

## RADēCO High Volume Air Sampler

Model H-810 and Model C-828 (Calibrator)  
EPA National Equipment List 05-09 Version 1  
August 2005

NOTE: Guides are to be used by trained personnel only and DO NOT replace the manufacturer's operations or technical manuals. These guides were developed by field personnel for utilization by EPA and their contractors and are helpful in quick start-up and operations. Various limitations have been identified through the experience of the development group. Different makes, models, and updates to this equipment may change the limitations. It is recommended that calibration, maintenance, and use be recorded in a logbook. If you have any changes or revisions please email one of the following:  
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Source: RADēCO 2004

### Uses:

**Note: The RADēCO Model H-810 collects air samples to determine if radiological contamination is airborne.**

The RADēCO Model H-810 High Volume Air Sampler is used to collect air samples onto a paper filter. The paper filter can be analyzed for radiological contamination using an instrument such as the Ludlum<sup>®</sup> Alpha/Beta Sample Counter Model 3030, 2929 or by an accredited laboratory.

The Model H-810 sampler is a grab sampler with an air volume totalizer. This microprocessor-based unit is designed to eliminate the use of rotameters and mechanical time meters. The air volume totalizer portion of the sampler is composed of an enclosed air turbine that rotates at speeds proportional to the air flow velocity of the sampled air. The turbine's rotation is sensed by a reflective sensor/breaker disc and a microprocessor converts the disc signal to air volume. The flow rate, total volume, and elapsed time are displayed on the liquid crystal display (LCD) screen.

### Quick Start-up and Operation

- Connect the instrument to the tripod and raise the tripod to the breathing zone (approximately 5 feet).
- Plug the instrument into a power source.

**Note: This instrument has been calibrated by the manufacturer for an operating range of 1 to 6 cubic feet per minute (cfm) with a model 0750-37, 2-inch diameter, type LB-5211 filter paper. If this instrument is going to be operated within this range and the same filter paper is going to be used, calibration is not necessary and proceed to step 3. If the instrument is going to be operated outside of the calibration range or a different filter paper is going to be used, proceed to the section titled “Operation With Calibration.”**

- Insert the filter medium into the sample cartridge holder by unscrewing the black ring on the sample cartridge. The filter paper should be placed on the sample cartridge, between the outer retaining ring and the mesh filter support grid, with the rough side of the medium facing out (away from the cartridge). Attach the sample holder to the pump.
- Turn the power switch ON.
- The model and serial number appear on the display followed by the calibration range (e.g. CALIBRATED RANGE 1.4-4.0 CFM). If this is the correct range, press ENTER. (If the last person to use the instrument did not press the CLEAR button before turning the unit OFF, VOLUME and TIME will appear in the LCD. If this is the case, press CLEAR, and the words “CALIBRATED RANGE” will appear in the LCD.
- A target sample volume will appear in the LCD (e.g. “TARGET VOLUME 20.0 ft<sup>2</sup>”):
  - If the sample volume is correct, press START to begin sampling;
  - If the sample volume is incorrect, press SET and enter a target volume. Then press ENTER and START to begin sampling.
- Adjust the flow rate as desired by turning recessed flow adjustment screw located at the left side of the unit. The correct flow rate and total volume are based on site-specific conditions. If the flow reading is blinking during regular operation, it is because the unit is running at a flow rate beyond its calibrated range. This can be corrected by increasing or decreasing the flow rate.

**Note: The site-specific flow rate will be used to calculate the derived air concentration (DAC) for the site. A DAC is the concentration of radionuclides in air that if breathed for a work year would result in an intake corresponding to an annual limit.**

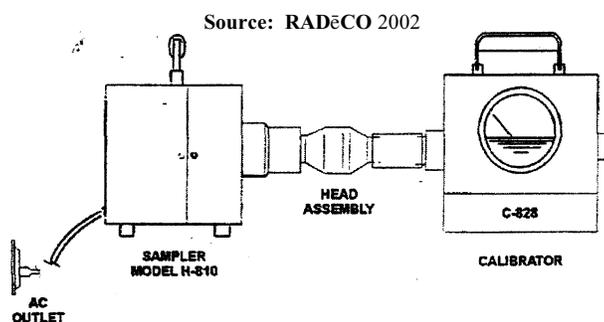
- The sampler will run until the desired total air volume has been sampled or the total run time has elapsed. Total volume and elapsed time will appear on the LCD when sample collection is completed.
- The sampler can be stopped at any time by pressing STOP. The total volume of air sampled at the time that the unit is stopped will be displayed on the LCD.
- Once the total air volume is achieved, collect the paper filter sample and prepare it for analysis.
- To clear data from the last sample run and display the original sample target volume on the LCD, press CLEAR.
- To turn the unit OFF, turn the toggle switch on the left side of the unit to OFF.

