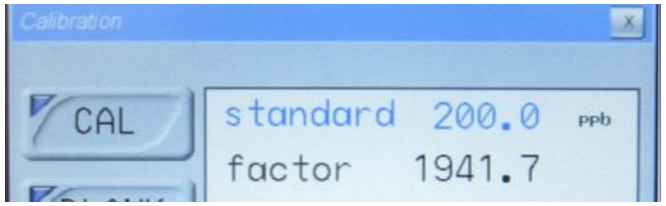
- Power the Analyzer
- Press Display
- Press Manual Step
- Select Sample 1 and enter 20 seconds
  - Sample pump runs for 20 seconds
  - If multi channel analyzer, Select Drain enter 5 seconds otherwise proceed to Add Reagent step.
  - Repeat for Sample 2 and 3, if present
- Select Add Reagent 1 and enter 40 seconds then 2, 3, 4
  - This primes the Micro Pumps
- Select Drain enter 5 seconds
- Select Sample 1 enter 20 seconds
- Exit Manual step menu and Display menu
- The CA-6 Analyzer is ready to go.





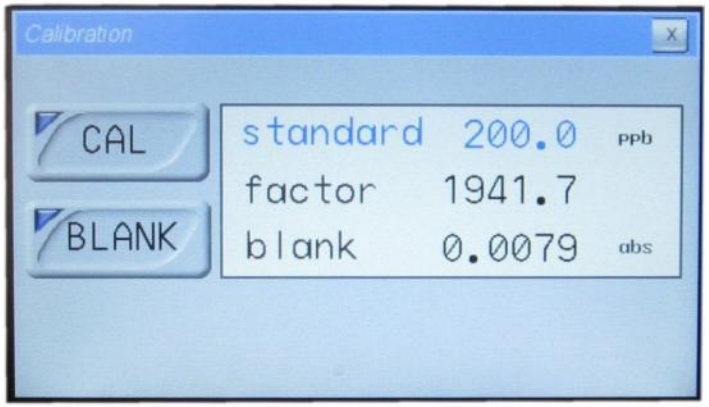
Calibration

- Two Point Calibration
  - Blank (zero point), 1st Cal
    - Distilled Water
  - Factor (slope), 2nd Cal
    - 200 ppb solution or
    - Whatever value is entered in the Standard line of the Calibration Menu
- Remove Sample Tube from Fast Loop Reservoir and place it in 1 liter of Cal Solution:
  - Distilled water
  - 200 ppb solution
- Press Run, enter 3 in Cycles to Run
- Press Cycles to Run



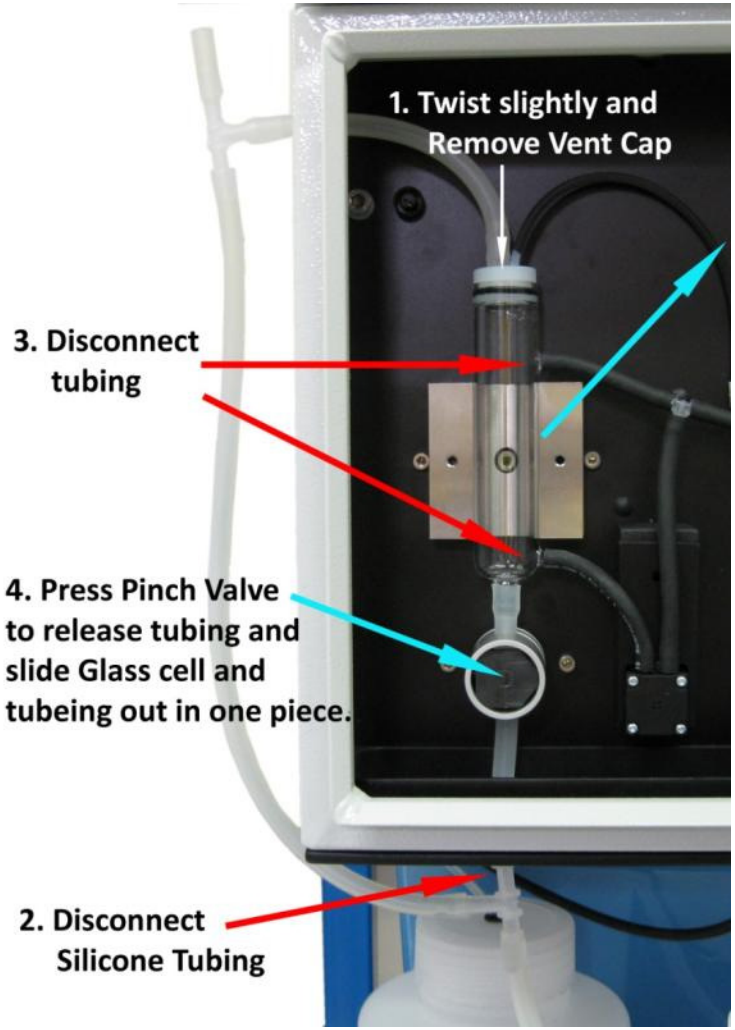
Calibration

- The CA-6 will run three cycles with the Cal Solution and Stop in the Standby mode.
- Press Program → Calibration → Blank
- HOLD the Blank button until the Screen updates
- Repeat the Process with the Cal Solution
- Replace the sample line on the fast loop reservoir



Maintenance & Cleaning

- Replace the Pinch Valve Silicone Tubing (monthly) or to Clean the Glass Colorimetric Cell
- Disconnect the LED wire from the analyzer not the SS Cover.
- Loosen the Thumbscrews and remove the thermostatic Stainless Steel Cover.
  - Use care as the SS Cover can easily break the Glass reaction vessel
- Remove the Cell as shown
- Clean with detergent or Laboratory Glass cleaner, rinse thoroughly with distill water.
- Replace Pinch Valve Tube and reassemble the cell in the reverse order.



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