STANDARD OPERATING PROCEDURES

SKC
Universal Sample Pump for Silica and Mercury

AMBIENT AIR MONITORING PROGRAM
for the
130 LIBERTY STREET
DECONSTRUCTION PROJECT

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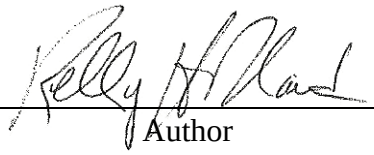

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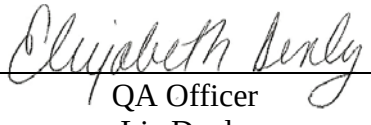

QA Officer
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1.0 PURPOSE OF SOP

This SOP was designed to describe the procedures used to sample

1. Respirable dust in ambient air using NIOSH Method 0600 – *Particulates Not Otherwise Regulated, Respirable*, following the recommendations for personal sampling
2. Respirable crystalline silica using NIOSH Method 7500 and
3. Mercury in ambient air using EPA Method 324 (modified).

2.0 EQUIPMENT DESCRIPTION

The Universal Sample Pump is a constant flow air sampler with a high and low flow setting application. The operator will refer to the manufacturer's operation manual for pictorials and additional information to aid in performing maintenance and operations.

3.0 EQUIPMENT OPERATION

In order to operate the pump, it is necessary to set the pump to either high or low flow applications.

3.1 High Flow Application Pump (Silica)

3.1.1 Initial Setup

1. Ensure the pump is set for high flow: Remove the cap screw covering the regulator valve and turn the exposed screw **clockwise** until it stops. Replace the cap screw. The pump is now set for high flow.

3.1.2 Setting Flow Rate

1. Using a ¼ inch tygon tubing, connect the sampling medium to the pump intake. (NOTE: Sampling medium for silica consists of a 37 mm diameter cassette with 5.0 µm pore size, polyvinyl chloride filter and a SKC aluminum cyclone. All sampling media will be supplied and pre-certified by the analytical laboratory. In addition, the filters will be pre-loaded in the cassettes by the laboratory.)
2. Start the pump using the on/off switch.
3. Connect the flowmeter to the intake of the sampling medium. Adjust the flow using the flow adjust screw until the flowmeter reads the desired flow rate (NOTE: The desired flow rate for the 130 Liberty Street ambient air program will be 2 liters per minute).
4. When the flow rate is set, press Flow and Battery Check to place the pump in Hold. Disconnect the flowmeter.
5. Replace the sampling media used for calibration with unexposed media for sampling collection.

3.1.3 Programming Delayed and Intermittent Sampling

1. To enter Delayed Start Mode: From Hold, press Set-up. Enter the number of minutes delay (up to 9999) before the sampling period begins by pressing Digit Select and Digit Set. Digit Select advances the flashing digit and digit set increases the value of the flashing digit.
2. To enter Sample Period Mode: Press Mode. Press Digit Select and Digit Set to enter the sampling time period in minutes. **Note:** The sample period is the total period in which sampling is performed and NOT the pump run time.
3. To enter Pump Period Mode: Press Mode. This is the actual running time of the pump. Use Digit Select and Digit Set to enter the pump run time.

3.1.4 Sampling

1. Using nitrile and/or cotton gloves, remove cyclone's grit cap prior to use and inspect the interior. Replace the cyclone if the inside is visibly scored. Clean the interior of the cyclone.
2. Check for the alignment of the filter holder and cyclone in the sampling head to prevent leakage.
3. Immediately prior to sampling, remove the top cover of the filter cassette cowl extension and position it face down in the sampler.
4. While the LCD displays HOLD, start sampling by pressing Start/Hold. Record the start time. At the end of the sampling period, press Start/Hold and record the stop time. Verify the flow rate at the end of the sampling period (see Section 4.0).
5. At the end of the sampling period, replace the top cover and small end caps.
6. Transport samples to laboratory.

Options During Sampling

1. Pause – Pause (shutdown) the pump by pressing Start/Hold. All timing data will freeze. To resume sampling, press Start/Hold; timing data will resume.
2. Flow or Battery Fault Shutdown – During restricted flow or low battery conditions, the sampler will shutdown. HOLD will display on the LCD and timing functions will pause. LO BATT or FLOW FAULT will display on the LCD. To restart from flow fault, correct the blockage and press Start/Hold. If LO BATT is displayed, recharge battery.
3. Display Times – Elapsed sampling period is continuously displayed on the LCD. Press and hold Pump Run Time to display pump run time. Press and hold Total Elapsed Time, to display total elapsed time, including delayed start time.

