

Partisol® Model 2000 Air Sampler



Flexible Sampling of Particulate Matter...
The Original USEPA FRM Low Volume Single-Filter PM-10 Sampler

Analyze • Detect • Measure • Control™

Thermo
ELECTRON CORPORATION

Flexible Sampling Platform

The Partisol Air Sampler was the first USEPA Federal Reference Method sampler to include an embedded microprocessor with internal data storage and bidirectional communication, active volumetric flow control, simple filter exchange, and quiet operation.

It continues to offer features not found in any other USEPA-designated particulate matter (PM) sampler. These include its unique hub and satellite configuration, and the ability to support a wide range of sampling hardware such as filter packs. The sampler can be operated as a single-filter system, or as a sequential or random sampler. In its default configuration, it operates at a flow rate of 16.7 l/min (1 m³/h), and houses 47 mm diameter filters in FRM-style filter cassettes for single-filter or sequential sampling.

The Partisol system can be fitted with a PM-10, PM-2.5 or PM-1 inlet for size selection, as well as a TSP inlet for total suspended PM.

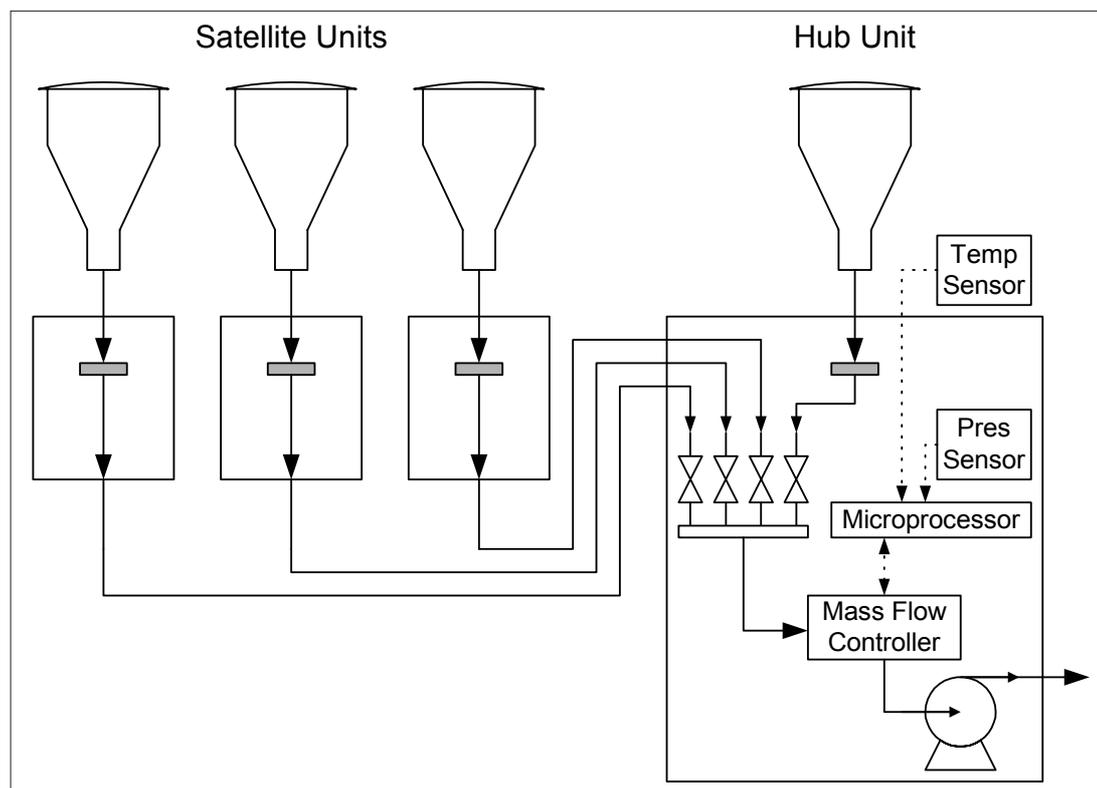


Hub Unit (Left) with Three Satellite Units.

Starnet™ System Configuration

The Partisol Air Sampler can contain up to four individual sampling stations to handle daily sampling requirements. This is accomplished through the system's hub and satellite configuration. The hub contains an active volumetric flow control system, electronic control and display hardware, an inlet and a filter exchange mechanism. Inexpensive satellite units are connected to the hub unit through a single flow line, and contain only an inlet and filter exchange mechanism. Solenoid valves in the hub automatically direct the system flow through either the hub or a satellite unit according to the sampling program defined by the user. Only one unit is active at a time.

In addition to basic sampling from midnight to midnight, users can program the sampler to operate by time and date range. For conditional sampling, the hardware can be triggered by wind speed and/or direction, under data logger control, or by remote serial communication. Sampling can also be set to switch back and forth between two sampling units at five-minute intervals.



