



Fermilab
ES&H Section

INDUSTRIAL HYGIENE INSTRUMENT CALIBRATION
THE GILIAN HFS-113 HIGH FLOW SAMPLING PUMP

August, 1992

Objective:

The Gilian HFS113 is a small, battery powered pump used for industrial hygiene sampling of dusts, mists, fumes, and some gases. Proper calibration is essential in collecting accurate data on employee exposures.

Electronic Bubble Meter Calibration

Equipment:

- Fully charged (on charge for at least 16 hours) Gilian HFS 113 pump
- Calibration sampling media (use the media that you will be using for sampling)
- Fully charged Gilian "Buck" calibrator
- Small standard screwdriver
- Liquid soap made for Buck calibrator (do not make your own solution)
- One Industrial Hygiene Sampling Form for each pump calibrated

Procedure:

1. Allow the pump to warm up for 5 minutes.
2. Connect the sampling media, tubing, pump, and calibration device as shown in Figure 1. Do not use cassette adapters.

- 3 Wet the inside of the electronic flow cell with the liquid soap solution. The bubble should travel to the top of the column without breaking. Let the unit warm up for 1 minute.

4. Adjust the pump rotameter, if applicable, to the approximate flow setting. To adjust the flow rate, adjust the screw marked Flow Adj. When using a filter, a flow rate of 1.5 to 2 liters per minute is used. The flow rate for respirable dust sampling using the SKC cyclone is 1.9 lpm. Consult the ES&H Section to select the correct flow rate.
5. Press and hold the plunger into the cell to create a bubble. There should be only one bubble and it should be flat (a collection on bubbles can give an erroneous reading). Record the reading. The meter reads out in liters per minute. Reset by pressing ON.
6. Repeat the calibration 5 times. The readings should be within 5% of each other. If they are not, repeat the calibration procedure until a steady flow rate is achieved.
7. If the desired flow rate is not achieved, adjust the flow rate and repeat the calibration.
8. Record the calibration information on the IH Sampling Notes form. Record the average in the "Calibration Results Before" section.
9. After sampling is completed, repeat calibration procedures and record the data.
10. Use an average of the pre and post calibration flow rates to calculate the average flowrate. Use this number to calculate sample volume.