3.2 Low Flow Application Pump (Mercury)

3.2.1 Initial Setup

1. Ensure the pump is set for low flow: Remove the tamper –resistant cover. Start the pump using the on/off switch. Press Start/Hold. Press Flow and Battery Check. Adjust the flow using the flow adjust screw until the built in rotameter

reads 1.5L/min. The LCD should indicate BATT OK in the upper left corner. Press Flow and Battery Check to place the pump in Hold. Remove the cap screw covering the regulator valve and turn the exposed screw 4 or 5 turns **counterclockwise**. Replace the cap screw. The pump is now set for low flow.

3.2.2 Setting Flow Rate

1. Connect a single adjustable low flow holder on to the pump intake using ¼ inch Tygon tubing.
2. Insert a opened sorbent tube into the rubber sleeve of the low flow holder with the arrow on the tube pointing toward the holder. (NOTE: Sampling medium for mercury consists of an iodated carbon trap. All sampling media will be supplied and pre-certified by the analytical laboratory.)
3. Connect a flowmeter to the exposed end of the sorbent tube.
4. Loosen the screw on the low flow holder. Activate the pump by pressing Flow and Battery Check.
5. Adjust the flow rate by turning the brass flow adjustment screw on the holder until the flowmeter indicates the desired flow. **Note: DO NOT** adjust the flow on the pump. Adjust the flow only by using the brass screw on the low flow holder.
6. When the desired flow is set, place the pump in Hold by pressing Flow and Battery Check. Disconnect the flowmeter. Replace the sorbent tube used for setting the flow with a new unexposed sorbent tube for sample collection. Keep the end caps on the tube until sample collection begins. (NOTE: For the 130 Liberty Street ambient air program, the desired flow rate is 0.4 liters per minute which allows for collection of approximately 0.6 m^3 over a 24-hour period.)
7. Place the appropriate size tube cover over the tube, and screw it into place on the low flow holder.

3.2.3 Programming Delayed and Intermittent Sampling

1. <u>To enter Delayed Start Mode</u>: From Hold, press Set-up. Enter the number of minutes delay (up to 9999) before the sampling period begins by pressing Digit Select and Digit Set. Digit Select advances the flashing digit and digit set increases the value of the flashing digit.
2. <u>To enter Sample Period Mode</u>: Press Mode. Press Digit Select and Digit Set to enter the sampling time period in minutes. **Note:** The sample period is the total period in which sampling is performed and NOT the pump run time.
3. <u>To enter Pump Period Mode</u>: Press Mode. This is the actual running time of the pump. Use Digit Select and Digit Set to enter the pump run time. (NOTE: For the 130 Liberty Street ambient air program, the sampling time is 24 hours. Also, the Sample Period Mode and Pump Period Mode are equivalent for continuous collection of samples and will only vary when intermittent sampling is performed.)

3.2.4 Sampling

1. Remove the end plugs of the carbon traps while wearing clean nitrile or cotton gloves.
2. Place end caps into the bag in which the tube was received.
3. While the LCD displays HOLD start sampling by pressing Start/Hold. Record the start time. At the end of the sampling period, press Start/Hold and record the stop time. Verify the flow rate at the end of the sampling period (see Section 4.0).
4. Place plugs back on carbon traps while wearing clean gloves.

Options During Sampling

1. Pause – Pause (shutdown) the pump by pressing Start/Hold. All timing data will freeze. To resume sampling, press Start/Hold; timing data will resume.
2. Flow or Battery Fault Shutdown – During restricted flow or low battery conditions, the sampler will shutdown. HOLD will display on the LCD and timing functions will pause. LO BATT or FLOW FAULT will display on the LCD. To restart from flow fault, correct the blockage and press Start/Hold. If LO BATT is displayed, recharge battery.
3. Display Times – Elapsed sampling period is continuously displayed on the LCD. Press and hold Pump Run Time to display pump run time. Press and hold Total Elapsed Time, to display total elapsed time, including delayed start time.

4.0 CALIBRATION

The following procedure applies to both low flow and high flow applications. Flow rates are checked twice a day (before and after sampling).

1. Connect the pump inlet to a calibrator (i.e., primary source Dry-cell calibrator) with representative media in-line.
2. If the calibrator reads a higher flow rate than the pump is set for, adjust the pump until they are in agreement (within ±20%). If the calibrator reads a lower flow rate, adjust the pump until they are in agreement (within ±20%).

5.0 MAINTENANCE

Maintenance on the Universal Sample SKC pump consists primarily of cleaning the filter/trap. The pump is fitted with a filter/trap inside an intake port housing. The filter should be visually checked to assure that it does not become clogged. If maintenance is necessary, the following procedures should be followed:

1. Clean dust and debris from around the filter housing.
2. Remove the four screws and the front filter housing.
3. Remove and discard the filter membrane and O-ring.
4. Clean the filter housing.
5. Insert a new filter membrane and O-ring.
6. Reattach the front filter housing.

6.0 ADDITIONAL INFORMATION

A more detailed equipment manual is available from SKC and is located in the site office for any other questions about the Universal Sample Pump.