

**MODEL 910PC AIR SAMPLER  
OPERATIONS AND MAINTENANCE  
MANUAL**

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**XONTECK Inc.**  
**MODEL 910PC**  
**LOW FLOW AMBIENT AIR SAMPLER**

1.0 Introduction

This specification describes a low flow ambient air sampler that is designed to collect volatile organic compounds in ambient air. Ambient air is collected into 6-liter “Summa” electropolished canisters as outlined in USEPA TO-14 Method. A diaphragm pump is used to pressurize the sample canister up to 15 psi. A mass flow controller maintains a constant flow into the canister over the desired sample period. When sampling is not taking place the sample canister is isolated from the rest of the sampling system by a pulsed, magnetically latched solenoid valve. The use of a pulsed solenoid valve eliminates the temperature rise and out-gassing of organic compounds from the valve seat materials that might occur in a normally energized valve. Materials used in the sample path are limited to stainless steel and Teflon ® or Viton ®.

The Model 910PC sampler can be used with a Model 912 Multi-Canister Sampling Adapter to route air samples into up to sixteen canisters.

Scheduling for the Model 910PC sampler and optional Model 912 Multi-canister Sampling Adapter is controlled by an internal computer board. Sampling schedules are entered through the front panel keypad or from a remote computer via modem. Remote control of the sampling schedule allows the schedule to be altered when episode days are predicted. A “Reschedule” function allows a sampling schedule to be repeated at a later date without re-entering the scheduling information.

Time, date, pre-purge delay, flow set point and rate, average flow, pump and canister pressure, beginning and end pressure for all samples, elapsed time, sampling schedule, and power failure errors are displayed on the front panel display or on a remote computer via modem. A hard copy of the above parameters is printed on the front panel-mounted printer at the end of each sample period. A print-out of the schedule or sampling report can be requested from the front panel keypad or from a remote computer.

Sampling can be initiated manually from the front panel for the purposes of manual sampling, troubleshooting or to perform a “leak check” when connecting new canisters.

Teflon ® is a registered trademark of DuPont.

Viton ® is a registered trademark of DuPont Dow Elastomers.

Recovery from a power failure is automatic, the sample pump will turn on and the sixteen port valve in the Model 912 will automatically advance to the correct position when power is restored.

## 2.0 Physical Specifications

2.1 The Model 910PC sampler is enclosed in a rack mountable (7" high by 19" wide by 13" deep) aluminum chassis. Finish is white powder coat chassis with clear anodized aluminum front panel.

2.2 The total weight of the sampler is less than 35 pounds.

2.3 AC power is supplied through a three conductor AC input cord that plugs into a rear panel mounted AC power entry module. The power entry module has a integral fuse holder and rfi filter. Cord set length is 9'.

2.4 AC power requirements: 115 VAC  $\pm$  10%, 60  $\pm$ 3 Hz, single phase, 3 Amps maximum.

2.5 Sample inlet and bypass fittings: 1/4", stainless steel Swagelok. Sample outlet (to canister) fittings: 1/8", stainless steel Swagelok. The inlet and outlet fittings are mounted on the rear panel.

2.6 All materials in contact with the sample stream are stainless steel and Teflon <sup>®</sup> or Viton <sup>®</sup>.

2.7 All fittings are Swagelok stainless steel. All tubing is 1/16", 1/8" or 1/4" dia. Stainless steel.

2.8 Pressure transducers: Stainless steel construction.

2.9 Pressure transducer range: Pump output 0 - 30 psi, canister pressure 30" - 0 - 30 psi.

2.10 Pump: Stainless steel head with Teflon <sup>®</sup> or Viton <sup>®</sup> diaphragm. Minimum 1 liter per minute bypass flow at 30 psi. Pump is shock mounted to chassis.

2.11 Pump Pressure: Pump pressure is regulated by an adjustable, stainless steel, pressure relief valve. The valve is located on the rear panel and is typically set to 25 psi.

2.11 Mass flow controller: Porter Model 201.

- 2.12 Mass flow controller range: customer specified, typically 0 - 20, 0 - 50 or 0 - 100 sccm.
- 2.13 Display: Back lighted liquid crystal, 2 lines by 20 characters, 0.191" character height.
- 2.14 Keypad: Numerals 0 through 9, five function keys.
- 2.15 Printer: Panel mounted impact dot matrix, RS-485 interface.
- 2.16 Modem: Internal, 2400 baud, Telco interface via rear panel mounted RJ-11 jack.
- 2.17 Meets all PAMs and TO-14 requirements. System is certified clean before shipment.

