Company information

- Naneos was founded on 1.1.2012
- We are a spin-off company of the institute for aerosol science at the university of applied sciences northwestern Switzerland
- We build on over a decade of experience in the design of aerosol instruments
Our mission

- Particle instruments are generally bulky, complex and expensive
- We build simple, robust and comparatively cheap instruments
Our technology

- Particles are charged electrically, and miniature currents are detected (well-known, used in many other instruments by many other companies)
- We use a novel non-contact detection by induced currents, which makes our instruments more reliable and robust, and allows for longer service intervals
1. **Unipolar diffusion charger, pulsed (on-off) to create clouds of charged particles**

2. **Faraday cage detector** – charge clouds induce equal and opposite currents on the detector.

![Diagram showing the process of unipolar diffusion charger and Faraday cage detector with labeled components: Pulsed high voltage, Charging current measurement, Ion Trap Voltage, Faraday Cage, Electrometer.]
Our instruments

Partector – the world's smallest nanoparticle detector

Partector TEM – with additional sampling capability for transmission electron microscopes (TEM)
Health relevant metric

The partector measures a health-relevant property, the lung-deposited surface area (LDSA) [µm²/cm³]. For every inhaled cm³ of air, the displayed number of µm² of particle surface area will be deposited in a typical human's lung.
10 good reasons

2 Miniature
At 13.4 x 7.8 x 2.9 cm, the partector is the world's smallest nanoparticle detector - it fits into a shirt pocket!
Lightweight
The partector weighs just 440 grams.
10 good reasons

Simple to use

Unlike handheld CPC's, the partector needs no working fluids that need to be refilled every few hours.
**Short warmup time**

Unlike other electrical particle detectors, the partector needs practically no warmup time – start measuring within 15 seconds after turning on the instrument!
Alarm capability
A built-in audible alarm with user-defined alarm level can alert users when particle concentrations are above a threshold level.
10 good reasons

Great battery life

Despite its small size, the built-in battery lasts for 12 hours due to careful low-power design.

Since the partector uses a USB connector for charging, you can extend battery life to 2-3 days by using any external USB battery pack.
10 good reasons

Wide size range

The partector can be used to measure particles in the size range from 10nm to 10 µm. Many particle detectors are limited to either small particles (e.g. below 300nm, typical for electrical particle sizers) or large particles (e.g. above 500nm, typical for optical instruments).
9. **Wide concentration range**

Measure particle concentrations between 1 – 20'000 µm²/cm³. This range typically corresponds to \(10^3 - 10^7\) particles/cm³, and covers all typical ambient particle concentrations, from very clean to very polluted air.
10 good reasons

10 Affordable

The partector costs about as much as a good light scattering mass monitor, or a cheap handheld CPC.
Use cases

Personal exposure monitoring
Monitor the nanoparticle exposure of persons working with nanoparticles, with 1-second time resolution. Useful in workplaces where nanoparticles are being produced, processed or handled. A neoprene carrying pouch with belt clip allows the partector to be mounted on person easily.
Use cases

Personal exposure monitoring
Combine partector data with GPS data (3 mouse clicks in provided software) to produce exposure maps with Google Earth
Use cases

Ambient monitoring

4 partectors deployed in Swiss air pollution monitoring network
NABEL for 6 months
Ambient monitoring

- Example: comparison with BC in Lugano
- LDSA generally correlates best with BC (better than with particle number or PM10)
- Much higher time resolution than BC measurement
Ambient monitoring

10 Partector units are deployed on buses in Lausanne, providing real-time air quality data in the entire city.
Use cases

**Ambient monitoring with GSM**

The partector can be integrated into a Decentlab-node – data is transmitted over the wireless phone network to the internet automatically
Use cases

**Diesel particle filter testing**

Prototype of a modified partector with integrated exhaust conditioning (dilution, drying, volatile particle removal) allows easy verification of DPF function in the field

info@naneos.ch / www.naneos.ch
The following companies are among our customers:

- ETH Zürich
- EPFL
- PSA
- KIT
- suva
- AVL
- ESA
- BASF