## Operation With Calibration:

- Insert the filter medium into the sample cartridge holder by unscrewing the black ring on the sample cartridge. The filter paper should be placed on the sample cartridge, between the outer retaining ring and the mesh filter support grid, with the rough side of the medium facing out (away from the cartridge). Attach the sample holder to the pump and connect the sample holder inlet to an air flow calibrator.
- Depress and hold the “ENTER” and “SET” keys simultaneously while turning the power switch to the “ON” position.

**Note:** After about 5 seconds, the LCD screen will read: “CALIBRATE FLOW?”; press “1” for yes.

- The words “UNIT OF MEASURE” will appear on the LCD screen; choose either “1” for cubic feet or “0” for liters.
- The words “ADJUST FLOW - HIGH POINT” will appear on the LCD screen. Adjust the flow to the high point of the calibration range by turning the recessed flow adjustment screw located at the left side of the unit. (Example: 3-4-5 cfm, 3=LOW POINT, 4=MIDPOINT, 5=HIGH POINT). Enter the high flow rate using the keypad, and then press “ENTER.” Keep the flow constant for 15 seconds.
- The words “ADJUST FLOW - MIDPOINT” will appear on the LCD screen. Adjust the flow to the midpoint of the calibration range by turning the recessed flow adjustment screw located at the left side of the unit. Enter the midpoint flow rate using the keypad, and then press “ENTER.” Keep the flow constant for 15 seconds.
- The words “ADJUST FLOW - LOW POINT” will appear on the LCD screen. Adjust the flow to the low point of the calibration range by turning the recessed flow adjustment screw located at the left side of the unit. Enter the low flow rate using the keypad, and then press “ENTER.” Keep the flow constant for 15 seconds.
- The words “VERIFY LINEARITY” will appear on the LCD screen. Adjust the flow to various points within the calibration range to verify the calibration accuracy. Press “ENTER” to accept calibration or “CLEAR” to reject it.



**Note: If the LCD screen reads “BAD CALIBRATION,” then either inaccurate flow data has been entered or the turbine speed sensor requires service.**

- The words “DEFAULT RUN MODE” will appear on the LCD screen. Select the mode of operation. Select “0” for TOTAL VOLUME or “1” for TOTAL TIME.
- The words “ENTER TARGET” will appear on the LCD screen. Select liters or cubic feet (TOTAL VOLUME MODE) or minutes and seconds (TIME MODE).

**Note: During normal operation, both volume and time are displayed.**

- The words “WARM UP DELAY IN SECONDS” will appear on the LCD screen. Enter the time desired for the sampler to become operational, before the actual sampling period begins (typically 2 seconds).
- The words “KEYPAD SECURITY” will appear on the LCD screen. Select either “0” for OFF or “1” for ON. When the keypad security is on, all keys on the keypad are disabled except the “UNITS”, “START”, and “STOP” keys. These keys allow the user to start the run or toggle the display readout from cfm to liters per minute (Lpm) using the “UNITS” key.

**Additional Operating Information:**

Handle the instrument with care. Avoid exposing the instrument to liquids (including water), moisture, foam, and other foreign substances. Such materials MUST be prevented from reaching the fan system intake, motor housing, and electrical components; otherwise, electrical shock could result.

**Routine Maintenance as Described in the Manufacturer’s Manual:**

Frequency	Action	Performed By	Manual Reference <sup>a</sup>
Daily	✓ Inspection and maintenance of flow sensor.	User	Page 4
Yearly	✓ Factory calibration.	RADēCO, LLC	Pages 12-14

<sup>a</sup> RADēCO 2002

**Limitations:**

- The accuracy of the air volume totalizer is limited to ± 5 percent.
- The sampler operates using an AC power cord. A backup battery is installed and can be used for sample data retrieval in the event of a power loss.

### **Replacement of Auxiliary Equipment and Supplies:**

Replacement supplies (such as the fan) must be purchased as needed to allow adherence to the maintenance schedule.

**Note: Do not send contaminated instruments for repair or calibration under any circumstances.**

### **Main Inventory of Items and Accessories:**

- RADēCO Model H-810 High Volume Air Sampler with air volume totalizer;
- 2500-23 Open-Face Filter Holder;
- 2-inch-wide, 6-foot-long belt for carrying or hanging the sampler;
- Operation manual
- Instrument logbook

### **Shipping Requirements:**

No special shipping is necessary or required for the RADēCO Model H-810 High Volume Air Sampler.

### **Contact Information (Technical Support):**

RADēCO, LLC  
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Taftville, CT 06380  
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On-Line address: <http://www.radecollc.com/>

### **References:**

RADēCO. 2002. "Operation and Maintenance Manual, Air Sampler with Air Volume Totalizer, Model H-810" March.

RADēCO. 2004. "Model H-810DC, High Volume Air Sampler." On-Line Address: <http://www.radecollc.com/pdfs/h-810dc.pdf>