

## URG- 3000N Carbon Sampler

FOR COLLECTION OF ELEMENTAL AND ORGANIC CARBON

The URG-3000N is designed to sample for organic and elemental carbon found in ambient PM<sub>2.5</sub>. The measurement of ambient carbon species is an important part of the United States national PM 2.5 $\mu$ m Chemical Speciation Network (CSN). The URG-3000N has been designed for the USEPA to achieve comparable data with the carbon measurements of the Interagency Monitoring of Protected Visual Environments (IMPROVE) PM<sub>2.5</sub> carbon module.

### Measurement Capabilities

Collects PM<sub>2.5</sub> particles on quartz filters. These filters are analyzed for organic and elemental carbon using Thermal Optic Reflective (TOR) analysis method.

### Features

- 1-in-3 day or 1-in-6 day filter sampling
- Active volumetric flow control
- Self-supporting stand to allow easy access to sampler and provide protection in field operation
- User friendly keypad for all operator interfacing

### Specifications

- Weather-tight with new improved stainless steel controller box
- 64" x 21" x 18", 61.4 kg (135 lb)
- Operates at -20° to 45° Celsius



# URG-3000N Carbon Sampler Component Details

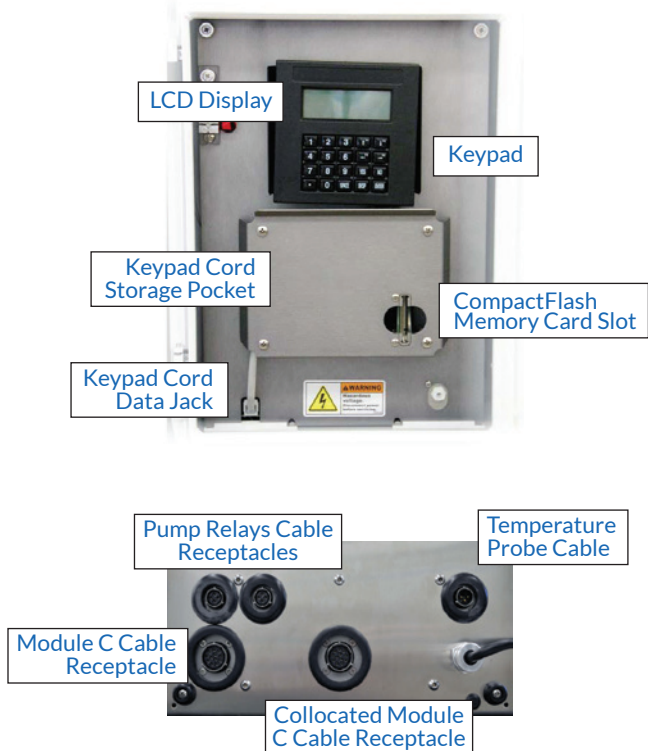
## Controller

The sampler controller is used to control the sample collection and acquire data during sampling. This consists of a controller, a terminal with LCD screen, a twenty-button keypad and the appropriate electronic components. The controller is shown below.

The lower portion of the figure shows the connectors on the bottom of the controller. The keypad and display terminal can be removed from the controller to be closer to the sampler modules. When left in the controller, the cord is contained in the storage pocket.

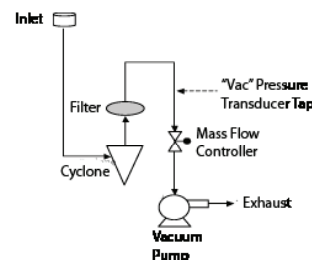
The controller:

- Provides a status of current sampler operations to the site operator
- Provides an interface for recording initial and final measurements of the filters during sample changes to the site operator
- Provides options for selecting sampling protocols. (1-in-3, 1-in-6, sequential, flexible etc)
- Up to 3 channels available for sampling
- Keeps the current date and time
- Switches the filter solenoids and pump relays on and off
- Records pressure temperature and flow measurements once a minute and averages are recorded on the CompactFlash memory card every 15 minutes
- Records the solenoid valve number that is open
- Downloads all the measurements to the removable CompactFlash memory card.



## Filter Cassette Cartridge

Filter cassettes and cartridges are manufactured specifically for the URG-3000N sampler. The two halves of the cassette snap together and are sealed with an O-ring. A special tool is required to separate and assemble the two halves. The individual cassettes are installed in cartridges with four cassettes per cartridge. Most cassettes are secured in the cartridges by a snap ring and cannot be removed easily. Each cartridge has a center hole and a small alignment hole. When the cartridge is placed on the cyclone manifold, alignment pins on the manifold prevent the cartridge from being installed incorrectly.



## Flow Diagram

The ambient air enters through a screened inlet on top of the stack. The screened inlet removes particles larger than 15 $\mu$ m. The air stream then passes through a cyclone that removes particles larger than 2.5 $\mu$ m. The cyclone is 50% efficient at removing particles with aerodynamic diameter larger than 2.5 $\mu$ m at the nominal flow rate of 22Lpm. It is volumetric flow controlled using a mass flow controller and corrections are made for temperature and barometric pressure variations.

## Additional Literature Available

- Complete URG Parts Catalog
- Compendium of Methods for the Determination of Inorganic Compounds in Ambient Air - IO-4.2 Determination of Reactive Acidic and Basic Gases and Strong Acidity of Fine Particles, USEPA publication 625/R-96/01a
- URG Systems Overview  
[Download at www.URGcorp.com](http://www.URGcorp.com)
- Compilation of research papers documenting URG Air Sampling Instruments from 1983 to present  
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