

UPAS v2

Ultrasonic Personal Air Sampler

Revision 1.3
June 20, 2022



(Actual device size)

HIGHLIGHTS

Integrated size-selective PM inlets
Wireless setup via mobile application
Active, accurate sample flow control
Small and quiet; minimal ergonomic burden
Comprehensive, time-resolved data logging
GPS tracking
Long battery endurance for extended sampling



**ACCESS SENSOR
TECHNOLOGIES**

Sampling made simple.

Access Sensor Technologies' Ultrasonic Personal Air Sampler (UPAS) is a compact filter sampler built around ultrasonic pumping technology. The UPAS is smaller, lighter, quieter, more affordable, easier to use, and more robust than conventional air sampling equipment.

Minimal ergonomic burden: The UPAS is silent, small, and light enough to be worn directly in the subject's breathing zone. The interchangeable size-selective sample inlets and filter cartridges integrate directly with the pumping mechanism, so there's no need for cumbersome tubing or tape!

Sampling made simple: It's easy to set up the UPAS and download sample data to your mobile device using our Android or iOS application.

Reliable data: An active sample flow control system maintains the target volumetric flow rate even as environmental conditions change and the pressure drop across the sample filter increases. The UPAS automatically logs a comprehensive set of operational data to facilitate robust sample quality assurance.

"I like the UPAS because it is easier to use."

-Dr. Robert Blount, University of Iowa

SPECIFICATIONS

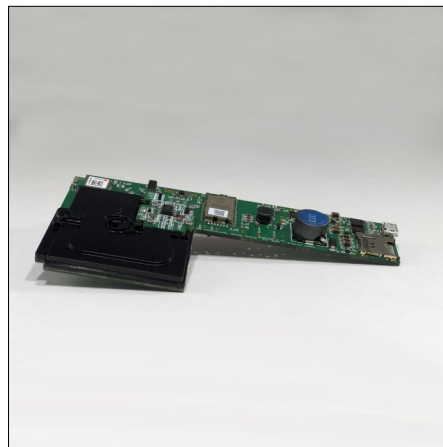
Exterior size	128 mm × 70 mm × 23 mm
Weight	230 g (with PM _{2.5} 1 L min ⁻¹ inlet)
Noise	<40 dB
Flow rate range	1 to 2 L min ⁻¹ ± 4% (actively-controlled)
Size-selective inlets (per relevant EPA, ACGIH, and ISO criteria)	PM _{2.5} , 1 L min ⁻¹ PM _{2.5} , 2 L min ⁻¹ Respirable, 2 L min ⁻¹ PM ₁₀ / Thoracic, 2 L min ⁻¹
Filter size	37 mm (quick-change filter cartridge)
Battery type	Li-ion, 24 W-h
Battery endurance	>35 h when sampling PM _{2.5} onto a PTFE filter at 1 L min ⁻¹ , extendable via duty cycle sampling or external battery/power connection
On-board sensors monitor:	<ul style="list-style-type: none">• Sample flow rate• Temperature/pressure/relative humidity• GPS location of UPAS• Differential pressure across the sample filter

These specifications depend on the filter used. Values reported here were determined using a 3 μm pore size PTFE filter from Measurement Technology Laboratories, LLC (PT37P-PF03).

SIMPLE FILTER REPLACEMENT



SIMPLE INTEGRATED DESIGN



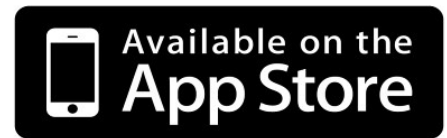
SIMPLE FORM FACTOR



WEARABLE FOR ALL AGES



INDOOR ENVIRONMENT

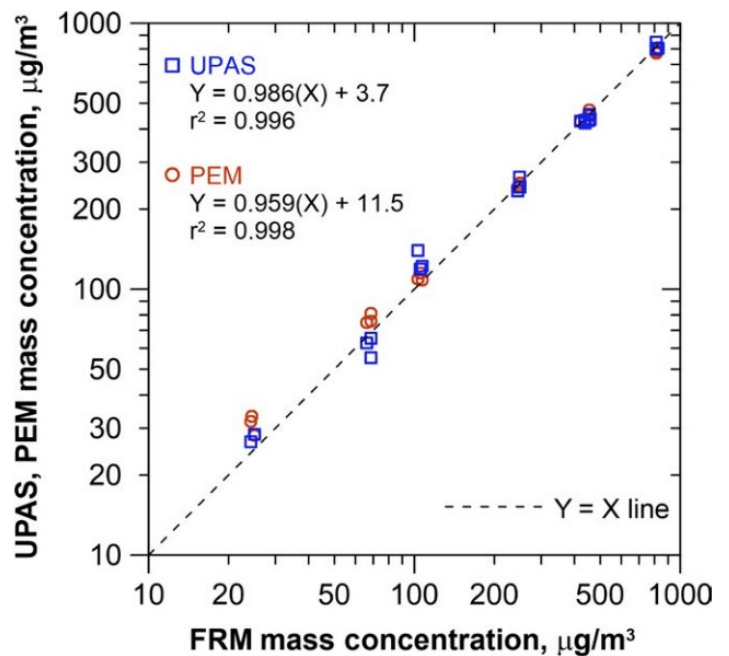


The UPAS has been laboratory- and field-tested alongside gold standards like the Harvard Impactor and the Mesa Labs/BGI Triplex Cyclone. For more information, see:

Volckens, J., Quinn, C., Leith, D., Mehaffy, J., Henry C.S., Miller-Lionberg, D. Development and evaluation of an ultrasonic personal aerosol sampler, *Indoor Air*, 2017, <https://doi.org/10.1111/ina.12318>

Arku, R.E., Birch, A., Shupler, M., Yusuf, S., Hystad, P., Brauer, M. Characterizing exposure to household air pollution within the Prospective Urban Rural Epidemiology (PURE) study, *Environment International*, 2018, <https://doi.org/10.1016/j.envint.2018.02.033>

Pillariseti, A., et al. Measuring personal exposure to fine particulate matter (PM_{2.5}) among rural Honduran women: A field evaluation of the Ultrasonic Personal Aerosol Sampler (UPAS), *Environment International*, 2019, <https://doi.org/10.1016/j.envint.2018.11.014>



Performance of the UPAS and a Personal Environmental Monitor (PEM + XR5000 pump) relative to an EPA Federal Reference Method (FRM) sampler for PM_{2.5} mass.

Access Sensor Technologies

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