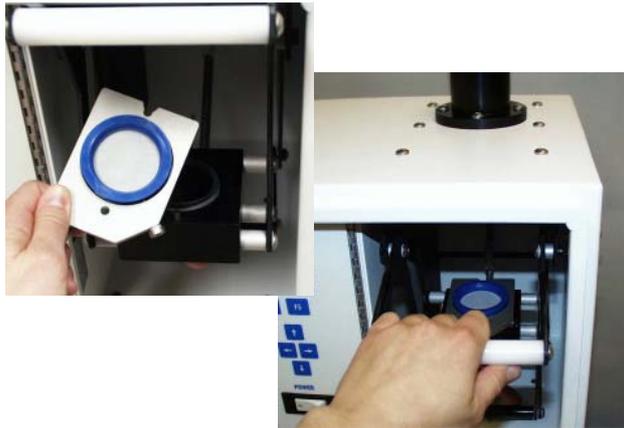
Regulatory Approvals

The Partisol Air Sampler conforms with the following major regulatory requirements:

- USEPA PM-10 reference designation (RFPS-0694-098).
- Reference equivalent method under European Norm 12341 PM-10 as documented by a report issued by the TÜV-Essen. Also conforms with European Union directives for the sampling of particulate matter for heavy metals analysis.



TSP Hub with PM-1 Satellite.

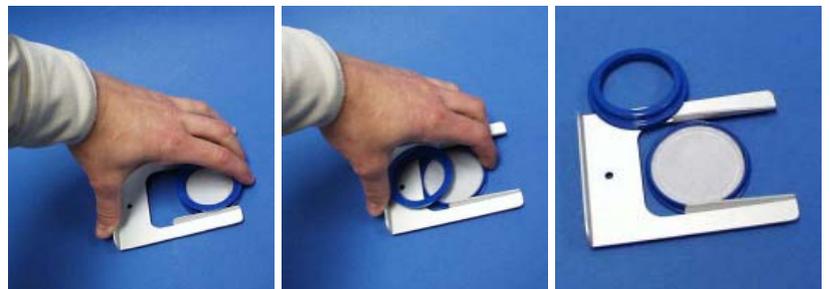


Filter Exchange and Sample Handling

The potential for contamination through direct hand contact with the filter is minimized by a carrier that holds the Partisol filter cassette. The filter cassette remains in the carrier during its entire time away from the weighing/analysis laboratory. A transport container holds up to two filter cassette carriers for protection in the field.

An optional filter cassette separator tool provides a convenient means of removing the 47 mm diameter sample filter from the cassette.

A unique serial number stamped on the bottom of the support screen in each filter cassette aids in recordkeeping. Blue-colored filter cassettes from Thermo are molded to ensure leaktight performance and consistency of fit.



Active Volumetric Flow Control and Audit/Calibration

An *active volumetric flow control system* maintains a constant volumetric flow at a user-defined rate (16.7 l/min by default). The sampler's microprocessor constantly adjusts the set point of the mass flow controller in accordance with the latest measurements from ambient temperature and pressure sensors. The use of a flow controller and buffering hardware in the sampler minimizes pressure pulsations and results in a very constant flow rate for proper size selection and fast flow audit and calibration procedures. Reported volume is expressed in terms of either actual or standard temperature and pressure.

The sampler contains built-in support for the Streamline™ Flow Transfer Standard, a highly-accurate and weather-resistant flow audit/calibration tool. This orifice-based flow measurement system has become a standard for audits and multi-point flow calibrations in the USEPA PM-2.5 national sampling network.



Data Input Capabilities

The Partisol Sampler measures, averages and stores the ambient temperature and pressure. In addition, a connector on the back panel of the sampler labeled "Anemometer" allows for the attachment of a wind vane/anemometer or the DustScan™ module.

When equipped with an optional wind vane/anemometer, the sampler also computes the average wind speed, as well as the vector-averaged wind velocity and wind direction. The optional DustScan device uses light-scattering technology to generate real-time trending information of the particulate matter concentration. It has the same internal diameter as the sample tube to avoid particle losses, and provides information that is automatically averaged and stored by the sampler.



ChemComb Cartridge, Filter Pack and PUF Sampler (Left to Right).

Flexible Sampling Options

The standard filter exchange mechanism may be replaced by optional mounting hardware to install a variety of alternate sampling devices. The sampling systems available from Thermo include the ChemComb® Speciation Cartridge, a 3- or 4-stage 47 mm filter pack, and a PUF (polyurethane foam) sampler with a 2-stage 47 mm filter pack.

Data Handling

The sampler stores operational data in filter-based and time-based data buffers. Users can access logged information through the user interface or a built-in RS232 connector. The communications port allows bidirectional information exchange with a PC or palmtop computer, or with a remote computer through the use of a modem.



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