### 3.0 Performance Specifications

- 3.1 Flow controller control range: 2% to 100% full scale, Operation of the flow controller within 10% of the end points is not recommended.
- 3.2 Flow rate drift: Less than  $\pm 2\%$  from the set point while the ambient temperature is held constant within  $\pm 1\%$  in a temperature range between 20° to 30°C.
- 3.3 Flow controller accuracy and linearity:  $\pm 2\%$  full scale.
- 3.4 Flow controller repeatability:  $\pm 0.5\%$  full scale.
- 3.5 Real time clock accuracy:  $\pm 1$  minute per month.
- 3.6 Flow display accuracy:  $\pm 0.25\%$  full scale.
- 3.7 Pressure transducer accuracy:  $\pm 1\%$  full scale.

### 4.0 Operation

The Model 910PC utilizes menu -driven software to accept operating parameters and display system information. System commands and variables are entered through the front panel keypad or remote computer. System information is shown on the front panel display or remote computer. Five "Function" keys are used to scroll through the system menu, increment or decrement numeric variables, branch to sub-menus, enter commands, and clear error messages. The numeric keypad is used to input numeric information.

## 4.1 Function keys

### 4.1.1 Arrow keys: The arrow keys are used to perform the following actions:

To step forward and back from one main display screen to another.

To step from one item to another after selecting (entering) one of the main display screens. The active item is underlined.

To increment or decrement a selected numeric item one unit at a time. The selected item will "flash" to indicate that it has been selected and changes can be made.

To change the answer to a yes/no (Y/N) query.

### 4.1.2 SELECT key. The SELECT key is used to enter the main display screens. Once entered, the active item within the screen is underlined. The SELECT key is then used to select the underlined item for modification.

### 4.1.3 EXIT key. The EXIT key is used much like the Enter key on a computer keyboard. Modified values are accepted and actions are initiated when EXIT is pressed. EXIT is also used to leave a main screen.

### 4.1.4 CLEAR key. The CLEAR key is used to clear an incorrect entry and reset some error messages. Pushing the CLEAR key after a numeric entry erases that entry and restores the previous value.

The CLEAR key is also used to reset all schedules and functions back to their "default" factory settings by performing a "Cold Start".

## 4.2 System menu. There are eight main screens in the menu.

### 4.2.1 Default screen - Displays time, date, power fail and flow error messages. Time, date, and unit ID # are set from this screen. A "Reset to Factory Defaults" command can be executed through this screen. Printed reports are requested on the front panel printer through this screen.

### 4.2.2 Pressure screen - Actual pump and current canister pressure are displayed on this screen. When a Model 912 Multi-Canister Sampling Adapter is used, channel start and end pressures are displayed at the end of a sample run. At the completion of a sample run a scan of the canister pressure(s) can be initiated and the results displayed on the front panel display or remote computer.

- 4.2.3 Flow/Pre-purge delay screen - Actual flow and pre-purge delay are displayed on this screen. Flow set point and pre-purge delay time are set through this screen.
- 4.2.4 Temperature screen - Actual system temperature is displayed on this screen.
- 4.2.5 Elapsed time screen - The actual sample time, flow average and total volume for each channel is displayed on this screen. Elapsed times, flow averages and total volumes are reset through this screen.
- 4.2.6 Schedule screen - Channel sample period date, start time and sample duration are input through this screen.
- 4.2.7 Leak check/manual run screen - For systems using a Model 912 Multi-Canister Sampling Adapter an automatic leak check can be requested through this screen. A manual run can also be initiated through this screen that allows a Model 912 channel to be selected and a manually timed sample run initiated for the purposes of manual sampling, troubleshooting or for leak checking a newly connected canister. A leak check or manual run can not be started during a sample period.
- 4.2.8 Reschedule screen - The reschedule screen allows an existing schedule to be repeated at a later date without re-entering the schedule.
- 4.3 Power failure recovery. Recovery from a power failure is automatic, the sample pump will turn on after a short delay and the sixteen port valve in the Model 912 will automatically advance to the correct position when power is restored. If the power failure lasts for more than 1 minute a power fail message is displayed in place of the Julian date on the default screen. Selecting this message will forward the operator to a special power failure screen where the affected channel # and power fail duration is displayed. If a power failure occurs or if the power is switched off during a sample run the output solenoid valve is automatically shut off. If the power failure lasts for less than 1 minute the power failure will not be recorded or displayed. The printer will print "READY" anytime that power is applied to the 910PC . The "READY" message is an indicator of power failures that last less than 1 minute.
- 4.4 Flow error message. A flow error message is displayed if the flow varies by more than  $\pm 10\%$  of the flow set point for more than 2 minutes. selecting this error message will forward the operator to a special flow error screen where the affected channel # and flow error duration is displayed.